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Cogito ergo doceo: A cross-case study of Latin teacher cognition in technology-rich communities of practice

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Cogito ergo doceo: A Cross-Case Study of Latin Teacher Cognition in Technology-Rich Communities of Practice

by

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To Sandy

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ABSTRACT

This empirical research study investigated the phenomenon of ancient language teacher cognition in the technology-rich contexts of two secondary teachers of Latin. Although one teacher was an inexperienced teacher working in a traditional, face-to-face classroom in an independent school, the other teacher was an experienced teacher working at a public virtual school. Features of teacher cognition, such as pre-active planning and inter-active decision-making were examined from a communities-of-practice theoretical perspective (Wenger, 1998). An exploratory, sequential mixed-methods research design was implemented in this cross-case study. Among the research findings that emerged from this investigation was the notion of the expedient integration of technology (EIT). According to the researcher, EIT includes elements of selective integration, efficient integration, recursive integration, and progressive integration. The researcher discusses important implications that emerged from the study, including theoretical and practical considerations, and also presents several suggestions for future research.

Chapter 1

Introduction

Cogito, ergo sum – René Descartes

Introduction

Although second language acquisition is a relatively recent area of scholarly research, the seeds of its inevitable genesis and development can be traced back to the ancient biblical tradition about the Tower of Babel. Here, in the opening chapters of the Hebrew Bible, the people of the ancient world are described as sharing one universal language with a limited vocabulary. As the people communicate and cooperate in designing and constructing a tower that reaches into the heavens, the deity looks down at the project with disapproval. The Lord determines to confuse their language and to scatter the people across the entire earth (*Biblia Hebraica Stuttgartensia*, 1967). This primeval, Old Testament narrative not only provides an ancient traditional explanation for the obvious differences between languages, it also anticipates the research agendas of theoretical and applied linguistics, including the relatively new discipline of second language acquisition (Ellis, 2005; Ortega, 2007; VanPatten & Williams, 2007). That is, one can interpret this ancient narrative as an early Mesopotamian reflection on the widespread linguistic diversity between various groups of people, and an implicit desire to know more about this phenomenon. Since ancient times, therefore, curious people have contemplated the problems associated with cultural and linguistic differences

between people from various regions or nations, and how to bridge these gaps of communication. Sometime after the middle of the twentieth century, the academic field of second language acquisition (SLA) emerged to address these and other related questions (Abello-Contesse, Chacón-Beltrán, López-Jiménez, & Torreblanca-López, 2006). Ortega (2007) suggests that the field of SLA did not become an "autonomous discipline" until the close of the twentieth-century (p. 225). Despite over a third of a century of impressive, innovative, and interdisciplinary scholarly activity, however, researchers and practitioners have not achieved a unified theory of second language acquisition. And while significant progress has been made in understanding how languages are learned, and in promoting genuine communication and comprehension in the target language, many questions remain unanswered (Ellis, 1994; Johnson, 2004; Lightbown & Spada, 2006). In some ways, the situation appears to be almost as chaotic and confused as the state of affairs described in the account about the ziggurat at Babel. This is especially true of research in the related areas of ancient language acquisition, including ancient language teacher cognition.

Although much literature on teacher cognition reveals an uneasy ambiguity between the terms cognition and beliefs (Borg, 1998), for the purposes of this dissertation, teacher cognition refers to "the unobservable cognitive dimension of teaching – what teachers know, believe, and think" (Borg, 2003, p. 81). Hence, this term includes teachers' pedagogical knowledge and reasoning (Richards, 1998), teachers' beliefs, assumptions, and knowledge (Woods, 1996), teachers' personal practical knowledge (Elbaz, 1980; Golombek, 1998), teachers' theoretical beliefs (Johnson, 1992),

and teachers' conceptions of practice (Freeman, 1993; Freeman & Richards, 1993). Teacher cognition, therefore, is a general umbrella term that covers the thinking and reasoning processes of teachers, including their basic assumptions, presuppositions, attitudes, beliefs, pedagogical knowledge, content knowledge, and their personal practical knowledge.

Statement of the Problem

Among the disparate areas of second language acquisition and applied linguistics that have received significant theoretical and empirical research are the investigations of second language classrooms in general, and second language teachers in particular (Antón, 1999; Chaudron, 1988; Nunan & Wong, 2005; Pica, 1987). Second or foreign language teachers constitute that special group of individuals so intimately involved in the promotion and practice of second language learning. Although some researchers have begun to address several of the issues surrounding the belief systems of second language teachers (Ellis, 1990; Freeman, 1996, 2002; Richards, 1994, 1998; Wallace, 1991), including teacher thinking (Borg, 2003, 2006), almost no research has focused on teacher cognition in ancient or classical language teaching. Moreover, very little research has addressed the issue of how technology transforms teacher thinking and student learning when the target language is an ancient language no longer in use, and is now considered to be a "dead" language (Ball & Ellsworth, 1996; Fernandez, Howell, & Lavin, 2005; Janson, 2004).

Although Latin is studied by millions of people worldwide (Janson, 2004, p. 107), the examination of Latin teachers, their instructional philosophies, their beliefs about

teaching, how they go about their practices, and how they implement modern computer technologies into their pedagogical routines has not been the focus of much empirical research. Latin teacher cognition in technology-rich communities of practice is therefore a project worthy of scholarly attention, especially in the contexts of modern language teaching precisely because Latin is unique. It is an ancient language that is studied primarily for literacy in reading ancient texts. However, the use of modern methods of language instruction – including computer technologies – is the subject of some controversy among foreign language educators in general as well as among Latinists in particular (Abbott, 1991; Ball & Ellsworth, 1996).

While some educators and language department administrators believe that such modern methods should be used in teaching Latin (Gruber-Miller & Benton, 2001; Leloup & Ponterio, 2000; McManus, 2001; Miles, 2000; Shelton, 2000), Ball and Ellsworth (1996), on the other hand, argue that modern communicative methods of language instruction, including certain uses of technology, cannot be productively employed in the teaching of this ancient language. Although the concerns of these traditionally-minded classicists are understandable, especially in view of the economic realities facing many departments of world languages, questions about how Latin teachers view the infusion of contemporary teaching methods and tools in their pedagogy demand scholarly attention, nevertheless. Consequently, more research that explores ancient language teacher cognition is needed. The thinking processes, including the educational philosophies and pedagogical practices of Latin teachers who regularly work in technology-rich educational environments are worthy of social-scientific research. This

study examined the pedagogical beliefs, attitudes, philosophies and practices of two secondary educators of Latin who teach in environments rich in the use of computer technology, including the Internet.

Theoretical Framework of the Study

Maxwell (2005, p.33) observes that the theoretical framework or background of a research study refers to the "idea context" or "conceptual framework" of the proposed research project. It is the framework or grid that assists researchers in understanding the phenomenon under investigation (Anfara Jr. & Mertz, 2006). The examination of Latin teacher cognition in technology-rich environments, therefore, is situated firmly within the theoretical contexts of second language acquisition (SLA), computer-assisted language learning (CALL), and the social learning theory of communities of practice (CoP). Latin teachers do, in fact, teach a second language, albeit an ancient one that is no longer spoken as it was in the days of the ancient Romans. The dynamics of Latin classrooms rich in technology certainly reflect the theoretical contexts of SLA as well as CALL. The teachers examined in this empirical study work in schools that employ computer technologies, including Internet technologies, in the instruction of Latin. Moreover, they are involved in several different communities, including their classrooms, which help to shape their thinking as professional language instructors.

Due to the nature of the research questions, a theoretical framework that focuses on the dynamics of communities of practice was chosen for this empirical investigation. Although many behaviorist and cognitive learning theories have contributed to our growing knowledge of first and second language acquisition (Bloomfield, 1933; Francis,

2005; Gass & Mackey, 2007; Johnson, 2004; Long & Robinson, 1998; White, 2007), comparatively little research has explored the phenomenon of second language teaching in general or second language teacher cognition from the perspective of situated learning (Lave & Wenger, 1991) or communities of practice (Wenger, 1998). Additionally, there is scant empirical research that has examined the phenomenon of ancient language acquisition generally, including Latin teacher cognition, from this perspective. Furthermore, no previous research has explored the phenomenon of Latin teacher cognition in technology-rich communities of practice.

Purpose of the Study

The purpose of this study was to explore Latin teacher cognition in two technology-rich communities of practice. This exploration involved the pre-active and inter-active thinking of two secondary Latin teachers who frequently employ the use of computer technologies into their instructional routines. Furthermore, the purpose of this study included the examination of their pedagogical beliefs and their teaching philosophies. While the study focused on the detailed examination of two high school Latin teachers working in two distinctly different types of educational environments (private face-to-face classroom environment and public virtual school environment) in the Southeastern United States, the research design included a cross-case analysis of these two unique contexts. The theoretical drive or perspective of this project was therefore qualitative and phenomenological in nature, implementing a sequential exploratory (QUAL → qual) mixed methods research design (Creswell, Plano Clark, Gutmann, & Hanson, 2003; Gay & Airasian, 2003; Glaser & Strauss, 1967; Holstein &

Gubrium, 1994; Lincoln, 2005; Maxwell, 2005; Morse, 1991, 2003; Stake, 1994, 2005; Whyte, 1993).

Morse (2003) argues that each part of a qualitative, explorative (QUAL → qual), sequential research project is a self-contained study. Each component is independent and complete. Nevertheless, she maintains that "the strength of sequential projects is when they can be viewed as a set" (p. 201). In this research project, the second phase of the study (qual) was designed to complement and enhance the first and dominant phase of the study (QUAL). Furthermore, other research methodologists (Creswell et al., 2003) maintain that the primary purpose of a sequential exploratory design is to explore some phenomenon. The emphasis is usually placed on the first phase of the research project, and the findings of these two self-contained phases are eventually integrated and viewed holistically during the interpretation stage of analysis (p. 227). This empirical research investigation, therefore, consisted of two independent case studies that individually and collectively addressed the research questions.

Research Questions

The following three research questions, and the related sub-questions, formed the focus of this study:

1.0. What do two secondary Latin teachers think about as they go about their routines in a technology-rich environment?

1.1. What pre-active planning strategies do two secondary Latin teachers use in a technology-rich context?

1.2. What inter-active decisions does the Latin teacher in the F2F classroom make?

1.3. What inter-active decisions does the Latin teacher in the online classroom make?

2.0. How do two teachers reconcile traditional Latin pedagogy with their practice within a technology-rich environment?

3.0. What functions do the differing communities serve in the day-to-day practices of these Latin teachers as they use technology?

3.1. What function does the community of teachers (colleagues) serve in the day-to-day practices of these Latin teachers as they use technology?

3.2. What function does the community of administrators serve in the day-to-day practices of these Latin teachers as they use technology?

3.3 What function does the community of students serve in the day-to-day practices of these Latin teachers as they use technology?

These three questions, and their respective sub-questions, constituted the essential core of focus during the process of this mixed-methods (QUAL → qual) research project, although additional interesting aspects of inquiry also emerged from these two naturalistic contexts, the details of which will be enumerated below in the final chapter. Maxwell (2005) observes that the emergence of additional research questions is typical of qualitative research designs. New foci of inquiry surface throughout every phase of the

study, including the review of the literature, data collection, data analysis, and data interpretation (p. 67).

Rationale for the Study

There are, of course, many reasons for conducting social-scientific research in general (Newman, Ridenour, Newman, & DeMarco, 2003), and research into second language teaching in particular (Davis, 1995; Seliger & Shohamy, 1989). In their survey of research purposes, Newman, Ridenour, Newman and DeMarco (2003) present a typology or taxonomy of research purposes. They argue persuasively that research in the social sciences is not only to make measurements or predictions of behaviors but also to understand complex phenomena, generate new ideas, and to make an impact on institutions, organizations, and individuals (pp. 175-179). From a philosophical perspective, there are at least three rationales for pursuing an empirical investigation into Latin teacher cognition in technology-rich communities of practice. In the first place, the unusual and intriguing juxtaposition of modern technology with the teaching and learning of an ancient, extinct language is an inherently interesting phenomenon. It is worthy of scholarly attention and reflection in its own right. It is an obviously complex social phenomenon, as described in the typology of research purposes cited above (Newman et al. 2003), and this phenomenon beckons understanding, especially when teacher educators and policymakers debate the best use of limited resources (Ball & Ellsworth, 1996; Lister & Smith, 2001; McManus, 2001).

Moreover, in an era of second language teaching that has been characterized by the development and practice of a variety of communicative methods of instruction, such

as the direct method, immersion, the natural approach, whole language approach, among others (Byram, 2004; DeKeyser, 2007; Ellis, 2007; Klippel, 2004; Pienemann, 2007; Weihua, 2004a), a research study examining how contemporary methods and tools, including technology (Leloup & Ponterio, 2003) converge with the teaching of an ancient language, like Latin, is a worthwhile endeavor. The principal reason for this is to inform and to transform ancient language teaching practices in the twenty-first century. Almost all students today, especially those at the secondary level of instruction, are intuitive users of technology (Blaisdell, 2006; Wallis & Steptoe, 2006). The exploration of how modern technology can be utilized to maximize ancient language teaching – and consequent student learning – is an exciting and important area of social inquiry. Part of this exploration includes the attitudes, beliefs, instructional philosophies and assorted cognitions of Latin teachers who actually employ technology into their pedagogical routines. Why do they do this, and do they think that this employment of modern technology enhances student learning? Does the use of computer technology change or transform their professional thinking or practice, especially when viewed from the perspective of traditional methods of teaching Latin? This line of inquiry especially sharpens the focus of the second (2.0) research question stated above.

Finally, a third rationale for pursuing this study is to make a contribution to the growing knowledge base of three key areas of educational research: teacher cognition, computer-assisted language learning (CALL), and communities of practice learning theory (CoP). “Social science researchers investigate phenomena to add to what is known – knowledge that has intrinsic value. Researchers conduct studies to strengthen the

knowledge base" (Newman et al., 2003, p. 178). In turn, this contribution to educational research can make an impact on social, organizational, and institutional policies. For example, school superintendents and other policymakers may find the results of this research helpful in making decisions on the use and distribution of limited resources, both human and technological.

As Figure 1.1 (below) illustrates, there is a key gap in precisely this area of research. There has been no empirical research investigating the integration of technology with ancient language teacher cognition. Moreover, the discipline of ancient language acquisition (ALA) in general, as well as its corollary – ancient language teaching – is an entirely new field of inquiry (Overland, 2004). ALA is a sub-discipline of second language acquisition (SLA), itself a field of research within applied linguistics. Furthermore, although the exploration of Latin teacher cognition and CALL has not been done from any theoretical vantage point, this study examined these phenomena from the perspective of a relatively new social learning theory: communities of practice (Cousin & Deepwell, 2005; Lave & Wenger, 1991; Wenger, 1998; Wenger, McDermott, & Snyder, 2002). This particular social learning theory was selected for this study not only because it is a new and promising framework for investigating learning, but especially because it places learning "in the context of our lived experience of participation in the world" (Wenger, 1998, p. 3). One learns by participating in an event, by doing something. Questions about how such participation transforms teacher thinking and consequent student learning form the base for several exciting areas of social-scientific research. One such area is Latin teacher cognition in technology-rich communities of practice.

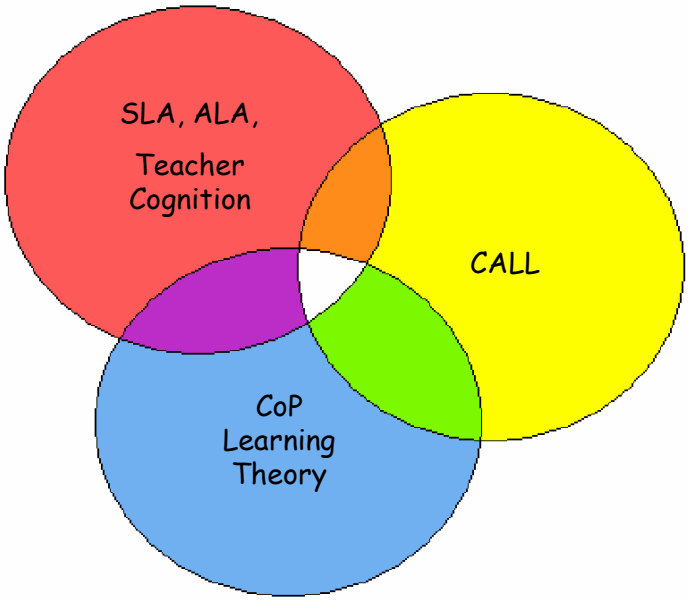

Figure 1.1. Theoretical Contexts of the Study.

Significance of the Study

Although many empirical research studies on teachers in general and on teacher cognition in particular have made significant contributions to educational practice during the last third of the twentieth-century, much work remains to be done (Clark & Peterson, 1986; Munby, Russell, & Martin, 2001; Shulman, 1987). Similarly, in the discipline of second or foreign language education, several studies have explored the area of teacher cognition, predominantly in the area of English as a second language (Borg, 1998, 2003; Freeman, 2002; Freeman & Richards, 1993; Sinprajakpol, 2004; Smith, 1996; Wallace, 1996; Woods, 1996). These empirical investigations have contributed to advances in foreign language teaching pedagogy and in the implementation of national standards in

foreign language education. No doubt, this empirical research into teacher cognition in technology-rich Latin classrooms will contribute to the venerable tradition of Latin pedagogy. Moreover, the examination of innovative instructional methods and strategies found in communities of practice that are rich in technology will be of interest to technologically-savvy foreign language educators in general, and Latin language teachers in particular. Language department heads and administrators will also benefit from the insights generated from the juxtaposition of ancient language learning and modern technology. Moreover, this research project offers insights into and ideas for course redesign and curriculum development for Latin educators that already integrate technology to some degree in their instructional strategies, but who wish to upgrade or enhance their pedagogical methods. This empirical study will also be of interest to publishers who are dedicated to developing Latin textbooks and other teaching materials that integrate technology into more traditional methods of Latin pedagogy. Moreover, software developers and designers will also benefit from insights into the needs of teachers and students who are looking for innovative tools to assist them in the enterprise of ancient language learning.

Definition of Terms

This section of the chapter identifies important technical terms and abbreviations which are commonly used in second language acquisition and instructional technology research reports.

Ancient Language. The term ancient language refers to a language that is no longer in use, although extant written documents of that language still survive. Examples

include: Biblical/Classical Hebrew, Classical Greek, Koiné [Biblical] Greek, Akkadian, Ugaritic, Ancient Coptic, Egyptian hieroglyphics, Sumerian Cuneiform, Sanskrit, among others (Woodard, 2004).

Ancient language acquisition (ALA). Ancient language acquisition, of course, refers to the phenomenon associated with learning a second language when that language is ancient and no longer spoken. The main objective in learning an ancient language is not to achieve oral fluency, but rather to acquire a reading knowledge of that language. Proficiency in literacy in the ancient language, of course, is necessary to decipher and understand ancient texts. For this reason, the dynamics of ancient language acquisition are somewhat different from the more general phenomenon of second language acquisition (Miles, 2000; Overland, 2004).

Asynchronous communication. Asynchronous communication refers to communication that does not take place in real time. That is, asynchronous communication typically occurs between the interlocutors at different time periods. Examples of asynchronous environments include electronic-mail, bulletin boards, and online discussion boards.

Classical Language. The term classical language is more specific than the general term of ancient language. There are two specific classical languages: Greek and Latin, although one finds occasional reference to Biblical Hebrew as Classical Hebrew (Weingreen, 1959). For the purposes of this study, however, classical language refers exclusively to ancient Greek and especially Latin. These classical languages were in common use in the environs of the Mediterranean basin from the period of the fifth-

century B.C. to the fall of Rome in the fifth-century A.D. Middle Latin or Medieval Latin, of course, refers to the widespread use of Latin for religious or liturgical activities in Medieval Europe, and to a lesser extent in Roman Catholic liturgies through the mid-twentieth century (Waquet, 2001). Although most Latin programs of study emphasize the classical Latin vocabulary and classical Latin texts, some exposure to Medieval Latin vocabulary and phrases is sometimes presented (Harwood, 2003; Janson, 2004; Keller & Russell, 2004; Waquet, 2001).

Communities of Practice (CoP). The term "communities of practice" refers to two referents: First, the expression "communities of practice" refers to a social learning theory first articulated by Lave and Wenger (1991) and later more fully developed and elaborated by Wenger (1998). Secondly, the phrase refers to actual communities that are actively involved in some practice that facilitates learning for the participants. Although Wenger has applied this theory principally to business and corporate contexts (Wenger, 1998; Wenger et al., 2002; Wenger & Snyder, 2000), he maintains that this conception applies to virtually every area of learning, including educational contexts, such as groups of students in traditional or virtual classrooms (Wenger, 1998, pp. 263-77). From an anthropological perspective, Lave and Wenger (1991) explored the phenomenon of apprenticeship among Yucatec midwives and naval quartermasters, among others (pp. 61-87). In this study, two communities that are involved in the practice of Latin language learning in contexts that are rich in technology were investigated.

Computer-Assisted Language Learning (CALL). Computer-Assisted Language Learning (CALL), as its name implies, refers to the utilization of computer technology

for SLA and foreign language education (Chapelle, 2001). The field of CALL includes the design and development of stand-alone software programs, such as computer-based training programs (CBT), Internet software such as web-based training (WBT) programs (Dick & Carey, 1978; Erben, 1999; Madrigal, Gomes, & Harrison, 2002; Reigeluth, 1999), and distance learning applications used for computer mediated communication (CMC) through distance learning technologies, including web-based learning platforms (Chapelle, 2001, 2004; Taylor & Gitsaki, 2004). Although there has been some discussion as to whether or not the term CALL is the most appropriate designation for this enterprise, a casual Internet search will easily reveal the widespread acceptance of this terminology (Levy & Hubbard, 2005).

Computer Mediated Communication (CMC). Computer Mediated Communication is one area associated with CALL that has received much attention among second language researchers and practitioners in the field of foreign language education (Chun & Wade, 2004; Ketchum, 2004; Lee, 1997; Perez, 2003; Warschauer, 1996, 1997; Williams, 2004). Advances in computer technology have provided language teachers and learners with an ever-growing array of powerful tools that can be productively used to enhance the learning process, in both synchronous (Arbaugh & Benbunan-Fich, 2005; Chun & Wade, 2004; Dziuban, Shea, & Arbaugh, 2005) and asynchronous environments (Hiltz & Goldman, 2005; Perez, 2003). An example of asynchronous communication would be the use of email to communicate in the target language. On the other hand, online chat sessions exemplify the use of real-time, synchronous communication in the second language.

Distance Learning. This term refers to learning that occurs when the participants are separated by geographical space. Although this type of education often takes place at the same time (synchronous), in many cases the participants do not communicate with each other or engage in learning activities at the same time. Instead, participants interact with each other at different times of the day using such tools as email and online discussion boards (asynchronous). Related terms include online learning, virtual learning and distance education (Gascoigne, 2004).

English as a Second Language (ESL). Without doubt, the lion's share of research in the fields of second language acquisition and second language teaching has focused on the study of English as a Second Language (ESL), although most modern languages have been represented in the research (Ellis, 1994; Gass & Selinker, 2001).

English for Speakers of Other Languages (ESOL). Closely related to the term ESL is the abbreviation ESOL, which refers to English for Speakers of Other Languages. ESOL refers to educational language programs designed to teach English for second language (L2) learners residing in the United States, the United Kingdom, and elsewhere (Ariza, Morales-Jones, Yahya, & Zainuddin, 2002, 2006; Peregoy & Boyle, 2001; Zainuddin, Yahya, Morales-Jones, & Ariza, 2002). The related acronym TESOL, of course, refers to teachers of ESOL or the practice of teaching ESOL.

Foreign language (FL). Foreign language is the term used to describe a language that is not the native or first language of a speaker, nor is it a language that is the common or official language of the place or country in which the language learner resides (Gass & Selinker, 2001). Typical examples include high school students learning German or

French in the United States, or university students in China learning English. Although this distinction between second language (L2) and foreign language (FL) is generally recognized in the fields of applied linguistics and second language acquisition (Gass & Selinker, 2001), for purposes of space and convenience this researcher will use the former term as a general cover to refer to both second language and foreign language respectively (Littlewood, 1984).

Interactive Planning. This term refers to the moment-to-moment, real time, extemporaneous and impromptu decision-making that teachers engage in while they interact with their students. It refers to the occasions where teachers are inspired to deviate from their pre-active planning or to elaborate or modify these lesson plans in some way (Clark & Peterson, 1986).

L1. This term is an abbreviation for first language or native language. See definition below on second language.

L2. This term is an abbreviation for second language; the target language of the learner, a language that is not the learner's first language.

Learning Strategies. Learning strategies refer to activities that students engage in for the purpose of promoting their own learning (Oxford, 1990, 1996). In this study, we are particularly interested in learning strategies that are encouraged by the teacher and developed by the students to foster ancient (Latin) language learning in technology-rich environments.

Pre-active Planning. Pre-active planning, as its name implies, refers to the planning and thinking that teachers engage in before they enter the classroom. It includes

general course and syllabus design, as well as specific lesson plans and discrete language activities. Although the use of brief and incomplete lesson plans constitutes teachers' "improvisational performance" (Yinger, 1987), this study will consider Yinger's term to refer to interactive decision-making.

Professional Practice. This term refers to the day-to-day activities of the second language teacher, including the teachers' pre-active, inter-active, and reflective planning and decision-making regiment.

QUAL → qual. The notations of QUAL and qual will be used from time to time in this research report. These notational abbreviations were developed by Morse (1991, 2003) as a systematic way to summarize the relationship between the dominant (QUAL) and secondary (qual) components of a qualitative research project that employs mixed methods of data collection. Although both phases of this study are exploratory and phenomenological in nature, the first phase of research is considered dominant, requiring the use of the upper-case abbreviation (QUAL). On the other hand, the second phase of research (qual) follows the first phase of research in scope and sequence, yet builds upon the initial findings of the first phase of research. Morse (2003) refers to a QUAL → qual design as a research project that uses two qualitative methods implemented sequentially, "one of which is dominant" (p. 197).

Reflective Planning. This refers to the retrospective thinking that teachers engage in after a teaching event or activity. Teachers may reflect on the relative success or failure of a particular lesson, thematic unit, course module or even an entire course or academic program (Bartlett, 1990; Birmingham, 2004; Richards & Ho, 1998; Wallace, 1991).

Teachers react to or reflect upon the activities of the classroom in an effort to inform and evaluate their work as second language teachers.

Second language (L2). Second language is the term used to describe a language that is not the native or first language (L1) of a student or language learner. While the term in many instances refers to a learner's second language, in many other cases the target language is actually a third or fourth language (Ellis, 1994). This term is typically used when the non-native speaker is learning or acquiring the target language in a place where that language is commonly used or is the official language of the state or country (Gass & Selinker, 2001). Typical examples include immigrants from Argentina or Mexico learning English in the United States or Japanese immigrants learning Spanish in Peru.

Second language acquisition (SLA). Second language acquisition refers to the process of acquiring a language that is not the native or first language of a language learner (Ellis, 1994; Gass & Selinker, 2001; Krashen, 1981). Many empirical studies in the field of SLA have been conducted in naturalistic settings, including educational classrooms. In this study, the related fields of classroom SLA (Antón, 1999; Chaudron, 1988; Donato, 2000; Pica, 1987), and especially second language teacher thinking, also called teacher cognition (Borg, 2003; Richards, 1994; Wallace, 1996; Woods, 1996), will receive particular attention.

Synchronous communication. Synchronous communication refers to interaction that takes place in real time, at the same time, but not necessarily at the same place. While face-to-face communication is obviously one type of synchronous communication,

other examples include telephone conversations, computer conferencing, and online chat sessions.

Teacher Cognition. See the definition of this term in the first section of this chapter (pp. 2-3 above).

Technology Enhanced Language Learning (TELL). Technology Enhanced Language Learning (TELL) is a virtual synonym for CALL, although it is more comprehensive in scope, including the latest innovations such as iPods, MP3 players, personal digital assistants (PDAs), sophisticated cell phone technology, as well as the constantly changing technologies surrounding the Internet (Bush & Terry, 1997; Delcloque, 2001).

Web-enhanced language learning (WELL). Web-enhanced language learning (WELL), as its name implies, refers to first-, second-, or ancient-language learning that implements the focused use of the World-Wide-Web, or the Internet, in the various instructional activities that are used in the curriculum or language program (Haworth, 1999).

Limitations of the Study

In keeping with the axiom that there are no perfectly designed research studies (Marshall & Rossman, 2006; Patton, 2002), there were several inherent limitations to this empirical investigation. This study was essentially a qualitative inquiry. As such, the traditional, quantitative research objective of generalizability was replaced by the corresponding objective of transferability, commonly employed in qualitative research (Guba & Lincoln, 2005; Lincoln & Guba, 1985). Nevertheless, although both phases of

research focused on the collection, analysis, and interpretation of qualitative data (QUAL → qual), some of the instruments used to collect these data were of a mixed type, corresponding to the fact that the two sites of research were inherently different (private, face-to-face classroom context vs. a public online, virtual classroom context). For example, a stimulated-recall interview protocol was implemented at the first site of research, but was not permitted by the administration at the second site of research. On the other hand, at the second location of data collection, several telephone interviews with students were implemented, but only face-to-face interviews with students were implemented at the first site of research. For this reason, Onwuegbuzie's (2003) expanded framework for external and internal validity threats will serve as a guide to describe the limitations of this study. This framework is not only employed in purely quantitative research projects, but also in studies employing mixed-methodologies, as in the QUAL → qual sequential, exploratory investigation herein described (Gorenc-Zoran, 2006).

Onwuegbuzie (2003) enumerates several possible threats or limitations to external and internal validity, including ecological validity, population validity, temporal validity, researcher effects, and researcher bias (pp. 80-81). The possible threat of ecological validity was present during this study since the participants were limited to two learning contexts in a limited geographical region. Although population validity is typically a concern in quantitative and mixed-methods research projects that employ a strictly random sampling procedure, the issue did not arise here since the sample for this research study was selected purposefully, not randomly. The two secondary Latin teachers who

agreed to participate in this exploratory study both teach in technology-rich learning environments.

Temporal validity was also possible, of course, due to the limitations of time imposed on the project for data collection. These time constraints were imposed on the researcher by the administrations at both sites of research, especially the second site. Nevertheless, the principle of temporal validity is true regardless of the actual amount of time scheduled for research. Phenomena change over time, naturally, and the collection and interpretation of data were inevitably limited by time (temporal validity) and space (ecological validity). Data on the two Latin teachers investigated in this study, and their students, were limited to a specific time period of approximately three months at each location. Furthermore, the influence of researcher effects was also quite possible in this – or any other – empirical study. Participants' typical behaviors and thoughts may have been modified in various ways, simply by being involved in a research investigation.

A possible limitation to the internal validity of this research study was the possibility of researcher bias. The particular perspectives and viewpoints of the researcher may inadvertently have been transferred to the participants of the study. Moreover, these viewpoints and perspectives may have influenced the creation and development of some of the themes or categories used to describe the phenomena under study. In this investigation, the taxonomies used to analyze and interpret the empirical data collected were generated from a conceptual framework that focuses particularly on a communities of practice perspective (Lave & Wenger, 1991; Wenger, 1998).

Although a thorough description of these limitations, along with considerations of dealing with them, is detailed in chapter three of this report, it is appropriate at this point to describe concisely how these limitations were addressed. The research design of this empirical study included inter-rater checks, member checks, and the implementation of a detailed audit trail to alleviate these limitations and to enhance the credibility, trustworthiness, and transferability of the findings of this empirical research (Huberman & Miles, 1994; Lincoln & Guba, 1985; Miles & Huberman, 1994; Ritchie, Spencer, & O'Connor, 2003).

Organization of the Remaining Chapters

The chapters that follow provide important background information that is relevant to this research project. Chapter 2 presents a summary of the social learning theory of communities of practice, the theoretical framework organizing this study. The influential phenomenon of computer-assisted language learning (CALL) is also explored, especially as to how technology is transforming foreign and second language education. Additional literature on CALL communities of practice is also considered. The chapter proceeds to a review of the existing literature on teacher cognition in the general mainstream of educational research and second language teacher cognition, including pertinent studies in second language teacher beliefs, second language teacher knowledge, and reflective teaching in second or foreign language education. The discussion next focuses on a concise sketch of the study of Latin since the times of the Roman republic, including the profound historical influence of Latin teaching on second and foreign language pedagogy. A discussion of various philosophies of second language teaching,

including philosophies about teaching Latin is also included. The last section of the chapter reviews research studies that focus on ancient or classical languages, including the emergent field of ancient language acquisition (ALA).

Chapter 3 outlines the methodological considerations of this study, including a description of the participants comprising the sample, an explanation of the sampling procedure, a survey of the methods of data collection, analysis and interpretation, evidence of ethical considerations and Institutional Review Board (IRB) protocol, and a discussion of the qualitative and pragmatist perspectives and strategies that were implemented throughout this research study.

Chapter 4 offers a description of the results of the study, including a recapitulation of the procedures that were implemented during the data collection and data analysis phases of research. A discussion of the creation and development of the various themes or categories that were used to synthesize and interpret the data is also included in this section of the dissertation. A detailed description of the thinking patterns and pedagogical routines of the two major participants of this study is also given.

The final chapter considers some of the important theoretical and practical implications that come out of this empirical investigation into Latin teacher cognition in technologically-rich educational contexts, and offers some suggestions as to critical areas requiring further research. The report concludes with a complete list of references cited in the text of this research report and several appendices that contain information supporting the statements made throughout the dissertation.

Cogito, ergo sum. I think, therefore I am. With these enigmatic words, the seventeenth-century philosopher and mathematician René Descartes (1596-1650) sowed the seeds of epistemological skepticism and inaugurated the era of modern thought. Rejecting the assertions of dogma and the methods of medieval scholasticism – most often articulated in the Latin language – Descartes built his entire philosophy on doubt. Beginning with the premise of his own conscious cognition, Descartes laid the foundation for a disciplined and scientific research methodology (Madrigal, 1999). Perhaps it is fitting to adapt these intriguing words of Descartes to the title of this dissertation on second language teacher cognition in technology-rich Latin settings. No doubt the two Latin teachers who participated in this research investigation can justifiably declare: *Cogito, ergo doceo*. I think, therefore I teach (Glare, 1982).

Chapter 2

Review of the Related Literature

El camino es siempre mejor que la posada. – Miguel de Cervantes

Overview

This literature review begins with an overview of the social learning theory of communities of practice, which constitutes the theoretical framework that organized this study. Examples of empirical research utilizing a communities-of-practice (CoP) conceptual framework are also reviewed. The discussion next proceeds to explore the widespread influence of computer-assisted language learning (CALL) in the fields of second language acquisition (SLA) in general, and foreign language education in particular. This research strongly suggests that technology enhances language learning and promotes genuine acquisition of the target language. Relevant studies that examine communities of practice engaged in the enterprise of CALL are also explored. The chapter next presents an analysis of the existing research on teacher cognition in the educational mainstream in general, including teacher beliefs, teacher planning, and teacher knowledge. This research provides the general theoretical framework for the disciplined examination of professional teachers, including formative influences on their concepts of learning in general and their ideas about teaching in particular. The review proceeds to examine the more focused area of second language teacher cognition, beginning with a survey of seminal studies in the field of SLA, which form the general

context for the study of L2 teachers. Significant studies in second language teacher thinking are next discussed, including reflective teaching in second or foreign language education, and second language teaching methods. Next, this literature review summarizes the profound historical influence of Latin teaching on second and foreign language pedagogy. Philosophies about the teaching of this ancient language are also considered. Finally, this review of the related literature examines relevant research studies that focus on ancient or classical languages, including Hebrew, Greek, and Latin.

Communities of Practice

Although there are many theories of learning prevalent in the research fields of education, psychology, and in applied linguistics, one theory that has received a significant amount of attention during the last decade is the social learning theory known as *communities of practice* (Smith, 2003). This theory was first articulated by Lave and Wenger (1991) and was subsequently developed and described more fully by Wenger (1998). Although there is some debate between Lave and Wenger as to who originally coined the phrase (Wenger, 1998, p. xiii), both scholars have labored diligently to develop their thesis that learning takes place in specific social situations where the principals involved actively participate in some worthwhile endeavor. In this way, the participants are engaged in an ongoing practice as legitimate members of a group or community. Membership in a community of practice, however, does not necessarily require face-to-face relationships nor easily seen social boundaries. “It does imply participation in an activity system about which participants share understandings concerning what they are doing and what that means in their lives and for their

communities" (Lave & Wenger, 1991, p. 98). This observation is especially relevant for this study, since the second phase of research (qual) focuses on an Internet community.

People learn, in other words, by doing. And people participate in various practices in a specific social context or community. It almost goes without saying, therefore, that in the technological era of the twenty-first century, there are countless virtual communities of practice, many of which are actively participating in the enterprise of learning languages (Johnson, 2001; Nichani & Hung, 2002; Sherer, Shea, & Kristensen, 2003). The learning theory of communities of practice, therefore, is situated in the larger theoretical contexts of social learning and social constructivism (Bandura, 1977). Learning is viewed not as consisting of merely a series of responses to a stimulus, as in the behaviorist tradition (Skinner, 1957, 1974), nor is learning perceived as merely the ongoing modifications of internal mental or cognitive processes within an individual learner, as in cognitive frameworks of learning (Chomsky, 1959, 1988). While Wenger (1998) does not suggest that his approach to learning is incompatible with other learning theories, he does maintain that his social perspective "takes for granted the biological, neurophysiological, cultural, linguistic, and historical developments that have made our human experience possible" (p. 279).

In a ground-breaking exposition of their theory of situated learning, Lave and Wenger (1991) collaborated in a powerful yet concise description of what they called "legitimate peripheral participation" (p. 29). This unusual and somewhat cumbersome term, according to the authors, focuses on the fact that "learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires

newcomers to move toward full participation in the sociocultural practices of a community" (Lave & Wenger, 1991, p. 29). Newcomers to the community, therefore, have a legitimate claim to at least participate in the group's activities and practices, even if this participation is limited to the periphery or fringes of the community's behaviors. As time passes, and as skills and knowledge increase, newcomers soon become more vital and integral to the mission and purpose of the community. In other words, newcomers eventually move from the periphery of participation to the center of participation in their respective community of practice. In so doing, the knowledge and skills that have been employed in their normal routines have been firmly synthesized. Authentic learning has occurred.

In this monograph, Lave and Wenger (1991) proceeded to examine the concept of apprenticeship, as this idea relates to their theory of legitimate peripheral participation. They cite five case studies that demonstrate the dynamics of learning in specific social contexts, which they call *communities of practice*. These five analyses of apprenticeship include: Yucatec midwives (all females), Vai and Gola tailors (all men), naval quartermasters in the United States Navy, supermarket butchers, and non-drinking alcoholics. The obvious diversity of these five cases only serves to highlight their similarities in demonstrating the characteristics of situated learning. In all of these cases, with the exception of the meat cutters, genuine learning was achieved by the apprentices as they gradually moved from peripheral participation to full engagement in the activities of the community. A dedicated, young apprentice learning the craft of tailoring, for example, contributes in various small ways to the production of the shop in exchange for

receiving ongoing opportunities to learn how to be a successful tailor (Lave & Wenger, 1991, p. 70). Although the tailor apprentices typically worked with a master tailor that was not a close relative, the Yucatec midwife apprentices usually were the daughters and grand-daughters of experienced midwives. In each case, genuine and practical learning was accomplished by engaged participation in the regular activities of tailoring and midwifery, respectively.

The cases of naval quartermasters and non-drinking alcoholics demonstrate similar learning trajectories. On the other hand, the apprenticeship of meat cutters serves to illustrate the fact that learning is not necessarily inevitable in all communities of practice. Some forms of apprenticeship hinder learning, rather than foster it. When journeymen meat cutters, for example, are prevented from learning important tasks of the trade – in order to learn one task well, such as wrapping cut meat in plastic – the effectiveness of their on-the-job-training is delayed significantly (Lave & Wenger, 1991, p. 78). But this exceptional case only serves to suggest that Lave and Wenger's basic thesis rings true. The case of the apprenticeship of grocery store meat cutters was characterized by peripheral participation in the community of practice that remained marginal. Participants rarely enjoyed the opportunity to become full-fledged butchers, or at least this process occurred rather slowly compared to the other four cases. Effective learning in communities of practice, therefore, can only occur when participation moves from the periphery to the mainstream of the communities' activities. If newcomers are consistently hindered or sequestered from legitimate participation in the community of practice, they will not effectively and efficiently learn the important practices of the

group (Lave & Wenger, 1991, pp. 100-105). Moreover, the newcomer's identity as an integral member of the community is suspect, and this likewise hinders progress in learning.

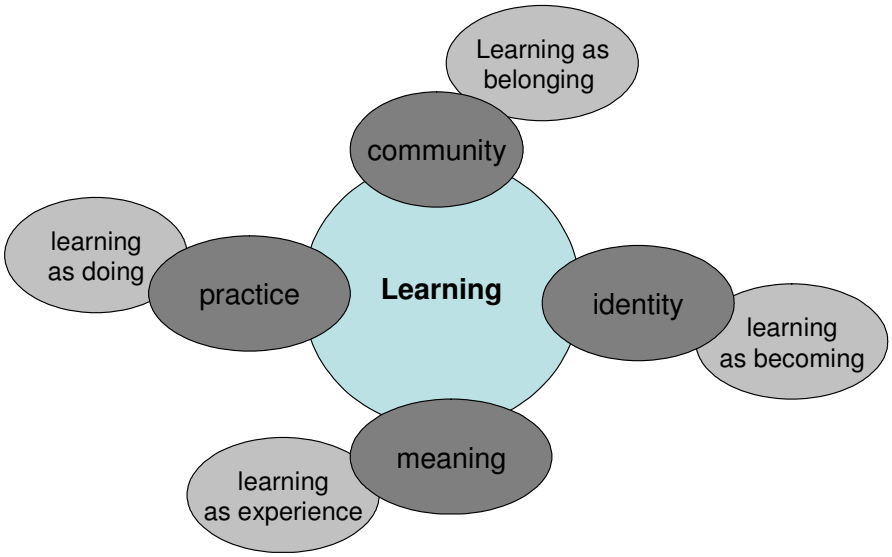

Figure 2.1. Components of Wenger's social theory of learning: Communities of Practice (Source: Wenger, 1998, p. 5).

Seven years later, Wenger (1998) published a detailed description of this theory of situated learning, entitled *Communities of practice*. In this monograph, Wenger more fully articulates the concept that learning begins with legitimate peripheral participation and subsequently moves to consistent and active engagement in a community of practice. Wenger focuses on an initial inventory of essential components to his theory of learning.

This inventory consists of four principal areas: community, identity, practice, and meaning (pp. 4-6). This investigation of Latin teacher cognition in technology-rich communities of practice, of course, focused on the analysis and interpretation of the phenomenon of ancient language teaching within these four principal areas (see Figure 2 above).

The component of *community*, expectedly, refers to the social context in which learning takes place. Human beings are social creatures, and as such learn about their world through social interactions with others. Describing this social context for learning is a key feature of social-scientific research. Moreover, Wenger maintains that this element of community is intricately fused with the area of personal identity. Secondly, the component of *identity* in his theory of learning is concerned with ways of describing how the learning experience transforms the identity of the learner as well as other participants in the community of practice. An individual develops a sense of self as he or she participates in the community. Next, the element of *practice*, as expected, refers to the shared practices, endeavors or enterprises of the community, whether these are the navigational procedures of naval quartermasters or the presentations of personal testimonials of non-drinking alcoholics in a support group of recovering substance-abusers. "Knowledge is a matter of competence with respect to valued enterprises – such as singing in tune, discovering scientific facts, fixing machines, writing poetry, being convivial, growing up as a boy or a girl, and so forth" (p. 4). Growing up as a boy or a girl, to focus on this example of Wenger, involves a child's participation in various communities, including family, school, playmates, and even his or her particular

community of faith (Madrigal, 2006). The recurring practices and routines that occur in these contexts help shape the developing child's identity and contribute to his or her knowledge of the world. Additionally, the area of *meaning* is an essential component of Wenger's description of his communities of practice theory of learning. The ultimate goal or objective of any piece of learning is to produce something that is meaningful, that adequately explains our active engagement and experience with a sometimes confusing world (p. 5).

In this research investigation, the focus was to explore and to describe two specific communities that are engaged in the practice of learning the ancient language of Latin in social contexts that are rich in modern technologies, especially computer and Internet technologies. The theoretical framework of communities of practice described above served as the lens or perspective through which the data collected during this study were analyzed and interpreted. Although the focus of this research was on the professional thinking of two secondary Latin teachers, the report also describes other participants in these secondary Latin courses, namely, the high school students in these two learning communities. The two contexts of learning – that is, the specific social environments in which learning occurs – were also explored and described in this empirical study, including the perspective of at least one colleague or administrator of each teacher. Unique student perspectives were also included in this investigation. Moreover, the study attempted to explore how these specific learning situations transform meaning and identity for all participants in the community, including students and

teachers. The thinking processes and activities of the two teachers constituted the central focus of this study.

Research into various communities of practice

Several recent studies illustrate how various communities of practice have been examined, explored and explained through this social theory of learning. Wenger himself makes regular application of his theory to business organizations and other corporate institutions (Wenger et al., 2002; Wenger & Snyder, 2000). An excellent case study that focuses on one educational community of practice is the Open Classroom that began more than twenty years ago in Salt Lake City (Rogoff, Bartlett, & Goodman Turkanis, 2001). The Open Classroom, or the OC, as it came to be called with affection, is an elementary school that was founded on the social learning principles of constructivism and discovery learning within an engaged community of children, teachers, parents, and other adults. The school actively recruits many adults who volunteer their time and talents to assist trained educators in the task of collaborative learning. In fact, parents or guardians of all the students are required to donate three hours of time per week to the activities of the OC for each child enrolled (p. 8). All participants collaborate in a variety of ways to promote the learning of the elementary school students. Of course, adults as well as children are actively engaged in the design, implementation and evaluation of many learning activities.

Over time, the OC has developed a sense of identity and belonging among the children and adults that participate in this particular community of learning. In the words of the authors and editors of this illuminating monograph, the concept of community

refers to “relationships among people based on common endeavors – trying to accomplish some things together – with some stability of involvement and attention to the ways that members relate to each other” (Rogoff, Bartlett, & Goodman Turkanis, 2001, p. 10). Cultural practices and traditions of the OC have developed during the twenty-plus years of its existence. These practices include not only the mechanics and processes of educating young people, but the development and maintenance of personal and community identities. Participants understand that they are part of a unique and dynamic educational community, and the way that they relate to one another is as important as the specific learning tasks that are planned and accomplished. Teachers in the OC, for example, have had to learn how to interact not only with each other and with their students, but also with a diverse group of parents and other adults who regularly participate in this community of educational practice. The multifaceted relationships include strategic planning of educational objectives, celebrating successes and dealing with occasional conflicts. Through the entire process, however, all members of this vibrant community of practice value their common goal of participating in the education of children. Wenger’s (1998) four components of meaning, identity, community, and practice are clearly visible in the daily interactions of the OC.

Similarly, this research study of Latin teacher cognition in two technology-rich environments explored these four components of Wenger’s (1998) concept of situated learning in two specific communities of practice. These elements of situated learning (meaning, identity, community, and practice) were used to explore and to describe the phenomena under investigation. As expected in most qualitative endeavors, additional

elements also emerged from this study. By means of the several methods of data collection that will be delineated in chapter three, including interviews with teachers, observations in the face-to-face Latin classroom, focus group interviews with students, and personal interviews with students, the researcher focused on the educational contexts of these two communities, including relationships among students, parents, and teachers. Because of this conceptual framework, the manner in which teachers integrate technology into their community of learning and how technology transforms the perspectives of these two communities of Latin teachers and students were topics of special interest throughout this project.

Other empirical studies have explored interesting and unusual communities of practice, including the transmogrification of four Mexican foreign exchange language teachers in the United States (Ban, 2006), communities of scuba diving practitioners (Lagache, 1993), teachers and learners of the Bible in congregational settings as well as in seminary schools (Mercer, 2005), network learners in a business environment (Cousin & Deepwell, 2005), information-technology professionals involved in English language teaching (Davison, 2005), the community and context of one secondary teacher of art (Hodkinson & Hodkinson, 2003), a community of learners of English as a second language (Toohey, 1998), physicians dedicated to using technology for professional development and continuing education (Parboosingh, 2002), the curricular negotiation experiences of thirteen adult students of a Spanish-for-healthcare professionals course (Bloom, 2007), and even the learning paths of twenty individuals devoted to the objective of becoming witches (Merriam, Courtenay, & Baumgartner, 2003). Of particular interest

for this research study, however, are the research studies that have explored the phenomenon of computer-assisted language learning (CALL) from a communities of practice (CoP) theoretical perspective. The following two sections provide a summary of CALL and a review of relevant studies that explore CALL using Wenger's (1998) social theory of learning.

Computer-Assisted Language Learning

Computer technology has become a critical part of what it means to be human in the third millennium (Salomon & Perkins, 2005; Sternberg & Preiss, 2005). Virtually all elementary, secondary, and traditional university students in the United States and other industrialized countries have never known a world without computers. From graphic-rich video games, email, iPods, PDAs, cell phones, Bluetooth, Blackberry technologies, and instant messaging to formal research reports using the Internet, young people seamlessly weave computer technology into the fabric of their daily routines (Wallis & Steptoe, 2006). People under the age of twenty-five embrace technology as an undeniable fact of life, perhaps because technology appeals to them at various levels, or even through multiple intelligences (Gardner & Hatch, 1989). It seems easy to understand, therefore, that these powerful tools of the information age should be harnessed for educational purposes, including the learning of second or foreign languages. Salomon and Perkins (2005) argue that technology not only provides learners with the opportunity to utilize some new and interesting tool, but actually enhances and modifies intellectual performance even when the technology itself is no longer being employed (p. 72). It is of interest to discover how CALL influences ancient language teacher thinking, including

teacher planning and instructional methodology. What follows is a review of the relevant literature on computer-assisted language learning (CALL) and second language teaching and learning. This summary not only reveals a key gap in the existing literature on CALL in ancient language teaching and learning contexts, especially from a communities of practice (CoP) theoretical perspective, but also provides key information about the use of CALL in L2 teaching.

The use of computer technology in general and the Internet in particular is revolutionizing how foreign language educators think about their craft, and how they facilitate learning for their students (Chapelle, 2001). The International Society for Technology in Education, along with the American Council on the Teaching of Foreign Languages (ACTFL) and other professional organizations, have developed the National Education Technology Standards (NETS) for teachers (International Society for Technology in Education, 2002). These standards are proposed to guide teachers, administrators, and teacher-educators through the ever-changing maze of technology. Moreover, these standards are designed to demonstrate how teachers may integrate technology in an effective way into their educational programs. As we approach the end of the first decade of the third millennium, it is imperative to explore how teachers are doing in the area of instructional technology. While this issue is vital in every area of education (Tetenbaum & Mulkeen, 1986), it has significant implications for the area of second and foreign language education (Chapelle, 2004).

The early history of CALL in the 1960s and 1970s was characterized by the extensive use of drill-and-practice type programs that simulated the audio-lingual method

of teaching foreign languages. Most programs were designed with behaviorist theories of learning as the framework for language instruction. Although many vocabulary and grammar drill programs are still in use today, their focus in the overall design of language teaching and learning has diminished significantly (Chapelle, 2001; Fotos & Browne, 2004). Transitions in second language learning theory as well as the development of powerful microcomputer hardware and software during the decade of the 1980s led to a second phase of CALL programs and CALL professional organizations.

This next generation of instructional technology has been referred to as Communicative CALL (Fotos & Browne, 2004, p. 5). This next wave of instructional technology and language learning placed great emphasis on interactive tasks and other activities that encouraged students to negotiate meaning in the target language. Rather than drills which focused on discrete grammar structures or vocabulary reviews, readings coupled with puzzles, cloze tests, writing practice, puzzles and other language games were developed to promote learner autonomy and peer collaboration (Chapelle, 2001; Kern & Warschauer, 2000). This period not only witnessed the creative development of computer software programs, but also the development of theoretical principles that supported the new technological innovations. Several seminal publications in the field of CALL appeared at this time, all focusing attention on the integration of technology with principles of first and second language acquisition (Ahmad, Greville, Rogers, & Sussex, 1985; Higgins & Johns, 1984; Underwood, 1984). Furthermore, important professional organizations in the field of CALL were established during this period, including the Computer Assisted Language Instruction Consortium (CALICO) in the United States and

its counterpart in Europe, the European Association for Computer Assisted Language Learning (EuroCALL).

More recently, the models for the effective use of CALL have focused on viewing technology as a stimulus for student motivation in learning the target language. Computer technology should be used to develop discovery learning and critical thinking skills (Levy, 1997). Students using computer technology are encouraged to become active learners who take responsibility for their own learning. Programs that encourage students to produce the target language, check their spelling and grammar with additional programs built into the software have been developed to promote student facility and manipulation of the second language. During the last decade of the twentieth century and during the first decade of the twenty-first century, CALL has featured the widespread use of the Internet, local area networks (LANs) as well as hypermedia technology to facilitate the use of linked resources, creativity and discovery learning. This most recent phase of the field has been labeled Integrative CALL (Fotos & Browne, 2004). Researchers and practitioners alike are stating that effective teachers in the twenty-first century must not only learn to use technology, but they must use technology to learn (Chapelle, 1998; Glenn, 2005).

Chapelle (1998), for example, suggests seven principles that classroom practitioners and multimedia designers need to consider when integrating technology into the L2 classroom. These principles are (1) making key linguistic characteristics salient, (2) offering modifications of linguistic input, (3) providing opportunities for "comprehensible output," (4) providing opportunities for learners to notice their errors,

(5) providing opportunities for learners to correct their linguistic output, (6) supporting modified interaction between the learner and the computer, and (7) acting as a participant in L2 tasks (pp. 27-28). Although these principles have been identified in many L2 research studies (Chapelle, 2001, 2004), virtually no research has examined how ancient language teachers may – or may not – apply these principles to the integration of technology in their ancient language classrooms.

Although there has been a veritable explosion of research in CALL during the last half of the twentieth century, virtually no empirical research has focused the lens of scholarly research on the phenomenon of CALL as it relates to ancient language teacher thinking. Similarly, no research has focused on ancient language acquisition or ancient language teacher cognition in learning environments that are rich in technology. Some studies, however, have examined CALL from a communities of practice conceptual framework.

CALL Communities of Practice

Among the research investigations that have examined various virtual or online communities of practice is a three-year study that examined the reflective thinking of 35 intern teachers that used asynchronous conferences over the Internet to post their communications (Hough, Smithey, & Evertson, 2004). Wenger's (1998) four components of learning were clearly present in this study as this online community of practitioners developed a sense of personal identity and mutual trust as they reflected on their professional practice as teachers. Content analysis was conducted on the interns' online messages. This analysis demonstrated that strong in-group relationships were formed

over time and that these relationships enhanced their sense of belonging to a special group or community. These relationships also contributed in no small measure to their personal growth and development as teachers. The nature of their online participation and the firm establishment of trust were two key components that emerged from this investigation. Similar findings were also observed in the present empirical study and will be noted in the fourth chapter.

One recent article poses the question of whether or not communities of practice can, in fact, exist online (Nichani & Hung, 2002). The authors suggest that virtual communities of practice are most effective when the social relationship between the participants has already been established. This finding echos the conclusions of a six-year study of mixed-mode distributed learning courses at the University of Central Florida (Dziuban & Moskal, 2001; Moskal & Dziuban, 2001). This study concluded that students in a mixed-mode or blended distance learning course consistently performed better than students enrolled in a fully online course or students enrolled in a traditional face-to-face classroom. Similar results emerged in two innovative undergraduate TESOL courses designed for pre-service elementary education teachers (Madrigal, 2004).

Other researchers and theorists have explored the dynamics of virtual communities of practice, especially as these relate to the professional development of educators (Brown, 2006; Hodkinson & Hodkinson, 2003; Johnson, 2001; Lander, 2005; Moore & Barab, 2002; Sherer et al., 2003; Sorensen & Murchu, 2004). Moore and Barab (2002), for example, explored the issues of faculty development and educational reform in secondary school classrooms. The Inquiry Learning Forum (ILF) is described as one

effective model for professional development, largely because of its Internet-based delivery and also because this method of continuing education creates new ties and links between in-service teachers, pre-service teachers, and university faculty. The authors conclude: "Applying a community of practice model to professional development, the ILF hopes to forge strong learning experiences and even stronger bonds between teachers of all levels as they seek to improve teaching and learning" (p. 49).

Sorensen and Murchu (2004) investigated the design and effectiveness of two online communities of practice, one in Denmark and the other in Ireland. Although Wenger's model was used as the conceptual framework guiding this study, Sorensen and Murchu focused on the design architectures of the delivery system for these comparable Master's level programs, and did not focus on the relationships between participants nor did they focus on issues of teacher thinking or teacher knowledge. The present research study, however, did focus on Latin teacher cognition in two technology-enhanced communities of practice. The distance learning method of course distribution was also a key consideration at the second site of research, a virtual school environment.

In a recent review of research investigating online communities of practice (Johnson, 2001), the author observes that the vast majority of such research consists of case studies. These case studies can be further classified into three categories: studies between groups, studies within groups, and detailed longitudinal investigations of individuals (p. 52). Of the 15 case studies surveyed by Johnson (2001), only one case consisted of a community of teachers (Fischer, 1998). This study explored the pre-service training of fifty-one middle school teachers in the Milwaukee Public Schools. Fischer

(1998) describes how these teachers collaborated in their learning outcomes and developed their own online learning styles by using Lotus Notes, an Internet-based learning environment. While this study did not specifically incorporate Wenger's (1998) four components of social learning, the elements of identity, community, meaning, and practice were certainly present. The study herein described implemented a case study methodology that focused on the practices of two communities involved in the enterprise of learning the ancient language of classical Latin in technology-enhanced environments. Moreover, the specific research questions were concerned with the general and specific ways that these two Latin teachers think about their professional activities in these dynamic learning contexts. Much educational research has been conducted in the areas of teacher thinking, pedagogical knowledge, personal practical knowledge, teacher planning, reflective thinking, and teachers' professional growth. These areas are now collectively referred to as *teacher cognition* by a growing number of researchers and scholars (Adams, 1996; Birmingham, 2004; Borg, 2003, 2006; Freeman, 2002; Golombek, 1998; Woods, 1996).

Teacher Cognition

Researchers have also examined the area of teacher cognition in the general mainstream of education, at all levels of instruction (Carr & Kemmis, 1986; Clark & Peterson, 1986; Eraut, 1994; Munby et al., 2001; Shulman, 1987). Nearly 20 years ago, for example, Shulman (1987) proposed that a significant area of research would be the collection and interpretation of "the practical knowledge of teachers for the purpose of establishing a case literature and codifying its principles, precedents, and parables" (p.

12). The examination of teachers, including their essential attitudes and beliefs toward their professions, their pedagogical knowledge, and their practical knowledge of their students and the contexts in which they operate all combine to form what is collectively described as teacher cognition. Moreover, Eraut (1994) has systematically explored the issue of knowledge and competence among professionals of all types, including teachers. Eraut is convinced that the same type of rigorous and cumulative professional development programs implemented in the disciplines of law, medicine and architecture must also be pursued in all professions, especially the issue of reflective practice in the teaching enterprise (pp. 199-201). Eraut suggests that professionals must regulate their own professional development programs and agendas to protect themselves and their clients from incompetence and unprofessional behaviors. For example, the core knowledge base of professionals, including the essential facts, concepts, theories and procedures necessary to conduct everyday business must be assimilated by the professional, and developed and refined over time (p. 200). Furthermore, Eraut maintains that the professional must also acquire the skills and attributes "for a professional approach to the conduct of one's work; and the cognitive processes which constitute professional thinking" (p. 200). It would appear to be quite logical, by extension, that skilled educators in general as well as ancient language teachers in particular must develop a similar regiment of professional growth and development. As will be seen in the cases of the two teachers examined in this research project, a focus on continuing education and professional development was considered to be a vital component of what they do on a regular basis.

In a similar vein, a growing contingency of social-scientific researchers maintain that research on educational practice is best conducted within a qualitative, constructivist framework that focuses on training teachers to become actively involved in the research process (Carr & Kemmis, 1986; Kemmis & McTaggart, 2005). Moreover, teachers must critically reflect on their own preparation and practice, and not merely delegate these activities to professional researchers. Carr and Kemmis (1986), for example, convincingly place this focus on reflective teaching within the ancient Aristotelian philosophical concepts of *techne*, *praxis*, and *phronesis*, which all refer to different aspects of knowledge (p. 34-5). *Techne* refers to basic craft knowledge, the technical types of knowledge that teachers regularly employ, such as basic communication skills, interpersonal skills, classroom management behaviors, and even how to raise students' test scores in specific subject areas, including their theoretical and conceptual contexts. *Praxis*, on the other hand, relates to the practical and pragmatic skills that teachers employ in their daily routines. It assumes a knowledge base that comes from experience. *Phronesis*, according to Birmingham (2004) has been translated as "practical intelligence, practical wisdom, or prudence" (p. 314). It involves the skills and abilities to apply general principles in specific contexts. Moreover, Carr and Kemmis observe that *phronesis* always involves a certain moral element to act truly, justly, and rightly (pp. 33-34). Furthermore, Birmingham (2004) maintains that these types of knowledge form the basis for a model of teacher reflection that is grounded in the ancient concept of virtue (p. 313). The explication of this concept of virtue was first systematically detailed by the ancient Greek philosopher Aristotle in his famous treatise, the *Nicomachean Ethics*

(Aristotle, 2006). Appropriately, the present study explored the thinking patterns and practices of two technologically-savvy Latin instructors as they pursue their teaching routines in technology-rich environments.

These issues that have been explored in the general educational mainstream during the past 20 years or so have also been studied within the context of second language and foreign language teaching. Within this research into second and foreign language teaching is the area of teacher cognition: the systematic examination of what language teachers think, know, believe, and do (Borg, 1998, 2003, 2006; Woods, 1996). Although there are many ways in which to explore the phenomenon of second language teacher cognition, Borg (2003) suggests that second language investigators can profitably and productively conduct their research within the framework or model that has already achieved widespread scholarly attention in the mainstream educational literature on teacher cognition. This literature has centered on three principle areas of study: cognition and prior language learning experience, cognition and teacher education, and cognition and classroom practice (Feiman-Nemser & Floden, 1986; Munby et al., 2001; Shulman, 1987). Although this framework could profitably be employed in the exploration of ancient language teacher cognition, the present study, on the other hand, pursued the phenomenon of Latin teacher cognition in technology-rich settings from a different perspective. Because of the nature of the research questions, this empirical investigation embraced a framework that focused on Lave and Wenger's (1991) model of situated learning. That is, contextual learning which occurs in particular and dynamic communities of practice (Wenger, 1998).

While most research into second language teacher cognition has explored teachers of English as a second language (Borg, 2003), some studies have focused on the thinking of teachers of other modern languages, including French, Spanish and English (Lam, 2000), German, English, Latin and Dutch (Meijer, Verloop, & Beijaard, 1999), French and Spanish (Freeman, 1993), and languages other than English (Brown & McGannon, 1998). In contrast to this plethora of research into second language teacher cognition among ESL teachers and among those teaching modern languages other than English, there is a paucity of research into teacher cognition among teachers of ancient or classical languages, such as Hebrew, Greek or Latin. For instance, although Meijer, Verloop and Beijaard (1999, 2001) conducted two studies that included teachers of Latin, these teachers were in the minority. Furthermore, Latin teachers received relatively little representation compared with their modern language counterparts teaching Dutch, English, French, and German. Moreover, there has been very little research into the integration of technology in ancient language learning. Hence, there is a significant need for more empirical research into the phenomenon of infusing computer technology into the study of ancient languages, including the examination of the beliefs and perspectives of ancient language learners and ancient language teachers. This study, of course, focused on only one of these ancient languages.

Teacher Beliefs and Cognition

Teaching is a profoundly complex phenomenon. Teachers' thought processes, beliefs, attitudes, philosophies and perspectives comprise a major dimension of the conglomeration of cognitive activities that we call teaching. Professional teachers

contemplate how they will impart specific, discrete units of information to their students, as well as how they will create and develop entire thematic units or modules that will facilitate their students' learning. Perhaps most importantly, these professional educators are actively involved in training their students how to think critically. Accordingly, teachers plan for their activities at a variety of levels, specific and general, and evaluate how these activities, tasks and procedures will impact the academic progress of their students. The formal research literature on the phenomenon of teaching is extraordinarily extensive, as evidenced in the appearance within 40 years of four editions of the *Handbook of research on teaching*, published by the American Educational Research Association (Gage, 1963; Richardson, 2001; Travers, 1973; Wittrock, 1986). This systematic examination into the phenomenon associated with teaching includes the development of theoretical models or paradigms that provide a framework in which to explore teaching (Floden, 2001; Hamilton & McWilliam, 2001; Shulman, 1986), philosophical perspectives from which to investigate teaching (Fenstermacher, 1986; Garrison & Leach, 2001; M. Greene, 2001; Moll, 2001), as well as critical discussions on the various research methods that are used to investigate teachers and the contexts of teaching (Crawford & Impara, 2001; Donmoyer, 2001; Erickson, 1986; J. C. Greene, 2001; Greene & Caracelli, 2003; Howe, 2001; Linn, 1986; Maxcy, 2003; Tashakkori & Teddlie, 1998, 2003a). In addition to this massive research into teaching in general, there has been a corresponding proliferation of research into the specific subject areas or disciplines, including the teaching of second languages (Borg, 2003; Hancock, 2001;

Nunan, 1999). In this regard, ancient languages – such as Greek or Latin – have received comparatively little attention.

Several seminal studies on teacher thinking appeared during the last third of the twentieth-century. One of the first descriptions of the cognitive processes of teachers appeared nearly forty years ago (Jackson, 1968). In this groundbreaking research, Jackson focused on the unique perspectives and planning categories of teachers. He distinguished between teachers' pre-active planning and interactive phases of activity. Pre-active teacher planning, as one would expect, refers to the mental activities such as curricular planning and the generation of specific lesson plans that teachers engage in prior to entering the classroom. Inter-active decision-making, on the other hand, refers to the real-time, synchronous decisions and behaviors that teachers do while they are actively engaged in the act of teaching. The distinctive terms of pre-active and interactive planning and decision-making are employed profusely in the literature on teacher cognition, both in general mainstream studies and in second language teacher research (Moallem, 1993; Peterson, Marx, & Clark, 1978; Yinger, 1977). These two areas of teacher thinking formed a significant portion of the data collection for this research study on two secondary teachers of Latin.

In 1974, the National Institute of Education sponsored a special conference on the subject of teaching to explore areas of the teaching enterprise that required focused research. The planning conference was divided into ten panels, corresponding to ten areas of specialization, including Panel 6 on "Teaching as Clinical Information Processing." Chaired by Lee S. Shulman, Panel 6 maintained that:

> It is obvious that what teachers do is directed in no small measure by what they think. Moreover, it will be necessary for any innovations in the context, practices, and technology of teaching to be mediated through the minds and motives of teachers. To the extent that observed or intended teacher behavior is "thoughtless," it makes no use of the human teacher's most unique attributes. In so doing, it becomes mechanical and might well be done by a machine. If, however, teaching is done and, in all likelihood, will continue to be done by human teachers, the question of the relationships between thought and action becomes crucial. (Clark & Peterson, 1986, p. 256)

The Panel compared the work of teachers to professionals in the traditional professions of medicine, law and architecture. Hence, a specialized research agenda on the unique thought processes of teachers was developed, resulting in the establishment of the Institute for Research on Teaching at Michigan State University two years later, in 1976 (Clark & Peterson, 1986). This organization has subsequently broadened its focus to include research into learning in general as well as teaching in particular. Subsequent research demonstrated several innovative and challenging methods to capture data on the mental activities of teachers.

Research Challenges

The serious and systematic study of teacher cognition has presented several significant challenges for social-scientific researchers. As Clark and Peterson (1986) observe, this type of investigation "depends heavily on various forms of self-report by

teachers, and the central methodological problem deals with how to elicit and interpret valid and reliable self-reports about cognitive processes" (p. 259). To address these concerns, researchers have made extensive use of think-aloud protocols (Peterson et al., 1978), journal keeping (Yinger & Clark, 1985), policy-capturing protocols and stimulated recall techniques (Clark & Peterson, 1981; Keith, 1988; Mangubhai, Marland, Dashwood, & Son, 2005; McMahon, 1995; Shim, 2004; Wodlinger, 1980). In addition to these creative methods of investigation, more traditional methods of interviews, observations, and document analyses have been implemented as well, especially in the area of second language teaching (Davis, 1995). This empirical research project implemented several methods of data collection, including interviews, observations, focus groups, document analyses, as well as stimulated-recall techniques of data collection for one phase of research (face-to-face teaching context), as well as interviews (personal, written, and telephone) for data collection in the second phase of research (online, virtual teaching context). Rationale for this procedure will be discussed below in the third chapter.

Teacher Planning

Perhaps the principal area of teacher thinking that has been explored, especially at the elementary school level, is teacher planning. During a typical academic year, no less than five distinct categories of teacher planning were identified in one of the first case studies on teacher planning: yearly, term, unit, weekly, and daily (Yinger, 1977). Using methods of data collection that included interviews, observations, field notes, and think-aloud protocols, Yinger (1977) investigated the planning processes of one elementary

school teacher that taught a combined first- and second-grade class. Yinger's doctoral research findings suggested that teacher planning is more recursive than linear. While teachers may make their initial plans based on a number of factors, including administrative demands for lesson plan submissions, to aid memory and reduce anxiety, or to meet established curricular goals, these plans later become part of the teacher's working frame of reference through a process of internalization and routinization. Yinger's model contrasts sharply with the most influential model of teacher planning that was first proposed in the mid-twentieth century (Tyler, 1950). There are four sequential steps to Tyler's (1950) Model: (a) specify objectives of the lesson; (b) select learning activities; (c) organize learning activities; and (d) specify evaluation procedures. While the Tyler Model has been prescribed for over 50 years in teacher preparation programs worldwide, more recent empirical studies suggest that the planning process is recursive, cyclical, and continuous throughout the academic year. As Clark and Peterson (1986) remark, the Yinger Model (1977) proposes a recurring design cycle "similar to the processes hypothesized to go on in the work of architects, physicians, artists, designers, and other professionals. In addition, [Yinger] acknowledges that schooling is not a series of unrelated planning – teaching episodes, but that each planning event can be influenced by prior planning and teaching experiences …" (p. 265). As noted above, this comparison of teaching to the more traditional and classical professions of architecture, medicine, and law has also been an important concept in theoretical work on professional development (Eraut, 1994) and in research on reflective teaching (Wallace, 1991). Beliefs and practices of teacher planning were of particular interest during both phases of this

empirical research study. It was evident, for example, in the case of the face-to-face classroom teacher (Natalie), that her approach to specific lesson planning was cyclical and recursive. On the other hand, as will be delineated in the discussion of the virtual school Latin teacher, the planning processes were more structured and definitely more linear in nature.

In their summary of four empirical studies on teacher planning, Clark and Peterson (1986) observed that while novice teachers created and developed more detailed lesson plans, more experienced teachers depended less on such detailed plans and focused more on the general flow of instruction over an entire week or unit of material. Furthermore, these research studies suggested that the planning process provides teachers with a broad working outline of the content to be presented, along with the general format of presentation, including grouping arrangements, but not the details of specific verbal behavior of either teachers or students. This research also underscores the fact that minute and miniscule details of classroom teaching cannot be carefully planned in advance. "Planning shapes the broad outline of what is possible or likely to occur while teaching and is used to manage transitions from one activity to another. But once interactive teaching begins, the teacher's plan moves to the background and interactive decision making becomes more important" (p. 267). Of course, these processes of teacher planning have been examined in the area of second language teaching at all levels of instruction for most modern languages (Huang, 2003). On the other hand, very little empirical research has explored teacher planning processes in ancient language educational programs. This is especially true for Latin teachers working in programs that

emphasize the use of technology in their language learning pedagogy. As will be seen in more detail below (Chapter 4), it became clear in the case of the teacher in the face-to-face Latin classroom that her pre-active planning quickly became a secondary consideration once the activities of real-time teaching commenced.

What were you thinking?

While the pre-active planning of teachers provides a broad, general outline of curricular goals and objectives, as well as general ideas about activity flow and student grouping arrangements, these plans quickly move into the background once the activities of classroom teaching actually begin. Research on teacher cognition has attempted to describe the thoughts and decisions that teachers make while engaged in various interactions with their students. Much of this research has focused on the cues or reasons that prompt teachers to change or modify their original lesson plans. The predominant research methods that have been employed in these studies are stimulated recall interviews, using video recording devices that collect detailed data on classroom interactions. Clark and Peterson (1986) list twelve studies in a table that summarizes and describes this research procedure (pp. 270-71). It is noteworthy that none of these studies examined teachers at the secondary level of instruction, not to mention post-secondary contexts. Only one study was conducted in a middle school location (Clark & Peterson, 1981), while 11 studies took place in elementary school contexts, including one doctoral research project that examined the thinking processes of one sixth-grade teacher (Wodlinger, 1980). Although Clark and Peterson (1986) report that several researchers video-recorded only one lesson per teacher studied, most investigations employing

stimulated recall techniques taped more than one lesson for each teacher studied (p. 268). The research design for the present study on teacher cognition in secondary Latin classrooms included two video-recordings for the Latin teacher operating in a traditional, face-to-face classroom environment, followed by the corresponding stimulated-recall interview sessions. The interactive decision-making of the second Latin teacher working in a virtual classroom environment, conversely, was explored through three personal interviews, through telephone interviews that included three students as participants, and especially through the interview with her colleague, who worked extensively with her as a co-teacher of the Latin I online course.

The stimulated recall techniques reviewed by Clark and Peterson (1986) typically involved the video recording of a teaching segment, ranging from a 15-minute lesson to teaching sessions lasting two and a half-hours. In one study (Peterson & Clark, 1978), researchers recorded teachers while they taught a two and a half-hour social studies lesson. Teachers then viewed the recording of the first five minutes of the lesson, and three 1-3 minute segments of selected sections of the video-recording. The following seven questions were then presented to the teachers in order to "stimulate recall" of their interactive thoughts during the lesson (p. 559):

1. What were you doing in the segment and why?
2. Were you thinking of any alternative actions or strategies at that time?
3. What were you noticing about the students?
4. How are the students responding?
5. Did any student reactions cause you to act differently than you had planned?

6. Did you have any particular objectives in mind in this segment? If so, what were they?
7. Do you remember any aspects of the situation that might have affected what you did in this segment?

One procedural consideration of the stimulated recall technique involves the decision of who determines which segments of the video recording to review: the researcher, the teacher, or both. For example, in the Peterson, Marx, and Clark (1978) study, the segments for review were selected by the interviewer. Conversely, in the Wodlinger (1980) study, the sixth-grade teacher commented on the segments of the video that she had selected herself (p. 72). During the two stimulated-recall interviews of the present study, both the researcher and the teacher selected the footage of the video to be examined.

Of these twelve studies that employed the stimulated recall technique, Clark and Peterson (1986) reviewed six of them that focused on the content of teacher's interactive thoughts. Although the content of teachers' interactive decisions included the areas of instructional objectives, subject matter issues, instructional procedures or instructional strategies, by far the most reported interactive decisions centered on student learning. Between 39% and 50% of teachers' interactive thoughts focused on their students. In the summary of their meta-analysis, Clark and Peterson (1986) emphatically declare that "in all of the six studies, the greatest percentage of teachers' reports of interactive thoughts were concerned with the learner" (p. 272). Also noteworthy is the fact that the six studies were "consistent in suggesting that, on the average, *teachers make one interactive*

decision every 2 minutes" (authors' emphasis, p. 274). An interesting observation about the six research studies reviewed by Clark and Peterson (1986) is that none of the interviewers informed the teachers that off-task thoughts, such as personal or family matters, also could be reported (p. 273). Consequently, only task-relevant thinking was considered in these studies.

Several paradigms of interactive decision making have appeared in the mainstream educational research, graphically depicting in flow-chart precision how teachers make their interactive decisions in the classroom. These models typically describe the process by which teachers shift from their pre-active plans and routines to alternative teaching activities. Although theoretical models of interactive decision making such as those proposed by Peterson and Clark (1978) and Shavelson and Stern (1981) have offered several insights into the interactive thinking processes of teachers, these models present inherent limitations and in any case may have been premature. According to Clark and Peterson's (1986) analysis, researchers should not propose new models of interactive decision making, nor modify existing models until more descriptive research is conducted on "how teachers make interactive decisions" (p. 278).

This stimulated-recall methodology has come under some criticism (Keith, 1988; McMahon, 1995). Although several studies using this data collection technique have been made recently in the area of second language research (Gass & Mackey, 2000), no new model of interactive decision-making has gained prominence. Moreover, in her critique of the stimulated-recall technique, Keith (1988) argues that the method does not, in fact, deliver on its promise to stimulate the accurate recall of teachers' interactive

thought processes and decision making. While the technique should not be abandoned altogether, she suggests that this technique realistically only allows teachers to reflect on their professional craft knowledge in a retrospective manner. Moreover, in his review of this research technique in the study of language teacher cognition, Borg (2006) suggests that stimulated-recall procedures are most effective when the researcher helps to prepare the teacher to reflect upon the selected video segments (p. 220).

The first phase of this research study (QUAL) called for two stimulated-recall sessions. To prepare for the first stimulated-recall interview with Natalie – the teacher that was the focus of this first phase of research – the researcher described the general concept of the procedure during the first informal interview session (See Appendix C and especially Table 4.1 below). Additionally, he also carefully explained the specific procedures that would occur two days in advance of the actual stimulated-recall session. As expected, Natalie was quite prepared to reflect on her interactive teaching activities during this first interview, and especially so during the second session.

Second language researchers have used the stimulated-recall technique for various purposes in recent years (Gass & Mackey, 2000; Mangubhai et al., 2005; Shim, 2004). In their important monograph on the subject, Gass and Mackey (2000) suggest that this technique can be used by researchers to explore four key areas in L2 research: interlanguage phonology, classroom interaction, oral production, and interlanguage pragmatics (pp. 113-122). The focus of this research has been on students in L2 and foreign language classrooms, rather than on teachers. One of the purposes of the present research project, however, was to contribute to this process of discovery and description

of Latin teacher cognition, including the interactive thoughts and decisions that take place in the face-to-face Latin language classroom.

Teachers' Knowledge

Without doubt, the area of teachers' knowledge, how it is acquired and how it develops, is a central issue in the field of teacher cognition. In their recent survey of the discipline, Munby, Russell and Martin (2001) provide an eclectic perspective of key concepts and studies that comprise an often vast and unwieldy area of educational research. Employing the use of a metaphor of travel to their meta-analysis, the authors characterize their survey as a "hitchhiker's guide" (p. 877) to research investigations on teachers' knowledge. Although the literature in this field is vast, the authors of this review do not attempt to provide an exhaustive examination of this literature. Instead, they focus on important conceptualizations of teachers' knowledge that are considered to be "new in the last 20 years" (p. 877). Several scholars have attempted to provide comprehensive, if not always comprehensible, conceptual frameworks for the study of teachers' knowledge and the larger discipline in which it rests, teacher cognition (Adams, 1996; Borg, 2006; Calderhead, 1996; Carter, 1990; Elbaz, 1980; Freeman, 2002; Golombek, 1998; Yoon, 2004).

Working within the perspective of teacher education, Carter (1990) considers the category of teachers' knowledge to consist of an epistemological mixing of three basic theoretical frameworks of teacher cognition: information processing, practical knowledge, and pedagogical content knowledge. Of these three frameworks, she thinks that the concept of practical knowledge is most useful, since this knowledge is linked

directly to the situational context of classroom teaching. Not surprisingly, Carter suggests that more empirical investigations be conducted using a phenomenological or case study approach. This cross-case study on Latin teacher cognition did employ such a phenomenological perspective. The various communities and contexts of teaching demonstrated that personal practical knowledge as well as pedagogical knowledge played significant roles in the cognitive activities of both teachers.

The doctoral research of Elbaz (1980) on teacher's practical knowledge and the work on how teachers employ contextual metaphors (Russell, Munby, Spafford, & Johnston, 1988) are examples of this phenomenological focus. Elbaz (1980) discovered five areas of practical knowledge that together form the practical knowledge base of teachers. These five orientations are: (1) situational, (2) experiential, (3) theoretical, (4) social, and (5) personal (p. 132-ff). Although all five aspects of teachers' practical knowledge were evident in the thinking of the two secondary Latin teachers who participated in the present research project, the areas of personal knowledge and situational knowledge were predominant. It is relevant to note, at this juncture, that empirical research into the practical knowledge and pedagogical knowledge employed by ancient language teachers, especially Latin teachers working in technology-rich communities of practice, has not been done previously. The present study, therefore, constitutes a pioneering contribution to this field of inquiry.

Perhaps the scholar cited most frequently in discussions of teachers' knowledge in general and of subject matter knowledge in particular is Lee S. Shulman, the current President of the Carnegie Foundation for the Advancement of Teaching at Stanford

University (Munby et al., 2001). In what is now widely considered to be his classic and seminal work on the subject of teachers' knowledge, Shulman (1987) describes seven categories that constitute the knowledge base of teachers: (a) content knowledge, (b) general pedagogical knowledge, (c) curriculum knowledge, (d) pedagogical content knowledge, (e) knowledge of learners and their characteristics, (f) knowledge of educational contexts, and (g) knowledge of educational ends, purposes, and values (p. 8). These seven types of teachers' knowledge emerged from Shulman's philosophical and empirical research program examining the mental lives of dozens of pre-service teachers as they developed into neophyte teachers. In this article, Shulman argues that even more research is needed to "collect, collate, and interpret the practical knowledge of teachers for the purpose of establishing a case literature and codifying its principles, precedents, and parables" (p. 12). While many have taken up this important challenge, no prior research has focused on teacher cognition or teacher knowledge in ancient language classrooms, including Latin. Similarly, although much research has focused on the infusion of technology into L2 teaching strategies in general (Bush & Terry, 1997; Leloup & Ponterio, 2003), very little research has focused on technology and ancient language teaching. In the present study, Shulman's categories of (a) content knowledge, (e) knowledge of learner characteristics, and (f) knowledge of educational contexts were particularly helpful in understanding the thinking patterns of the two principal participants. As will be seen in the discussion of the findings of this research (Chapter 4 below), both teachers rely heavily upon these types of knowledge as they plan for their lessons and as they interact spontaneously with their students.

Similar to Shulman's seven categories of teacher knowledge are Grossman's six domains of teacher knowledge (Grossman, 1995). These domains are: (a) knowledge of content, (b) knowledge of learners and learning, (c) knowledge of general pedagogy, (d) knowledge of curriculum, (e) knowledge of context, and (f) knowledge of self. While the first five of these domains replicate the first six of Shulman's categories (Grossman collapses general pedagogical knowledge and pedagogical content knowledge into one domain), the sixth domain constitutes Grossman's key contribution to this scholarly discussion. Undoubtedly the most unique and personal knowledge domain is the teacher's knowledge of self. Lave and Wenger (1991) and Wenger (1998) refer to this as the element of identity in their social theory of learning. This vital variable must be understood if the practitioner is to navigate the treacherous and often hostile waters of classroom teaching. Professional educators must clearly understand and assess their own personal strengths and weaknesses and adapt these attributes in an appropriate manner to facilitate successful learning experiences for their students. Academic researchers can assist in this process of professional development by collaborating with classroom practitioners in research projects designed to promote good practice in the field (Carr & Kemmis, 1986; Kemmis & McTaggart, 2005; Mertler, 2006). Without doubt, this research "should include investigation into all domains of teacher knowledge, examination of the connections among teacher knowledge, school context, student learning, and pursuit of the nature of knowledge and cognition" (Munby et al., 2001). The exploration of ancient language teacher knowledge in communities of practice that contain a significant amount of activities using computer technology will certainly

contribute to these issues of school context and student learning. For example, the issues of institutional context are clearly critical in the case of a virtual school where the principal method of course distribution is the Internet. Language educators, including those that teach ancient languages, need to have a clear conception of what it is that they are attempting to do using this medium of instruction. Moreover, the teaching professional will need to have a clear evaluation of his or her personal skills and strengths in the area of technology integration to even attempt the task. Grossman's sixth domain – the teacher's knowledge of self – played a key role in the investigation of the thinking patterns and pedagogical practice of the two Latin teachers who participated in this research study.

Focusing on the investigation of mathematics teachers, Borko and Putnam (1996) developed a typology of five categories of teachers' knowledge, including (a) situated knowledge, (b) event-structured knowledge, (c) personal practical knowledge, (d) images, and (e) knowing-in-action. While there are several obvious similarities between these categories and those of Shulman (1987) and Grossman (1995), there are at least two important differences as well. In the first place, there is the obvious emphasis on the local situation and context of the teaching event. Moreover, Borko and Putnam focus on the teachers' personal practical knowledge, including the ways images and metaphors are integrated into the knowledge base of teachers (Borko & Putnam, 1996). Philosophers of language, of course, have long maintained that imagery and metaphor is an inherent characteristic of human thought and communication in general, and not merely a pedagogical strategy employed by professional educators (Lakoff & Johnson, 1980).

Perhaps the key consideration in this analysis, however, is the idea of situated knowledge. As one would expect, this concept is very intimately related to Lave and Wenger's (1991) conception of legitimate peripheral participation and Wenger's (1998) component of community. Teacher knowledge exists in a certain social and cultural context, and this context helps to formulate teacher practices in general, and teacher attitudes and beliefs in particular.

Teacher Beliefs

Closely connected to the concept of teachers' knowledge is the concept of teacher beliefs. A cursory review of the literature confirms the fact that these terms are often considered synonymous. One scholar (Kagan, 1990), for example, stated that she often uses the terms "*beliefs* and *knowledge* interchangeably" (emphasis author's, p. 421). This state of affairs, as far as professional jargon or terminology is concerned, is unfortunate as well as frustrating and confusing. However, several scholars in the field of educational research have made attempts to contrast clearly the two concepts (Calderhead, 1996; Pajares, 1992; Richardson, 1996). Richardson (1996), for example, maintains that while knowledge claims must satisfy the philosophical criteria of truth and verification, claims about beliefs do not. Nevertheless, as Pajares (1992) observes, the concepts of values, predispositions, attitudes, opinions, perceptions, and personal ideologies all seem to overlap in the literature on teachers' beliefs. More recent research recognizes the inevitable blending of these concepts and terms, and implements the broader term of teacher cognition to serve as a convenient and comprehensive category (Borg, 2003; Woods, 1996).

Of particular interest to this research study, however, is the fact that these research studies cumulatively suggest that the beliefs and attitudes of teachers, including their general pedagogical knowledge, content knowledge, personal practical knowledge and their overall philosophy about education play a pivotal role in how they go about the practical business of teaching (Nunan, 1999; Nunan & Wong, 2005; Richards, 1998). As one might expect, this is not only true for the enterprise of teaching in general, but also for ancient language teaching in particular. The following sections discuss how teacher beliefs and philosophies about second language education not only constitute one area of the entire enterprise of SLA, but also inform the emerging discipline of ancient language acquisition, which includes the study of ancient language teachers.

Philosophies about Second Language Teaching

In his comprehensive analysis of the field, Ellis (1994, p. 667) compares the study of SLA to the methodical examination of a multifaceted prism. One can explore carefully each side and angle of the prism, making important observations and notations about relationships and similarities between the various faces of the prism. With every subsequent investigation, more is known about the prism, including its intricate complexity, and even its inherent beauty. No single study, nor composite of studies, however, has succeeded in producing a unified theory that adequately captures the essence of this prism known as SLA. VanPatten and Williams (2007) compare SLA research to the popular parable about four blind investigators examining different parts of an elephant. The blind man who touched the elephant's trunk came away from his "study" with a different albeit truthful description than the blind man who grabbed the

elephant's tail (pp. vii-viii). The ambitious objective of describing a unified theory of SLA is not likely to be achieved in the foreseeable future. In the meantime, however, it is profitable and illuminating to systematically examine the constituent parts or facets of this interesting phenomenon, including the special focus of this research investigation: Latin teacher cognition in technology-rich communities of practice.

Much early work in the field of SLA centered on the investigation of the L2 learner (Oller & Richards, 1973; VanPatten & Williams, 2007). Although the examination of learner language, error analysis (Corder, 1967), developmental sequences of SLA (Bailey, Madden, & Krashen, 1974; Dulay & Burt, 1974), as well as psychological and sociolinguistic factors of SLA have been examined from the perspective of the student or learner of the second language, researchers have also focused on the investigation of second language classrooms (Chaudron, 1988) and the phenomena of language teaching, including the careful investigation of second and foreign language teachers (Freeman, 1996; Nunan, 1999; Richards, 1994, 1998). These studies have not only contributed many insights into a growing body of theoretical research, but have also yielded many practical implications for second language pedagogy (Brown, 2000; Larsen-Freeman, 2000; Richards & Rodgers, 2001).

Richards (1998), for example, observes that the phenomena that have been recently identified as various aspects of L2 teacher cognition can be conveniently divided into two separate categories (p. 51). On the one hand, there are matters that relate to subject matter content knowledge and curricular concerns. These issues roughly correspond to five of Shulman's (1987) seven categories. The two areas excluded are

general pedagogical knowledge and pedagogical content knowledge, which correspond to Grossman's (1995) general domain of pedagogy, as noted above (p. 63). On the other hand, Richards suggests that the other type of teacher knowledge is intrinsically more important. This "other kind of knowledge relates to teachers' implicit theories of teaching – that is, their personal and subjective philosophy and their understanding of what constitutes good teaching" (p. 51). In discussing this matter of second language teacher philosophy, Richards outlines eight maxims of good teaching:

(1) Involvement – follow learners' interests

(2) Planning – pre-active, interactive, and evaluative

(3) Order – maintain order and discipline in the classroom

(4) Encouragement – seek ways to promote learning

(5) Accuracy – work for accurate language output

(6) Efficiency – make the most of class time

(7) Conformity – follow the prescribed teaching method

(8) Empowerment – give learners control over their own learning (pp. 53-60)

Although Richards details these eight maxims in terms of modern language teaching, it will become clear in chapters four and five below that these principles are also evident in ancient language teaching, at least in the cases of the two teachers of Latin that were the focus of this empirical study. The only maxim where this is questionable is Richard's seventh maxim on conformity. The reason for this is because the prescribed method for teaching Latin has historically been the grammar-translation method, and this

methodology is often perceived as being at odds with contemporary communicative methods of language instruction. Nevertheless, the study of this particular ancient language has been extremely influential in the pedagogical methods of second language teaching and learning since medieval times.

The Study of Latin

The Latin language has been extremely influential since the period of Roman dominance. In fact, scholars and historians have great difficulty in attempting to measure the impact of Latin on western civilization in general, and on the intellectual history of Europe in particular (Janson, 2004; Waquet, 2001). The first major translation of the Bible, to cite one prominent example, was Jerome's rendering of the original Hebrew, Aramaic, and Greek texts into Latin (Madrigal, 2005). Jerome's Latin Bible, later known as the *Versio vulgáta*, became the cornerstone for the Roman Catholic liturgy throughout Europe for over a millennium (Janson, 2004, p. 79). Furthermore, his translation has been consulted as a key reference in many new translations of the Bible into modern languages (Metzger, 1977, 2001). Near the beginning of the fifth-century AD, Augustine, perhaps the most renowned of the church fathers, wrote his *Confessiones* (Confessions) and his *De civitate Dei* (The City of God) in Latin. In the sixth-century, the Italian scholar Cassiodorus wrote a monastic handbook designed to train the monks to learn Latin, not only for religious purposes, but also to be educated in the liberal arts, including grammar, rhetoric, arithmetic, music, geometry, astronomy, and logic (Janson, 2004, p. 102-103). The great medieval monasteries throughout Europe disseminated their liturgical texts and sermons in Latin. In England, under political pressures, King John commissioned the

production of the famous *Magna Charta* in the year 1215. About five hundred years later, Sir Isaac Newton produced his most famous work on physics, the *Principia Mathematica*. As a matter of the scholarly protocol of the period, these key documents were written in Latin. These examples demonstrate that Latin was the language of learning. Any intellectual worth his salt learned to read efficiently and write productively in Latin. Most universities in Europe used Latin almost exclusively until the nineteenth-century. Notable exceptions by Descartes (1637) [*Discours de la méthode*] and Calvin (1560) [*L'Institution de la religion chrétienne*] opened the door for the academic use of modern languages (Küng, 1980). These classic works, theologian Hans Küng (1980) observes, "contributed in no slight degree to the abandonment of Latin as the language of educated people" (p. 4). Since the period of the Protestant Reformation and the Enlightenment, "Latin has had a much less eminent place in the schools of Europe, even though several million students study it every year" (Janson, 2004, p. 107).

Philosophies about the Teaching of Latin

Of particular interest to this research project, however, is the fact that the study of Latin became the premier model for how second or foreign languages were taught and learned well into the twentieth century. In fact, it became the only model. The grammar-translation method, as it came to be called, was based on the academic study of the classical languages of Greek and Latin, and is characterized by an almost exclusive focus on vocabulary memorization and detailed attention to rules of grammar and syntax (Weihua, 2004b). Therefore, it was no accident that primary education in North America was routinely labeled *grammar* school. While the connotations of the term nowadays

may include the study of English grammar, the earliest and most basic referent was, of course, the study of Latin. Although scholars and historians have shown that foreign language education before the twentieth century sometimes included inductive and communicative methods of instruction, these methods served only a minor role (Klippel, 2004).

A key element (See Research Question 2.0) of this empirical research into the cognitive domains of two secondary teachers of Latin working in contexts rich in technology focuses on this issue of teaching philosophy. This focus of inquiry concerns how these ancient language teachers reconcile traditional Latin pedagogy (grammar-translation teaching methodology) with their practice in technology-rich environments. These technology-rich learning contexts often include communicative elements and strategies in the teaching of modern languages. For example, the use of text-messaging or instant messaging often mimics the informal face-to-face conversation in the study of modern languages (Beauvois, 1998; Chism, 2004; Williams, 2004). How do Latin teachers adapt these modern tools and methods to their ancient language pedagogy? In their own thinking and instructional planning, do they think that such methods and strategies are possible or even desirable? The section below summarizes the development of modern communicative methods of second language teaching through the past century and concludes with a discussion of the philosophy of Latin language teaching.

During the last half of the twentieth-century, largely motivated by the momentous events of two World Wars, politicians and educators on both sides of the Atlantic developed and promoted several new methods of modern language instruction. The *direct*

method, which focused on the direct use of the target language as the vehicle of instruction, was used in Europe, especially in France and Germany (Weihua, 2004a). In the United States, the most popular method advanced immediately after the Second World War was the *audio-lingual method*. As its name implies, this foreign language methodology emphasized the use of audio or spoken language in short drill exercises, recorded and subsequently played on plastic records until replaced by cassette tapes. Following a behaviorist theory of learning, the audio-lingual method stressed repetition and drills of discrete items of vocabulary, common phrases, and inflections of nouns and verbs (Bloomfield, 1933; Byram, 2004). This method, to the exclusion of others, was employed extensively to highly motivated personnel in the armed forces in the United States as early as 1943. Fifteen foreign languages were taught, using an intensive course that included 15 hours of instruction per week for a nine-month period of time (Byram, 2004, p. 59). Prominent aspects of the audio-lingual method continue to enjoy widespread influence, most notably in the production and dissemination of modern language podcasts, typically accessed by language learners through iTunes software and Internet websites using mp3 files (Godwin-Jones, 2005).

The most widely influential methods of foreign language instruction to be advanced during the last quarter of the twentieth century, however, were communicative in nature. These methods of language teaching, without doubt, underscored the importance of language learners developing *communicative competence* in the target language (Canale & Swain, 1980; Savignon, 1972). Modern language teaching emphasized the objective of assisting L2 learners to negotiate meaning in realistic and

practical ways, often overlooking students' oral production errors. Canale and Swain (1980) discuss several key components of communicative language teaching, including grammatical competence, sociolinguistic competence, and strategic competence. Although researchers have explored the application of communicative methods to L2 classrooms (Savignon, 1997), these studies have largely ignored the study of ancient languages. This situation is most unfortunate, especially since the classic teaching techniques which focused on grammatical form and structure are now receiving a resurgence of interest among L2 researchers and L2 educators (DeKeyser, 1998; Doughty & Varela, 1998; Doughty & Williams, 1998; Harley, 1998; Huang, 2003; Lightbown, 1998; Porter, 2005; Williams & Evans, 1998). Porter (2005), for example, suggests that highly skilled teachers provide a significant emphasis on linguistic morphology at various junctures during the course of study (p. 188), but also encourage language students themselves to take responsibility for learning the grammatical and lexical forms (p. 194). Borg's (2006) recent summary of grammar teaching cognition is in congruence with Porter's evaluation (pp.109-134).

One of the central issues in this empirical study, as indicated above (p. 72) and in the introductory chapter (p. 8), is how two secondary Latin teachers routinely balance the traditional emphasis on grammatical form and vocabulary acquisition with the contemporary tools of technology, which may or may not include communicative instructional delivery methods. As one might expect, this objective can present unique challenges to teachers of a dead language. Some classicists, in fact, maintain that this goal of balancing deductive methods of instruction (grammar-translation methodology)

with more inductive methods (communicative) is dubious and suspicious (Abbott, 1991; Ball & Ellsworth, 1996; Miles, 2000).

Ball and Ellsworth (1996), for example, argue that the teaching of the Latin language cannot be profitably conducted using modern communicative methods of pedagogy:

> At recent conventions of the American Council on the Teaching of Foreign Languages (ACTFL), Latin session speakers have promoted teaching the language by the four skills approach. They tend to use such phrases as "living language," "oral/aural learners," "language of communication," etc., phrases that have become buzz words at Latin language sessions. The New York State syllabus *Latin for communication* (n.d.), applies the four skills approach to the teaching of Latin and provides guidelines for instruction in speaking, listening, writing, and reading. Although this syllabus emphasizes reading as the primary goal of Latin for communication, the Regents [sic] proficiency examination clearly includes questions that test the other three language skills. *Latin for communication* makes the unsubstantiated claim that as students learn to communicate in Latin, they will become uniquely equipped to "communicate more effectively in English" (p. 1). It further maintains that by studying the classical language, students will become increasingly equipped to "communicate with the ancient world" and to "open lines of communication to the future" (p. 5) … At the heart of these documents lies the refusal to admit what everyone knows – that Latin is a dead language, a language no longer used by human beings as a

> vehicle of communication. Although Latin lives on in the modern languages, (i.e. in words derived from the classical language), this polemical and paradoxical use of it as a living language has no place in a major academic syllabus. (pp. 78-79)

The above remarks clearly focus the nature of the current debate about Latin language teaching as an academic subject. Ball and Ellsworth (1996) not only maintain that modern communicative methods of L2 instruction should not be implemented, they also are quite critical of any non-traditional method of Latin language instruction, including the use of translations of modern texts into Latin. They cite the popular children's story of *Winnie the Pooh* as one unworthy example (p. 78).

Other researchers and educators in the field disagree and advocate that these approaches and strategies can be profitably employed in the Latin language classroom (Beard, 2004; Gruber-Miller & Benton, 2001; Ijsewijn, 1990; Lister & Smith, 2001; Nilsen & Nilsen, 2006). Nilsen and Nilsen (2006), to cite but one example, make a strong case for the use of the trendy Harry Potter novels for building vocabulary in the Latin language classroom. The infusion of children's literature, including traditional fairy tales, into the L2 classroom is receiving a resurgence of interest not only in the teaching of Latin, but also in the instruction of modern languages (Davidheiser, 2007).

Whether or not an ancient language teacher actually adopts and employs these modern methods of language instruction will depend in large measure upon their inherent beliefs about Latin pedagogy. This element of Latin teacher philosophy comprises one area of focus in this empirical investigation (See Research Question 2.0, p. 8 above). As will become clear in the following section, some ancient language teachers not only

believe that modern computer technology should be used in the teaching of ancient languages, but also that modern communicative methods of language pedagogy can also be used effectively.

Ancient Language Acquisition and Teacher Thinking

Although there has been relatively little empirical research examining teacher thinking in the area of ancient languages, including the classical languages of Greek and Latin, the studies that have been conducted suggest that there is much fertile pedagogical soil for researchers to cultivate. While this review of the literature has demonstrated that most of the research into second or foreign language teacher cognition has focused on the modern languages, especially ESL, at least one empirical study was conducted recently in a language classroom that relates to the issues of ancient language acquisition and ancient language teacher cognition.

Overland (2004) was curious to know if recent advances in SLA theory could, in fact, inform the practice of teaching and learning the ancient language of Biblical Hebrew. This ancient Near-Eastern Semitic language is no longer spoken. It is, however, principally pursued by students in undergraduate and graduate courses to acquire a reading knowledge of Hebrew prose and poetry. Basic literacy in this language is, in turn, foundational for the exegesis and interpretation of the Hebrew Bible (Madrigal & Madrigal, 2007). In his classroom experiment, Overland incorporated concepts from both the fields of CALL and SLA to the ancient language classroom. In an attempt to improve the quality and effectiveness of instruction to fifteen adult learners of Biblical Hebrew, Overland reviewed the research literature in SLA, especially in the area of

communicative competence and immersion. As he planned his two-quarter graduate level course, he incorporated instructional songs, relaxation techniques, language games, graphic charts and organizers, and elements of the total physical response (TPR) methodology (Asher, 2003) into his instructional routines. Additionally, Overland attempted to create an immersion environment to facilitate acquisition of the target language for his students. This was done using handouts of Hebrew vocabulary centered on classroom objects, people, and activities. When a necessary expression could not be produced using Biblical Hebrew, a Modern Hebrew substitute was indicated on the handouts. Overland (2004) observed that "Oral exchange was limited to Hebrew. Dialog sheets, however, were fully bilingual (including instructions), allowing rapid comprehension of any new vocabulary" (p. 53).

In addition to infusing elements of SLA theory, including current best practices, into his ancient language classroom, the teacher-researcher (Overland, 2002) created a CD-ROM software program to aid in the vocalization, pronunciation, and memorization of Biblical Hebrew vocabulary. Students were required to master the materials presented on this CD before the face-to-face class sessions began. To accomplish this, Overland sent this CD to all the students, thus infusing a measure of distance learning into his course. Fortunately, since that time, other audio programs have been published to aid the learning of ancient Hebrew pronunciation (Pratico & Pennington, 2006). Overland concluded that the infusion of SLA and CALL into his ancient language course improved the learning outcomes for all participants, based on course retention (thirteen of the

original fifteen learners completed the two-quarter course) and average cumulative course grade of 92.6 percent (Overland, 2004, p. 55).

Overland (2004) maintains that this "experiment using Second Language Acquisition methods in an Ancient Language Acquisition classroom indicates that communicative methods can benefit students by cultivating greater interest and skill in an ancient language. This follows in part from the apparent fact that communicative methods reach more students in more learning modalities than traditional methods" (p. 57). Moreover, the infusion of CALL software in a distance learning format helped to prepare students for the learning experience. Overland indicated that more research into the phenomena of ancient language acquisition is needed, especially as this research incorporates principles from the fields of SLA and CALL. His study (2004) constitutes an important, pioneering contribution to this new area of research. In a personal email correspondence (April 28, 2004), Overland indicated that the examination of teachers of ancient languages, such as Latin, would constitute a crucial area of inquiry in this emergent field of ancient language acquisition (ALA).

The present research investigation of Latin teacher cognition in technology-rich communities of practice fills an obvious gap in the literature in SLA in general and ALA in particular. The road that has been traveled in this review of the relevant literature has revealed a rich and vibrant scholarly landscape. It is expected that the contributions made from the present study will further advance human knowledge about this interesting and inviting linguistic terrain. Four centuries ago, the most prominent author of Spanish literature, Miguel de Cervantes, observed insightfully in his *magnum opus* that the "road

is always better than the inn" (Cervantes Saavedra, 1999). This maxim suggests that the process of traveling down the road itself is always preferable to actually reaching the inn, or one's final destination. Certainly, this metaphor implies that it is usually the process of pursuing some worthwhile endeavor, and not necessarily reaching the end of that endeavor, that is most meaningful. Perhaps the reader of this literature review and the ensuing research report will agree with Cervantes' aphorism. Consequently, the itinerary of the following chapter discusses the methodology that was implemented during this empirical study.

Chapter 3

Method

Our position is not logical; it is phenomenological. – Glaser & Strauss (1967, p. 6)

Phenomenological Perspective

What is research? The answer to this broad question has important implications for the social-scientific research enterprise in general and for this investigation into the processes of teacher cognition in two secondary Latin communities of practice in particular. One simple, straightforward answer to this query is this: research is the disciplined, deliberate, and dynamic process of discovering and describing the phenomena of the social world. While this definition could certainly be modified to suit the technical investigations of the natural sciences, especially those employing experimental, quantitative methods, it is especially suited to social-scientific research studies. Even within the social sciences, however, although this working definition encompasses the purposes and goals of deductive, quantitative research, it is particularly descriptive of inductive, exploratory, qualitative research. Such studies are typically conducted within the naturalistic contexts or environs in which these social phenomena occur.

This empirical research into the processes of Latin teacher cognition in technology-rich environments adopts such a phenomenological approach. This epistemology or view of truth, as Lincoln and Guba (1985) argue, "involves not only

propositional knowledge but also *practical* knowledge … and *experiential* knowledge" (emphases by Lincoln and Guba, p. 31). Whether the researcher is interested in understanding the complexities of the social life of urban slums (Whyte, 1993) or the professional planning processes of an elementary school teacher (Yinger, 1977), the guiding objective of the research study is to discover and to describe naturally occurring phenomena. The researcher asks: What is going on here? What is happening in this situation? How can the social phenomena under consideration best be understood, analyzed, synthesized, interpreted and, of course, reported (Holstein & Gubrium, 1994; Lincoln & Guba, 1985; Patton, 1990)? Gay and Airasian (2003), in their authoritative guide to educational research, suggest that a key question for researchers adopting a phenomenological perspective is this: "What is the experience of an activity or concept from these particular participants' perspective" (p. 166)?

The Research Cycle

One way to graphically illustrate the various approaches to social-scientific research is to view the process of investigation as a cycle or circle, with three main focal points. The three principal focal points on this cycle are: phenomena, theory, and inference. *Phenomena*, as one might expect, refer to the empirical data. In a strict positivisitic sense, this is the sustained and careful focus on the facts of the situation. To take an example from a typical scenario of a crime scene detective, like a Sherlock Holmes novel or a protagonist on a crime scene investigation television show, the phenomena refer to the discovery of a dead corpse, apparent signs of strangulation, a couple of wine glasses in the living room, and other interesting artifacts at the scene. The

next focal point on the research cycle can be labeled *theory*. As one might expect, this concept refers to evolving considerations of viable explanations of the phenomena under scrutiny. The theoretical or conceptual framework guides the investigator in his or her analysis and interpretation of the data. In our illustration, the crime scene investigator, upon learning that the spouse of the decedent had sufficient motive and opportunity to commit this murder, may quickly jump to the third focal point on the cycle: *inference*. The area of inference, of course, refers to the various conclusions that a researcher may draw after initial considerations of the phenomena and initial formulations of theories or explanations of the situation. As in this example from a crime scene, the researcher or detective may have to revisit the phenomena (evidence) or revise the initial hypotheses in an iterative and reiterative process of deduction and induction. While the preliminary inferences focus on the description of the immediate phenomena in question, secondary inferences or generalizations are often made concerning the significance of these conclusions to other populations or similar contexts. Some serial killers, for example, have been apprehended and indicted because police detectives were aware of similar phenomena that occurred in other geographical locations during concurrent time periods (Newton, 1990).

In the social sciences, many research methodologists consider qualitative and quantitative methods of research to be complementary components of the entire enterprise of scientific research (Greene & Caracelli, 2003; Maxcy, 2003; Morse, 1991; Tashakkori & Teddlie, 1998, 2003a; Teddlie & Tashakkori, 2003). Quantitative researchers begin with an initial theory or explanation of certain phenomena, such as the

idea that computer technology improves the performance and learning outcomes of middle-school algebra students. They then proceed to formulate a precise hypothesis of this idea and create an instrument to measure whether or not this hypothesis is true. Quantitative researchers, in other words, are in the business of testing or confirming hypotheses. Key questions for researchers adopting a quantitative orientation include what- and why-type questions.

Qualitative researchers, on the other hand, begin with the actual phenomena under consideration, and study these phenomena in their naturalistic contexts. Possible theories or explanations of the phenomena under consideration are created and developed from these empirical studies. To borrow Glaser and Strauss' (1967) famous concept, *theory* is thus *grounded* in the empirical evidence at hand, and not necessarily built upon previous research findings. Taking a phenomenological approach, the researcher may design a plan for research that includes many observations of middle school students working out algebra problems in various classrooms. The investigator may proceed to interview teachers, teacher-assistants, administrators, and/or parents. Key questions in this approach include who-, what-, when-, or where-type questions, and especially how-type questions.

In the estimation of this researcher, the conceptualization of this research cycle is a helpful tool to envision the dynamic processes of social-scientific research. Moreover, it is possible to argue that the research process can begin at any of the respective points on the cycle, and proceed in either direction. The detailed explication of this thesis will not be pursued here, since the present investigation will begin with the exploration of the

phenomena of technology-rich communities of practice. Nevertheless, the proposition or idea itself may provide the reader with additional insights into the dynamics of induction and deduction that are always present in carefully conducted research studies.

Pragmatist Orientation

The last quarter of the twentieth century witnessed a controversial and sometimes heated debate among social-scientific research methodologists on the relative merits or demerits of the two principal research paradigms: qualitative and quantitative. While this dispute has evolved more into a dialogue or discussion in recent years, the issue is certainly alive and well at the beginning of the twenty-first century. The perspective or taxonomy which positions qualitative methods of research against quantitative methods of research is, of course, merely one of several perspectives on social-scientific research. This concise summary of this discussion about approaches to social-scientific research is offered to the reader of this report to assist in understanding where the researcher positions himself epistemologically.

The explosive controversy between quantitative and qualitative researchers has been commonly referred to as "the paradigm wars" (Howe, 2001; Tashakkori & Teddlie, 1998; Teddlie & Tashakkori, 2003). While Lincoln and Guba (1985) provided a scathing, point-by-point rebuke of the positivistic, quantitative approach to social research, traditional researchers maligned qualitative methods as being nothing other than unscientific and subjective research techniques (Cizek, 1995; Howe, 1988; Sullivan & Brockington, 2004). Perhaps the most comprehensive review of these paradigm wars can be found in the three editions of the *Handbook of Qualitative Research* (Denzin &

Lincoln, 1994, 2000, 2005b) and the first edition of the *Handbook of Mixed-Methods in Social and Behavioral Research* (Tashakkori & Teddlie, 2003b). The literature in the field of social-scientific research methodology is quite extensive, and constitutes a legitimate field of inquiry in its own right. For our purposes, however, it will be necessary only to provide a brief summary here.

The traditional approach to research in the social sciences, including the fields of first language acquisition and second language acquisition, has been the positivistic, hypothesis-testing model using a variety of quantitative methods. This quantitative approach to research, as its name implies, focuses on numbers. Adherents of this research methodology maintain that meaning and truth can be discovered through the analysis and interpretation of empirical findings that are reduced to a series of descriptive or inferential statistics (Campbell & Stanley, 1971; Gay & Airasian, 2003; Seliger & Shohamy, 1989). Through the use of carefully controlled variables in a laboratory setting, researchers can conduct experiments upon a random sample of participants and generalize the results of the study to the larger population from which the sample was selected. Of course, in most social-scientific research investigations, a true experimental design is rarely used. Quasi-experimental designs, using modified varieties of sampling strategies, are often the most viable and ethical options for social-scientific investigations of human subjects today (Beauchamp, 2005; Cassell, 2005; Christians, 2005).

This traditional, quantitative, positivistic, and foundational model of research has come under a considerable amount of scrutiny in recent years. Although qualitative research methods have been around for quite some time, especially in the fields of

sociology and anthropology, a veritable explosion of qualitative research in virtually every field in the social sciences has occurred in the 22 years since the publication of Lincoln and Guba's (1985) groundbreaking treatise. In this volume, the authors present a philosophical critique of the traditional, positivistic research paradigm and offer what they consider to be a better approach to social-scientific research: naturalistic inquiry. Lincoln and Guba (1985) question the idea of truth itself, asking whether or not there is such a thing as a single truth, and whether or not researchers can discover it. They present a strong case for the existence of multiple realities, including objective reality, perceived reality, constructed reality, and even created reality (pp. 81-85). Other social philosophers have also dealt with this conception that reality itself is a social construct (Berger & Luckmann, 1966; Koenig, 2004). Philosophers of language, of course, have also contributed to this scholarly discussion on research methodology and epistemology (Derrida, 1997; Garrison & Leach, 2001).

Additionally, Lincoln and Guba (1985) forcefully argue that there is no such thing as objectivity, and that the related concepts of causality and generalization are likewise merely fictions received by and for the social-scientific research community. Furthermore, the authors maintain that any and all research is value-laden and filled with bias. The image of an objective scientist, perhaps wearing a white laboratory jacket, conducting experiments that generate value-free and bias-free (objective) results is resolutely ridiculed (pp. 160-86). Of course, many of these issues have received substantial treatments in authoritative texts in the field of qualitative research (Denzin & Lincoln, 1994, 2000, 2005).

Scholars taking the more traditional, positivisitic, quantitative approach quickly observed the wide divergence of perspectives, methods, orientations, and conclusions used by researchers taking the qualitative approach to research, assuming that this fact somehow demonstrated an inherent weakness in the approach. Recognizing the broad spectrum of perspectives and even disagreements within the qualitative, interpretivist research community, Howe (2001) quickly pointed out that there are at least three significant points of agreement:

> First, "subjectivities" count. This is a general implication of the interpretive turn and the constructivist epistemology that goes with it. Second, social arrangements are irremediably interest-, power-, and value-laden. Accordingly, they need to be carefully examined – "deconstructed" – in this light. And third, the result of educational research should be a more just and democratic system of schooling and, ultimately, a more just and democratic society. That is, the goal of transformation drives educational research. (pp. 207-08)

It is not surprising, therefore, that these points of agreement between qualitative researchers did not – and do not – persuade quantitative researchers of the values of this approach to social-scientific research. Research methodologists taking a more conciliatory and pragmatic viewpoint subsequently suggested a philosophical middle ground, arguing that researchers should use both numbers and narratives to conduct social inquiry. In other words, research studies could be profitably and successfully pursued using either approach, and perhaps even be enhanced by using both. Quantitative

and qualitative methods were not inherently incompatible, but could be complementary to the research enterprise (J. C. Greene, 2001; Howe, 1988; Tashakkori & Teddlie, 1998). Miles and Huberman (1994) concluded that it takes both numbers and words to make sense of the social world. This methodological compromise was not a new concept. Maxcy (2003) cogently traces the history of pragmatism in philosophy and the social sciences, demonstrating that the current research interest in combining quantitative and qualitative methodologies is based on a strong and venerable tradition. Citing the seminal works of John Dewey, Charles Sanders Peirce, William James, and Arthur F. Bentley, Maxcy (2003) shows that contemporary mixed-methods research practices are firmly based on the philosophy of science called pragmatism. Perhaps the most authoritative and influential guide to the current state of this pragmatic, mixed-methods approach is the handbook edited by Tashakkori and Teddlie (2003).

At first glance, it would appear that the idea of striking a balance between the quantitative and qualitative approaches to research was the perfect resolution to this debate about research paradigms. However, many qualitative research methodologists were not – and are not – so easily persuaded. Denzin and Lincoln (2005), in their most recent treatise, for example, argue that the new craze for mixed-methods is nothing other than the old positivism dressed in new clothes. “Mixed-methods designs are direct descendants of classical experimentalism. They presume a methodological hierarchy in which quantitative methods are at the top” and qualitative methods are relegated to a secondary or auxiliary role (p. 9). On the other hand, one researcher (Cizek, 1995), whose personal comfort zone is clearly within the quantitative research tradition, openly admits

that if "one views qualitative research as sustained, reflective observation and interpretation, it is not storytelling at all. In fact, it is the process of sustained, concerted, reflective observation that is unquestionably the foundation of all science" (p. 26). Therefore, it takes both exploratory as well as confirmatory studies to produce knowledge that can be profitably used by society in general and by educational practitioners in particular. Of course, the key factor in determining which approach to take in any particular research investigation is the nature of the research questions (Maxwell, 2005, pp. 65-78).

While this researcher finds strengths and weaknesses in both quantitative and qualitative research paradigms, he is more inclined to view himself as a philosophical pragmatist with a phenomenological orientation. Research methods in most circumstances depend on the kinds of questions being asked. In the case of the present research study examining Latin teacher cognition in two technology-rich communities of practice, the principal perspective or approach is qualitative and naturalistic (QUAL). Nevertheless, anticipated future studies in a program of ancient language acquisition research will include both exploratory and confirmatory queries.

Research Questions

This research project sought to explore and to describe Latin teacher cognition in two technology-rich environments. In order to direct this empirical investigation in a systematic and organized manner, the following three research questions, and their corresponding sub-questions, constituted the focus of this study and guided the activities and scope of the project:

1.0. What do two secondary Latin teachers think about as they go about their routines in a technology-rich environment?

1.1. What pre-active planning strategies do two secondary Latin teachers use in a technology-rich context?

1.2. What inter-active decisions does the Latin teacher in the F2F classroom make?

1.3. What inter-active decisions does the Latin teacher in the online classroom make?

2.0. How do two teachers reconcile traditional Latin pedagogy with their practice within a technology-rich environment?

3.0. What functions do the differing communities serve in the day-to-day practices of these Latin teachers as they use technology?

3.1. What function does the community of teachers (colleagues) serve in the day-to-day practices of these Latin teachers as they use technology?

3.2. What function does the community of administrators serve in the day-to-day practices of these Latin teachers as they use technology?

3.3 What function does the community of students serve in the day-to-day practices of these Latin teachers as they use technology?

These three questions – and sub-questions – steered the processes and parameters of this phenomenological research project. Although many interesting areas of inquiry emerged throughout the course of this empirical investigation, from research design and

literature review to data collection and data analysis, these three research questions helped keep the research activities on track (Maxwell, 2005, p. 67).

Two Case Studies – Two Phases of Data Collection

The collection of data for this empirical investigation took place in two phases, corresponding to two separate periods of time and two separate geographical locations (See Appendix C for timeline and schedule of research). Each case study provided sufficient data to answer the research questions. In fact, an intensive examination of Latin teacher cognition in either of these technology-rich communities of practice would have constituted a legitimate focus of research in its own right. Nevertheless, the research design included the collection and analysis of data from each site independently, followed by a cross-case analysis and interpretation of the collective results.

Participants

This investigation into Latin teacher cognition required two principal participants, both secondary Latin instructors, working in two different high school environments in the Southeastern United States. While one of the participants teaches in an online, virtual school environment in a major distance learning program in the Southeastern United States, the other teacher works in a traditional, face-to-face classroom environment in an independent, private school in the Southeastern United States. Both of these participants were selected by the researcher after a series of initial contacts made through email correspondence, telephone conversations, and on-site visits at twenty area schools. Final selection of the participants was made using a combination of homogeneous and

opportunistic sampling strategies (Kemper, Stringfield, & Teddlie, 2003; Miles & Huberman, 1994). Due to the nature of the research design, participants were selected from two different contexts, both employing technology-rich instructional methods. Therefore, a cross-case study was employed in this project. Stake refers to this research approach as a "collective case study" (Stake, 1994, 2005).

Although both of these participants work as secondary teachers of Latin in two types of educational programs in the Southeastern United States, the research findings may be of interest to computer-literate second language educators in other locations and at different levels of instruction (Lipton, 1991, 2004). Insights into secondary Latin teachers' personal practical knowledge, their belief systems, and their general cognitive processes concerning the integration of technology into their language instruction may provide ideas or suggestions for pedagogical planning and professional development for other language instructors, including those teaching ancient languages, especially classical Latin. Moreover, this study has certainly yielded practical suggestions and recommendations for curriculum development and course redesign of existing Latin courses that already infuse technology into their language programs. The specifics of these curricular recommendations, of course, will be delineated in detail in the final chapter of this research report.

After several contacts with the researcher, both teachers agreed to participate in the study. Additionally, the principal administrator (Headmaster) of the independent school also indicated enthusiasm at the prospect of participating in this research study. Before data collection began (March, 2006), these participants signed an informed

consent form that detailed the nature of the research and any possible benefits or risks associated with participating in this study. Code names and/or numbers were used to ensure the confidentiality of the participants. Only the principal investigator has access to documents that identify the participants, and these documents and the data generated throughout the process of research have been stored in a locked filing cabinet in the researcher's office.

Although the focus of this research centered on the cognitive processes of two teachers of classical Latin in technology-rich environments, there were additional participants. The research design included interviews with other members of these two communities of practice, such as teaching colleagues and/or administrators as well as students in both school contexts. To elaborate: a focus group protocol and an interview protocol was administered to selected students of Teacher A (hereafter to be identified as "Natalie") in order to obtain more information concerning their beliefs about learning Latin in general, as well as how technology is used in the process of teaching and learning this ancient language (See Appendix E). In the case of Teacher B (hereafter to be identified as "Samantha") – the virtual, online Latin teacher – the focus-group protocol was modified to a brief, semi-structured written interview protocol, followed by three telephone interviews with three individual Latin students. This modification was made after several unsuccessful attempts to persuade the administration of the online school to permit data collection through one synchronous, online focus-group interview. This written interview protocol was congruent with both the original research permission letter

given by the administration of the online school and the recommendation of the co-chair of the researcher's faculty committee.

In the case of Natalie, one interview was conducted with a teaching colleague, who also happened to be the departmental chair for foreign languages at the school. Another interview was conducted with the Director of Technology at the school, and still another interview was conducted with the principal administrator at the school. All provided critically important data on Natalie's thinking and planning routines, as well as her instructional practices. In the case of Samantha, other participants included a teaching colleague who was especially familiar with her teaching practices and planning styles, since she had the opportunity to learn her own virtual teaching craft under the guidance and mentorship of Samantha. Furthermore, this colleague also spent one year co-teaching Latin with Samantha in this progressive, virtual environment. These experiences provided her with unique and personal insights into Samantha's professional teaching practices. Additionally, several of Samantha's students participated in an online semi-structured written interview. Three of these students also participated in a follow-up telephone interview, as outlined in the research protocol negotiated with the virtual school's Department of Research and Grants (See Chapter 4 below, and Appendix C).

The selection process for these interviews was expedited using a combination of purposive, opportunistic and convenience sampling strategies (Kemper et al., 2003). Participants were identified based on the following criteria: First, how well does the colleague or administrator know the Latin teacher? Preference was given, of course, to individuals who enjoyed a close working relationship with the Latin instructor being

investigated; Secondly, was the colleague or administrator in a position to understand and evaluate the professional activities of this Latin teacher? Third, was the colleague or administrator accessible to the principal investigator of this research project? Finally, was the colleague or administrator willing to participate in this research study. While a minimum of one interview was planned to be conducted with a colleague or administrator of the Latin teacher at each school, the researcher discovered more opportunities for such data collection at the first site of research (private, independent school). Due to the strict and inflexible policies of the virtual school's research department, however, only the negotiated research protocols and initial research design were implemented.

Instruments for Data Collection

This research endeavor sought to explore the phenomena of Latin teacher cognition in two technology-rich environments. Therefore, the approach of this empirical study was essentially phenomenological in nature (Glaser & Strauss, 1967; Patton, 1990). There were eight principal instruments of data collection employed during the process of this investigation: four semi-structured interview protocols (Fontana & Frey, 1994, 2000); a focus group protocol that explored student beliefs about learning Latin in a technology-rich community of practice [face-to-face classroom]; a brief, semi-structured questionnaire that approximated the focus-group protocol [for the online, virtual classroom students]; an open-ended field notes protocol, and the researcher himself. Additionally, the researcher solicited and received selected documents such as course syllabi, handouts, activity sheets, etc. that Natalie [face-to-face classroom teacher] regularly distributes to her students.

First, a semi-structured interview protocol [Instrument # 1 – Appendix D] was used by the researcher as he conducted initial, formal, personal interviews with each of the two participating Latin teachers. The focus of this first interview was to capture data on the participants' cognition on second language learning, second language teaching in general, and especially to capture data on each participants' thoughts on teaching the ancient language of Latin in environments rich in modern technology. Of course, specific pre-active lesson planning strategies and practices were also explored in this initial interview, including the development of course syllabi and the adoption and adaptation of language textbooks to course design (Lightbown & Spada, 2006; Madrigal, 2003). Although there were several open-ended topics addressed in this interview protocol, additional topics and follow-up questions emerged through the iterative processes of these conversations. In the case of Natalie, the researcher had many occasions to pursue follow-up questions during subsequent interviews and conversations. Additional opportunities arose before, during, and after many of the observation sessions on location at her face-to-face classroom (Fontana & Frey, 1994, 2000; Lincoln & Guba, 1985).

As the period for data collection at this independent school drew to a close, the researcher conducted focus group sessions [Instrument # 2 – Appendix E] with three of Natalie's intact classes. Although some of the specific questions for these sessions were similar to the student interview protocol [Instrument # 3 – Appendix K], the social dynamics of the focus group methodology did generate richer data than was collected through the student interviews alone (Short, 2006). Furthermore, the focus group sessions were used to identify students who were willing to participate in private interviews with

the researcher to explore these opinions further. This information provided important data triangulation of this study of Latin teacher cognition in technology-rich communities of practice, and thus strengthened the findings that emerged from the data and their subsequent analyses (Lipton, 1991).

Altogether, this phase of research – at the private school with traditional, face-to-face classrooms – generated thirty-six events of data collection which took place over the course of a seven week period (March 30, 2006 through May 18, 2006 – See Table 4.1 below). These events of data collection approximated 33 clock hours of prolonged engagement at this site of research, including 24 clock hours of classroom observations. An open-ended field note protocol was implemented for these observation sessions [Instrument # 4 – Appendix G]. This protocol contained clearly demarcated sections for recording observational notations, as well as reflective notes. Gay and Aiasian (2003), in their widely used textbook on educational research, recommend this type of field-note protocol (p. 201).

Two of these observation sessions at this first site of research [face-to-face classrooms] were video-recorded. Although Lincoln and Guba (1985) argue that normal field notes are more advantageous than recordings (p. 241), the purpose of these two video recordings was to collect data that the researcher analyzed and reviewed with Natalie – the teacher – during the second and third interview sessions. The key objective of these stimulated-recall interviews, of course, was to provoke Natalie to reflect on her inter-active teaching activities. The first stimulated-recall interview occurred two days after the actual teaching session took place [Event # 21 – April 27, 2006, See Table 4.1].

As expected, Natalie was able to review and reflect on her thinking processes that were taking place during the actual instruction of the class session. She also made several observations about deviations or modifications of her initial lesson plans that were made spontaneously or extemporaneously (Richards, 1998; Yinger, 1987). While the second and third interview (stimulated-recall) protocols were semi-structured in format, they were also more open and flexible than the first interview protocol, focusing on the relative interests, context, and teaching practices of this traditional, face-to-face classroom teacher.

In preparation for the two stimulated-recall interview sessions, the researcher first reviewed the footage of the video-recorded classroom sessions and selected pertinent or interesting sections of each of the two recordings to review with the teacher. This prepared interview protocol [Instrument # 5 – Appendix F] was somewhat modified and enhanced to reflect the questions that emerged from these initial reviews of the video footage. In addition to the footage that the researcher selected for review, Natalie herself also had the opportunity to review and comment on the entire video-recorded sessions. These two stimulated-recall interviews were captured by digital audio-recordings and were subsequently transcribed by the researcher.

Although the initial research design stipulated a formal interview session with either a key administrator or a colleague of the teacher – someone familiar with the teaching style and practices of this Latin teacher – instead three separate interviews were arranged: one with the Headmaster of the upper school (high school); one with the Director of Technology at this school; and still another interview with Natalie's

Departmental Chair and teaching colleague. These interviews provided important perspectives on the teaching behaviors and practices of this Latin teacher being studied at this private, independent high school, and consequently provided key data triangulation (Denzin, 1989). These data assisted the researcher in obtaining important information from associates who were familiar with Natalie's work as a teacher of Latin in this technology-rich community of practice. These interview sessions employed semi-structured protocols [Instruments # 6 and 7 – Appendices H and I] that steered the flow of the interviews. Although the researcher tailored each interview session according to the dynamics of the situation, he regularly consulted these protocols as he prepared and initiated each interview (Fontana, 2003; Fontana & Frey, 2005; Holstein & Gubrium, 2003; Rubin & Rubin, 2005). Of these standard treatments on qualitative interviewing techniques, Rubin and Rubin (2005) refer to semi-structured interview protocols as "conversational guides" (pp. 146-51).

The eighth and most important instrument that was used in this investigation was the researcher himself. Although this researcher could refer to himself as a participant-observer in this study, it is also appropriate to conceptualize his role as an instrument of data collection. Lincoln and Guba (1985), for example, maintain that the "use of humans as instruments is not a new concept. Indeed, classical anthropology utilized virtually no other instrumentation, and much of that tradition has been maintained in modern sociology, at least the branch that continues to rely heavily on field studies" (p. 192). Moreover, this seminal publication (Lincoln & Guba, 1985) provides a precise diagram that charts the ebb and flow of naturalistic inquiry (p. 188).

Table 3.1.

Data Procedure

Research Question	Data Collection	Data Analysis	Data Interpretation
1. What do two secondary Latin teachers think about as they pursue their professional practice in a technology-rich environment? (Sub-questions, too)	Audio-recorded interviews with Latin teachers and interviews with colleagues; collection of artifacts and/or documents such as syllabi, lesson plans, worksheets and handouts, etc. Write-ups of descriptive field notes of classroom observations (F2F); two video-recorded lessons from the F2F classroom teacher, and corresponding, audio-recorded stimulated-recall interviews for both of these sessions.	Reflective memos about data; data reduction by coding the transcripts of the audio-recordings and write-ups of field notes using the constant-comparative method; refine themes/categories that explain data; member-check; obtain inter-rater reliability	Synthesis and interpretation of data; graphs and data display; significance and implications of data within a communities of practice theoretical framework
2. How do two teachers reconcile traditional Latin pedagogy with their practice within a technology-rich environment?	Interviews with Latin teachers and interviews with colleagues; focus group sessions; and follow-up interviews with selected students.	Memos from the reflective field notes, written concurrently and after the descriptive field notes; coding of transcripts of the stimulated-recall interviews; develop and refine themes/categories that emerge from data.	Synthesis and interpretation of data; graphs and data display; significance and implications of data within a communities of practice theoretical framework
3. What functions do the differing communities serve in the day-to-day practices of these Latin teachers as they use technology? (sub-questions, too)	Interviews with Latin teachers and interviews with colleagues; focus group sessions; and follow-up interviews with selected students.	Memos from the reflective field notes, written concurrently and after the descriptive field notes; coding of transcripts of the stimulated-recall interviews; develop themes/categories that explain data.	Synthesis and interpretation of data; graphs and data display; significance and implications of data within a communities of practice theoretical framework

During the processes of data collection, and especially during the interview sessions, the researcher employed tacit knowledge and impromptu observations that were made to probe the interviewee to elaborate, explain, clarify, or otherwise expand on any verbal or nonverbal statements that were made. Following these principles, the researcher regards himself as an important instrument that can respond and adapt to each unique research situation (Lincoln & Guba, 1985). At the conclusion of each interview, the researcher summarized the salient aspects of the interview, and asked for immediate feedback from each participant. In this way, the participant was given the opportunity to approve the researcher's provisional findings, and/or to offer corrections or extensions of the topics discussed. Table 3.1 above summarizes the procedures for the collection, analysis, and interpretation of the empirical data that were implemented throughout this research study.

Limitations of the Study

As with any social-scientific study, this mixed-methods research project incorporated several significant limitations. These limitations will be discussed in terms of the mixed-methodology employed in the entire project (QUAL → qual), including the initial case study of the face-to-face teacher (QUAL), and the complementary, case study of the online teacher (qual). In the first place, the external validity or generalizability of this study was limited in terms of time and space. More precisely, the issues of ecological validity, and temporal validity of this research contained inherent restrictions or limitations. Since the study focused on two Latin teachers in two limited and specific geographical areas, the results and inferences generated from the study were similarly limited. Broad, sweeping generalizations can rarely be made in ethical social-scientific

research, especially in the case of a research study with qualitative or naturalistic theoretical thrust. Additional empirical research that replicates the findings of this study in other geographical locations will be needed in future investigations. Similarly, the temporal validity of this research project was threatened by the limitations of time in which the data were collected. Phenomena change over time, and therefore any findings or implications generated by the study must be understood and evaluated within the temporal context in which they occur. These two qualitative case studies focused on a limited cross-section of time and place, and did not examine Latin teacher cognition in technology-rich environments across time. As in the case of ecological validity, more empirical studies with a longitudinal design will be needed in the future to complement and strengthen the findings of this research project (Stake, 2005).

Yet another threat to the external validity of this research project concerned the population or sample of participants in the study. The plan of research focused on an exploratory, cross-case study design. Therefore, instead of the selection of a random sample of secondary Latin teachers, the study utilized a purposive sampling strategy that is always appropriate for this type of research (Kemper et al., 2003). This research study focused on the detailed examination of two high school teachers of Latin working in two different types of contexts (private face-to-face classroom and public distance-learning classroom). Hence, the issue of population validity arose out of design, not accidence. The purpose of the study was to explore and to describe two educational communities of practice, not to confirm hypotheses or to make predictive inferences (Erickson, 1986; Geertz, 2001; Lincoln & Guba, 1985).

Still another limitation of this research project concerned the issue of researcher or observer effects. The participants in a research study often behave differently while participating in a research project than they would behave under normal conditions. Although this is to be expected – and even welcomed in qualitative research – the researcher anticipated that these effects would be limited or reduced over the course of data collection through prolonged engagement at the first site of research (QUAL), and to a lesser extent at the second site of research (qual). Lincoln and Guba (1985) define this process of prolonged engagement as "the investment of sufficient time to achieve certain purposes," including the process of learning and absorbing the very essence of the culture being investigated (p. 301). Moreover, researcher or observer effects were restricted through the use of less obtrusive methods of data collection, such as audio-recordings of the interviews and video-recordings of selected class sessions, and the collection of material documents used in these courses. The consistent, regular presence of the researcher in the face-to-face classroom (twenty observations over the course of seven weeks) certainly limited these effects. Moreover, the researcher attempted to be as unobtrusive as possible while observing the regular practices of this community of Latin language learners.

The research design included several interviews with each of the two participating teachers, extensive field notes of twenty observations of the face-to-face classroom, three interviews with administrators or teaching colleagues of the teacher at the first site of research, as well as three focus group sessions of students at this location. A written version of the focus-group protocol was distributed to the students of the online Latin

teacher and returned to the researcher via email. As expected, these student data complemented the data generated by each teacher examined, and provided helpful data triangulation. Moreover, additional student data were captured by interviewing three students from each school who volunteered for this procedure. These interview sessions were audio-recorded and transcribed. The researcher functioned as a non-participant observer during the observation sessions at the traditional, face-to-face classroom, documenting his observations in descriptive and reflective field notes. Gay and Airasian (2003), for instance, suggest more open-ended and holistic field notes for this type of educational research (pp. 199-201).

An important threat to the internal validity of this empirical study was the issue of data saturation. The question is: how much data are sufficient to explore and describe the phenomena of teacher cognition in two technology-rich Latin classrooms? Although finding the precise balance between the under-collection of data and the over-collection of data is always imprecise, the research design of this study proposed a minimum of 20 hours of data collection over a period of at least six weeks at the first site of research, the traditional Latin classroom, and a minimum of twelve hours of data collection over a period of at least five weeks at the second site of research, the virtual Latin classroom. Actual clock hours of data collection events significantly exceeded these proposed hours (See Tables 4.1 and 4.2 below).

Although the researcher had originally intended on capturing several hours of online interactions (virtual classroom observations) through the use of appropriate software, such as *Snag-It* or *Camtasia*, as well as synchronous, online, focus-group

sessions with the virtual school students, these methods of data collection were denied by the administration of this school. Nevertheless, the researcher believes that valuable and adequate information was obtained from this second site of research, especially considering its unique design and focus on distance learning. For these reasons, the discussion of observations below will concern the activities of the traditional, face-to-face Latin classroom, and not the virtual Latin classroom.

On most days of research, at least two sessions of data collection occurred. For example, a typical day of research included observations of two class sessions, or at times two observations plus one interview session (see Table 4.1 below for a detailed record of data collection events). Since similar doctoral research studies on teacher cognition have been successfully completed by implementing comparable amounts of data collection (Borg, 1998; Wodlinger, 1980), it was expected that these data would yield sufficient information that the categories or taxonomies generated would reach a point of redundancy or saturation (Gay & Airasian, 2003; Glaser & Strauss, 1967; Lincoln & Guba, 1985; Strauss & Corbin, 1994; Tashakkori & Teddlie, 2003a). Such data saturation was, in fact, observed by the researcher and noted in his research memos. Wodlinger (1980), for example, in his case study of one sixth-grade teacher, videotaped ten lessons and later conducted ten follow-up stimulated recall interviews with the teacher during her lunch hour, typically lasting between 30 and 50-minutes (p. 73). It is of interest to note, in the case of Wodlinger's (1980) doctoral study, that his research design had to be altered after the initial round of data collection due to the participant's decision not to continue in the study. Rather than collect data to explore the teacher's interactive decision making at

two distinct times during the school year (Spring, then Fall – to determine if and how teacher's interactive decision making changes over time), Wodlinger deleted the second phase of the study (pp. 305-307). An authoritative source in qualitative research (Strauss & Corbin, 1998) suggests that sometimes even the most elaborately detailed research plans need to be modified, even after official data collected has begun. Strauss and Corbin (1998) insightfully observe that there are always "those unanticipated twists and turns along the way that lead us to rethink our positions and question our methods" (p. 55).

Therefore, the research design of this project limited the sources of data to those that are typically found in second or foreign language classrooms: the teacher (interviews, observations, and descriptive survey), the students (observations, focus group sessions, and follow-up interviews), and the material culture of the classroom, including textbooks, syllabi, handouts, software or websites that may be used, and other samples of documents and material that may be utilized (Adler & Adler, 1994; Day, 1990; Fontana & Frey, 1994, 2000, 2005; Hodder, 1994). The use of these forms of data: interviews, field notes, observations, and documents informed the researcher of the thinking and reasoning processes of Natalie, a progressive and energetic teacher working in a dynamic community of educational practice. Moreover, these data also informed the researcher into the teaching strategies and instructional practices of both participating teachers. These data collection methods, of course, are widely used in qualitative research and in mixed-methods research across many disciplines (Johnson & Turner, 2003; Miles & Huberman, 1994) and in second language acquisition research in particular (Davis,

1995). Furthermore, these resources of information provided sufficient data saturation – and data triangulation – to support the analysis, interpretation, and conclusions described below in the final two chapters of this research report (Atkinson & Delamont, 2005; Denzin, 1989; Lincoln & Guba, 1985; Morse, 1991; Tashakkori & Teddlie, 2003a).

An additional potential limitation to the internal validity of this study was researcher bias. At the design level, the researcher made every effort to avoid the intrusion of bias at every stage of research. Although this threat is always present in social-scientific research, it is particularly characteristic of qualitative inquiry. This threat will be discussed below in the context of the general limitations that are characteristic of naturalistic or qualitative inquiry. Chief among these limitations is the extent to which the implications and findings of the research may be generalized to other contexts or populations. Although a rich and thick description (Geertz, 2001) of the phenomena of teacher cognition in two technology-rich Latin classrooms will be provided in the following chapter, the homogeneous sample size (Kemper et al., 2003) was limited to two participants active in two technology-rich school settings: one private traditional face-to-face high school classroom environment, and one public virtual high school environment.

Hence, a sequential exploratory (QUAL → qual) research design was employed, that focuses on a cross-case study approach. Therefore, while the depth of the data was extensive, especially at the principal site of research (with Natalie in the face-to-face environment), the breadth of the data was enhanced by the data collected at the secondary site of research (with Samantha in the virtual school environment). Accordingly, the conclusions and implications of this empirical study will be limited to those contexts that

are sufficiently similar to the contexts of this investigation to permit transferability (Denzin & Lincoln, 2005a; Lincoln & Guba, 1985; Maxwell, 1996). In other words, in contrast to a strict experimental quantitative research design, only tentative and qualified generalizations may be extrapolated from a research study employing a qualitative, naturalistic research design. Using somewhat different terminology, one widely influential textbook on case study research differentiates between analytic generalization and statistical generalization (Yin, 2003). Obviously, case study research does not employ the use of inferential statistics to generalize research conclusions and findings to a larger population (pp. 31-33).

To address some of these important limitations and potential threats to this research study, several measures were taken to ensure the integrity, credibility and trustworthiness of the investigation. During the process of the data collection (interviews, observations, and materials), the researcher solicited feedback from the participants to enhance accuracy in formulating the initial themes and categories generated, as well as during their subsequent analyses and interpretation (Lincoln & Guba, 1985; Tashakkori & Teddlie, 1998). Additionally, the researcher utilized the technique of peer review from two fellow researchers/colleagues who possess expertise in all of the areas relevant to this research: SLA, qualitative research methods, instructional technology, and communities of practice learning theory. This process of peer review facilitated the examination of any presuppositions, assumptions, bias or logic used during the analysis and interpretation phase of the research. Any conflicting cases or discrepant data overlooked by the researcher were identified by this process of feedback and peer review. Miles and

Huberman (1994) maintain that the reliability of a qualitative research project is significantly enhanced by this process (p. 64). Finally, the researcher kept an online journal that recorded the iterative and reiterative processes of induction and deduction that occurred throughout the entire research project, including the creation and documentation of the various categories and taxonomies that were used to synthesize and interpret the empirical findings of this research project (Constas, 1992).

Coding of Data

Although there is no uniform approach among qualitative researchers as to how and when to create codes to be used in the analysis of empirical data, the present study attempted to strike a balance between the more general and open inductive approach typically taken by grounded theorists (Glaser & Strauss, 1967; Marshall & Rossman, 2006; Strauss & Corbin, 1994, 1998), and the more specific, deductive approach advocated by Constas (1992) and Miles and Huberman (1994). The idea behind grounded theory is to approach the research project with a completely open mind, without any preconceived patterns or conceptual frameworks in view. In this way, each datum will "speak for itself," and the codes and themes will simply emerge. Theory, in other words, is not imposed upon the data; rather, theory arises from the data set, as it is collected, analyzed and interpreted. One major weakness of this approach is that the analysis of data in a grounded theory research project can quickly reach the point of information overload. For this reason, among others, Miles and Huberman (1994) recommend the creation of a provisional start list of field codes prior to the collection of empirical data (p. 58).

This provisional coding scheme is based on the specific research questions of the study, and the conceptual framework used to organize the entire research project. It is also reasonable to allow for additional codes or categories that may emerge during the research. Marshall and Rossman (2006) suggest that this inherent tension between the more objectivist pre-coding of data before data collection and the more interpretivist orientation that allows new codes or categories to emerge from the data set "typically go hand in hand to build a coherent interpretation" (p. 155). Table 3.2 below outlines the "start list" of codes that was used during the analysis of data. Additional codes or themes that emerged from the data set will be enumerated in the following chapter. Actual code designations, along with other relevant notations, were handwritten or inserted by editing software in the margins of the field notes and interview transcripts by the researcher and his two colleagues. While the researcher himself coded the entire data set, the two professional colleagues coded a sample of approximately one-fourth of these data. Inter-rater reliability measures were calculated by the researcher (Marques, 2005). A thorough description of these processes of data analysis, along with the results of this analysis is provided in the following chapter.

Miles and Huberman (1994) maintain that "Lofland's (1971) scheme suggests that codes in any study can deal with the following sorts of phenomena, graduated from micro to macro levels" (p. 61). Hence, the preliminary start list of codes used in data analysis considers the relevant acts, interactions and activities that were used at the two sites of research during the data collection stage of research, as well as the pertinent thoughts,

beliefs, and ideas on teaching of both principal participants of this empirical research study.

Table 3.2

List of Codes used in Data Analysis

Abbre-viation	Component from CoP Framework	Similar to Lofland (1971)	Description	Research Question(s)
P	Practice	Acts and Activities	Acts, tasks, interactions whether brief or long	All
M	Meaning	Meanings	Ways participants assign meaning, significance to their activities, practices	All
I	Identity	Participation	Ways participants behave or adapt to teaching or learning Latin in this technology-rich context; descriptions of how people view themselves or others	2.0
C	Community (focus on specific, interpersonal relationship/s)	Relationships	Interrelationships among participants; a sense of belonging in a special group or community	2.0, (case 1), 1.2 (case 2), 1.3 3.0, 3.1, 3.2, 3.3
X	Context (focus on entire school community)	Settings	Focus on the entire setting (school context) under study as the unit of analysis	3.0, 3.1, 3.2, 3.3
E	Emergent		Additional code or codes may emerge during the processes of data collection and data analysis	All
D	Dross		Data which seem, at first glance, trivial or useless. Apparent dross may later prove to be valuable, or may remain unusable	None

The descriptive codes used by Lofland (1971) are included on Table 3.2 above, merely to show a certain degree of similarity to Wenger's (1998) communities of practice

conceptual framework. In other words, the researcher considers Lofland's scheme to contain incipient qualities that are characteristic of Wenger's social theory of learning. Table 3.2, therefore adapts these codes, taxonomies or themes to a framework that focuses on a communities-of-practice (CoP) theory of learning.

Trustworthiness

Traditional quantitative research studies conducted within a positivist framework typically employ the use of inferential statistical measures, using a random sampling procedure to ensure that the results of the research may be generalized to the population under consideration. If a statistical test consistently achieves the same measurements, it is considered to be a reliable instrument. Similarly, if a statistical test or measurement actually measures what it purports to measure, it is judged to be valid. Considerations of validity extend to the sample under investigation (internal validity) as well as to the general population from which the sample is taken (external validity). These issues of validity (both internal and external), reliability, and objectivity are rigorously pursued in the evaluation of quantitative research reports in many areas of social-scientific research (Campbell & Stanley, 1971; Cohen, 1994; Gay & Airasian, 2003; Onwuegbuzie, 2003; Seliger & Shohamy, 1989), including second language research (Seliger & Shohamy, 1989). In qualitative research studies, on the other hand, alternative methods of evaluation are pursued to ensure the trustworthiness of the investigation. Alternatively, the concepts of credibility, transferability, dependability, and confirmability are commonly used in assessing the value of qualitative, naturalistic, research (Lincoln &

Guba, 1985). A brief description of each of these concepts as they relate to this study is presented below.

Credibility

Credibility, as it is used in qualitative or naturalistic research, roughly corresponds to the concept of internal validity in quantitative, experimental research. In other words, how can readers be assured that the research is valuable and trustworthy? Although it is impossible, and perhaps undesirable, to eliminate researcher bias in the collection and analysis of data, several steps were taken to enhance the trustworthiness and credibility of this research project. First, Lincoln and Guba (1985) maintain that the researcher must be actively engaged in the research context for a prolonged time period. They refer to this criterion as prolonged engagement or persistent observation (pp. 301-304). During this study on Latin teacher cognition in technology-rich communities of practice, the researcher spent over 33 contact hours at the first site of research (traditional, face-to-face, classroom teacher), over a period of seven weeks. At the second site of research (virtual, online Latin classroom teacher), the researcher spent eight days collecting data over a period of 13 weeks. For the first site, the breakdown of this schedule included over 20 hours of observations; four hours of interview sessions with the participating Latin teacher; two hours of interviews with Natalie's colleagues and/or administrators; two hours to conduct the focus group sessions with the secondary Latin classes taught by this teacher; and two hours to interview selected students who were identified by these focus group sessions (See Table 4.1 and Table 4.2 for a detailed summary). In the case of the second site of research (virtual school), the data collection

included three separate formal interview sessions with the participating teacher, one interview with a teaching colleague, and three follow-up interviews with student participants who were willing to be interviewed.

Both participating teachers, and their respective administrators, understood that the nature of this research project required some flexibility on the part of the participants as well as on the part of the researcher. Accordingly, they agreed to work with the researcher in his efforts to collect sufficient amounts of data, and demonstrated their eagerness to collaborate on this project. It is important to note that similar doctoral research studies on teacher cognition have been successfully completed by implementing comparable amounts of data (Borg, 1998; Wodlinger, 1980). As expected, these data yielded sufficient information that the categories or taxonomies generated reached a point of redundancy or saturation, as noted in the researcher's onsite field notes, and in the subsequent write-ups and journal entries. Through these procedures and activities of research, the criterion of prolonged engagement was satisfied.

The researcher typically observed Natalie as she interacted with her intact (face-to-face) classes during two and sometimes three class sessions on most designated days of observation. Field notes were recorded by the researcher during each observation session, using an open-ended protocol that distinguishes descriptive field notes from reflective notes generated in the field. Later in the day, or certainly by the next day, the researcher recorded additional thoughts and reflections in the margins of these field notes, while the observation experience was still fresh in his mind (Gay & Airasian, 2004, p. 201). These detailed note-taking techniques were employed throughout the

classroom observation sessions, especially focusing on the use of technology in this traditional, face-to-face Latin classroom. One observation session, for example, focused on how Natalie guided her students through their completion of language tasks using technology, such as the use of the school's official website to review PowerPoint presentations on discrete vocabulary items. During this session, students also had the opportunity to play Latin language games on a popular educational website (see http://www.quia.com), most notably the games of Battleship and Hangman (See Event 16, Table 4.1 below).

The data collection methods for all of the interview sessions, on the other hand, included the use of a digital audio-recorder. The interviews were audio-recorded and subsequently transcribed to facilitate data analysis, peer review and member checking. Secondly, the data were analyzed using a process of unitizing and categorizing, usually referred to as the constant-comparative method of analysis (Glaser & Strauss, 1967; Huberman & Miles, 1994; Lincoln & Guba, 1985; Miles & Huberman, 1994). As themes and taxonomies were identified, beginning with a start list of codes (See Table 3.2 above), the researcher recorded these categories in his analytical notes and journal entries. Specific examples of teacher cognition, beliefs, attitudes and personal, practical knowledge of the participants were noted by the researcher and supported by the transcripts. A tentative and evolving concept map was generated during this phase of analysis and interpretation (Constas, 1992; Lincoln & Guba, 1985). The researcher also used the experience and history of each session of data collection to inform, develop, and streamline the subsequent sessions of data collection with Natalie. To elaborate: while a

tentative interview protocol guided the researcher through the structure of the each interview, important topics and/or questions surfaced that required further exploration and elaboration. When this occurred, the researcher immediately pursued those topics during the current interview, and also explored those topics or themes in the subsequent contacts with this teacher-participant. In this way, the researcher was able to explore the interactive, spontaneous and extemporaneous thinking of both teachers, but most especially with Natalie (Clark & Peterson, 1981; McMahon, 1995; Wodlinger, 1980). Furthermore, follow-up interview sessions provided additional opportunities for the investigator to check the accuracy of his tentative conclusions and provisional findings, particularly in the case of Natalie at the first site of research. Lincoln and Guba (1985) consider this process of member checking to be critical in establishing the credibility of the final research report. An additional measure of critical feedback was obtained by the researcher in a letter sent from Natalie upon reading a penultimate draft of the research results (See Appendix M).

Although there are powerful computer programs available to assist in the analysis and reduction of data (NUD·IST, NVivo, Ethnograph), there are several important limitations inherent in such software programs (Bazeley, 2003; Richards & Richards, 1994; Rubin & Rubin, 2005; Weitzman, 2000). For example, in their discussion of the use of computerized software to analyze qualitative data, Rubin and Rubin (2005) warn that while computers facilitate the search for word counts and various associations between concepts, the process of "thoughtful analysis necessary to qualitative theory building" is best expedited by first-hand data analysis by the human researcher (pp. 243-

4). Furthermore, one recent account of the processes of qualitative research (Silverman, 2005) included a review of several key weaknesses of computerized software programs designed to analyze qualitative data. For example, Silverman (2005) observes that (a) good word processors often can do many of the tasks found in specialized software programs, (b) these data analysis programs often impose "a narrowly exclusive approach to the analysis of qualitative data," and (c) these programs are best reserved for processing very large amounts of data (pp. 195-200). Moreover, Gay and Airasian (2003) recommend that a researcher's first qualitative analysis experience be "a manual, noncomputer one" (p. 238). Consequently, the data collected during this investigation were analyzed without the use of specialized qualitative software programs.

Another important issue that promotes research credibility is the criterion of triangulation, a concept adapted from geometry to social-scientific research (Denzin, 1989; Lincoln & Guba, 1985). In his seminal study of the art and craft of the research act, Denzin (1989) describes four types of triangulation: data (multiple data sources), investigator (multiple observers), theoretical (perspectives, paradigms, or interpretations, etc.), and methodological (multiple methods). In this research project, the criterion of triangulation was achieved through the use of multiple sources of data (interviews, focus group sessions with students, documents, and observations of the face-to-face classroom), as well as investigator triangulation at the analysis stage of research. The material culture of the face-to-face classroom, such various documents and artifacts that are consistently used in the classroom were solicited, collected, and analyzed. Examples of these documents included textbooks, workbooks, syllabi and handouts distributed to the

students for in-class tasks or for homework, as well as pertinent posters and decorations used in the classroom, and the software or computer hardware that is used at this school. These data were analyzed by the researcher and two professional colleagues using the coding scheme described above (Table 3.2).

Transferability

While judgments of external validity are made in quantitative investigations in order to generalize the research findings from the sample studied to a larger population, the criterion of transferability is used in qualitative research reports. The concept of transferability refers to the ability of a reader or consumer of a research report to transfer the results of the study to his or her context. In order to facilitate this, the report must contain a rich portrayal or narrative of the entire research project, including a sketch of the participants, an explanation of the research questions, a description of the institutional contexts of the study (See Chapter 4, below), including classroom activities, and a detailed account of the data collection methods and data reduction and analysis strategies that were implemented in the project. In other words, the final report must provide a "thick description" of the entire research process (Geertz, 2001). While a summary of this research methodology is outlined here, the results of these methods are described in detail in the following chapter.

Dependability and Confirmability

In quantitative research studies, the concepts of researcher neutrality and reliability of measurements are often cited to assure readers of the usefulness of the final

research report. In naturalistic or qualitative research, on the other hand, the criteria of dependability and confirmability are used to promote the reliability of the study. In other words, how can the researcher persuade his or her readers of the integrity, value, usefulness, and reliability of the research findings? While the issue of scientific or researcher neutrality has been strongly challenged in recent years (Guba & Lincoln, 1994; Lincoln & Guba, 1985; Maxcy, 2003), investigators using qualitative research methods must be able to demonstrate the scientific and disciplined rigor of their research activities as well as the dependability and usefulness of their findings. These objectives can be realized through the use of a detailed audit trail and a reflective journal (Lincoln & Guba, 1985), as well as through the process of peer-review during the analysis stage of research, and the procedure of member-checking during the interpretive stage of research. These research strategies and their subsequent execution has been documented in this chapter, and is also partially addressed in the following chapter.

According to these designed research activities, this researcher created and developed appropriate collections of raw data, data reduction notes, preliminary taxonomies and categories, as well as tentative summaries and conclusions and guarded these materials in his office. Data analysis began almost immediately with the reflective field notes and memos noted by the researcher at the time these data were collected. In addition to this audit trail, the researcher kept a reflective journal that detailed the various issues associated with the entire research project, including the schedule of research, contact information for participants, code names for each participant, tentative findings, hypotheses, and provisional conclusions. Additionally, perhaps in a noble effort to

preserve his sanity, the researcher also recorded reflective and introspective accounts of frustration, setbacks, milestones and relative successes. A portion of these reflective journal entries was posted on a private website at http://nicenet.org to document the timing of these thoughts and observations. Through these varied and strategic research activities, a rich description of the entire research project was directly available to the auditors of the preliminary research documents and indirectly to the readers of the final research report. Some descriptive data displays were also generated during subsequent analyses of these data.

Therefore, this examination of Latin teacher cognition in two technology-rich communities of practice, represents a major endeavor on the part of this researcher and on the part of the two Latin teachers of this study. Considering the heavy work load of the researcher as well as the responsibilities of the two principal participants of this empirical investigation (Natalie and Samantha), there were certainly moments when the determined pursuit of such a research project did not seem logical. On the other hand, as the procedures outlined in this chapter clearly demonstrate, the nature of the study was unequivocally phenomenological. The following two chapters provide a detailed description of the results of this study (Chapter 4) and a discussion of the theoretical and practical implications that proceed from these empirical findings (Chapter 5).

Chapter 4

Results

"Education is not merely formative – it is transformative." – Wenger (1998, p. 263)

Introduction

This section of the report provides a detailed description of the procedures of data analysis and the findings of this phenomenological investigation into the thinking processes and professional practices of two secondary teachers of Latin working in technology-enhanced educational environments. The discussion will begin with a description of the procedures that were used in the analysis of the data set, including the coding of data and the calculations of inter- and intra-rater reliability. This discussion is followed by an examination of the findings of the data collected at each site of research, considered separately (two case studies), and will conclude with a consideration of the two cases viewed holistically (cross-case study). The examination of the results of each case study will be organized around the three research questions and their related sub-questions.

Data Collection and Procedures of Coding

Data analysis took place almost as soon as data collection occurred, at least in tentative measures, often in the form of preliminary reflections by the researcher in the margins of his field notes. These observational notes and reflective notes were expanded

further in subsequent write-ups and in the researcher's journal entries. More formal and detailed analysis procedures continued after data were collected, including the tedious task of transcribing the audio recordings of the interviews. These procedures will be described at this juncture of the report.

Once the data were collected and transcribed in a format conducive for easy analysis (typewritten with 1.5 spacing), the researcher sent a sample of the data to his two colleagues for their preliminary analyses, including discussions on what would constitute a basic unit of analysis. Although some of the units could be easily identified or distinguished by the questions or prompts contained in the various interview protocols, other units of analysis had to be identified through a careful reading of the transcript. While some research projects implement a highly detailed level of analysis, this type of micro-level analysis was not required in the present study. As Miles and Huberman (1994) observe: "How fine should the coding be? That depends on the study. Some linguistic analyses require line-by-line or even word-by-word coding. More typically, codes get applied to larger units – sentences, monothematic 'chunks' of sentences, or paragraphs in the written-up field notes" (p. 64). Although there is some variation in the way that qualitative researchers approach the unitizing process, there is strong agreement that the selection of specific units of analysis is directly tied to the purposes of the research project (Krippendorff, 2004; Neuendorf, 2002). There may be some types of empirical investigations that require rather lengthy units of analysis. Neuendorf (2004), for example, reports that the unit of analysis "should be large enough to well represent the phenomenon under investigation" (p. 73).

Through several exchanges of email communication, the researcher and his colleagues agreed as to what would constitute a unit of analysis, or – in the words of Miles and Huberman – a *monothematic chunk* of data. Since the project implemented the conceptual framework of Wenger's (1998) communities of practice, the researcher and his colleagues determined that the basic start list of codes (See Table 3.2 on page 112 above) was sufficient for analyzing this data set. No further breakdown of the data was required. If a particular sample of the data could be classified as describing the way the participant viewed herself (**I** for identity), rather than describing a particular teaching routine (**P** for practice), no further reduction of the data was necessary. Moreover, in the case of the various communities (classroom or colleagues) in which each teacher participated, the instrument of data collection itself served to identify which community was under consideration. Furthermore, the decision to identify monothematic chunks of data as the basic unit of analysis was congruent with the training that the researcher gave to his two colleagues, which was largely tied to the start list of codes mentioned above. Subsequently, a 63-page sample of the data set – comprising 28 units of analysis – was sent to the researcher's colleagues for analysis. The transcriptions of the entire data set amounted to 266 pages, excluding 21 pages of hardcopy material documents from Natalie (mostly lesson plans and quizzes) and seven electronic PowerPoint files.

At the first site of research (See Case One: Natalie below), the Sunshine Preparatory Academy, the researcher utilized the various instruments of data collection outlined in the previous chapter. Examples from the field notes protocol, the interview protocols, and the focus-group protocol will be cited below to demonstrate how the

researcher and his colleagues assigned codes – or themes – to these data in their independent analyses.

One example from the observational field notes (See Figure 4.1 below) demonstrates that the researcher noted several episodes that could be summarized as typical "practices" of this community of Latinists. He therefore assigned the code of **P** (for *Practice*) for several activities in Natalie's classroom on that day, including (1) the use of a PowerPoint slide show used as an interactive review for an upcoming quiz, and (2) the use of notebook computers for a series of online tasks. The section on the field notes protocol designated as "descriptive notes" included annotations on the time of day (start time: 7:50am; end time of 8:44am – noted at the bottom of the reverse), how many students are enrolled in the course as well as how many students actually showed up for class that day, as well as other assorted notes of a purely descriptive nature. The PowerPoint slides included some animated clip art used to prompt the students to recall the Latin vocabulary item (without the explicit use of English words). Natalie effectively used the classroom white board as the "screen" upon which to project the PowerPoint slides, and also upon which to add handwritten notes or linguistic variations of the Latin item. In this way, the board was doing double duty.

Setting: ODA
Individual Observed:
Observation # 1
Observer Involvement:

Date: 4/4/
Place:
Start time: 7:50 am
End time:

Descriptive Notes (Detailed, chronological notes about what the observer sees, hears; what occurred; the physical setting)	Reflective Notes (Concurrent notes about the observer's thoughts, personal reactions, experiences)
8:01 physical classroom, 23' x 23' 12 students enrolled, 10 in this class (5 girls, 5 boys) PPT for quiz review - principal parts and meaning; gen. and gender ch. 24 Oxford Latin course	Room is adequate - yet could be bigger kids seem to enjoy this review "cutting up"
examples { caveo prafereo, provideo, veho, fio victoria, inimicus, spectaculum cliens, ordo, spectator, genus	Ask N. if she has used this ppt before
PPT use of clip art (some "moving" art) for vocab. review crudelis est, ferox, denique magnopere, quam (w/ comparative) quamquam = although tristis, tristior (sadder) tristissimus (saddest) sad	
N. writes on white board, "thm" the ppt slide spectaculum - show, spectacle cara - expensive provideo - foresee, video - I see	This is next. N. elaborates & prompts using the dual-media of ppt + board - ask about this after class
interaction in L1, explanatory grammar not the "funcky" words, but regular	
grab a laptop - (1) review ppt file, (2) for Latin review (3) Oxford online ... quia.com "game"	on CD's not

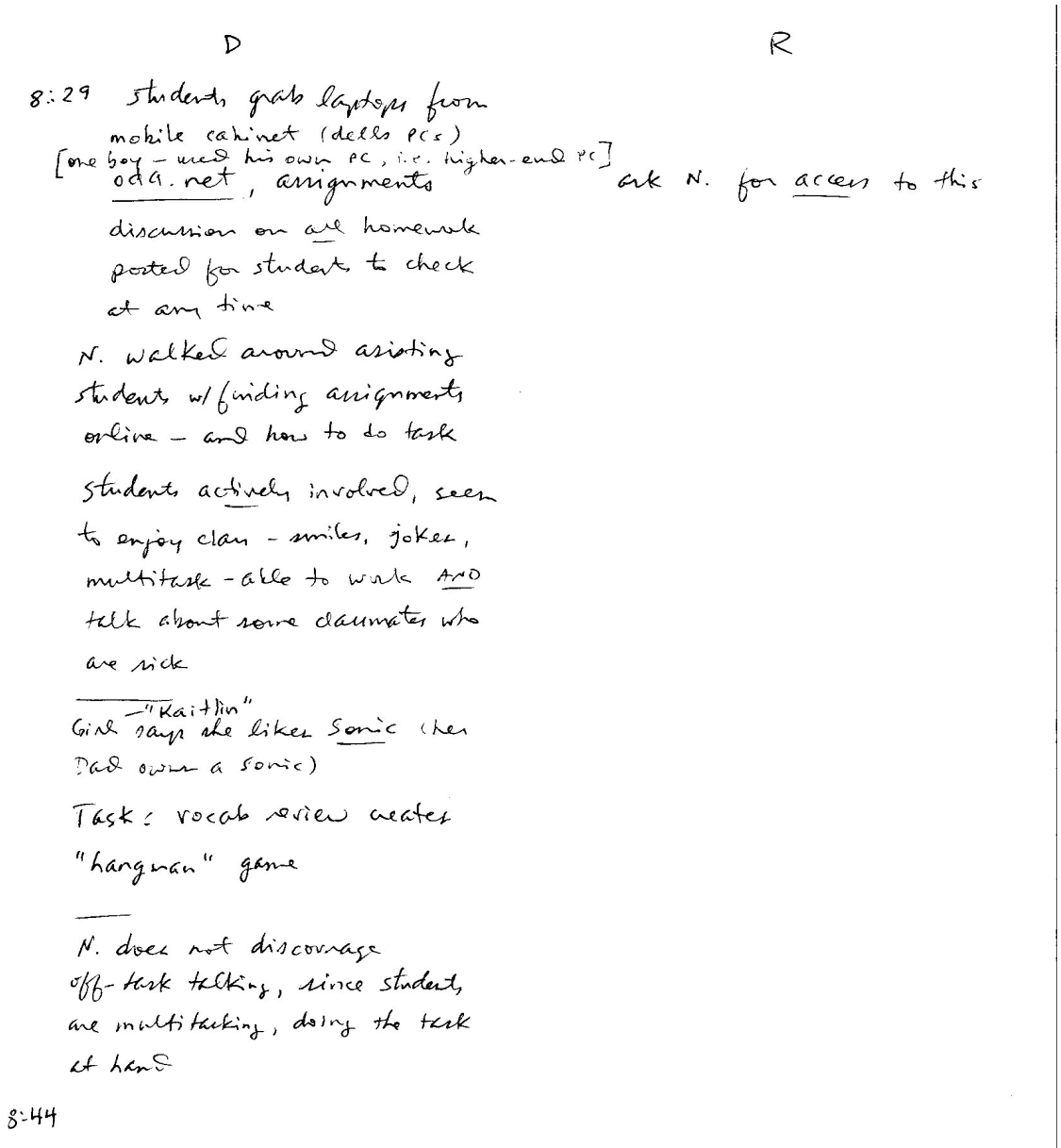

Figure 4.1. Sample of Field Notes Protocol (obverse and reverse)

The review also focused on the use of the Latin comparatives and superlatives, and Natalie would also prompt students to call out answers to her questions. For example,

Natalie asked the students to react to the clip art image displayed on the screen. Several shouted the Latin word for sad: "*tristis*." The clip art image would display an intensification of this emotion, and the students shouted: "*tristior*" (sadder), and then, expectedly, "*tristissimus*" (saddest). The researcher coded this section of his field notes as **P** for the practices observed in this ancient language classroom on that day. Subsequent sessions of observations evidenced similar practices. Toward the end of data collection at SPA, the researcher noted that the observations had reached a point of redundancy or saturation. That is, no new previously-unobserved-types of classroom activities or tasks were taking place.

The field notes also mention other tasks or activities that were done through the distribution of Dell notebook PCs from a mobile computer cabinet (i.e. "Apple Cart"). Students grabbed a PC and powered up for several online activities, including reviews of the PowerPoint slideshow just presented to the entire class, a website dedicated to the course textbook (Oxford Online), and some online language games at http://www.quia.com for review of the linguistic structures presented earlier that class period. Students were also able to check their homework grades on the school's website: SPAnet. Throughout this part of the class period, the researcher observed students working independently on their tasks, while simultaneously talking to each other about various things. Some of these conversations related to the L2 task at hand, and other exchanges were not directly related to the current activity, such as asking about the two students who were absent from that day's class. The researcher noted in his observational notes (obverse) that Natalie did not discourage students from talking about off-task issues, as

long as they were staying on task. To verify this, she did rotate around the room, monitoring students' work and answering several questions.

In his reflective remarks, the researcher made a note to ask Natalie whether or not she had used this particular PowerPoint slide presentation previously. This question was prompted by the manner in which the students so quickly reacted to some of her questions. After class, Natalie replied affirmatively to this question. She had, indeed, used a similar slide show previously, yet more in an instructional, informative manner. This time, however, the students had to respond with their answers orally before she would display the correct responses on the next slide. In some cases, as noted above, she extended the activities – or elaborated with additional examples – by writing spontaneous notes "through" the slide upon the white board with a colored marker.

In another instance – in the analysis of an interview transcript – the researcher and his colleagues coded a section of the transcript as **P**, since this particular unit of analysis contained a description of the typical *practices* of this community of Latin students:

> R: Are there some technologies that you use on a regular basis, personally, that perhaps, later you think that you could use in your classes?
>
> N: Well, um, we use Outlook here at the school for all our communications, we are all up on the network at Sunshine Preparatory Academy (SPA), I mean I communicate with students, I use Blackboard on the SPAnet, which is basically Blackboard.
>
> R: Is that the software that is used at SPA?
>
> N: Yes, it is basically Blackboard, but we call it SPAnet. And so, that I do use,

> for example, the reviews or PowerPoints that I use in class or anything that I come up with, I put those on SPAnet, or the Blackboard site, for the students to use, they can access that there. I told the students just the other day in my Latin II class to go to SPAnet and review the PowerPoint slides that we reviewed in class, for example. The information is right there for them, so that is sort of like integrating the technology into the things that I do everyday in class, and there are websites posted up there that they can go to, all the PowerPoints are posted up there, all the homework is there, too.

Because this unit of analysis contains a rich description of how Natalie regularly uses these technologies, and how her students regularly use such technologies in their tasks and language learning activities, the code or theme of **P** was assigned unanimously to this unit of analysis by the three coders.

Still another example displaying this theme [or category or code] of *practice* (**P**) was the transcript data of the interview with Maribel Márquez, Natalie's colleague and Department Head at SPA. Although the following excerpt was initially coded as **M** (for *meaning*) by one of the research analysts, she subsequently agreed with the other two researchers in assigning the code of **P** to this unit of analysis, due to the description of the typical procedures for pre-active planning by teachers at this independent school:

> R: And on the way over here [walk from M's classroom to the teachers' lounge] we talked about lesson plans. Does the Department [of Foreign Languages] or the school require written lesson plans, or is this just something that the teachers

organize for themselves?

M: No, it is something that the teachers organize for themselves. We do not, as an independent school, require that. I think that the principle is – the philosophy is – that when you hire, you observe that person teach a couple of times, you see their [sample] lesson plans, and then when you are hired, it is assumed that you are a professional, that you have been checked out, with references and such, and so, um, the lesson plans are really just an individual thing. We do not have a policy for turning in lesson plans, I do not have my teachers – as Department Head – show me their lesson plans every Monday. We are not rigid in that way like public schools, like other schools.

Although all three coders of this excerpt agreed that the element of *meaning* (**M**) was present in this passage, the theme of *practice* (**P**) was the dominant category. The text describes the typical routines and practices of the foreign language teachers, as well as the normal practices of the Head of the Department. Nevertheless, the passage includes a rationale for those typical practices, and that rationale led one data analyst to initially assign the code of **M** to this unit of analysis. While it is true that Natalie uses a simple yet flexible written lesson plan in her pre-active teaching cognitions, formal submissions of lesson plans are not required at this school.

Still another example from the coding procedures is taken from the second focus-group session with the Latin III students at SPA (See Event # 26 in Table 4.1 below). This unit of analysis was coded as **M** (for meaning) by all three data analysts, principally

because the participants in this focus group described positive and negative reasons for considering Latin to be a dead language (R = researcher):

> R: OK, the religious or ecclesiastical use of Latin is still an option in some places, that is true. A medieval type of Latin. So, since we are not speaking it as a modern language, do you consider it to be dead?
>
> M: Yeah.
>
> A: No.
>
> R: OK, some of you are saying yes and some of you are saying no; so, which is it? Yes, or no?
>
> M: Well, it's dead because nobody speaks it anymore.
>
> R: OK, so it is really our perspective or our definition of what constitutes "dead." It is not spoken anymore, and if, for that reason Latin is dead, then perhaps it is.
>
> A: It's like a book. If the book remains closed, it's kind of not living. But if you open the book, its alive in the reader's mind. So, it's kind of different in perspective. You could, for example, write a letter in Latin, and in that sense the language is still alive, it is still being used.
>
> R: OK, OK, I can see that, good. So, then the study of Latin opens up that older, ancient world for modern readers?
>
> M: Yeah, it really does. It brings you back in history.
>
> L: So, in that sense it is still alive.
>
> R: OK, well, I asked the question in that way because there is, in fact, more than one way to look at it. If we have a very specific definition [of language death],

like M. was talking about, then we would have to say, well, yes, it is dead – as compared to, say – Spanish.

L: But who is to say what's dead? I mean, when we study it, we still speak it in the classroom.

R: Ah, you are on to something, L. We do, in fact, speak it, although in limited ways. We pronounce it or recite it.

A: Well, some people ask me: Why are you studying Latin, it is a dead language. And I say: It is not dead. That's why I am going to this school, and have a chance to study this language. I mean, we still read it, study it, and it helps so much with other languages. When somebody speaks French or Spanish, I can easily understand it, because of my knowledge of Latin.

R: It helps you to learn other languages, OK. Sort of like a bridge to help you cross over?

A: Yes, exactly.

While one could detect in some of these comments a certain element of *identity* (**I**) – the notion of students identifying themselves as Latinists, students of Latin – by far the most prominent theme to emerge from this unit of analysis was the category of *meaning*, and was therefore assigned the code of **M** by the researcher and his two colleagues.

For an example of a unit of analysis displaying an emergent code or theme, the following passage was initially identified as **E** (for emergent) by the researcher and one of his colleagues. The researcher suggested that this theme be identified as *selective integration*, and this colleague agreed that this identification was an appropriate

description of the data found in this text. In a subsequent round of analyses, the third analyst concurred with this designation, too. This notion of selective integration and other similar emergent themes were subsequently synthesized and labeled by the researcher as the concept of *expedient integration* of technology (See Chapter 5 below for a detailed explication). From the interview transcription, the following thematic chunk of data was identified:

> R: So then, you have your students generate PowerPoint slideshow, too?
>
> N: Yes, definitely. They make vocab PowerPoints and present them to the class. I had my Latin III kids do that … In teaching a language, you have to have visuals of some kind. It may be the words written up there [on the board] somewhere so that they can see, they are not going to remember me just telling them [orally] things.
>
> R: Right.
>
> N: There is no way. So if it's a picture, then it's a picture. Let's say it's the Latin IV class, they are juniors. These kids are 17 years old. I do not necessarily do the vocab ppts with them for every lesson [like I do with the Latin I class]. Every now and then I do, but I do present a grammar review, or new material to them using a PowerPoint. When they have to review, I have had them do a PowerPoint and present it to the class for that purpose; grammar, or whatever we are doing.
>
> R: Get them involved in their own learning?
>
> N: Yes, exactly, I mean they love that. As well as the games. Quia.com has been very effective with all of my students, but especially with the younger kids, the

8th- and 9th-graders, and even the 7th grade. Um, the older they get, I don't know, at least at this school, for some reason, they don't really respond to the Quia website, making games on Quia. I don't know why that is. So I have just stopped using Quia [on a regular basis] with the older students. That wasn't working for them.

R: This was the Quia.com website?

N: The Quia, yeah, where they can generate their own games with the vocab and culture items we learn. My 10th-graders absolutely love the Latin bingo game [*Vinko*], that is how they learn the vocab the best, that and this Taboo game.

R: Uh-huh.

N: They are not really big on the Quia thing, so I don't use it much with them. My 11th-graders this year really liked Quia last year, but this year they are not very much into it, so I don't use it much with them either. They don't find it useful, so we do other things. We do *Vinko*, we do pictionary [on the board], we do the *Taboo* game, um, you know, whatever works.

R: Whatever engages their attention!

N: Right, whatever captures their attention, what they can focus on to learn the material. Now, my Virgil class, they use the flash-cards that are online. They like those, so I use those to review the material, and that is technology usage.

While certain elements of Natalie's practice (**P**) are certainly discernable in this unit of analysis, the researcher and his colleagues assigned the code of **E** (emergent) to this unit because of the *selective* way that Natalie decides to integrate technology into her classes.

What works for younger Latin students may seem redundant or boring for other, older students. Natalie describes her sensitivity to these concerns of her students, and decides accordingly which technology to use.

Results of Data Analysis

After the tedious and time-consuming process of transcribing the data and defining appropriate units of analysis, the researcher selected a sample of these data to send to his two researcher-colleagues for a first round of formal analysis. Although acceptable researcher triangulation is routinely accomplished by cross-coding of data by two researchers (Ban, 2006, pp. 92-93), the researcher triangulation in this empirical study was enhanced through the analyses of three researchers. Initially, 28 units of analysis, comprised of 63 pages were sent to these fellow researchers for coding. The transcribed text of these 63 pages were spaced at 1.5 line-spacing, rather than single-spaced or double-spaced. Of course, double-spaced formatting of text would have produced more pages, but essentially the same units of analysis. These 28 units of analysis represented 23.8% of the entire transcribed data set. Three of these units were subsequently deleted from analysis by mutual agreement by the three coders. In other words, they agreed that these units could be classified as "dross" as far as the purposes of research were concerned. The remaining data set of 25 units of analysis amounted to 22.6% of the data set. Inter-rater reliability calculations were made on the results of this analysis, according to the procedure outlined by Miles and Huberman (1994, p. 64).

Upon receipt of analyses from both colleagues, the researcher calculated the inter-rater reliability on this initial round of analyses. Although two of the researchers, working

independently, agreed on 23/25 units of analysis, amounting to an inter-rater reliability percentage of 92%, the research design called for this calculation to be made by including all three researchers, working independently. In this case, the three researchers agreed on the coding of 16/25 units of analysis, thus achieving an inter-rater reliability measure of 64%. According to Miles and Huberman (1994), this kind of result is to be expected in the initial round of analyses, as the coders discuss the definitions of the codes and negotiate the denotative and connotative meanings of their initial designations of themes and categories. In fact, Miles and Huberman matter-of-factly state that: "you usually don't get better than 70% intercoder reliability using this formula" (p. 64) during this first round of analysis.

After discussing the definitions used in the coding scheme, and also negotiating how this coding scheme could be consistently applied to the analysis of data, a second round of analyses was conducted by the three coders. This time, the results were significantly better. Indeed, the findings were perfect as the inter-rater reliability calculation came to 100%. In retrospect, the researcher surmised that one of the principal reasons the first round of data analysis evidenced such a high inter-rater reliability measure between himself and one of his colleagues (92%) was due to the fact that this particular colleague had a greater degree of training in two key areas than did the third coder, despite the fact that this third coder was qualified in all key areas of this research. Nevertheless, the second coder did possess more experience with the research literature on the study of second language teachers and Wenger's (1998) communities of practice social learning theory.

In addition to making these inter-rater reliability calculations (two rounds), the researcher also calculated intra-rater reliability using the same formula. However, the entire data set of 121 units of analysis was re-analyzed seven weeks after the initial analysis was made. This measure came to 117 agreements out of the 121 units. This fact initially surprised the researcher, who had expected to code the data set exactly the same way, with 100% results. However, upon reflection, a 97% measure for intra-rater reliability – while not perfect – is certainly acceptable. Miles and Huberman (1994) suggest that these subsequent rounds of data analyses should approach the 90% mark (p. 64). Possible reasons for even this small amount of intra-rater inconsistency include some overlapping of codes. For example, in describing her typical routines of technology integration, Samantha also discusses her view of herself as an online teacher of Latin. This unit of analysis [interview transcription] could easily be classified as **P** for "practice" according to the researcher's coding scheme (See Table 3.2 above), or as **I** for "identity," since the unit includes elements of both ideas. Another possible reason to account for the four disagreements is fatigue. In any case, these calculations of inter-rater and intra-rater reliability demonstrate a very high degree of consistency in the analysis of the data collected from both sites of research. These reliability measurements provide important researcher triangulation in the analysis of these qualitative data, and undoubtedly enhance the trustworthiness and credibility of this qualitative research project. What follows is a detailed narrative of the empirical findings at each site of research.

Case One: Natalie

After visits and observations at 20 area high schools, the researcher selected two teachers of Latin, who agreed to participate in this study. The rationale and procedure for this purposive selection of the research sample were outlined in the previous chapter on research methodology. One of these participants is an energetic 29-year-old educator with four years of teaching experience. For the purposes of this report, she will be identified as "Natalie." At the time that data were collected for this empirical research project, Natalie was completing her second year of serving as the sole teacher of Latin at a private, independent school located in the Southeastern United States. For purposes of this research report, including ethical issues of confidentiality through anonymity, this non-religiously affiliated school will henceforth be identified as "Sunshine Preparatory Academy."

First Site of Research: Sunshine Preparatory Academy

The official name of the school: Sunshine Preparatory Academy is shortened routinely and affectionately to "SPA" by all members of this progressive and innovative educational community. Administrators, teachers, support staff, students, and also the parents of students are all quite proud to be a part of SPA. Even the interactive website (both internet and intranet) of the school employs this abbreviated acronym: *SPAnet*. The location of Sunshine Preparatory Academy is divided into two separate campuses: the lower-school serving grades K-6, and the upper-school serving grades 7-12. Natalie, of course, teaches Latin at the SPA upper-school. As the only teacher of Latin, Natalie's full-time teaching load is heavy, as she co-teaches a middle-school (grade 7) exploratory

language course, which introduces students to the modern language of French and to the ancient language of Latin. The idea is to provide some exposure to both languages so that students can decide which language to pursue in future studies. Spanish, of course, is also offered at SPA, and is studied by a majority of students. In addition to this half-year exploratory course, Natalie teaches Latin I, Latin II, Latin III, Latin IV, and an AP Latin course that focuses on Virgil's *Aeneid*.

According to the chief administrator of the upper-school, SPA enrolls annually approximately 300 students, with a student-teacher ratio of ten-to-one, and a typical class size of 16 students. Because of these smaller class sizes, as well as the fact that most students complete their secondary education at SPA, the students and the teachers tend to know each other well, and this contributes to an overall sense of community at this school. This inherent impression of belonging is enhanced to a greater extent in the case of Natalie, since she retains the same students year after year. This is inevitable since she is the only Latin teacher at SPA, and since most of her students wish to continue studying this ancient language. As will become clearer in the discussion below, these general characteristics of SPA and the intimate climate of Natalie's Latin classes unmistakably evidence two qualities of Wenger's (1998) communities of practice learning theory: a focused feeling of personal *identity* within the social context of a dynamic learning *community*.

Sunshine Preparatory Academy also enjoys an unusually high level of parental involvement, which not only contributes to the overall atmosphere of belonging, not unlike that of an extended family, but also contributes to the creation and maintenance of

a vital repository of dependable human resources that aid in the ongoing activities of the school. Moreover, this researcher sensed a definite sense of professional accountability on the part of the faculty and administration of SPA, due to the regular presence of many parents on campus. Yet the students and teachers seemed to carry out their daily routines with a sense of purpose and confidence, despite the presence of parents, visitors, or even the presence of an educational researcher.

Every person with whom the researcher came into contact during the seven weeks of data collection was friendly, personable, and willing to help with the project in every way possible. Because of this open and willing institutional atmosphere, the researcher was able to collect even more data than he had anticipated. For example, instead of arranging a single interview with either a colleague or an administrator of Natalie, the researcher was able to conduct three interviews: one with a teaching colleague and departmental chair; one with the school's Director of Technology; and one with the Headmaster of the Upper School. A synopsis of the events of data collection at SPA are detailed in Table 4.1 below. The reader should note that this synopsis only represents a brief summary of the researcher's observations that were made during the periods of data collection at this site of research.

Table 4.1.

Record of Data Collection at Sunshine Preparatory Academy

Event #	Date	Duration minutes	Type of Data	Class, n = # of students	Notes
1	3/30	60	Informal interview		Negotiate schedule for research; campus tour
2	4/4	75	Observation #1	Latin II, n = 12	Quiz review (ppt); use of laptop "Apple" cart
3	4/4	60	Observation # 2	AP Latin (Virgil), n = 6	Reading; much use of G-T method
4	4/4	60	Observation # 2A		Holistic view of the school; campus, quad
5	4/4	60	Observation # 3	Latin III, n = 4	Laptops used in class; *Vinko* game; paired work
6	4/6	60	Observation # 4	AP Latin (Virgil), n = 6	"Spirit Day" blue/white colors; Taboo game
7	4/6	60	Observation # 5	Latin II, n = 10	Quiz using ppt on ch. 24 (Oxford); N plays Taboo
8	4/6	60	Observation # 6	Latin III, n = 4	Quiz, Taboo game
9	4/6	75	First Formal Interview		Background; philosophy; pre-active planning
10	4/18	75	Observation # 7	Latin IV, n = 7	Poetry, syncopation, Taboo game
11	4/18	75	Observation # 8	AP Latin (Virgil), n = 6	Review quiz; students eat food during class (is OK)
12	4/18	60	Observation # 9	Latin III, n = 4	Comparatives/superlatives (ppt); use own laptops
13	4/18	60	Observation # 9A	School quad outside library	Kickball after lunch; girls view photos of drama
14	4/20	60	Observation # 10	Latin II, n = 12	Principal parts of vocab. (ppt); culture: *toga virilis*
15	4/20	60	Observation # 11	Latin IV, n = 8	Read, recite, translate lines (Oxford III); Winko
16	4/25	75	Observation # 12	Latin II, n = 12	Laptop cart; class session video-recorded
17	4/25	45	Interview # 2		With Head of Technology
18	4/27	60	Observation # 13	Latin IV, n = 8	Gerundive of obligation (ppt)
19	4/27	60	Observation # 14	Latin II, n = 12	TPR "relay race" to board to conjugate verbs

20	4/27	60	Observation # 15	Latin III, n = 4	Own laptops used; adverb review (ppt); Winko game
21	4/27	75	Interview # 3		Stimulated-recall interview on Obs. # 12
22	5/2	75	Observation # 16	Latin IV, n = 7	Pictionary game on vocab Oxford III, p. 111; trans.
23	5/2	20	Focus-Group Interview # 1	Latin IV, n = 7	Technology is valuable for learning Latin
24	5/2	45	Interview # 4		With MH (Department Chair; and colleague)
25	5/2	60	Observation # 17	Latin III, n = 4	Students use own laptops for notes; video-recorded
26	5/2	20	Focus-Group Interview # 2	Latin III, n = 4	Technology: how to better use? Sense of community
27	5/9	60	Observation # 18	Latin II, n = 12	Vocabulary review before a quiz (ppt); video-record.
28	5/9	20	Focus-Group Interview # 3	Latin II, n = 12	Redundancy/saturation (same as previous F-Gs)
29	5/9	45	Interview # 5		With DB (Administrative Head of Upper School)
30	5/16	75	Observation # 19	Latin IV, n = 7	Cum circumstantial (ppt); video-recorded 30 min.
31	5/17	75	Observation # 20	Latin II, n = 11	Comparatives/superlatives (ppt); group work; Taboo
32	5/17	15	Interview # 6	Latin III	Student Interview A
33	5/17	15	Interview # 7	Latin II	Student Interview B
34	5/17	15	Interview # 8	Latin IV	Student Interview C
35	5/17	75	Interview # 9		Stimulated-recall interview (Obs. # 17-19)
36	5/18	20	Interview # 10		Exit-interview; tentative plan for member-checking
Totals for Site 1	**12 days**	**33 clock hours**	**36 events of data collection**		

This synopsis summarizes the several events of data collection which took place on the SPA upper school campus during the months of March, April and May, 2006. While the focus of research centered on Natalie's cognitive activities surrounding her teaching Latin in a technology-enhanced setting, these thinking processes did not – and

do not – occur in isolation from the entire social environment of the school. For this reason, much of the narrative that follows gives due consideration to the entire context of this independent educational institution.

Natalie's Odyssey

The first research question (Question 1.0), as it relates to Natalie, focuses on her pre-active (Question 1.1) and inter-active (Question 1.2) cognitions that occur as she goes about her normal teaching activities in an environment rich in technology. However, before these specific strategies can be clearly addressed, some attention will be given to Natalie's personal background as this relates to her decision to enter the teaching profession in general and to concentrate on teaching Latin in particular. From a situated learning (Lave & Wenger, 1991) theoretical perspective, the individual's sense of identity is absolutely foundational for personal and collaborative success in any particular community of practice (Wenger, 1998). A series of seemingly unrelated events and life experiences navigated Natalie through the sometimes dubious waters of self-discovery and self-knowledge.

This personal journey began, as one would expect, in childhood. Natalie grew up in a bilingual home, speaking Greek and English fluently before the age of three. While she attended private parochial schools in Chicago for her primary education, including Greek schools, she graduated from a large public high school in a suburb of this ethnically diverse city. During her secondary studies, Natalie discovered that she really enjoyed languages, and seemed to have an aptitude for learning them easily. She studied

four years of Spanish, thinking that perhaps she could use this language in her pursuit of a law degree someday.

After her family migrated to a somewhat smaller city in the Southeastern United States, Natalie attended two universities and earned her undergraduate degree in history, with a special emphasis on medieval and ancient history. These studies included the continued pursuit of Spanish, and also a focus on the classical language of Latin. Natalie learned that Latin, like her formal studies of Spanish, came easily for her, perhaps because of her bilingual background. She soon found herself tutoring in this language, and these experiences were quite positive and enjoyable. At this time, as she was contemplating a graduate degree in medieval history, a door of opportunity opened in an unanticipated direction.

Natalie's classics advisor informed her of a teaching position at a nearby high school. The school was looking for a Latin teacher. The administration of this high school was searching for a teacher to help currently enrolled Latin students to complete their foreign language requirement. They really had no interest in continuing a language program in Latin. It was a temporary job. And since the position would likely last for only two years, teacher certification was not an issue. Although she was apprehensive about the idea, Natalie interviewed for the position and was hired immediately. As she relates the account, Natalie describes the school as being "very desperate" for a Latin instructor. In retrospect, however, this two-year teaching experience charted the course for Natalie's journey as a professional educator. In her own words (emphasis researcher's):

> And so, I got the job. And um, I ended up teaching at [name of school] high school for almost two years, and at the same time I took Latin graduate courses at [a nearby university] … because I loved it so much. I mean, I had no idea that I would enjoy it so much, but just by doing it though, I had the best experience, I loved it. And the market at that time [was favorable], there was a better chance for me teaching Latin, than teaching history. And *I thought*, you know, *I think* that I'm better at teaching the language and the culture … *I figured out* that *I think* I'm more suited to teaching languages than teaching a social science or history.

Despite the fact that this teaching position was temporary, it undoubtedly was instrumental in revealing key personality attributes that were previously concealed from even Natalie herself. The reader will observe the italicized words in the excerpt above: *I think*. Natalie began to see herself as a teacher, to view herself as a teacher of Latin! Because of this important discovery, Natalie decided to pursue a graduate degree in education, which would also give her appropriate teaching credentials, including certification. She also determined to find another teaching job once this temporary position was completed. This search led her to Sunshine Preparatory Academy, where she was hired for a tenure-track position teaching Latin.

These experiences in Natalie's life as a fledging language teacher demonstrate clearly what Lave and Wenger (1991) refer to as "legitimate peripheral participation." Although Natalie began her professional teaching career at the periphery or margins of

the profession, her participation in these educational practices gradually increased in magnitude and in complexity. For example, Natalie admits that her first reaction to the use of technology in the classroom was one of fear and intimidation. But she was at least intrigued by the idea, and certainly open to try it. The graduate coursework in educational technology encouraged Natalie to think about imaginative and innovative ways to teach Latin. She noted: "*I think* that I am a very creative person, but it [the program in educational technology] helped me see how I could be creative in my classes, all the different activities that I could do, um, you know, multiple intelligence theory, the different ways you can get students to understand things." And so, as she learned about creative ways that technology could be used in the language classroom during her graduate studies, she began to implement steadily these technologies into her own instructional routines with her students. And the more she did this, even more ideas about technology integration in ancient language teaching emerged in her own thinking. In fact, she began to plan for it.

Pre-active Planning and Expedient Integration

Although Natalie maintains that one of her greatest assets is a good memory, she nevertheless insists on preparing a weekly planning guide that outlines her teaching agenda for every class session. And while neither the administration nor her departmental chair at this independent school require the submission of written lesson plans, Natalie typically writes a lesson plan every week, and prints out a hardcopy for her own usage. This paper outline is her constant companion through the week, as she adds notations, observations, and ideas for teaching as the week progresses. For example, two excerpts

from her daily lesson plan (dated April 4) show a seamless integration of technology in her pre-active planning (See also Appendix N below for a scanned image of Natalie's handwritten lesson plan):

> **Tuesday** *4/4*
> **8:00-9:15 (B): Latin II** – *vocab. & regular adj.*
>
> *→ Qz. Thursday > tell ss → vocabulary & adjectives: review w/pwrpt 1st Adjs. on board*
>
> *→ Play Taboo*
>
> *→ At least ½ hour > Laptops → (1) Oxford Online Ch. 24 practice*
> *(2) Quia for vocabulary & SPAnet practice w/pwrpts*
>
> **12:51-1:45 (G): Latin I** – *Quiz Wednesday* ✓*Boys/Girls Tennis: 1:15*
>
> *(1) → Go over lines 14-21*
>
> *(2) → Quiz tomorrow: orally → genitives p. 126 (phrases)*
>
> *(4) → Laptops: (1) Oxford online; (2) Powerpoints > study for quiz, HW: Quiz*
>
> *(3) → Taboo*

The **bold** print corresponds to what Natalie produces through her Word software program and prints out in five pages each week. In this way, Natalie is able to see at a glance all of the planned activities for the entire week, as well as the agenda for each particular day. She leaves sufficient spacing in between each class session to write in long-hand her specific plans for that class (indicated above in *italic* print). And while this planning guide helps Natalie keep things moving in a general curricular direction, she remains open and flexible to modifying these lesson plans along the way. For instance, in the second class period excerpt above, Natalie decided at the last minute to add the Taboo

game, and also to alter the order of activities. She indicates this by adding numbers to the left margin. This one-page synopsis of her daily agenda provides order and comfort to Natalie as she goes through her teaching regiment. According to the principles of the Yinger Model of teacher planning, one of the most basic rationales for the production of lesson plans, even in outline form, is to reduce anxiety (Yinger, 1977). This is precisely the reason that Natalie develops her own plan for teaching activities. “It helps me with my sanity,” she declares.

While most of Natalie’s pre-active pedagogical planning revolves around the topics of Latin language and culture, an increasing amount of time is spent on thinking about how to best integrate the technologies available to her into her instructional routine, within her institutional context (Borko & Putnam, 1996). Some ideas for the use of technology are suggested by the textbook publishers, such as Oxford, who provide an ancillary text-specific website that can be accessed by teachers and students of Latin over the Internet, and without the need of a membership key or code. Natalie encourages her students to use this website that corresponds to the presentations of language and culture in the textbooks she uses with her students, the Oxford Latin series, as seen in the lesson plan above. Moreover, Natalie complements these useful online websites with materials that she has generated herself, and posts these items regularly on the school’s website: SPAnet. These materials, of course, are not only used during regular class time, but can be accessed at any time from SPA students, as well as their parents.

Although much of this pre-active pedagogical planning, including the integration of technology, is done during the course of the academic school year, Natalie finds that

she does a significant amount of her own planning over the summer months. Part of the rationale for this, of course, is just pragmatics. Because of her teaching load, heavy in contact hours with students, Natalie does not have sufficient hours built into her weekly schedule for planning purposes. So, she uses some of her "vacation" time during the summer months to plan the general contours of her teaching activities for the upcoming year. Perhaps this is to be expected from a dedicated language teacher with relatively few years of teaching experience. But in the estimation of this researcher, Natalie pursues these activities because she loves to do so. She lives and breathes her work. During the school year, additionally, Natalie uses time during the weekends to review and modify her lesson outlines for the upcoming week.

Of particular interest for this empirical investigation is how Natalie plans for the use of technology in her teaching activities. The data analyzed in this study demonstrate that Natalie implements a strategy that this researcher has labeled *expedient integration* into her pre-active planning routines. Although the precise description of this strategy and corresponding theoretical implications will be elaborated below in the next chapter, it is appropriate to introduce this concept here. Natalie chooses to use a certain technology in her teaching activities when it helps her students learn the subject matter: the vocabulary, grammar, culture and history of the Latin language. Naturally, Natalie selects those technologies that she herself has mastered and that are readily available for her use on the SPA campus. Interestingly enough, the administration of SPA determined to install LCD projectors in every SPA classroom during the summer of 2005 for regular use during the 2005-06 academic term, just months before this research study began. Because of this

added feature to her classroom, Natalie decided to amplify her use of technology in her teaching activities. Furthermore, SPA's Director of Technology provided in-service training sessions to all SPA teachers on how to best use this new equipment. The administration also provided state-of-the-art notebook computers to all teachers at the upper-school [secondary] and has plans to provide the same technological hardware and training for middle-school and primary-school teachers within the next year.

Table 4.2 below provides a sampling of the types of technologies that Natalie regularly uses in her instruction of Latin at SPA. Instances of the integration of all of

Table 4.2.

Types of Technologies used at SPA for the Study of Latin

Technology	**User**	**Purpose**	**Venue**	**Notes**
Word Processor	Teacher	Write lesson plans; create quizzes, tests	Office hours; weekends at home; summer	This does count as a technology, yet taken for granted
Word or Notetaking Software	Students	Take in-class notes	Classroom	All students [grades 10-12] have notebook PCs
Email	Teacher & students	Communication	School and at home	Parents, too
PowerPoint	Teacher & students	Presentation/Review of content matter	Classroom and SPAnet	Students typically collaborate on this
Pdf files on LCD screen	Teacher	Presentation/Review of content & culture	Classroom	Easy projection of text, photos, maps
Internet use	Teacher & students	Webquests; access at Oxford and Perseus websites, & SPAnet	Classroom and homework	Comparatively few sites available for the study of Latin
SPAnet [Blackboard]	Teacher & students	Syllabus, schedule, Access of ppts, files	Classroom and at home	Parents can also access information
Video [movies]	Teacher & students	Present mythology, history, culture, etc.	Classroom	Example: Trojan War
Digital photography	Students	Enhance PowerPoint presentation	Classroom and SPAnet	Natalie learns from students at times!

these technologies were observed on the SPA campus by the researcher during the period of data collection. Typically, as Natalie plans for her instructional routines, she focuses not only on the specific linguistic or cultural topics that will be covered during each class period, but also on the variety of activities and tasks that will be done during these class sessions. She reflects on past experiences – both successes and failures – in order to anticipate the classroom logistics of the activity, possible student reactions to the assignment, as well as potential learning outcomes.

Her pre-active planning, therefore, incorporates cognitions about the flow of each lesson, thoughts about the attention span of students, beliefs about the nature of learning an ancient language like Latin, considerations about the purpose, timing, and transitions of learning activities, including how best to integrate technology into these routines. Moreover, Natalie intends to build into her lesson plans a certain amount of flexibility, which is particularly useful at SPA, where the class schedule alternates on a two-week schedule ["Blue Week" and "White Week"]. This system ensures that afternoon extra-curricular activities and events, which typically require early dismissal from classes, do not consistently disrupt the same courses. These observations, as were noted in chapter two above, correspond to what several researchers have labeled as situated knowledge (Borko & Putnam, 1996). This concept has been variously described as the general practical knowledge base of teachers (Shulman, 1987), or more precisely what some scholars have labeled as personal practical knowledge (Elbaz, 1980; Golombek, 1998). Natalie manages to adapt her teaching responsibilities to the institutional context in which

she operates, including the technological hardware and infrastructure available at her school.

Observations of classroom sessions as well as interviews with students and colleagues demonstrated the effectiveness of Natalie's instructional delivery methods. These language teaching methods include – in part – both pre-active planning and inter-active decision-making. During a focus-group interview session with her Latin II class, one of Natalie's students commented on this teacher's style of instruction: "Well, she breaks up everything into different things to do, which we like … we would get bored otherwise. She always keeps changing activities, and that keeps me interested in what's going on. That really helps." Another student made similar observations about Natalie's eclectic teaching style in general, and her effective integration of technology in particular: "Miss Natalie is great because she's really stepped up the learning. I really feel that way about her because she does so many things … she uses a lot of PowerPoints, a lot of games to help cement everything into our minds. I definitely think that I have learned a lot more from Miss Natalie." Obviously, this student, who has studied four years of high school Latin, feels very strongly about his teacher, and uses a picturesque metaphor to describe the L2 learning process.

Natalie herself observes that her pre-active planning includes considerations of variety in the presentation of the material, including the use of instructional technology. She thinks that a good mixture of teaching methods is imperative due to the relatively short attention span of most of her students. In fact, although she is an ardent supporter of technology, she believes that this innovative tool of teaching can sometimes be overused,

to the detriment of students. In commenting upon the possible negative side-effects of the use of instructional technology, Natalie made these remarks: “I think that the biggest thing, um, is that they expect an answer really, really fast. I mean, they know that they can get online and get whatever they need so quickly, that I think that they have lost a little bit of the process of getting an answer, or finding different ways to get to a solution.”

For these reasons, therefore, Natalie’s pre-active teaching strategy involves a careful selection of instructional technology. This process of technology integration is quite deliberative. It is planned by Natalie as she considers the learning objectives of the particular course or level of Latin, as well as the learning modalities of her students, including their obvious enthusiasm for games. Natalie incorporates both collaborative in-class language games as well as virtual games. These online games are sometimes competitive and collaborative, and sometimes oriented toward the individual student. But they are always focused on language learning. Of course, these pedagogical plans and strategies not only occur pre-actively, as Natalie thinks about each class lesson, but are expedited mid-stream, in the ebb and flow of interactive decision-making. Here, in the dynamic context of real-time – face-to-face – Latin teaching, she sometimes finds it necessary to improvise.

Interactive Teacher Cognition and Expedient Integration

Another research question that served to guide the focus of this study (1.2) was concerned about the inter-active decisions that are made by Natalie, in the context of her F2F classroom. As described in the previous chapter on methodology, a stimulated-recall

interview protocol was developed by the researcher to capture data on this aspect of language teacher thinking (See Appendix F). Two class sessions at SPA were video-recorded for this purpose, followed by interview discussions with this teacher as she reflected on her inter-active teaching routines, as well as her inter-active thinking generally. The first of these stimulated-recall interview sessions was conducted two days after the observation of this class session took place. Classroom activities and events of Natalie's Latin II class (n = 12 students) were video-recorded. Although the actual class period was 75 minutes in duration, the recorded footage on the digital video cassette was approximately 45 minutes, as the observer-researcher selected only certain tasks and classroom activities to record, and others not to record, in order to avoid recording redundant behaviors and to conserve space.

Later that day, the researcher reviewed the video footage, marking appropriate areas to review with Natalie two days later, during the next date of research. Although the researcher would discuss these episodes of the class activities with Natalie, he would also provide Natalie with the opportunity to select additional segments of footage to stimulate her recall of her inter-active thinking. As discussed in chapter two above, the research literature on this method of data collection is of a mixed-type, some studies describing researcher-selected segments of footage (Clark & Peterson, 1981; Peterson & Clark, 1978) and other studies allowing the teacher to make such selections (Gass & Mackey, 2000; Keith, 1988). The research design of this empirical study called for the researcher to select certain episodes for review, and to allow the option for the participating teacher to also make such selections for review and reflection. Natalie was an enthusiastic

participant during this interview, requesting to stop the tape on several occasions to make comments on what was going on during the class session. This stimulated-recall interview session was audio-recorded and later transcribed by the researcher (See Event 21 on Table 4.1 above).

The class period consisted of several language tasks, some of which were focused on the use of technology, and others were not. As mentioned above, Natalie likes to mix things up, making transitions from one activity to another. She thinks that this element of instructional variety is, perhaps, more critical in extended class sessions that last for 75 minutes. The class session began with Natalie asking students to work independently on translating a paragraph in the textbook that included a grammar exercise on the review of Latin gerunds. Natalie rotated around the room, offering help as needed to the students. As Natalie watched herself on the video, she felt self-conscious at first. But as the interview progressed, she became more relaxed, and commented with ease on her teaching activities and her thinking processes during the class.

Natalie encourages her students to develop strategies that will help them learn the core vocabulary that is necessary to learn the Latin language, especially for purposes of literacy. In one segment of the video-recording, Natalie asked to stop the tape, rewind, and review what was happening during the class period. In the excerpt from the transcript below, Natalie commented on one student's facility with an interactive online game called *Battleship*, and how this competence was made possible through the practice of one of her in-class games called *Taboo*:

> And with the Taboo game, it's really helping a lot, they are learning the vocab quite a bit from that game, so they feel more confident with the Latin vocabulary. I would say that before we started playing Taboo, honestly, we would get quite frustrated at the vocabulary problems, many of them could not remember the vocab [for each new chapter], so Cynthia, right here, is working on this online Battleship game [at www.Quia.com], and she's doing great with it, in part, because the Taboo game that we do in class. She was having problems with learning the vocab, she doesn't have the patience as some of the other students do, so I was *thinking* [emphasis researcher's] of ways to help her and the others increase their vocabulary. So now [that] she is really retaining the vocab, she did great on this [online] game … It's fun. It's a game. They're competitive, you know, And that makes it fun for them. [Here] I'm seeing how they are all doing on their PCs, and Cynthia was doing great here.

In reflecting upon this segment, therefore, Natalie commented both on her pre-active planning and her in-class inter-active practices of assisting students as they work on their Latin assignments, some of which are comprised of competitive games. These popular and fun activities are of both the virtual variety and the traditional F2F classroom type. In observing her students as they work online, she sometimes has to lean over one student's desk to see the notebook PC monitor of another student, due to the small size of her classroom, and the way that Natalie arranges the furniture in the classroom, especially her students' desks. The researcher asked her during this interview to comment on her

rationale for not setting up her students' desks in the classroom in the typical style of rows, but instead using two rows in a double U-shape:

> I like to have the desks set up in a U-shape, where I can go down the middle, and see to the right and to the left of each student. When we're using laptops [i.e. notebook PCs], I can usually just lean over and see each PC, and talk to each student … Anyway, what I have started to do, is when they have the laptops, is to have them do these [online] www.Quia.com activities, and to review assignments on the Oxford online website, but to also have them review the PowerPoint slides that I have posted on SPAnet. They can access it for review purposes, and they really like that. Some kids are using those PowerPoints here [in this video footage] as I walk around the room, and I can see that [monitor them].

As Natalie interacts with her students, both passively by being available as a resource to them as they individually and personally take on the responsibility of learning Latin, and actively as she instructs them and provides tools and strategies for them to succeed in this endeavor, she becomes a negotiator. In terms of Lave and Wenger's (1991) conceptions of situated learning within communities-of-practice, Natalie collaborates with her students in making sense of classroom routines, including online language activities. Within the context of this learning community, Natalie helps her students negotiate meaning out of everyday practices and semester-long goals and objectives. The phrase "negotiation of meaning" has a very specific referent among SLA theorists and practitioners. It refers to the activities of reaching understanding when two or more

interlocutors communicate with each other. On the other hand, this focus on language communication is not how Wenger (1998) employs this term. He uses the term in a much broader fashion. In the milieu of his theory of situated learning he suggests that this idea of negotiation involves at once the characteristic of mutual respect as the parties continuously interact in a process of give-and-take and the element of gradual achievement (p. 53). Wenger goes on to explain that this process of "negotiated meaning is at once both historical and dynamic, contextual and unique" (p. 54). Hence, Natalie negotiates with her students the varied tasks that will define their particular community of practice, and the terms of their implementation. In fact, Natalie herself recognizes this process of negotiation. She noticed one student modifying the outline that she had written on the classroom whiteboard before students had arrived that day. He decided to amend the agenda by adding the Taboo game to the schedule, a favorite activity of the Latin II group of students. Because of his action, and the general dynamics of the class that day, Natalie decided to alter her original lesson plan for the day. She asked the students to shut down their notebook computers, put them away, so that they could play Taboo. The researcher asked her during this interview to explain why she decided to do this.

> I did [that] because they we're losing focus. They were not really thinking about what they were doing, they were talking too much with each other [off task], they weren't getting out of it [the technology module that day, using the notebook PCs from the "Apple Cart"] what they usually get out of it, and they were not getting the benefit of the activities that I had [originally] planned, on the computers, you know what I mean? So, I just said [*thought to myself*], well, one of the objectives

> for the computers that day was to review vocabulary, and they were not really doing that to the level that I wanted, so I *decided* that we would review vocabulary a different way, in the Taboo game, and I was hoping that this would get them to refocus on the task.

Therefore, in her interactive thinking, Natalie makes decisions based on the specific dynamics of that particular class period, including the integration of technology and its cessation, too. In this instance, which she considered to be abnormal, the students were not staying on task sufficiently to accomplish the objectives of the computer activities that she had assigned. So she simply charted a different course mid-stream, and switched to another activity, in this case, one that did not involve the use of technology. In other words, she employed what Yinger (1987) calls "improvisational performance," a concept outlined in the review of literature above (Chapter 2). While Natalie did, in fact, alter the specific activities of her planned lesson, she did so in congruence with her original goals for that class: the review of Latin vocabulary for the current module of studies. Natalie's inter-active decision-making is done within the parameters of her curricular objectives. Her planned integration of technology, its implementation in the classroom, and even its cessation are all guided by the pedagogical precept of expediency. This researcher refers to this phenomenon as the *expedient integration* of technology. If the task or activity helps to carry out the planned learning objectives for that particular period, it is included and expedited. If the task or activity does not accomplish this goal, then it is modified or scrapped altogether. While Natalie is flexible in these practices in her community of

Latin learners, she remains firmly in control of the situation, and makes decisions that will facilitate her curricular goals.

A Creative Reconciliation

The second principal research question of this study (2.0) will be addressed in two parts, which correspond to the two participants of this investigation: How do two teachers reconcile traditional Latin pedagogy with their practice within a technology-rich environment? Of course, this section of the report will focus on Natalie, at the first site of research, while the second teacher, Samantha, will be considered in a subsequent section later in this chapter. Therefore, the question as it relates to the first participant in this study is: How does Natalie reconcile traditional Latin pedagogy with her practice at Sunshine Preparatory Academy?

In a word, Natalie does this *creatively*. Her reconciliation of two seemingly opposite methods of language instruction is accomplished in highly imaginative and resourceful ways. While Natalie admits that she herself learned Latin the old fashioned way, one that emphasized the rote memorization of lengthy vocabulary lists and the tedious reading of dry descriptions of grammar rules and exceptions, she understands that the exclusive use of this traditional grammar-translation style of instruction is a recipe for inevitable disaster. She knows that the current generation of high school students will not easily acquire this ancient language without instructional variety, including the ingenious integration of the newest tools of the trade: computer technologies.

On the surface, of course, the idea of juxtapositioning ancient Latin with notebook PCs and PowerPoint presentations delivered by a state-of-the-art LCD overhead projector

in the classroom seems odd or strange. But this scenario is not odd or unusual for Natalie. Although there is no language teaching methodology that can effectively eliminate the need for vocabulary memorization and regular reviews of grammar, Natalie believes that technology serves a useful purpose. She thinks that there are utilitarian rationales for the efficient and effective implementation of technology in her instructional routines at SPA. Natalie says that computer technology meshes perfectly well with the learning styles of her students. They already use computers regularly for their own entertainment and their own ways of interacting with each other. Why not harness that knowledge and facility for learning Latin? The Internet is a fascinating virtual environment that provides almost unlimited exposure to the history and culture of ancient Rome, including artifacts and inscriptions displaying Latin script. Why not assign WebQuests on Roman mythology or Roman architecture that complement her own classroom presentations of culture, history, and language?

> OK, I guess that on my part, as a teacher, I use it [technology] in different ways. One thing that I have found to be very effective are the vocab PowerPoints. I mean, an unbelievable difference. If I do a PowerPoint [slide show] with pictures, to introduce the vocab, and I review the vocab using PowerPoint several times over the course of [studying] that chapter, I cannot tell you what a difference that makes in [terms of] them remembering, especially the meaning of the words. Now I think [that] the other things like the genitives, and genders, and things like that, or the principal parts of the verbs, [those grammar structures] are a little more difficult.

Nevertheless, Natalie presents and reviews grammar using this key technology. In her estimation, PowerPoint presentation software makes it easy for her to focus on frequently used vocabulary items, or verb conjugations, and to integrate interesting images, clip-art, or photos that illustrate the meaning of the linguistic structure under consideration. A sample of Natalie's incorporation of visual aids in her PowerPoint slideshows is given in Figure 4.2 below. This technology also facilitates the memorization process, especially when she cycles through the material at regular intervals.

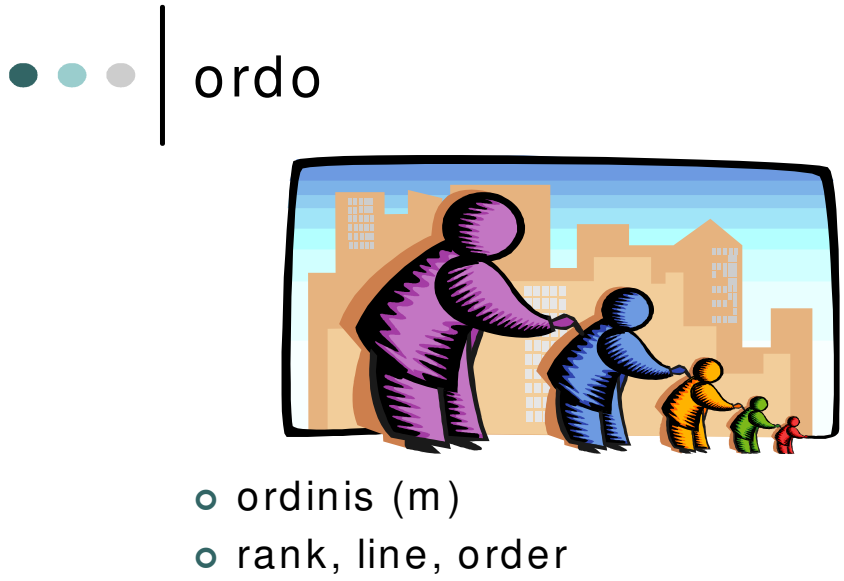

Figure 4.2. Sample of PowerPoint Vocabulary Slide.

While Natalie introduces new vocabulary or grammatical structures by generating a new PowerPoint slide presentation, she finds it helpful and instructive to reuse these same ppt

files, typically by making some slight modification. Instead of providing a quick translation of the item or structure in Latin, this edited PowerPoint presentation now includes prompts to generate student participation in declaring what the correct response should be.

These recursive reviews, of course, provide her students with learning experiences that help synthesize the acquisition of essential language structures. Natalie's intuitive use of presentation software is consistent with current trends and best practices in the field of instructional technology (Summers & Madrigal, in press). Although the reconciliation between traditional Latin pedagogy and the integration of modern computer technologies presents certain challenges, and even an undeniable tension in Natalie's thinking, she resolves this tension creatively. Natalie's educational practices attempt to provide a balance between medieval grammar-translation methods and contemporary instructional technology. Therefore, her own resolution to this problem is to seek creative, yet effective ways to use technology. Moreover, Natalie's thinking, her pre-active and inter-active acts of cognition, is continuously focused on her students' progress. Technology is a tool – a powerful and efficient tool – that is instrumental in the learning of Latin. Technology is best integrated in ways that are creative, selective, recursive, and progressive. These elements of technology integration, of course, will be discussed at length in the next chapter. It must be noted at this point, however, that these characteristics of Natalie's cognitions about the use of technology in teaching Latin can be conveniently summarized in the concept already introduced above: the *expedient integration* of instructional technology.

Functional Roles and Communities of Practice

To review, the third principal question of this empirical study was the following: What functions do the differing communities serve in the day-to-day practices of these Latin teachers as they use technology? This final research question (3.0) – as it relates to Natalie and her work at Sunshine Preparatory Academy – focused the lens of research upon the unique roles of three distinctive communities at SPA: the community of her colleagues or teaching peers (3.1), the community of her administrators (3.2), and the community of her students (3.3). Each of these communities, in turn, will be addressed below.

Although Natalie is the only teacher of Latin at SPA, there are three Spanish teachers and one French teacher in the Foreign Language Department at this school. Because of this, she does have opportunities to relate to fellow language teachers in the department as well as other faculty members from other areas of instruction. During formal faculty meetings or informal conversations in the faculty lounge, teachers often discuss matters of mutual interest, such as classroom management, interacting with students or parents, teaching tips, and other similar matters. Last summer, for example, she served as a faculty co-sponsor for an educational tour to Italy, which featured an itinerary that appealed to students of Latin as well as to students of art history. One colleague that has been particularly helpful to Natalie, as she goes about her daily routines in this technologically-rich environment, is the Chair of the Foreign Language Department. She will be identified, for purposes of this research report, as Maribel Márquez.

Freedom to Teach

When asked about her relationship with the Chair of the language department, Natalie remarked: "I have a pretty close relationship with her, she is wonderful, helpful. She is great because she leaves me alone. I enjoy a lot of [professional] independence … she gives me freedom to do what I need to do in my classroom." And while Natalie has a great deal of independence as she expedites her teaching tasks, she considers Maribel to be an important resource person for professional development. During one interview, Natalie made these observations:

> If I need anything, if there is something going on [in the area of language teaching], she will come and tell me about it, she is just great. And I work really well that way as a teacher. I don't like people telling me how I should teach, you know, micro-manage my teaching style. I need my independence to develop myself professionally.

The entire SPA faculty seems to function as a team, offering support and guidance to young teachers, and sharing instructional methods and pedagogical tips whenever it is appropriate to do so. Language-specific suggestions, however, are not possible in Latin, since Natalie is the only teacher of this language. "I think that, within my department, we do support each other and we do help each other when we can, but the Spanish teachers have a little more of an advantage in this regard, especially in the sharing of materials and that sort of thing." Natalie characterizes SPA as a close-knit community that provides

guidance and help when required, and the freedom that she needs to teach creatively and effectively.

In another interview, Natalie's colleague and departmental mentor, Maribel Márquez was asked to comment on the way her Latin teacher infuses technology into her instructional practices: "I think that Natalie does a good job of integrating technology. I know that she likes to use [LCD] projectors and … when she learns something new, she likes to integrate it into what she does everyday in the classroom." Maribel also added that she has observed Natalie on several occasions, and her students absolutely love her. The manner in which she relates to her students more than compensates for the unusual challenge to maintain student motivation to learn this ancient language. Natalie has the uncanny ability to make her students feel at ease. As the interview progressed, Maribel noted: "Well, in the study of foreign languages, they call that the affective filter. And so, when you – as a student – are relaxed and comfortable, you learn [better], there's more [information/input] that can come in. But if you're tense or nervous, or your stress level is too high, then it's much more difficult for learning to take place." According to her Departmental Chair, therefore, Natalie effectively reduces her students' affective filter (Krashen, 1981) and thereby promotes language acquisition. And one way in which she is able to do this is through the expedient integration of technology.

Although her students regularly display enthusiasm and appreciation for the great instructional variety that Natalie incorporates into her teaching – and their learning, – their eager participation stems from something far more basic than professionally installed computer hardware – such as LCD projectors – and presentation software. They

belong. Natalie's students exhibit an assured sense of belonging to the SPA school family in general, and a sense of being an integral part a special group of Latin learners. They identify themselves as members of a long and venerable tradition of scholars who have become conversant with the ways of the classical world. Of course, their growing knowledge of Latin will help them achieve higher scores on their SAT tests, too. But in the estimation of this researcher, such self-serving motives are secondary to the strong sense of confidence and personal identity evidenced by Natalie's Latin students. In this, he agrees with Maribel Márquez. Natalie – in her work as a Latin teacher – has the ability to foster a sense of community among her charges.

As noted in the review of literature above, Wenger's (1998) social learning theory suggests that real progress occurs when participants move from the periphery of the community toward the center of the group. Wenger views the dynamics of the educational enterprise primarily "in terms of identities and modes of belonging … and only secondarily in terms of skills and information" (p. 263). While additional observations along these lines will be made below in the discussion of the role of Natalie's community of students (Research Question 3.3), it is clear that Natalie enjoys mutually beneficial relationships with her teaching peers at SPA, especially with Maribel. These relationships not only foster a sense of professional accomplishment, professional development and personal growth, but also a sense of belonging to a unique team of educators at an exceptional school.

A Rising Star

Without doubt, Sunshine Preparatory Academy is a special place. And this relatively exclusive independent institution is headed by an administration that seems to understand the challenges facing educators in the twenty-first century. Another research sub-question (3.2) that focused the investigative procedures of this study considers the community of administrators, and how this group functions to assist Natalie in her regular teaching routines and tasks. As was observed in the discussion above, Maribel Márquez functions not only as Natalie's language teaching colleague, but also as her Chair in the Department of Foreign Languages. In this role, therefore, Maribel serves as a bridge between Natalie (and her language-teaching colleagues) and the SPA administration. Many of her observations and comments were in congruence with those of other administrators at SPA, including the Head of the Upper School. This key administrator, for purposes of confidentiality, will be identified as Daniel Brierre.

Mr. Brierre, who hails from the state of Pennsylvania, has over 20 years of experience as an educator and administrator in private, independent schools. He strongly believes in teacher autonomy, but that independence must be earned through hard work, superior academic credentials, unquestioned expertise in the content area of instruction, and excellent interpersonal skills. SPA teachers must not only be good teachers, they must be able to relate well to the entire SPA community: colleagues, support staff, students and parents. In his estimation, his high school Latin teacher is "a rising star." Brierre makes this extraordinary declaration because he enjoys a rather unique position from which to evaluate Natalie's abilities as a teacher. Three of his children are currently

enrolled in Natalie's Latin courses. Because of this situation, he does not find it necessary to sit in on many of Natalie's classes, as he would normally do in overseeing the work of young teachers, or even tenured faculty. He has three accurate monitors that provide key information about the dynamics of their Latin classes. In commenting on Natalie's teaching in general, and on her infusion of technology in particular, Mr. Brierre had this to say:

> One of the things that impresses me most about Natalie is that her care and concern about the kids comes through loud and clear, and because of that, they are willing to work for her. I think that that's a really important part of it [Natalie's success] … I think that she is one of the teachers that really uses technology, she is one of the teachers on the upper end of those teachers who use the technology … a lot of her usage is what she does in the classroom in terms of presentation of the material.

Furthermore, Brierre noted that Natalie is always eager to employ new technology as soon as it becomes available. There is no shelf life for computer hardware or software in her classroom. She begins to use it once it is in place. For example, Brierre observed that every classroom at SPA received a hardware upgrade during the summer of 2005, yet only Natalie and a handful of other SPA teachers regularly use the new LCD projectors in their teaching.

The administration at SPA, according to Brierre, regularly provides in-service training to their teachers for all of the new technology that they use, including the new

projectors installed in every SPA classroom, the SmartBoard used in the history classes, and most recently the podcasting technology that is being integrated into the Spanish courses. While SPA employs one full-time administrator in this area – the Director of Technology – who oversees all of the technology infusion at the school, sometimes outside experts are brought in. For example, trainers from the Texas Instruments company are scheduled to conduct in-service training sessions to the SPA mathematics department so that the teachers understand the capabilities and applications of the new TI-89 calculators.

In addition to faculty-wide and department-specific in-service training, Brierre said that SPA provides opportunities for their teachers to attend professional meetings in their particular subject area. Natalie has certainly taken advantage of these opportunities for professional development, and this fact has also made an impression on the SPA administration. Not only has Natalie participated in regional meetings of the American Classical League (ACL) and local chapters of the foreign language association, she has also taken continuing education credits with the College Board, specifically in preparing advanced students to pass the AP Latin Test. Despite her obvious zeal for learning and professional development, Brierre laments that Natalie has not yet registered for David Mallery's Institute, which specializes in the development of gifted new teachers, working in independent schools:

> I really wanted her to go to something that I went to as a young teacher, but it's up in Pennsylvania, it's a big time thing, but she would have to miss several of her classes here in order to go, and the timing was bad … it's a new teacher

> institute run by NAIS (National Association of Independent Schools – see http://www.nais.org/), run by David Mallery. [Normally], I hate going to those things, but this guy, he's just fantastic. One of the few times that I've had a great time at a workshop, and I've been to everything that he has done because of that first impression.

In Brierre's judgment, even a naturally gifted teacher like Natalie would be able to bring her skills up to another level by participating in this particular NAIS institute, with this internationally known presenter. Nevertheless, Brierre surmises that Natalie will certainly navigate her own trajectory toward stellar teaching. And she will use "cool" technology along the way. Brierre and the entire administration at SPA appreciate the role that these new innovations play in the teaching program at SPA, including the Latin curriculum.

Peter Knowles, the Director of Technology, serves as a human resource that occasionally helps Natalie in mastering the technology infrastructure at SPA, and in making general suggestions for how best to infuse these tools in her teaching. In his estimation, however, Natalie is a fast learner, as far as technology-integration is concerned:

> She is doing a fantastic job. The thing is, she's open. I say: Natalie, why don't you try this? And she says: Oh, that looks great, how do I do it? Her response is not: Oh, I'm [already] doing it this way, and I don't need to change what I'm doing, and so forth. Natalie is open to new ideas and new methods of getting the job done, and that always impresses me. I just love her openness, and I have said

> many times to the administration that Natalie is outstanding in this regard. She's [way] up there. Now, she's a relatively new teacher, and that may be one reason, but I really think that that's just her nature.

In a word, Natalie is *open*. She is open to the challenge of technology; open to finding creative ways to use it in her classroom; open to discovering how these innovative tools might better foster student motivation, enthusiasm, and learning. Moreover, Natalie is continuously thinking about how technology will help advance student learning. Knowles suggests that Natalie seems, by nature, to seek success and make progress in this way, building her skills in new instructional technologies. In the view of this researcher, the evidence for this theme or concept of the *expedient* integration of technology is accumulating.

What function does the SPA community of administrators serve in Natalie's day-to-day teaching practices? The answer to this question (3.2) is clear: the administration provides the tools of technology and the corresponding teacher-training that is necessary for these tools to be used effectively. Moreover, the SPA administration provides their teachers, including Natalie, the academic freedom and instructional liberty to manage their own professional development. The Head of the Upper School, Daniel Brierre, is there to assist Natalie in her own growth as a teacher, providing some administrative feedback and encouragement, which will continue to be effective as Natalie strives to reflect on her own teaching, including the use of technology. This topic of reflective teaching was included in the review of literature above (chapter 2), and remains a key area for L2 research and pedagogy (Richards, 1998; Wallace, 1991, 1996).

In his theoretical discussion of this issue, Eraut (1994) sees this element of self-awareness as foundational for progressive growth as a professional, including the self-knowledge and self-management of teaching professionals (pp. 95-97). As noted throughout this report, Wenger (1998) describes this phenomenon as the element of personal *identity* within functioning communities of practice. Maribel Márquez and Peter Knowles function as additional resources for Natalie as she strives to find her own best-practices approach to technology integration in ancient language teaching. And while the community of administrators and the community of colleagues serve to provide resources and support for Natalie as she goes about the business of teaching Latin, it is in actuality another community altogether that helps her to maintain her professional and pedagogical focus.

A Community of Latin Learners

The final sub-question (3.3) that guided this empirical research project focuses on the function of the community of students upon Natalie's day-to-day practices as a Latin teacher. By far, this group – the community of Latin language learners– provides the most important influence on Natalie's cognitions and practices in this technology-rich environment. In general terms, the students are the objects of Natalie's pre-active planning and her inter-active decision-making. They serve as daily reminders of all her cognitions about language teaching, jogging her memory about their difficulties and their triumphs in learning this ancient – and in some respects dead – language. Perhaps most importantly, they function as a collective source of inspiration as she goes about her regular teaching routines.

When a new type of instructional technology comes to her attention, whether it be the course management software that is SPAnet [Cf. Blackboard], the school-wide installation of LCD projection systems, or the promising potential of an image-scanning device, Natalie tackles technology with a spirit of adventure. Not surprisingly, her attitude shows a special concern for her students' overall well-being, and their success in learning Latin in particular. This energetic high school teacher and her students comprise a community of ancient language scholars that view themselves and their work as unique, timeless, and worthwhile. During a formal interview session, Daniel Brierre, the Headmaster of the school, noted this special sense of community in Natalie's classes:

> I've observed on several occasions the unique interactions between the students in Natalie's classes as well as their interactions with her. I think that this is due to the nature of the school, the sense of closeness that we have. It's a real community. But especially I think that this is true of classes such as Latin or French, because they [students] have that same teacher in that subject area all the way through high school, that does not change. Whereas, for example, a math class will change classmates and teachers.

Although their perception of themselves and their collective activities are constantly evolving, they know that what they do on a regular basis has intrinsic value. It really matters. They can assign meaning to the practices of their community of Latin learners because there is purpose in what they do. While some short-term objectives, such as SAT scores and getting into the college of their choice, are clearly present to motivate and focus their individual and collective energies, something else is also going on. Teenagers

of the twenty-first century are making direct contact with the language, literature, culture, history, society, politics, philosophy and even the vices of the classical world. Of course, one of the key curiosities of these phenomena is that this encounter between the ancient and the modern [or postmodern?] is being facilitated by the expeditious use of computer technologies. This curious clash between old and new is evident not only in Natalie's assemblage of practicing Latinists, but also in other technology-rich communities of practice. One such group is comprised of an assortment of online students who never see each other, and who, for that matter, never even meet face-to-face with their teacher. It is a virtual school with a unique way of assigning meaning to themselves, and their ongoing practices of learning Latin. Perhaps the next episode in this exploratory study is best introduced by recasting another old query: What has Rome to do with cyberspace?

Case Two: Samantha

The second teacher examined in this empirical study is an educator with over 25 years of teaching experience in traditional secondary Latin classrooms and an additional six years of teaching experience in the virtual classroom environment. For purposes of this research report, this teacher will be identified by the name "Samantha." Although there are some obvious differences between Samantha and Natalie, the teacher focused on in the first case study of this project, they both teach the ancient language of Latin in contexts that are extremely rich in the use of technology. It is, of course, precisely for this reason that they were selected to participate in this research study. Data were collected intermittently over a period of three months, detailed in Table 4.3 below.

Unlike the case of Natalie, however, Samantha is currently teaching Latin in a high school distance learning environment that uses the Internet for its basic course delivery system. At the time that data were collected on Samantha, she was completing her sixth year of work at an online public high school. For purposes of confidentiality and anonymity, this school will be identified as the "Southeastern Virtual School" (SEVS). What follows is a description of this unique educational institution.

Table. 4.3

Record of Data Collection at Southeastern Virtual School

Event #	Date	Duration minutes	Type of Data	Misc.	Notes
37	9/21	30	Informal conference call (teacher, LG & researcher)	Review plan of research (suggest online focus-groups?)	LG (Manager of Research & Grants) and S; no approval given to modify or change research plan
38	9/22	120	Interview # 1	F2F meeting at Internet café in Samantha's home town	Overview of VS Latin program; pre-active planning pre-determined
39	11/15, thru 11/27	90 est.	Student interview questions – semi-structured (written)	DL version of focus group-type questions for online (n = 22)	Teacher distributes semi-structured questions online to students, including query on follow-up telephone interview
40	12/7	40	Interview # 2	Discuss relationship with Samantha	Colleague (Colleen)
41	12/19	20	Interview # 3	Telephone conference	Student A (Allison)
42	12/19	20	Interview # 4	Telephone conference	Student B (Marcus)
43	12/20	20	Interview # 5	Telephone conference	Student C (Bruce)
44	12/21	20	Interview # 6	Exit Interview with Samantha	Summary of preliminary results; tentative plan for delivery of initial draft for feedback
Totals for Site 2	8 days	6 clock hours	8 events of data collection		

Southeastern Virtual School

The Southeastern Virtual School has been offering distance learning courses to thousands of students in their host state for over ten years. The school offers nearly 100 different courses taught by over 300 full-time teachers, and an additional group of adjunct teachers, numbering close to 200. Nearly a third of these full-time teachers have earned the distinction of being Nationally Certified Teachers (exactly 87 teachers – to date). Two world languages are currently offered: the modern language of Spanish and the ancient language of Latin. At the time of data collection, the SEVS employed five full-time teachers of Latin, including Samantha, and one part-time teacher of Latin. Although the normal teaching load for a full-time language instructor at the SEVS is approximately 200 students, Samantha's current teaching load has been reduced to a third of that number, due to her additional administrative responsibilities as a mentor and coordinator for substitute teachers at SEVS.

The SEVS requires students and their parents to read and accept an integrity statement that assures that all work submitted will, indeed, be that of the registered student, and that students will not collaborate on any assignments without the express permission of the teacher. Moreover, students are asked to read the description of plagiarism on the school's website, which describes the potential dangers of "cutting-and-pasting" text materials from online sources. When a student signs up for a course, including Latin, he or she must participate in a "welcome call" with the assigned teacher. This conference call includes a parent of the student. In this way, both the student and the parent understand the dynamics of taking an online course, including the self-discipline

that is required to successfully complete the course. Usually, this welcome call lasts about twenty minutes, allowing sufficient time for the new enrollee and the parent to ask any questions that they may have about the course. Contact information is confirmed, as well as the SEVS protocol about students' communication with their teacher. The SEVS policy is for teachers to be available to their students from 8:00AM to 8:00PM daily, although individual teachers may expand these published times of availability if they desire. For example, Samantha tells her students that they may telephone her until 9:00PM. This welcome call is an extremely important event because it sets the tone for the entire online experience for the student and for their parent(s). More importantly, it inaugurates the relationship between the student and the teacher in this unique virtual community of practice. Additional facts about the policies, procedures and practices of Latin teaching at the SEVS, as they relate to Samantha's thinking, will be presented below.

Pre-active and Inter-active Teaching

The first research question (1.0) of this empirical investigation is: What do two secondary Latin teachers think about as they go about their routines in a technology-rich environment? Two sub-questions, as they relate to the second case of this research study are as follows:

What pre-active planning strategies does Samantha use in this technology-rich context (Question 1.1)? Moreover, what inter-active decisions does Samantha [the Latin teacher in the online classroom] make (Question 1.3)? Because of the unique nature of

this online learning environment, both of these questions will be addressed together below in the discussion of Samantha's teaching routines and practices.

Samantha's first reaction to the matter of pre-active planning was to declare that she does not engage in any pre-active planning whatsoever. The reason for this assertion is tied to the fact that SEVS Latin teachers do not plan their curriculum individually. This curriculum was developed over several years by a team of educators at the SEVS. Individual teachers do not really adjust or modify the lessons or the tasks that their Latin students are required to do. In this sense, the online course differs from traditional classroom lesson planning, as the face-to-face learning environment may be modified during the course of the semester. However, at the SEVS, the Latin curriculum is pre-determined, including the specific tasks and assignments of each of the sixteen weeks of lessons. Teachers are not at liberty to add supplementary assignments to the curriculum or to delete a required task from their students' assignment list. In short, the pre-active teacher planning has already been done. Even new Latin teachers must simply adopt the pre-set curriculum.

However, upon further exploration of the phenomena of teaching Latin at the SEVS, the researcher discovered that Samantha does, in fact, engage in unique types of pre-active teacher planning. While there is no need to review textbook materials or to select certain ancillary materials to present in specific Latin lessons, there are strategies that Samantha uses in anticipation of certain types of interactions with her students. For example, Samantha knows that some of the particular assignments in the Latin curriculum are perceived by students as being more difficult than other tasks. The teacher

may decide, if a student is having a difficult time in progressing through a lesson, to ask that student to do a different assignment, perhaps one that focuses on Roman numerals or a cultural history lesson on mythology. This task would normally be done for a future lesson, but SEVS teachers do have the flexibility to alter the sequence of specific assignments. This modification may provide encouragement to the struggling student, who momentarily can only contemplate a seemingly endless list of course assignments. The successful completion of a relatively easier task gives the student a sense of pride and accomplishment, and s/he is motivated to continue with the study of more difficult grammatical structures or vocabulary drills.

This example demonstrates that Samantha's pre-active thinking centers on strategies that will only be utilized as she interacts with her students on an individual basis. And while the Latin curriculum is pre-determined, there is some flexibility as to choices that students may make in completing an assignment, and there is some flexibility as to the order in which these tasks may be completed. Using the metaphor of building a Roman Road, the Latin I course at SEVS includes regular assignments that offer students various choices as to how they will complete the task. These choices are labeled: "Fork-in-the-Road" assignments. As each assignment is completed, the online course interface deletes each task from the student's "pace chart," and displays only the remaining assignments. As students near the end of an 18-week course (16 working weeks plus two "floating" weeks built-in), the tasks are routinely completed. Students soon perceive the proverbial "light at the end of the tunnel" and this often gives these online Latinists a strong motivation to complete the course. Moreover, this diminishing

task chart also provides a genuine sense of accomplishment when they click off that final assignment.

According to the social theory of learning that has been selected to interpret the data from this research study (Lave & Wenger, 1991; Wenger, 1998), Samantha strives to create a sense of community and belonging for each of her students and develops a routine or practice of consistent communication with each student. As was seen in the case of Natalie at Sunshine Preparatory Academy, Samantha negotiates the routines of course completion and task options with her students. In Wenger's (1998) description of his community of practice learning theory, he maintains that this element of negotiation is "a joint enterprise [that] gives rise to relations of mutual accountability among those involved. These relations of accountability include what matters and what does not, what is important and why it is important, what to do and what not to do, what to pay attention to and what to ignore" (p. 81). Of course, in Samantha's online community of Latin learners, what matters most is the successful completion of 16 weeks of pre-set assignments, with some limited flexibility built into the curriculum. Samantha creatively negotiates this flexibility with each student on an individual basis so that each student can succeed in the course. In this way, Samantha adapts her pre-active knowledge of the online course to the needs of each student. This adaptation or negotiation is only possible through her interactions with particular students. While students clearly understand what is expected of them (made explicit in the "welcome call" with at least one parent present), they sometimes need their virtual teacher to act as a motivator or a cheer leader, giving

them a dose of self-confidence at moments when they are struggling through a difficult reading or translation task.

Latin at SEVS

While the SEVS offers three levels of Spanish and three levels of Latin, by far the most popular Latin course is the first-year sequence. Many students are interested in pursuing only one year of Latin, which is very helpful in preparing for SAT vocabulary tests in English. Samantha has taught all three levels of Latin, although her colleague Colleen has a teaching load of over 200 students, all enrolled in the Latin I course.

Samantha was instrumental in developing the SEVS Latin courses, and observes that the online Latin curriculum follows the general scope and sequence of the widely used *Latin for Americans* textbook (Ullman, 1997). Virtually all Latin learning resources are online for student usage, including hyperlinks to materials traditionally located in the appendices of printed language books, such as verb paradigms and noun declensions as well as summaries of grammatical rules and conventions. There are also links to key websites related to the study of Latin grammar and the culture and history of the classical world. Although the SEVS had originally negotiated a contract with a Latin textbook publisher to develop their online courseware, the school later decided to develop the curriculum internally. Because of this policy decision, the SEVS enjoys total control over the specific content of each lesson, and the flexibility to modify the materials in ways that best serve the needs of their students.

The Latin curriculum was designed to conform to the mandates of state and National Standards. Of course, these standards stipulate that the "study of classical

languages requires that the foreign language benchmarks be adapted by placing greater emphasis on reading and writing skills than on speaking and listening skills. The benchmarks listed for this course are aligned with the expected levels of language proficiency, rather than grade levels" (See Appendix L below). The online, virtual learning environment is especially suited to developing literacy skills in the target language, since various types of print or scripted materials can be presented to the students, such as website links displaying ancient inscriptions found in archeological digs. Unlike the standards for modern languages, which emphasize oral proficiency as well as proficiency in written communication, state and national standards for teaching Latin focus on reading and writing skills.

Adaptive Reconciliation

The second research question (2.0), as it relates to Samantha, is: How does Samantha reconcile traditional Latin pedagogy with her practice in this technology-rich environment at SEVS? In a word, Samantha does this *adaptively*. That is, she assimilates traditional Latin pedagogy to the context of a distance-learning model of educational practice. Although she does not interact with her students in a F2F classroom setting, she makes regular contact with every student through telephone calls, online instant-messages, e-mails and occasionally through a synchronous, real-time, software program called Elluminate (See http://www.elluminate.com/). Through these methods of communication, Samantha checks to see if her students are employing the traditional learning strategies of making vocabulary flash cards and using them regularly. Sometimes, she verifies students' statements through parental inquiries, too. At other

times, Samantha finds it necessary to rehearse English grammar lessons with her Latin students, such as reviewing what a participle is, or other parts of speech. During one interview session, Samantha observed:

> Well, some of them have never had it [formal English grammar course], and some of them that have had it have forgotten it, or didn't do very well in it, so we have to help them again. I mean, formal grammar can be somewhat artificial. You don't really need it to use English, and if you were a Roman citizen, you probably didn't study Latin grammar very much although you used it every day.

As Samantha explained the dynamics of adapting traditional Latin pedagogy to the virtual context, she reiterated the importance of memorizing the core vocabulary of each lesson in the SEVS curriculum. As she and the researcher viewed her notebook computer monitor, she pointed the cursor to the vocabulary hyperlink in the student interface. She noted:

> OK, here is our vocabulary section. We are quite traditional here about vocabulary. We expect them [students] to learn the vocabulary, to make flash cards, and so forth. We do try to provide study skills for them, such as requiring them to make flash cards. And while we [teachers] cannot really check their flash cards, we do ask their parents if they [students] have, in fact, made them, and so forth. When students call me with a problem passage, and they are stumbling through it, and they don't really have a grasp of the vocabulary, I will ask them: Now you have flash cards, are you using them everyday? We sometimes focus on

> the parents, and we ask them: Now remember when you helped your child to read? Could you help drill them with their Latin vocabulary flash cards? And usually I get a positive response from a parent, and they collaborate in that way.

This phenomenon of tapping into parental collaboration, of course, is quite similar to the community of practice found at the Open Classroom – the OC – that includes a relatively high level of parental cooperation (see pp. 35-36 above). This element of parental involvement, in effect, provides an important measure of student accountability, and this can certainly contribute to a significant difference in the learning outcomes of students in Samantha's virtual community of practice. While these observations demonstrate that the community of parents plays an important role in Samantha's thinking and practices, the detailed investigation of this specific community was not a part of the research design of this empirical study. It is obvious to this researcher, however, that this is a key area for future research.

Co-teaching and Mentoring

The third research question (3.0) that guided the focus of this research study is: What functions do the differing communities serve in the day-to-day practices of these Latin teachers as they use technology? Three sub-questions centered respectively on the functions of the communities of teachers/colleagues (3.1), administrators (3.2), and students (3.3) as they relate to the day-to-day practices of these Latin teachers as they use technology. Of course, as mentioned in the section above, a fourth community (parents) is yet another worthy area to be pursued in future social-scientific inquiry, but was not

specifically identified for detailed exploration in this empirical investigation. However, the function of Samantha's colleagues, administrators, and students will be described below.

During respective interviews with Samantha and fellow Latin teacher Colleen, the researcher inquired about their relationship as colleagues at the SEVS. Both agreed that their professional association together was a very positive relationship, one that produced reciprocal benefits, such as sharing the burden of being accessible to students on weekends. But more than that, their ongoing relationship provides special benefits for their professional development as world language teachers and also provides positive, supplemental learning opportunities for their Latin students. From Colleen's perspective, her relationship with Samantha evolved from small beginnings to full-fledged partnership in a co-teaching arrangement. This development over time in this educational community of practice is to be expected according to Lave and Wenger's (1991) situated learning theory. Colleen describes the progression of her own "legitimate peripheral participation" in the practice of online teaching to her official appointment as a full-time teacher at the SEVS:

> OK, when I first started at the SEVS three years ago, I started as an adjunct teacher, and I was working with a part-time teaching load, while I was still teaching full-time up here in [name of district] County, and Samantha was my mentor. I think that she was one of the first internal mentors at the SEVS. She has been with that program for a long time. Samantha is the one that helped get me started in this online teaching, with the curriculum, how to do things. She just

> really showed me the ropes, she did a wonderful job of it [mentoring]. Well, the next year, I decided to go on full-time, and – I can't remember exactly how it came about – but we had mentioned the idea of co-teaching with each other on several occasions, and some other teachers at SEVS were trying it, too. Anyway, since we had gotten along so well that year, we decided to give it a shot. I was really happy about that, because going from adjunct to full-time [virtual teaching] is a huge, huge learning curve, as far as time-management [is concerned], and learning to work from home full-time, and that sort of thing.

This co-teaching arrangement was a very positive experience, according to both teachers. Colleen recalls that she was responsible that year for 135 students and that Samantha was responsible for 50 students. Samantha had a reduced teaching load to offset her additional responsibilities as a mentor and a coordinator at the SEVS. Nevertheless, both members of this co-teaching team were therefore responsible for finishing 185 students through the Latin I course. And evidently this arrangement was quite successful:

> It worked out really, really well. I really wish that all new full-time employees [SEVS teachers] could co-teach, because it really showed me what the teaching load is like for a full-time teacher. Um, we swapped off weekends, for phone calls, for example – to be available for kids – we would divide up the grading, you know: you take these assignments, and I will take these other assignments, that sort of thing. When we had to do progress reports every month, we would

divide those up, too. We would divide up phone calls. We just worked really well together.

According to both teachers, the students seemed to enjoy this co-teaching arrangement as well. This provided them with quicker response time in communications with a teacher. If one phone line was busy, for example, they could easily call their other Latin teacher, and get some problem or question resolved. And while most students seemed to enjoy having access to two teachers, other students tended to gravitate exclusively to one of the two teachers. Colleen suggests anecdotally that these students seemed to prefer the teacher that gave them their initial welcome call to the SEVS course. Samantha also remembers certain students who persisted in making contacts with one teacher to the exclusion of the other. Of course, there were times when all of these students had to work with both teachers, but they still demonstrated their unmistakable preference for most interactions.

Samantha and Colleen not only collaborated in the task of co-teaching, but also have worked together in making formal presentations at regional professional meetings. At one recent state conference, they presented an interactive workshop on successful methods of integrating technology into foreign language teaching. While they illustrated these methods by citing examples from their experience as online Latin teachers, they also offered practical suggestions as to how these methods could easily be adapted to other languages, and especially how these methods could be used to enhance L2 teaching in traditional F2F classrooms. This collaborative experience in professional growth and

development highlights one of the principle functions of the administration of this virtual school.

The Role of the Administration at SEVS

A corollary research question (3.2) of this empirical investigation focused on the function of the community of Samantha's administrators at the SEVS as she goes about her day-to-day practices in this technology-rich school. Perhaps the most significant role that the administration has played as far as Samantha's teaching is concerned is that of nurturing and encouraging continuing education. In order to effectively teach in a virtual environment, Samantha believes that she must continue to grow as a teaching professional. Second language teachers who operate online, using state-of-the-art internet technologies, must continuously learn and master these latest advancements in personal computing and Internet programs. To their credit, the team of administrators at the SEVS correctly understands this need and therefore provides sufficient resources for their teachers to enhance their skills and training in technology.

All teachers at the SEVS are given an updated notebook computer, a wireless cell phone, reimbursement for additional telephone expenses, and a high level of financial support [reimbursement] for expenses incurred for attending or presenting at professional meetings. In a discussion about how her administrators strongly encourage constant training in technology, Samantha stated candidly:

> In fact, that's part of my job now. I make sure that I share any knowledge that I have. For example, I may go to an *Elluminate* session at a language conference

> and learn how to use it. I may offer an in-service workshop for my fellow teachers,so that they can learn it, too. Or ten people will come to such a session, and they will, in turn, share that with others. We have a core group of Nationally Certified Teachers [currently 87] … And this is a part of their job [description]. They are hired to do that [mentoring]. But even though we have these teachers, we try to tap into the strengths of every teacher that we have, whether they be part of this core group of mentors or not. We get to do training sessions from time to time.[For example,] We are doing our staff training at [city in Southeastern United States] this year … and we have break out sessions on technology, class management, best practices, curriculum, and that sort of thing. So yes, we are given the tools that we need to upgrade and develop our professional skills. In fact, I do a professional plan for each year, which includes things like conferences and the like, and we encourage our teachers to participate in these professional development events, and we give them the resources to do that, either as presenters or just as attendees.

Samantha acknowledges that while most full-time teachers in the public schools have access to some resources for professional development, the administration at the SEVS provides a relatively higher level of support for their teachers. Although the financial support may not be at the 100% level, it is significantly higher than that which she received as a F2F classroom teacher.

Even the casual observer would expect administrators at a cutting-edge type of educational institution to encourage or even require teachers to routinely upgrade their

technological skills and training. Furthermore, one would also expect administrators in such a context to assist their teachers in mastering the tools of their online endeavors, as viewed from a communities-of-practice theoretical perspective. Virtual school teachers must be given the resources and skills to easily and effectively employ new technology, such as Voice-over-Internet-Protocol (VoIP), to stay in touch with their students and colleagues. Moreover, leaders and program developers must provide online educators with the vision to view their activities – and even their own identities as teachers – from new perspectives. Wenger (1998), for example, observes that one "problem of the traditional classroom format is that it is both too disconnected from the world and too uniform to support meaningful forms of identification. It offers unusually little texture to negotiate identities: a teacher sticking out and a flat group of students all learning the same thing at the same time" (p. 269). From the foregoing observations, therefore, it would seem that the SEVS administration understands the importance of professional development, and provides adequate opportunities and resources for their teachers to grow in this vital area.

Virtual Students at a Virtual School

The final research question that guided this study (sub-question 3.3), as it relates to this second site of research was: What function does the community of students serve in the day-to-day practices of Samantha as she uses technology? Although this question will be addressed below as part of the cross-case considerations, it can also be examined through a focus on the community of students at SEVS. This is true despite the fact that student-to-student interaction is minimal. While there are some instances of student

collaboration in the SEVS Latin courses, such as occasional instant-messaging communications or perhaps the infrequent sharing of cultural projects, these opportunities for peer-to-peer interaction are few, and typically mediated through the teacher. On the other hand, while student-to-student interaction is merely intermittent, SEVS students interact regularly and frequently with their Latin teacher. Samantha says that 50% of her work is done through telephone conversations with her students. These numerous and consistent communications with students provide Samantha with important information, such as insights into the genuine progress that students are making in learning the language. Quizzes and other measures of evaluation are regularly given orally over the telephone, and this provides a necessary confirmation about students' knowledge of the material. Furthermore, such interactions provide the opportunities for Samantha to build a nurturing relationship with each student. During these telephone calls, students often express any difficulties or problems that they are having with their assignments, and they also get a chance to practice their pronunciation skills.

As these communications continue, the corresponding relationship with each student also develops. Samantha discovers unique talents or interests of particular students, and uses this growing database to advance the objectives of student motivation and student learning. For example, during one telephone call that focused on one student's recitation of a passage of Latin poetry, the student asked if he should sing the poem – as it was printed along with musical notations. Samantha said that she would very much enjoy hearing his vocal rendition of the poem. She was so impressed with his singing that she suggested that he record the piece for later incorporation as part of a

Latin podcast – to share with other students. Although the student exhibited an initial reaction of modesty, upon his teacher's insistence, he quickly warmed up to the idea. After all, he is currently enrolled in a magnet school for the performing arts, and this suggestion was just another opportunity to be in the limelight, albeit the virtual stage of an ancient language podcast. In discussing this idea during a telephone interview with the researcher, this talented sophomore acknowledged that he would like to participate in and produce more musical performances in Latin:

> There's a couple of those things [performances previously recorded] that were done in Latin, and they used orchestra musicians and the Director of the Mormon Tabernacle Choir, so it's pretty cool. And I think that I might be able to do that [record a podcast in Latin]. I have some more Latin stuff [music] that I'd have to look up, but I think that I could be able to do something like that.

Of course, Samantha derives much pleasure from such felicitous discoveries about her students, especially when such information can be productively channeled into tasks, activities, and resources that promote the learning of this fascinating and timeless ancient language. Other students interviewed agreed that they would use podcasts to help them learn Latin, and that they would especially welcome additional integration of audio files for more translation exercises and reading tasks. The ability to simply move your cursor over a printed text appearing on the computer monitor to hear an audio recording that gives a clear pronunciation of the Latin would be a wonderful enhancement to the SEVS curriculum.

During another interview, a female senior agreed that while she considers herself to be more of a "paper and pen" type of language student, she would probably use Latin podcasts if they were available. She owns an iPod, and actually uses it more than she does her cell phone. Conversely, she commented on one of the problems of learning Latin in a virtual environment: "I think, um, I think that it's a little more difficult for me to learn online, because you don't always get the chance to speak it as much with other people … I really think that the main drawback is the vocal [and aural] part. I've found some students at school who speak Latin, and so I get to practice a little bit with them." On the other hand, both Samantha and Colleen maintain that most of their students prefer to work independently, and the virtual school allows them to do just that. Moreover, some students feel self-conscious about pronouncing the language in front of other students, and for that reason do not miss interacting with other students.

Cross-Case Considerations

Although the two teachers examined in this research study both work in school contexts that are enhanced by state-of-the-art instructional technology, these settings are quite unique. Similarly, while there are many differences between the two cases, there are also some fundamental similarities, both of which will be explored below. Unlike the respective discussions of each individual case (which followed a question-by-question format), these cross-case considerations will be guided by the research questions in a more general way (See pp. 7-8, 91 above). These research questions formed the central focus of the study, and constituted the background context of study.

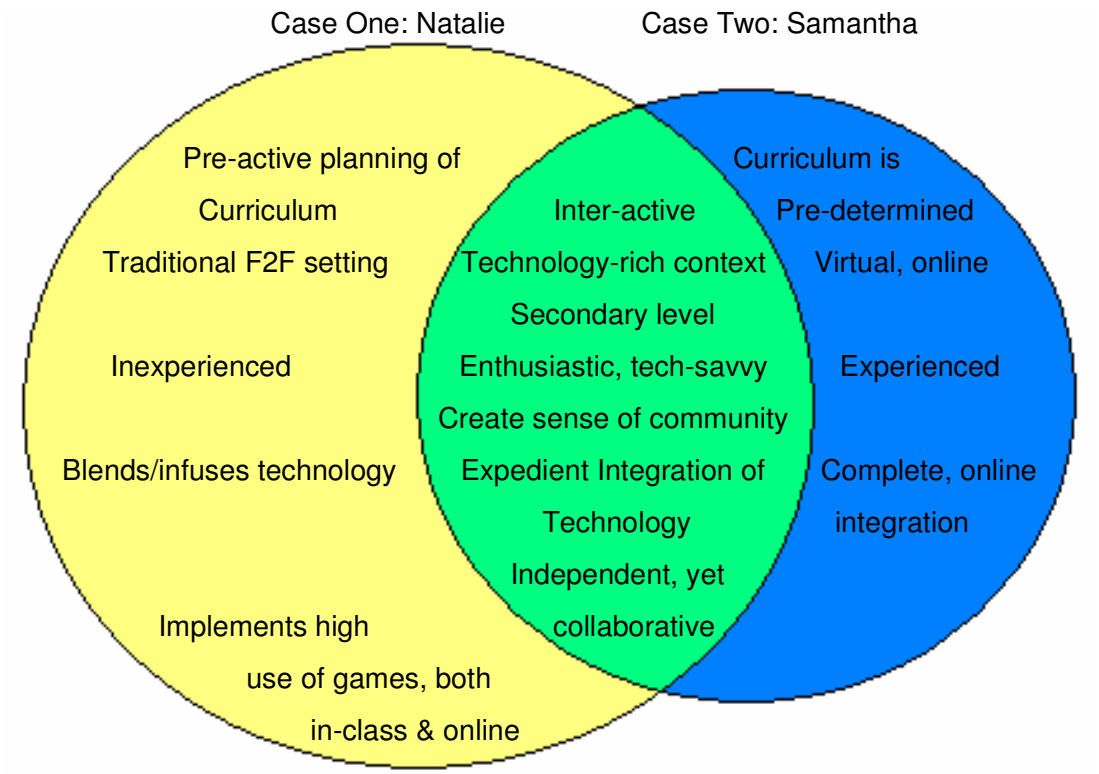

Figure 4.3. Synopsis of Cross-Case Analysis.

Figure 4.3 above provides a handy visual summary of the principal similarities and differences between the two teachers examined in this empirical research study. The area in the left circle depicts several unique characteristics of the first teacher examined in this investigation: Natalie. Some of these attributes include her focused pre-active planning strategies, the imaginative blending of technology into her regular teaching routines in a traditional, face-to-face language classroom, and her creative use of language-learning games. These competitive linguistic contests are both the online variety as well as the in-class type. This visual also notes the fact that Natalie is a young, relatively inexperienced Latin teacher, working in a traditional, face-to-face classroom.

The area in the far right region of the right circle, conversely, corresponds to the unique characteristics of the second teacher examined in this study: Samantha. Some of these distinctive qualities include the fact that the Latin curriculum that Samantha uses at the SEVS is pre-determined, which does not allow much flexibility in terms of specific lesson planning or the purposive selection of text-specific ancillary resources. Most of this is already built into the 16 weeks of lessons in the online course curriculum, as described above. Samantha is teaching in a virtual, online environment, and interacts with her students through this medium as well as by telephone communications.

What is of particular interest to this research, however, is the intersection of these two independent cases, which is depicted in the center of this Venn diagram. Some of the key similarities between these two unique teachers are highlighted in this shaded area. These include the obvious fact that both Natalie and Samantha teach the ancient language of Latin in technology-rich educational contexts. They both teach at the secondary level of instruction. A high-level of inter-active decision-making is evidenced in the thinking of both teachers, as they address the specific needs of their students and as they seek to integrate the unique gifts and talents of their students into their instructional routines. The collective abilities and contributions of individual students are harnessed for the mutual benefit of the entire language-learning community. Naturally, this is to be expected in an educational community of practice where all the members understand that they are mutually engaged in the enterprise of learning Latin and share in a repertoire of artifacts and actions peculiar to their group (Wenger, 1998, pp. 152-53). Despite their age differences, both Natalie and Samantha share an enthusiasm for the classical language

that they teach, and for the creative ways that new technologies can be effectively used to enhance learning. Neither one is intimidated by technology, whether it be computer hardware or the corresponding software programs. Both seek creative ways to incorporate technology into their instructional routines for the purpose of promoting ancient language acquisition. The researcher has labeled this phenomenon as the *expedient integration of technology*, already introduced above in the description of the individual cases. Additional observations on this concept will be delineated in the final chapter of this report.

Although there is little peer-to-peer collaboration among Samantha's students, this deficiency is currently being addressed at the SEVS. Nevertheless, these virtual school students identify themselves as members of a unique and special educational program. This sense of identity and purpose, in turn, contributes to their mastery of the Latin language and to the successful completion of the course. Likewise, Natalie's students at SPA view themselves as being members of a special group of classicists, studying at a dynamic and unique school. Both teachers promote this sense of community at their respective institutions.

Another cross-case consideration is the fact that both Samantha and Natalie are highly independent teachers who thrive on the freedom to develop their own styles of teaching. Natalie desires the freedom to teach, and does not believe that administrators should micro-manage teaching styles. Samantha is at ease with her routines of online teaching, and exhibits the high levels of self-discipline required to effectively teach in a virtual environment. At the same time, however, both Samantha and Natalie welcome the

collaborative help of their teaching colleagues and their administrators. They identify themselves as playing a vital role in the ongoing activities of their respective schools, the communities in which they practice the art of L2 teaching. The experienced mentoring teacher and the zealous newcomer to the profession both know the tremendous power that they possess. They understand that what they do on a daily basis exerts a remarkable influence on their students, as well as their colleagues. Both acknowledge with Wenger (1998) that "education is not merely formative – it is transformative" (p. 263).

Chapter 5

Discussion

"Every generalization is dangerous, especially this one." – Mark Twain

Introduction

This exploratory, sequential research study focused on Latin teacher cognition in technology-rich communities of practice. Although the phenomena examined throughout this research could have been viewed from a variety of theoretical perspectives, this study focused on the thinking routines and practices of two secondary teachers from a situated learning theoretical framework (Lave & Wenger, 1991). This conceptual approach, as described in the first two chapters of this report, is also known as a communities-of-practice perspective (Cousin & Deepwell, 2005; Wenger, 1998).

This chapter considers the significance of this research project. That is, there are several important implications that emerged from this empirical investigation worthy of discussion. As this is the place where the researcher moves from a position of observer and reporter to that of interpreter, the narrative voice will display a transition from the third to the first person. In this way, I hope to enter the conversation about Latin teacher cognition in technology-rich communities of practice in a more personal way. We will begin with a consideration of some of the key theoretical implications that have surfaced from this study. These implications include a discussion of the cognitive domains and professional trajectories of the two teachers examined in this study. Next, the discussion

will proceed to an examination of the practical ramifications – or significance – of this research for foreign language pedagogy in general, and ancient language teaching in particular. Of course, these would include issues of program development and curriculum design, as well as observations on best practices that may be appropriate for similar communities of practice. Finally, I will discuss some of the implications of this research as it relates to prior research and offer some suggestions for future research in this fascinating area of social-scientific inquiry.

Implications for Theory

This empirical investigation into the thinking patterns of two secondary Latin teachers working in contexts rich in technology yielded several intriguing insights into the phenomena of ancient language teacher cognition. Perhaps the most important of these findings is the conception of what I call the *expedient integration of technology*. It may be helpful at this juncture to define the term *expedient*, since there are several denotative and connotative ways in which this term is currently used. One connotation of the term is the idea that what is done expediently is done quickly or fast. But this is not the principal definition of the term. According to the 10th edition of Miriam-Webster's dictionary, the only two definitions given for the word are: "1. suitable for achieving a particular end in a given circumstance. 2. characterized by concern with what is opportune." A thorough study of several established lexicons of the English language confirm that the term expedient is concerned with that which is appropriate, advisable or useful in a given situation (See, for example, the dozens of definitions available at one website: http://www.onelook.com/?w=expedient&ls=a). The infusion of technology in

foreign language classrooms, both modern and ancient, must be done in a way that is expedient. That is, technology integration will lead to or at least enhance the goal or objective of second language acquisition. Through the expedient integration of technology in the L2 classroom, students will better meet the purposes of language study, whether these goals are the communicative aims of modern language study, or the essential objective of literacy in the case of ancient languages, like Latin. In other words, technology will help *expedite* this process of learning.

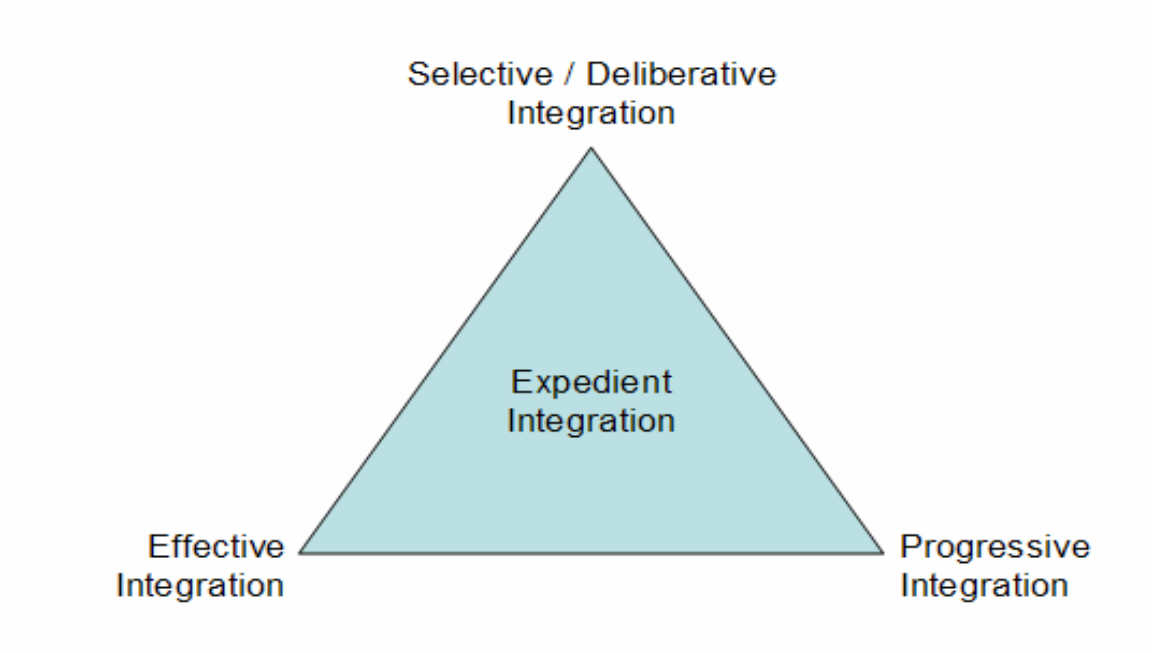

Figure 5.1. The Elements of Expedient Integration of Technology

Through the process of data analysis, several elements or aspects of this concept began to emerge. I made notations about these ideas and themes in my field notes, research memos

and in my reflective journal. As data analysis progressed, the conception began to crystallize in my thinking. During my most contemplative moments, I attempted to draw out several concept maps that could, perhaps, more easily display this notion of the expedient integration of technology. Continuum scales, Venn diagrams, spider maps, and other assorted scribblings were created, developed, trashed and redeveloped. I finally settled on the simplicity of the geometric shape of the triangle, as illustrated above.

Figure 5.1 suggests that this concept labeled the *expedient integration of technology* (EIT) involves three related and complementary characteristics. In the first place, the integration of educational technologies into the instructional delivery methods of foreign language teachers in general, and ancient language teachers in particular, must be *selective* or *deliberative*. That is, as L2 teachers create and develop their lesson plans, they invariably think about various choices, such as which technology to employ, how often to use this technology, at what point in the course of language instruction to integrate it, and so forth. Considerations of how a particular technology will be received or used by students are also made. At times these pre-active thoughts include an appeal to multiple intelligences (Gardner & Hatch, 1989) or attempts to foster student motivation, as Richards (1998) outlines in his first precept of good L2 teaching, which he calls the maxim of teacher involvement (p. 54-55). Moreover, the relative interests of the teacher's current students must also be given careful consideration, since these preferences are subject to change from year to year. The L2 teacher must also take into account the availability of specific technologies, budgetary costs, among other considerations. Such deliberations are usually made by the language educator in a cyclical or recursive

manner, as relative successes or failures of the particular technology are contemplated, evaluated, and incorporated once again – perhaps with modifications – into the language pedagogy.

Several examples from the findings of the present research study illustrate how L2 teachers make choices in their implementation of technology in their ancient language pedagogy. Natalie, for instance, regularly uses PowerPoint presentation software to present new grammatical structures, such as the declension of nouns or the conjugations of Latin verbs. While Chapelle (1998) suggests that this use of technology helps to demonstrate the saliency of the linguistic structures of the L2, Natalie chooses to use this technology for a variety of reasons. Natalie's knowledge of the school context, including the ready availability of the LCD projectors in all SPA classrooms, helps her to decide to use presentation software on a regular basis. This usage is congruent with Shulman's (1987) sixth category and Grossman's (1995) fifth domain of teacher knowledge, discussed in the review of literature above (p. 63-64). Elbaz (1980) and Borko and Putnam (1996) have also addressed the importance of teachers' situated knowledge, as have Lave and Wenger (1991) and Wenger (1998).

Additionally, Natalie makes decisions as to the type of technology usage (or non-usage) on the basis of her L2 teaching philosophy in general, as well her beliefs about teaching Latin in particular. For example, while Natalie's students may occasionally use instant-messaging software programs to communicate synchronously with each other, such use is typically conducted in the L1 for secondary or tangential reasons, rather than in the L2 for communicative objectives. They may assist each other in carrying out the

assigned task, or collaborate in a particular activity. Borrowing from a key image in social-cultural theory, her students may build scaffolds to share or access knowledge with their peers, but this is principally done in English, not Latin. However, Natalie does not currently assign instant-messaging tasks for her students so that they can communicate in the target language. The reason for this is that the essential objective for the study of this ancient language is literacy in reading ancient texts, not for oral communication. In this respect, Natalie's Latin teaching philosophy is more in line with the traditional thinking of Ball and Ellsworth (1996), delineated above (see pp. 74-76). Nevertheless, Natalie indicated to me during our exit interview that she is open to the idea of exploring how more communicative language learning tasks may be infused into her Latin pedagogy, especially those activities that use state-of-the-art computer technologies, such as instant-messaging, podcasting and cell phone technologies. As we observed in the description of the research findings in the preceding chapter, the SPA Director of Technology depicts Natalie as a young teacher that is "open" to new ideas. That is, she is receptive to new approaches and is willing to try new things in her teaching.

Similarly, in her work at the SEVS, Samantha also makes discriminating and selective decisions to use or not to use certain technologies in her instructional routines. It is important to observe that Samantha makes a distinction between modern technology and modern communicative methods of language pedagogy. Although she understands the value of promoting oral language skills in the instruction of modern languages, Samantha maintains that there is little profit in the infusion of communicative methods of language instruction in teaching ancient languages, like Latin. In this respect, Samantha's

teaching philosophy is quite similar to Natalie's. Like her colleague at the independent school, she believes that the traditional approach to Latin language instruction, the grammar-translation method, is pedagogically sound. It should be the primary methodology for any Latin course, regardless of the course delivery system (traditional F2F or online).

Nevertheless, she believes that more language learning activities of a collaborative type should be infused into the Latin program at SEVS, or at least made available to those students who desire them. As noted in the previous chapter, many independently-minded students pursue coursework at the SEVS precisely because the course delivery format appeals to this particular learning style. For Samantha, one key rationale for selecting certain technologies into her teaching is determined by how these technologies facilitate distance education. Hence, text-messaging, phone calls, emails and instant-messaging technologies are selected simply because they help expedite the distance learning format of course distribution. While these tools of technology could also be used to foster communicative activities in the L2, Samantha does not currently use them in this way. It is quite clear, therefore, that these elements of teaching philosophy in general and especially Latin language teaching philosophy (Ball & Ellsworth, 1996; Leloup & Ponterio, 2000; Shelton, 2000) undoubtedly drive the selective integration of technology, and how this technology is used to study Latin, at least for these two educators.

Secondly, this conception of expedient integration contains the component which I call the *effective* integration of technology. The component refers to the effectiveness

and efficiency of technology infusion in the instructional activities of the L2 classroom (face-to-face, or virtual). Technology is not being used merely for the sake of using technology, but rather is being implemented because it assists or enhances the language learning process. In the case of Samantha's teaching at the SEVS, the technology itself is the method employed for delivery of the course. On the other hand, an example of this effective integration of technology can be seen in the face-to-face classroom. As we saw in the previous chapter, Natalie made decisions to use – or not to use – technology for pedagogical reasons. Sometimes this may mean that the L2 teacher will plan to review grammatical structures or vocabulary using a PowerPoint presentation; at other times, it may be prudent [expedient] to refrain from the activity of playing online language games at www.quia.com because students are not adequately staying on task. An effective teacher will often make spontaneous inter-active decisions based on what he or she sees is occurring in the language classroom. On occasion, this successful, efficient and effective integration of technology may be nothing more complex than the projection of a portable document format (PDF) file onto the classroom whiteboard or screen. It does not matter that this very image can be found in the student textbook. At times, merely the use of a technological tool helps to capture, maintain or retain the attention of the students. If this happens, the integration of technology has, in fact, been effective and expedient. Moreover, we may consider this use of technology to be creative and innovative, since instruction incorporates the presentation of old material in fresh and new ways. This element of the effective integration of technology also fosters a sense of discovery learning. Internet activities such as webquests that explore the culture of the classical

world empower students to gain easy access to repositories of knowledge that enhance their learning. This illustrates yet another of Richards' (1998) maxims of second language teaching: the maxim of empowerment (pp. 58-59). Such online assignments give Natalie's students control over their own learning.

In the case of Samantha's instructional routines at the SEVS, the use of the Internet as the principal tool for course distribution was at first based upon the whole concept of distance education disseminated from a virtual school with a team of online teachers. The availability of an online Latin language course gave many students throughout the state (and beyond) the opportunity to study this ancient language. Most of these students would not otherwise have been be able to learn Latin. The curriculum selected for the presentation of Latin followed the curriculum scope and sequence outlined in one popular Latin textbook (Ullman, 1997). The general presentation and specific elements of this 16-week course subsequently were tailored to the needs of the SEVS students. Administrators, program developers and the Latin teachers themselves collaborated to streamline the curriculum. Although the use of the Internet typically involves a minimal investment of computer hardware for all students, it was selected as the main technology in the program. Once a student logs into the SEVS website, s/he has immediate access to libraries of online resources, most of which employ hyperlink software. Virgil's *Aenied*, Caesar's *Gallic Wars*, English-Latin dictionaries, lexicons, and other information is just a mouse click away. Samantha helped develop this program of online Latin study, and assists her students in using these resources. Samantha monitors her students' progress and makes recommendations as to which of these online resources

will be most beneficial to them at this point in their acquisition of this ancient language. The reader will recall that Samantha estimates that approximately one-half of her workload is communicating with students through telephone and cell phone calls. With her guidance, students learn to efficiently use their online time and navigate quickly and effortlessly from one webpage to another. Students are given control to determine their own pace of learning. And as they complete L2 tasks, their motivation levels stay high as they see their Latin assignments diminish from the pace chart. Samantha makes decisions as to which online task, activity, assignment, or resource will best meet the needs of particular students as they work through the SEVS Latin courses. Occasionally, she schedules a real-time, synchronous, *Elluminate* session with her students. These sessions are infrequent and typically selected when several students are struggling with similar problems in understanding Latin grammar or translation issues. Such use of technology effectively expedites the process of learning. It certainly expedites the process of teaching (better than 40-50 separate phone calls).

One can think of scenarios where this element of effectiveness or efficiency in this model of expedient integration of technology can also be applied to other virtual school contexts, such as the use of audio files to teach pronunciation, or assigning webquests to investigate classical culture. Moreover, hyperlinks to audio files or podcasts in the modern languages are currently available in many virtual school programs, including the SEVS. Although many modern language podcasts are currently available to the general public on the Internet, there are few Latin language podcasts (See, for example, this website: http://www.podcastalley.com/search.php?searchterm=spanish).

The ancient language teacher, however, must make decisions as to which technology to employ and when to select its implementation. Like a quarterback scanning the field after the snap of the ball, the effective and efficient L2 teacher will use her peripheral vision to look for expedient and efficient ways to integrate technology into her pedagogical routines.

The third element of my model of expedient integration is labeled: *progressive integration*. This component of the expedient integration process, as its name implies, refers to the manner in which language teachers steadily increase the infusion of technology into their instructional repertoire, especially in terms of frequency and complexity. I will cite two instances from the present study to illustrate how this procedure develops. As mentioned in the previous section, almost as soon as she learned how to create portable document format (PDF) files, Natalie began to think about ways in which she could use that technology in her classroom. Even with older technologies, such as PowerPoint, Natalie looks for ways to revise and recycle old slide presentations. She does this not as a shortcut on her preparation time, but instead to incorporate transitions that can be used to provide immediate feedback to her students. For example, she may create a slide presentation to inform her Latin students about a particular Latin structure, such as the ablative of means. Several weeks later, however, she will revise that same presentation, including additional items or examples, and prompt her students to state orally how the Latin should function in these examples. In this way, the PowerPoint technology has been modified in a recursive or progressive way. These decisions exemplify several of Richards (1998) maxims, including planning, accuracy, and

efficiency. In the case of Samantha in her work at the SEVS, she began to think about how she could not only tap into the creative abilities of her Latin students, but also share those gifts with others through the production and dissemination of Latin podcasts. In other words, the two participating teachers in this study demonstrated by their cognitions – and practices – that the expedient integration of technology in the L2 classroom is a continually developing and evolving process. In a word, it is progressive.

Therefore, let us summarize these observations: the conception of the expedient integration of technology (EIT) is composed of three complementary yet distinct components. Expedient integration is selective or deliberative; it is effective; it is recursive and progressive in nature. Without doubt, more empirical research into these processes of expedient integration will certainly reveal more crucial information about L2 teacher cognition in technology-rich environments, both in modern and ancient language classrooms.

Natalie's Communities of Practice

This research project incorporated a communities-of-practice theoretical framework. It may be appropriate, at this juncture of the report, to comment upon the different communities of which Natalie is a part, and her status or position in these communities. No doubt, the most important community, as far as Natalie is concerned, is the community composed of her Latin students. The relationship that she shares with her students is of utmost importance. She is progressing toward the very center of this key community of practice. While she began her journey into language teaching at the periphery of the profession, she quickly moved to the mainstream of this community of

practice. She is regularly engaged in the enterprise of Latin language study with her students, and creates a repertoire of activities and practices that she participates in with her pupils (Wenger, 1998, pp. 73-76). While she would be the first to recognize that she has many things to learn about the enterprise of second language teaching generally, such as finding creative ways to incorporate more communicative tasks into her ancient language pedagogy, she remains quite confident about her own knowledge of the content area and her own personal teaching strengths. Moreover, she is ready to build upon those strengths in her own personal growth as a teacher in this independent school context. From my perspective as a researcher, Natalie is rapidly approaching the center of this community of practice in her journey as a fledging Latin teacher.

Although Natalie has no contact with other Latin teachers at SPA, she does interact in positive ways with the whole SPA community, including fellow faculty members in the foreign language department, teachers in other content areas, and the administration. According to the perspectives expressed by her administrators, Natalie is definitely making great strides as a teaching professional. The principal reason for this is her care and concern for her students. As a researcher and as a fellow ancient language teacher, however, I believe that Natalie could enhance her teaching qualities by pro-actively seeking advice from her L2 teaching colleagues, despite the fact that she is the only ancient language teacher at her school. This pursuit of teaching tips and methods from her colleagues in the foreign language department at SPA could potentially yield many positive ideas for Latin pedagogy. As Natalie reflects on the best practices found in teaching the modern languages, she will begin to contemplate how these ideas could be

modified for teaching the Latin language. Although she no longer is positioned at the periphery of the community of teaching colleagues at SPA, she still has some way to go in this journey.

One area, however, where Natalie seems to remain positioned at the periphery is in her interactions with other Latin teachers and second language professionals. More attention to active participation in professional meetings and conferences would certainly enhance her participation in this key community of practice. Staying abreast of the latest trends in the fields of L2 pedagogy, including ancient language teaching and technology integration is a key focal point in Natalie's professional development. From my vantage point as an observer, Natalie's journey from the periphery toward the center of this community will not only provide many resources to advance her teaching career, it will enhance everything that she does in the classroom.

Samantha's Communities of Practice

In contrast to Natalie's relative position at the periphery of the community of fellow teaching professionals, Samantha finds herself in the center of this important community. She attends and makes presentations regularly at professional associations dedicated to the instruction of foreign languages in general as well as those focused on the teaching of Latin in particular. She has published articles in peer-reviewed educational journals. As a teaching mentor at the SEVS, she also is quite active in the community of teachers at this institution, and most especially the community of Latin teachers at this school. Unlike Natalie, Samantha enjoys consistent opportunities to regularly interact with fellow teachers of this ancient language at SEVS and elsewhere.

These associations have also included co-teaching the Latin I course with her colleague Colleen. As noted in chapter four above, this experience was very positive for both teachers, as well as the SEVS students.

Similar to the experience of Natalie, on the other hand, is her participation in the community of students at SEVS. For Samantha, this relationship with her students is of primary importance. She also demonstrates her high commitment to this community of Latin learners by extending the hours in which her students may contact her for help or guidance. Perhaps one reason that Samantha can more easily juggle her commitments to her students and her own professional development is the great flexibility that she enjoys as a virtual school teacher. Even at a professional conference on technology or at a language teacher convention, she is able to carry out her regular teaching responsibilities using the two key tools of her trade: a notebook computer and a wireless cell phone. With these highly portable devices at her disposal, she can bring her virtual school students with her as she participates in her own development as a second language teaching professional.

While both Natalie and Samantha are actively engaged to varying degrees in several communities of practice, they both remain highly energetic and open to consider new adventures in teaching a language that is quite old. Their enthusiasm for this ancient language, their commitment to their students, and their expedient integration of technology are exemplary models for others who wish to join the ranks of (or enhance their effectiveness in) this distinguished community: The guild of ancient language teachers.

Implications for Practice

Several considerations for professional practice surfaced in the process of this study, most prominently in the emergence of this notion of the expedient integration of technology. First, I will explore some general practical suggestions that may be useful in L2 teaching, no matter what course delivery system is implemented. I will follow this discussion with some ideas that may be particularly applicable to contexts similar to the F2F classroom in which Natalie operates. Finally, I will consider some suggestions for distance learning contexts similar to the virtual school environment in which Samantha works.

Generally, the findings of this empirical research suggest that second language teachers can best pursue the challenge of technology by viewing it as a tool that can be used to expedite learning. Not only can teachers profitably harness computer and Internet technologies to facilitate modern and ancient language acquisition, but they can integrate technology in ways that promote initiative and discovery learning among their students. Natalie did this in assigning webquests for her Latin students, especially in the first two levels of Latin I and Latin II. Samantha also encouraged her students to explore the language, culture, and history of the ancient Romans though her "Fork-in-the-Road" assignments.

High levels of creativity and curiosity are prerequisite to the expedient integration of technology in L2 teaching. Effective language educators will accurately assess the needs and abilities of their students, the resources of their institutions, and their own energies to integrate technology into their own instructional routines in decidedly

expedient ways. In these technology-rich communities, they will find meaning and satisfaction in what they do because the principal objective of L2 learning remains at the center of their activities.

The Transformative Power of Technology

In the third millennium, it has become axiomatic that teachers and students of world languages must not only learn to use technology, but they must use technology to learn (Glenn, 2005). In this respect, computer and Internet technologies have the power to renovate the entire language learning process. It can transform the L2 teacher's pre-active planning and interactive decisions that are made throughout instruction. Technology can influence how students perceive their language learning activities and motivate them to discover more about the content area itself and about learning in general. In the cases of the two teachers who were the focus of this research, the use of technology served to alter and enhance the process of teaching Latin. To illustrate this proposition, I will focus on the culture of teaching grammar.

As noted elsewhere in this report, both Natalie and Samantha adopt a traditional grammar-translation methodology in their Latin pedagogy. This stems naturally from their general outlook or philosophy about the study of this ancient language, which includes the central learning objective of literacy in reading classical Latin texts. While some examples of Natalie's and Samantha's repertoire of instructional routines seem to simply transfer materials from the printed page to an electronic format, other activities demonstrate a more creative and powerful use of computer and Internet technologies. Both teachers understand the essential need for students to master Latin vocabulary and

the common inflections of Latin words. The use of flash cards in the memorization of these items is a well-tested practice in traditional Latin pedagogy. Yet students can now create electronic flash cards and download these to their cell phones or personal digital assistants (PDAs) for easy access. Alternatively, they can browse online websites that present ready-made electronic flash cards, which give interesting and trivial facts about the frequencies of words in specific ancient texts. Natalie directs her students to these the online resources, such as the Perseus website (http://www.perseus.tufts.edu/), websites that supplement Latin textbooks (http://artemis.austincollege.edu/acad/cml/rcape/latin/) and her own materials that are posted on the SPAnet website. The mere existence of these tools of technology serves to stimulate the pre-active thinking of L2 educators, including teachers of Latin.

An example of a more powerful, interactive, and collaborative use of teaching Latin grammar is found in Natalie's use of online language learning games, such as those found at the http://www.quia.com website. The integration of online computer games that focus on the vocabulary, grammar, and culture of Latin is a great motivator for Natalie's students. In Samantha's instruction at the SEVS, students have access to these and other online resources. Despite this fact, Samantha encourages her students to create hard copy flash cards for vocabulary memorization and confirms the execution of these assignments through parental collaboration. In her view, if students have ready access to flash cards in two formats, they are better equipped to learn. Additionally, there is something about the process of creating flash cards that promotes learning, perhaps the appeal to manipulative

intelligences of some students. On the other hand, Samantha's students at SEVS do not currently participate in online competitive games.

As teachers and students become familiar with innovations in computer technology and assorted electronic devices, they will be disposed to seek ways that these technologies can be applied to the study and teaching of Latin. Samantha's interest in creating Latin podcasts for her students, for example, was sparked by the vocal talent of one precocious sophomore. These and other podcasts can be accessed and used by current and future SEVS students. One can foresee students using iPods, iPhones, PDAs and other gadgets to download Latin podcasts or audio programs that provide practice with pronunciation or verb conjugations. Moreover, for advanced students of Latin literature, podcasts which feature oral interpretations of selected excerpts from Catullus or Cicero, for example, will not only provide helpful review of the content of these classic texts, but also will offer a consistent exposure to current academic pronunciation of ancient Latin.

Although this research suggests some salient parallels to Chapelle's (1998) seven principles of technology integration, there are also some key divergences worthy of consideration. For instance, both Natalie and Samantha attempt to: (1) make key linguistic characteristics salient to promote literacy in the target language and (2) offer modifications of linguistic output, either during a PowerPoint slide show where students are only given one grammatical form of a word and must provide various declensions or conjugations (Natalie) or during a telephone conference with individual students (Samantha). Moreover, both teachers (3) provide opportunities for comprehensible output, at least in terms of the limited vocabulary and linguistic structures of ancient

Latin. They also (4) provide ample opportunities for learners to notice their errors and (5) to correct them. This may be done in several ways, such as allowing students to participate in competitive games (Natalie), or in a virtual school drill on vocabulary or verbal morphology (Samantha). Both of the teachers examined in this study also (6) encourage modified interaction between their students and the technology, whether that interaction consists of generating interactive Latin games on www.quia.com (Natalie) or the use of hypertext links on the SEVS course interface (Samantha).

On the other hand, Chapelle's (1998) seventh principle of acting as a participant in L2 tasks is more difficult to incorporate in the ancient language classroom. The reason for this is simple enough. While Chapelle suggests that interactive tasks "must focus the learner's attention on accomplishing a goal through the use of language rather than on solving problems of linguistic form" (p. 28), the primary objective of learning Latin is literacy, and that goal accentuates a focus on linguistic form. Perhaps this underscores a key challenge for the design of multimedia CALL for ancient language pedagogy. While the two teachers examined in this study are quite comfortable with using technology in their ancient language classrooms, they are likewise most comfortable with the grammar-translation method of language instruction. A challenge for curriculum designers and teaching practitioners alike is to add more communicative components to their instruction, including more collaborative and communicative tasks employing technology (Canale & Swain, 1980; Warschauer, 2004).

It will be recalled, for example, that Overland (2004) employed the use of communicative interactive activities in his two-semester graduate level course in Biblical

Hebrew. Perhaps similar imaginative and creative language activities, including the use of computer technologies, can be developed for Latin pedagogy. Why not use the power of instant-messaging or text-messaging to encourage students to interact synchronously and/or asynchronously with each other in the target language? This could be done using in-class computers or anyplace anytime using cell phones.

For L2 teachers working in traditional, face-to-face classrooms, like Natalie, there are several implications arising from this research. First and foremost is the importance of professional development. Although Natalie understands the value of participating in professional conferences and continuing education programs, she is hesitant to trade class time with her students for opportunities of self-development. However, it must be recognized that such sacrifices of instructional contact hours will pay many dividends over time, whether the context is a public school or an independent school. Some useful workshops on technology or seminars on L2 teaching are typically scheduled during the academic calendar, and are seldom scheduled for the summer months. On the other hand, additional opportunities for professional development are offered on-site as in-service hours. Peter Knowles, as Director of Technology, regularly offers such opportunities for teachers at the SPA. This area of professional development is especially critical for teachers of less commonly taught languages, such as Latin, since many of these teachers serve as the sole instructor of that language at their school. Administrators and program developers in such cases may schedule more in-service workshops or similar opportunities for professional development on their campus. In this way, conscientious

teachers – like Natalie – will be able to participate and to benefit without sacrificing too much class time.

Still another suggestion that comes to mind is the opportunistic use of L2 students as resources in the use of technology. In many if not most educational contexts, the students generally are more computer-literate than their teachers. Certainly in some cases, teachers can be sensitive to the technological expertise of their students and tap into that resource in effective, appropriate, and expedient ways. For instance, although Natalie comfortably uses presentation software in her instructional delivery methods, she has been able to refine these skills by learning technology tips and/or shortcuts from her students. In viewing the PowerPoint submissions from her students, Natalie discovered features of that software that she was unaware of previously. Effective language teachers will be ready and willing to learn from their students. In fact, they will seek to create a community that is characterized by a sense of discovery. All participants in these educational communities of practice will welcome new ways to learn old things, including the study of ancient languages.

For L2 teachers working in distance-learning contexts, such as Samantha at the SEVS, there are also some practical suggestions that emerged from this research project. Perhaps the most vital of these concerns the merit of the co-teaching arrangement. Both Samantha and Colleen maintain that their experience of co-teaching the Latin I course was an absolute success. This included the sometimes tedious tasks of grading students' assignments as well as the more personable communications with students through email and telephone calls. While I think that this policy would be especially beneficial for new

virtual school teachers, the arrangement could be implemented successfully in many courses. This feature would not only provide greater flexibility for the co-teachers, but also provide more opportunities for students and their parents to receive timely help or feedback from the teachers. This arrangement also has the advantage of providing students with access to more than one language teacher, which can give distinctive perspectives on language grammar, and especially pronunciation. While this benefit would be most useful in the case of modern languages, like Spanish, it could also give students of ancient Latin exposure to the issues of pronunciation that are peculiar to the learning of Latin.

Although many students enrolled in virtual school courses consider themselves to be highly independent learners and therefore are satisfied at the limited opportunities for peer-to-peer interaction, other students would welcome more collaborative activities. The infusion of synchronous chat, asynchronous bulletin board threads, and more student-to-student communications would enhance the Latin program at SEVS and at other institutions of virtual learning. Perhaps such learning tasks could be optional, but they should at least be available. Several of the virtual school students interviewed in this study maintained that they miss that aspect of language learning. Future enhancements to the SEVS curriculum should make provisions for students who desire more opportunities to collaborate with others.

An additional upgrade to such virtual school language programs is the integration of audio files for most Latin translation passages. Not only would this capability enhance learning by appealing to multiple intelligences (visual and aural simultaneously), but it

would provide additional pronunciation practice. While increased integration of audio into the virtual school curriculum would benefit the study of modern languages, this improvement would be particularly useful in the learning of ancient languages, where the availability of extra-curricular learning opportunities is limited.

Implications for Research

This section of the report will discuss several implications of this empirical study as it relates to prior research as well as several implications for future research. In the area of teacher cognition in general and teacher knowledge in particular, Shulman's (1987) seven categories and Grossman's (1995) six domains (see pp. 63-64 above) were evident in this empirical study. Perhaps the most important of these domains, as far as the implications of this study are concerned, is the teacher's knowledge of students, self, and context. These three types of knowledge were clearly seen in the planning and practices of Natalie at SPA. She chose which technologies to implement and when to do so based on her knowledge of students' preferences and learning styles. Of course, she integrated the technologies that were readily available to her (school context) and those technologies that she had mastered herself (knowledge of self). Similar observations on these types of knowledge were identified in the case of Samantha in her work at the SEVS. Knowledge of her students allows her to tap into their peculiar talents and abilities, not only to encourage their own acquisition of the target language, but also to design and develop additional methods of pedagogy to share with other Latin learners, such as the production and dissemination of Latin podcasts featuring an aria sung by one of her more extroverted students.

In the process of conducting empirical research, many additional and interesting questions inevitably emerge. Let me suggest several important areas for future research. While these suggestions are by no means exhaustive, they certainly merit the attention of scholars working in the disciplines of second language acquisition, ancient language acquisition, teacher cognition, and research methodology. One area that presented itself during the course of this study was the role of the philosophy of teaching Latin in the way Latin teachers approach their work in general and their use of technology in particular. It became clear through the course of this research that the traditional approach to teaching this ancient language – the grammar-translation method – remains popular among many Latin teachers, including the two participants of this empirical investigation. Suggested questions for future research include: What role does Latin teaching philosophy have on technology integration? Does Latin teacher philosophy limit the integration of certain technologies in the Latin classroom? For Latin teachers who integrate communicative approaches in their L2 pedagogy, what technologies are most promising? In what ways may the technology skills of Latin students be effectively integrated into the pedagogy? These and other related questions will be piloted by this researcher in an upcoming Latin language session at the Annual Meeting of the American Council on the Teaching of Foreign Languages (Madrigal, in preparation).

As this research represents one of the pioneering studies in the field of ancient language acquisition (ALA), the field is especially ripe for additional social-scientific research. For example, more studies are needed in the study of ALA at all levels of instruction, such as the study of Coptic or Aramaic among graduate and seminary

students or the study of Biblical languages at undergraduate institutions. The examination of ancient language teachers, including their pre-active and inter-active acts of cognition in face-to-face classrooms, in distance-learning contexts, and in technology-rich environments are all areas demanding more empirical research. Moreover, how ancient language teachers integrate technology into their practices is another area that deserves exploration. As noted throughout this research report, L2 teacher cognition as a field is relatively new to the social-sciences, and offers many questions for researchers. Borg (2006) recently observed, for example, that additional research "is thus required for us to understand not just what language teachers have cognitions about, but how the different elements in teachers' cognitive systems interact and which of these elements, for example, are core and which are peripheral" (p. 272).

Still another area deserving of attention is the study of the community of parents involved in ancient language learning environments. The active and consistent presence of the community of parents emerged as an unexpected yet interesting aspect of this investigation. Although the research design of the present study did not explicitly include this area of focus during the course of research, it became obvious to me that the role of parents was indeed a vital factor at both sites of research. Similar to the role of parents at the Open Classroom (OC) described in the second chapter, a high degree of parental involvement is evident in the daily events and activities at SPA. Natalie regularly communicates personally with her students' parents when they visit the SPA campus, and also online through emails and the SPAnet website. As we have seen in the educational practices of the SEVS, Samantha regularly collaborates with her students' parents or

guardians on several levels. On the one hand, SEVS parents are required to participate in the official welcome call as the virtual school teacher explains the typical procedures of the school, including the virtual school's expectations of students. On the other hand, Samantha also asks parents to collaborate with their children in the language learning process. For example, they sometimes monitor their students in the production and use of vocabulary flash cards. Moreover, parents at the SEVS are also solicited to proctor exams, such as the National Latin Examination. This formal exam is not taken online. Rather, it is a paper-based examination that is sent directly to the students' home for a parent to administer. The parent or legal guardian, in this case, serves to proctor this formal test. One can see from these examples from the present study how the variable of parents in the enterprise of ancient language study may be explored further. The role of parents in ancient language learning, including what Latin teachers think about such parental collaboration, whether the context is a traditional F2F classroom or a virtual learning environment, is a promising and exciting field of research. Certainly more studies, even of a replicative nature, would advance our understanding of this area.

This study explored the phenomena of Latin teacher cognition in technology-rich environments from a situated learning perspective. I chose Wenger's (1998) communities of practice theory as the conceptual framework from which to view and interpret the data. Obviously, these same data could be analyzed from other theoretical frameworks, and yield additional insights into the phenomena of ancient language teacher cognition. For example, I am personally intrigued by the prospect of examining Latin teacher cognition using Mary Douglas' theory of Grid and Group (Harris, 2006). The various tensions

between individualistic objectives and group goals could be explored using Douglas' conceptions of cultural theory. An example of this might be the exploration of a high group and low grid classroom structure, where the individual participants function for the benefit of the goals and objectives of the whole community. While such a framework would certainly produce findings similar to a communities-of-practice approach, no doubt additional insights would also be discovered. Similarly, many areas of ALA including ancient language teacher cognition could be profitably explored from a socio-cultural theoretical (SCT) perspective (Moll, 2001).

An additional focus for future research is my conception of the research cycle, composed of three intrinsically related elements: phenomena, theory, and inference. These three focal points of research can be graphically illustrated by placing three points on a circle, each point representing one of these three stages of formal research. In my view, social-scientific research can begin with any one of the three elements and proceed in either direction. Although this formulation was introduced briefly in my discussion of methodology above (see pp. 82-83), a detailed explication of this concept is fertile ground for future theoretical research.

Conclusion

This exploration into Latin teacher cognition in two technology-rich communities of practice has provided some insight into the phenomena of second language teaching, and particularly ancient language teaching in two dynamic and progressive educational contexts. Language teaching in the twenty-first century must certainly address the challenge of technology. But this challenge must be viewed as an opportunity. As the

Roman Trojans prepared to conquer a fortified city in ancient times, they understood the unique challenges of their ambitious objective. Sometimes months and years would be spent merely in building a network of roads, all of which led to the center of their empire. Sometimes, the tasks would include the construction of a strategically located encampment surrounding the city, discouraging the shipment of needed supplies, including water. In most cases, the implementation of new technologies was harnessed to meet the specific goal at hand.

Similarly, second language teachers must learn to think creatively about integrating cutting-edge computer and Internet technologies into their teaching practices. Although this empirical study focused on how two ancient language teachers do this, we must be careful how we generalize the results of this research to other contexts. I am reminded, at this juncture, at the admonition of Mark Twain – quoted at the heading of this chapter. While it may be true that there is an element of danger in every generalization, Twain himself implies that there are limits to his observation. It is my intent that second language teachers – including those that specialize in ancient or classical languages – who read this research report will find much to stimulate their thinking about technology, and how technology can be integrated expediently into their teaching. Meeting the challenges of teaching in the twenty-first century will require conscious, concentrated, and creative acts of cognition on the part of the L2 educators at all levels of instruction. When this occurs, the effective and reflective teacher can certainly proclaim that such contemplation empowers her to do what she loves to do: I think, therefore I teach! *Cogito, ergo doceo.*

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Appendices

Appendix A – Permissions Letters

SouthEastern Virtual School [logo]

3/7/2006

Mr. Ramón Madrigal

This letter is in regards to Ramón Madrigal's research. He is being given the opportunity to pursue his research at SouthEastern Virtual School. He is being asked to have his research done by January 30, 2007.

Ray will be doing the following in his study:

Title: *Cogito ergo doceo*: A cross-case study of Latin teacher cognition in technology-rich communities of practice.

Investigator: Ramón Madrigal, PhD Candidate in Second Language Acquisition & Instructional Technology

Affiliation: The University of South Florida (Tampa)

What is the purpose of this study? The purpose of this study is to explore Latin teacher cognition in two technology-rich communities of practice. One of these teachers is Samantha Smith of the SouthEastern Virtual School (Samantha has agreed to participate). Research questions include: How does the technology-rich environment influence teacher thinking and practice? How does a technology-rich environment transform teachers' and students' perspectives on learning Latin?

How many participants will take part in this study? At least one teacher (Samantha Smith), one colleague or her administrator, students who agree to take a survey, and up to 3 students for an interview. The exact number of students to include in the survey is unknown at this time.

What will happen in this study? The principal participant (Samantha Smith) will be interviewed by the researcher (with audio-recorder) to explore her thinking on the practice of teaching an ancient language like Latin using modern technology. A colleague or administrator familiar with Samantha's teaching will also be interviewed. Latin students will have the opportunity to take a brief survey to explore their perspectives on studying an ancient language through internet technology. Two or three of these students will have the opportunity to be interviewed to explore their perspectives further with the researcher and Ms. Smith.

A protocol has been discussed with Mr. Madrigal for interviewing SEVS students. Samantha Smith will be present during interviews. To assure confidentiality, an identifier will be assigned the students. Ray has shared his survey and interview instruments with us. For all contact with students, a disclosure of confidentiality and informed consent will be offered, SEVS may amend these documents. Mr. Madrigal may interview up to 3 students.

Ray will provide SEVS with his recommendations regarding teaching practices and pedagogy in a technology-rich environment in three increasingly formal ways. First, during the process of data collection, he will "bounce off ideas" with Samantha Smith and any other teachers/colleagues/administrators he interviews. Secondly, he will provide participants with a preliminary write-up of his research, soliciting feedback from them as to the accuracy and tone of his interpretations. This preliminary report will also contain recommendations on course redesign, curriculum development and teaching pedagogy in a technology-rich environment. Finally, after synthesizing this feedback into his analysis, he will provide the SEVS with a copy of his report (dissertation) which will contain updated recommendations in these areas along with suggestions for further research. Additionally, he will offer to make a presentation (workshop) with SEVS personnel on this research and any further recommendations.

We are pleased to work and support Mr. Madrigal in pursuing his research at SEVS.

Let me know of any further information that you may need.

Respectfully Submitted,

Dr. Keren Giraldo [code name]
Manager of Research and Grants
SouthEastern Virtual School – SEVS

Sunshine Preparatory Academy [logo]

March 10, 2006

Re: Mr. Ramón Madrigal

This letter is in regards to Ramón Madrigal's research. He is being given the opportunity to pursue his research at the Sunshine Preparatory Academy. We understand that his research will begin sometime after March 28, 2006.

Ray will be doing the following study:

Title: Cogito ergo doceo: A cross-case study of Latin teacher cognition in technology-rich communities of practice.

Investigator: Ramón Madrigal, PhD Candidate in Second Language Acquisition & Instructional Technology

Affiliation: The University of South Florida (Tampa)

What is the purpose of this study? The purpose of this study is to explore Latin teacher cognition in two technology-rich communities of practice. One of these teachers is Natalie Ferenzce (Natalie has agreed to participate). Research questions include: How does the technology-rich environment influence teacher thinking and practice? How does a technology-rich environment transform teachers' and students' perspectives on learning Latin?

How many participants will take part in this study? At least one teacher (Natalie Ferenzce), one colleague or her administrator, students who agree to take a survey, and up to 3 students for an interview. The exact number of students to include in the survey is unknown at this time.

What will happen in this study? The principal participant (Natalie Ferenzce) will be interviewed by the researcher (with audio-recorder) to explore her thinking on the practice of teaching an ancient language like Latin using modern technology. A colleague and/or administrator familiar with Natalie's teaching will also be interviewed. Latin students will have the opportunity to take a brief survey [later modified to focus-group protocol] to explore their perspectives on studying an ancient language using computer technology. Two or three of these students will have the opportunity to be interviewed to explore their perspectives further with the researcher. Two of Ms. Ferenzce's class sessions will be video-recorded. The investigator and Natalie will review selected segments of these videos to reflect on her teaching practices and thought processes that

may have occurred during these segments. Mr. Madrigal will also observe at least twelve additional class sessions during the course of research. For all contact with students, a disclosure of confidentiality and informed consent will be offered.

Ray will provide Sunshine Preparatory Academy with his recommendations regarding teaching practices and pedagogy in a technology-rich environment in three increasingly formal ways. First, during the process of data collection, he will "bounce off ideas" with Natalie Ferenzce and any other teachers/colleagues/administrators he interviews. Secondly, he will provide participants with a preliminary write-up of his research, soliciting feedback from them as to the accuracy and tone of his interpretations. This preliminary report will also contain recommendations on course redesign, curriculum development and teaching pedagogy in a technology-rich environment. Finally, after synthesizing this feedback into his analysis, he will provide Sunshine Preparatory Academy with a copy of this report (dissertation) which will contain updated recommendations in these areas along with suggestions for further research. Additionally, he will offer to make a presentation (workshop) with the Sunshine Preparatory Academy personnel and/or students on this research, and/or on social-scientific research in general.

We are pleased to support Mr. Madrigal as he pursues his research at SPA.

Sincerely,

Daniel Brierre
Head of Upper School

Sample of IRB Permission Letter (Approval for Continuing Review)

USF
UNIVERSITY OF
SOUTH FLORIDA

February 8, 2007

Ramon A. Madrigal, MA
6207 Tanager Place
Temple Terrace, FL 33617

RE: **Expedited Approval** for Continuing Review
IRB#: 104524 (I)
Title: *Cogito ergo doceo: A Cross-Case Study of Latin Teacher Cognition in Technology-Rich Communities of Practice*

Study Approval Period: February 7, 2007 to February 6, 2008

Dear Mr. Madrigal:

On February 7, 2007, Institutional Review Board (IRB) reviewed and **APPROVED** the above protocol **for the period indicated above.** It was the determination of the IRB that your study qualified for expedited review based on the federal expedited category number 8.

Please note, if applicable, the **enclosed informed consent/assent documents are valid during the period indicated by the official, IRB-Approval stamp located on page one of the form.** Valid consent must be documented on a copy of the most recently IRB-approved consent form. Make copies from the enclosed original.

Please reference the above IRB protocol number in all correspondence regarding this protocol with the IRB or the Division of Research Integrity and Compliance. In addition, we have enclosed an Institutional Review Board (IRB) Quick Reference Guide providing guidelines and resources to assist you in meeting your responsibilities in the conduction of human participant research. Please read this guide carefully. It is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB.

OFFICE OF RESEARCH • DIVISION OF RESEARCH INTEGRITY & COMPLIANCE
INSTITUTIONAL REVIEW BOARDS, FWA NO. 00001669
University of South Florida • 12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-5618

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to the Human Research Protections Program. If you have any questions regarding this matter, please call 813-974-9343.

Sincerely,

Paul G. Stiles, J.D., Ph.D., Chairperson
USF Institutional Review Board

Enclosures: (If applicable) IRB-Approved, Stamped Informed Consent/Assent Documents(s)
IRB Quick Reference Guide

Cc: Various B. Menzel, USF IRB Professional Staff
Tony Erben, Ph.D.

SB-IRB-Approved-EXPEDITED-0601

Appendix B – Informed Consent Forms

Social and Behavioral Sciences
University of South Florida

Information for People Who Take Part in Research Studies **School name HERE**

Researchers at the University of South Florida (USF) study many topics. In this study, for example, we want to learn more about what teachers and students of Latin believe about using technology in the study of this ancient language. To do this, we need the help of people who agree to take part in a research study.

Title of research study: Cogito ergo doceo: A cross-case study of Latin teacher cognition in technology-rich communities of practice.

Person in charge of study: Ramón Madrigal

Study staff who can act on behalf of the person in charge: N/A

Where the study will be done: Name of School here, City, State

Who is paying for it: The researcher himself, Ramón Madrigal

Should you take part in this study?

This form tells you about this research study. You can decide if you want to take part in it. You do not have to take part. Reading this form can help you decide.

Before you decide:

- Read this form.
- Talk about this study with the person in charge of the study or the person explaining the study. You can have someone with you when you talk about the study.
- Find out what the study is about.

You can ask questions:

- You may have questions this form does not answer. If you do, ask the person in charge of the study or study staff as you go along.

- You don't have to guess at things you don't understand. Ask the people doing the study to explain things in a way you can understand.

After you read this form, you can:

- Take your time to think about it.
- Have a friend or family member read it.
- Talk it over with someone you trust.

It's up to you. If you choose to be in the study, then you can sign the form. If you do not want to take part in this study, do not sign the form.

Why is this research being done?

The purpose of this study is to find out what teachers and students of Latin think about learning Latin in a technology-rich environment. Information [data] will be collected through observations, interviews, and a survey/questionnaire.

Why are you being asked to take part?

We are asking you to take part in this study because you are a teacher of Latin in a technology-rich environment, and we want to find out more about teacher cognition in such a context.

How long will you be asked to stay in the study?

You will be asked to spend about seven weeks in this study, which will include the times when the researcher is observing your classes and the times when he interviews you.

How often will you need to come for study visits?

A study visit is one you have with the person in charge of the study, Ramón Madrigal. He will actually come to your school (Name of School here) to collect data. He will observe your classes or conduct interviews on site approximately twenty times over the course of seven weeks. The study timetable will likely consist of five or six weeks during the months of April and May, 2006, followed by two weeks in September or October, 2006. Most visits will consist of two or three hours of observations and/or interviews two times each week (Tuesdays and Thursdays). Some visits may be longer or shorter.

- Most visits will consist of two or three observations of Latin classes. There will also be several interviews and one brief survey/questionnaire. Questions on the survey and on the interview protocols focus on teacher beliefs and practices on teaching Latin in a technology-rich environment.

The exit interview will include recommendations by the researcher for course redesign and curriculum development for teaching Latin in technology-rich communities of practice.

What other choices do you have if you decide not to take part?

If you decide not to take part in this study, that is okay. You do not have to participate.

How do you get started?

If you decide to take part in this study, you will need to sign this consent form.

What will happen during this study?

During the first week of this study, you will be interviewed by the researcher. This interview will take about one hour. Also during this first week, the researcher will observe you teaching several class sessions. In subsequent weeks, two of your class sessions will be video-recorded. Later that day, or perhaps on the next visit, the researcher will discuss selected segments of these video-recordings with you to stimulate your memory and thinking about what was happening during the class session. Also, one or two of your colleagues and/or administrators will be interviewed as well. On another visit, your students will take a brief 20- to 30-minute survey. Up to three of these students will take a brief 20- to 30-minute follow-up interview (if they are willing) on yet another visit. During the last week of research, the researcher will conduct an exit interview with you to ascertain your feedback as to his tentative conclusions and interpretations.

Here is what you will need to do during this study

You will need to be available to the researcher after normal school hours (or during lunch hour or break time) for the interview sessions described above. Additionally, you will need to plan several activities where you infuse technology into your teaching routine when the researcher is available to observe these activities. Also, you will need to provide class materials, syllabi, handouts, etc. to the researcher (Ramón Madrigal).

Will you be paid for taking part in this study?

- We will not pay you for your participation in this study.

What will it cost you to take part in this study?

It will not cost you anything to participate in this study, other than your time.

What are the potential benefits if you take part in this study?

We don't know if you will get any benefits by taking part in this study. It is likely, however, that you will learn something about social-scientific research, and also gain additional insights into the processes of teaching and learning Latin in a technology-enhanced environment.

What are the risks if you take part in this study?

There are no known risks to those who take part in this study.

What will we do to keep your study records private?

Federal law requires us to keep your study records private.
Your name will not be used on any documents used by the researcher. A code-name or number will be used instead of your name. Any data collected by the researcher on you will be housed in a locked-filing cabinet in the researcher's office. At the completion of the research study, these data will be destroyed.
However, certain people may need to see your study records. By law, anyone who looks at your records must keep them confidential. The only people who will be allowed to see these records are:

- The researcher(s).
- People who make sure that we are doing the study in the right way. They also make sure that we protect your rights and safety:
    - The USF Institutional Review Board (IRB)
    - The United States Department of Health and Human Services (DHHS)

We may publish what we find out from this study. If we do, we will not use your name or anything else that would let people know who you are.

What happens if you decide not to take part in this study?

You should only take part in this study if you want to take part.

If you decide not to take part:

- You won't be in trouble or lose any rights you normally have.
- You will still get the same services you would normally have.

What if you join the study and then later decide you want to stop?

If you decide you want to stop taking part in the study, tell the researcher as soon as you can. There will be no negative consequences of quitting this study.

You can get the answers to your questions.

If you have any questions about this study, call Ramón Madrigal at (813) xxx-xxxx home or (813) xxx-xxxx cell or Email at SampleEmail@Email.com
If you have questions about your rights as a person who is taking part in a study, call USF Research Compliance at (813) 974-5638.

Consent to Take Part in this Research Study

It's up to you. You can decide if you want to take part in this study.

I freely give my consent to take part in this study. I understand that this is research. I have received a copy of this consent form.

_____	_____	_____
Signature of Person taking part in study	Printed Name of Person taking part in study	Date

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect.
The person who is giving consent to take part in this study

- Understands the language that is used.
- Reads well enough to understand this form. Or is able to hear and understand when the form is read to him or her.
- Does not have any problems that could make it hard to understand what it means to take part in this study.
- Is not taking drugs that make it hard to understand what is being explained.

To the best of my knowledge, when this person signs this form, he or she understands:

- What the study is about.
- What needs to be done.
- What the potential benefits might be.
- What the known risks might be.
- That taking part in the study is voluntary.

_____	_____	_____
Signature of Investigator or authorized research investigator designated by the Principal Investigator	Printed Name of Investigator	Date

Appendix C - Timeline and Schedule of Research

PHASE 1 – Access

Initial Contact with possible teachers/participants (March-July, 2005)
Visits to 20 area schools to follow-up with possible participants (Spring, 2005)
Sample of two selected based on technology-rich context criterion (May, 2005)
First site access granted (May 9, 2005, formal permission letter March 10, 2006)
Second site access granted (March 7, 2006)

PHASE 2 – Data Collection at Site One (See actual record of data collection events in Chapter 4 above); 3-4 hours per week (March 28 – May 18, 2006)

Week 1 – First interview with Natalie; collect signed informed consent forms from students and parents/guardians; and 1-3 observation sessions
Week 2 – Observations with Natalie and interview colleague or administrator
Week 3 – Observations and second interview (Stimulated-recall) with Natalie
Week 4 – Observations with Natalie and interview colleague or administrator
Week 5 – Observations with Natalie and third (Stimulated-recall) interview
Week 6 – Focus group sessions and interviews with selected students

PHASE 3 – Data Analysis

Initial data analyses to take place throughout Phase 2 (QUAL)
Researcher memos, reflective notes, and journal entries; transcriptions
Subsequent & more concentrated data analysis (began in May, 2006)
Develop codes & categories w/constant-comparative method; use CoP framework
Two SLAIT colleagues will also code data (begin in Fall, 2006)

PHASE 4 – Data Collection "at" Site Two; 3-4 hours per week (September-Dec. 2006)

Week 1 – First interview with Samantha, collect signed informed consent forms from students and parents/guardians
Week 2 – Interview colleague or administrator
Week 3 – Follow-up interview with Samantha
Week 4 – Conduct interviews with students (See Appendix K)
Week 5 – Third Interview with Samantha (preliminary, tentative findings)

PHASE 5 – Data Analysis – ongoing from Phase 2 and continuing from Phase 4

Initial data analyses to take place throughout Research (QUAL → qual)
Researcher memos, reflective notes, and journal entries; transcriptions
Subsequent & concentrated data analysis (December, 2006 thru February, 2007)
Refine codes & categories w/constant-comparative method using CoP framework
Two SLAIT colleagues will also code data; calculate inter-rater reliability

PHASE 6 – Data Interpretation (November, 2006 thru March, 2007)

Interpret findings of both case studies individually (QUAL → qual), and as a set

(cross-case study)
Get Feedback (Appendix J) from Teachers on preliminary write-ups of their CoP
Conclusions, Implications & Suggestions for further research

PHASE 7 – Final Write-up of report (March-April, 2007)
Defend Dissertation (May 14, 2007)
Final Revisions of Dissertation and Format Checks (July 16, 2007)

Appendix D - First Interview Protocol*

The following questions and probes are designed to elicit information about the beliefs, attitudes, teaching style, and general teaching cognition of Ms. _____, who teaches Latin at this technology-rich school (i.e., a community of practice). This protocol, of course, is a semi-structured guide to the interview, and may be modified prior to or even during the actual interview.

Getting to know you

1. Tell me a little about yourself, your interests, family, hobbies, etc?
2. What languages do you know or have you studied?
3. Have you traveled to places where these languages are spoken? Or, in the case of Latin, have you traveled to Rome or Italy? (possible follow-ups): Have you studied classical civilization from the perspectives of art, history, or the humanities?
4. Why did you decide to study this language?
5. When did you begin your teaching career?
6. Are there other subjects that you have taught or for which you have teaching credentials?
7. What made you decide to focus on teaching Latin?
8. What memory or memories do you have of an especially gifted language teacher? Could you elaborate?
9. Did you ever have a disappointing or negative language learning experience?
10. In your view, what are the most important qualities of an effective language teacher?

11. On the other hand, what are some weaknesses or limitations to avoid?

12. Are there any unique situations or problems associated with the teaching of an ancient language, like Latin, that you would care to talk about?

Teacher Education Background

13. Could you tell me about your teacher education experience?

14. Did you take any methods courses that you found particularly helpful in preparing you for teaching Latin?

Professional Development

15. What opportunities do you have for professional development?

16. Do you hold membership in any professional organization or society? (follow-up: does this organization focus on teaching in general or Latin/language instruction in particular?

17. What does reflective teaching mean to you? How does this school promote reflective teaching?

Technology

18. Please tell me about your interest in using computer technology in language teaching?

19. How did you prepare yourself professionally to integrate technology with your teaching of Latin?

20. What technologies do you find most useful for your own personal use?

21. Are there some technologies that you prefer to avoid?

22. What technologies do you consider to be most adaptable for teaching purposes?

23. What new technologies do you think your students would enjoy using to learn Latin?

24. Have you thought about ways that students could use iPods or cell phones to learn Latin?

25. Are there any challenges or problems that you think hinder the integration of technology into the teaching of Latin? If so, please describe these.

26. Have you discovered Latin language textbooks – or other resources – that help you to integrate technology into your teaching?

27. What technology, such as a specific software program or the use of the Internet, have you used in your Latin classes?

28. To what extent, if any, would you consider using this again?

29. Are there some examples of technology integration into teaching that you would like to try? Explain.

30. In your view, how do your students respond to learning Latin in this technology-rich environment?

31. In your view, how does this technology-rich environment influence your students' perspectives on learning Latin?

32. In what way has this technology-rich context transformed your own perspectives on teaching and learning Latin?

33. Would you say that your students find the study of Latin more relevant to their lives because they are using modern technology to learn this ancient language? If so, explain.

34. Do you have any additional thoughts on the relative merits or demerits of using technology in the study of Latin?

Community of Practice

35. Would you say that your students have a sense of belonging to a special community of learners here at ____? If so, could you elaborate (give one or two concrete examples)?

36. In what ways, if any, do your students collaborate with each other in their activities or assignments?

37. In your view, do these interactions and cooperative activities create a sense of belonging or a sense of community among your students?

38. Would you say that your students feel special or privileged to be a part of this school? Explain.

---

*Source: Protocol developed by author from several sources, including Rodriguez-van Olphen (2002, pp. 114-16) and Rubin and Rubin (2005, pp. 152-72).

Appendix E - Questions for Focus Groups

1. What do you like about learning Latin?

2. Do you think that Latin is a dead language?

3. What do you think is the greatest benefit of using technology to learn Latin?

4. In general, can you think of any problems with using technology to study Latin?

5. In your opinion, how could Latin instruction be improved at this school? (remember: your thoughts will be held in confidence)

6. Feel free to make any other comments or observations you have about this topic.

7. Would you be willing to be interviewed (about 20-minutes) to discuss some of these issues further?

Questions for Written submission (online school)

Same as above questions.

Appendix F - Stimulated-recall Interview Protocol

The following questions, adapted from Clark and Peterson (1986, p. 268) were presented to the Latin Teacher A, "Natalie" (in the traditional classroom environment) in order to "stimulate recall" of her interactive thoughts during the video-recorded lesson:

1. What were you doing in this segment and why?
2. Were you thinking of any alternative actions or strategies at that time?
3. What were you noticing about the students?
4. How were the students responding in this activity?
5. In your view, did students participate in a way that fostered their learning? Explain.
6. Did any student reactions cause you to act differently than you had planned?
7. Did you have any particular objectives in mind in this segment? If so, what were they?
8. Do you remember any aspects of the situation that might have affected what you did in this segment? (p. 268)
9. In retrospect, how effective do you feel that the use of technology was in this session?
10. What other pertinent thoughts or ideas do you recall from this segment?

Appendix G - Descriptive Notes & Reflective Notes Protocol (for, F2F classroom)

Setting:
Individual Observed:
Observation #: (first observation, second, etc.)
Observer Involvement:

Date/Time:
Place:
Duration of Observation (indicate start/end times):

Descriptive Notes (Detailed, chronological notes about what the observer sees, hears; what occurred; the physical setting)	**Reflective Notes** (Concurrent notes about the observer's thoughts, personal reactions, experiences)

Source: Gay and Airasian (2003, p. 201)

Appendix H - Interview Protocol with Administrator

The following questions and probes are designed to elicit information about the administrator's association with Ms. ____, who teaches Latin at this school, and his evaluation of the teaching practices, style, pedagogical knowledge, etc. of this teacher. This protocol, of course, was a semi-structured guide to the interview, and was modified and expanded during the actual interview.

Main Questions

1. How long have you know Ms. ____?

2. Has your association always been in the capacity of a supervisor or administrator?

3. Could you comment on your opinion of Ms. _____ as a Latin teacher? (follow-ups)

4. What would you consider Ms. _____ teaching strengths to be? (follow-ups)

5. Weaknesses? (possible follow-ups)

6. What types of planning for or management of instruction do you encourage your teachers to do? Are written lesson plans or thematic units required? If so, how often must they be submitted, etc.?

7. In your view, how does Ms. _____ do as far as this pedagogical planning is concerned?

8. Please comment on Ms. ____ use of technology in her teaching of Latin.

9. How do the students of Ms. ____ respond to her teaching in general, and her use of technology in particular?

10. Do Ms. ____ students enjoy learning Latin in this technology-rich environment?

11. In addition to this type of planning, are there other kinds of professional development opportunities available for your teachers (including Ms. _____, your Latin teacher)? If so, could you elaborate?

12. In general, could you share with me the general philosophy of your school and its administration about the use of technology? (follow-up with NETS, standards, etc.)

13. Do you provide in-service training to your teachers in this (or other) areas?

14. In your view, is Ms. _____ active in developing herself professionally? If so, please give me some specific examples.

15. In your view, in what ways does Ms. _____ integrate technology into her teaching of Latin?

16. Are there difficulties or challenges that you feel limit the integration of technology into the educational program here?

17. Do you have any additional thoughts or comments that you believe are appropriate concerning Ms. _____?

Appendix I - Interview Protocol with Colleague

The following questions and probes were designed to elicit information about the colleague's association with Ms. ____, who teaches Latin at this school, and his/her opinion of the teaching practices, style, pedagogical knowledge, etc. of this teacher. This protocol, of course, was a semi-structured guide to the interview, and was modified and expanded during the actual interview.

Main Questions

1. How long have you know Ms. ____?

2. Has your association always been in the capacity of a teaching colleague?

3. Could you comment on your opinion of Ms. _____ as a Latin teacher? (follow-ups)

4. Upon what evidence do you base your opinions?

5. What would you consider Ms. _____ teaching strengths to be? (follow-ups)

6. Weaknesses? (possible follow-ups)

7. What types of planning for or management of instruction are encouraged by the administration of this school? Are written lesson plans or thematic units required? If so, how often must they be submitted, etc.? Must the integration of technology be included?

8. In your view, how does Ms. _____ do as far as this pedagogical planning is concerned?

9. In addition to this type of planning, are there other kinds of professional development opportunities available for language teachers here? If so, could you elaborate?

10. Could you comment on the general philosophy of the language department here on the use of technology?

11. In your view, does Ms. _____ use technology effectively? If so, please elaborate.

12. In your view, do Ms. _____ students enjoy the integration of technology with their learning of Latin?

13. What difficulties or challenges do you feel are present which limit the integration of technology into the foreign language program here?

14. Do you have any additional thoughts or comments that you believe are appropriate concerning Ms. _____?

Appendix J - Feedback Interview with Teacher

There were two principle purposes for this interview. The first was to solicit feedback (member-checking) from the Latin teacher to confirm or correct any initial interpretations and tentative conclusions made by the researcher. The second purpose was to provide an opportunity for the researcher to discuss any suggestions or recommendations that he thinks could improve or enhance the instruction of Latin at this school.

PART I

1. Could you give me your reaction to my preliminary report on your teaching methods at this unique school?
2. Would you say that my general observations and descriptions of your CoP are accurate?
3. Are there any specific points of disagreement that we should discuss?
4. Are you pleased with the tone and presentation of the report?
5. Are there any issues that you found in the report that failed to provide appropriate measures of confidentiality for you or your students?
6. Is there anything else that you would care to share with me about this study in general or this preliminary [tentative] report in particular?

PART II

Recommendations suggested by the researcher and discussed with the teacher:

Misc. Observations:

Appendix K - Student Interview Protocol

The purpose of this interview protocol was to explore and probe students' opinions about learning Latin in a technology-enhanced learning environment as well as their views about their teacher and her instructional methods. Specific items for this protocol were developed from responses generated from the focus-group sessions with Natalie at the face-to-face environment and the online written interview questions with Samantha at the online school (Appendix E, above).

1. What do you like about learning Latin?

2. Do you think that Latin is a dead language?

3. What do you think is the greatest benefit of using technology to learn Latin?

4. In general, can you think of any problems with using technology to study Latin?

5. In your opinion, how could Latin instruction be improved at this school? (remember: your thoughts will be held in confidence)

6. Do you have any additional comments or observations you have about this topic.

Appendix L - State Standards for Latin 1 (Revised 2006)

Department of Education

COURSE DESCRIPTION - GRADES 9-12, ADULT

Subject Area: Foreign Languages
Course Number: 0706300
Course Title: Latin 1
Credit: 1.0

A. Major Concepts/Content. The purpose of this course is to introduce students to fundamental Latin vocabulary and grammar and to classical culture.

The content should include, but not be limited to, the following:

- communication in Latin using reading, writing, and comprehension strategies, with emphasis on reading and writing strategies
- perspectives, practices, and products of classical culture
- application of knowledge of the Latin language and classical culture to further knowledge of other disciplines
- comparison and contrast of the Latin language and classical culture with the student's own language and culture
- influence of the Latin language and classical culture in modern society

Course student performance standards must be adopted by the district, and they must reflect appropriate State Standards benchmarks.

B. **Special Note.** Course content requirements for the two-course sequence M/J Latin, Beginning (0706000) and Intermediate (0706010), are equivalent to Latin I (0706300). Course content requirements for the three-course sequence that includes M/J Latin, Beginning (0706000), Intermediate (0706010), and Advanced (0706020), may be equivalent to the two-course sequence Latin I (0706300) and Latin II (0706310). It is each district school board's responsibility to determine high school foreign language placement policies for those students who complete the M/J Latin sequences in middle school.

The study of classical languages requires that the foreign language benchmarks be adapted by placing greater emphasis on reading and writing skills than on speaking and listening skills. The benchmarks listed for this course are aligned with the expected levels of language proficiency, rather than grade levels.

B. Course Requirements. These requirements include, but are not limited to, the benchmarks from the State Standards that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate.

C.

After successfully completing this course, the student will:

1. Communicate in Latin using reading, writing, and comprehension strategies.
   - 2.1.1 follow and give simple instructions (e.g., instructions to participate in games or instructions provided by the teacher for classroom tasks).
   - 2.1.2 restate and rephrase simple information from materials presented orally, visually, and graphically in class.
   - 2.2.1 give and understand written and verbal instructions, using known, verbal patterns in the target language.
   - 2.2.3 organize information in spoken or written form about a variety of topics of academic and cultural interest (e.g., by making lists, categorizing objects, or organizing concepts).

2. Demonstrate understanding of perspectives, practices, and products of classical culture.
   - 1.1.3 recognize various familiar objects and norms of the target culture (e.g., toys, dresses, and typical foods).
   - 1.2.1 recognize various activities and celebrations in which children participate in the target culture (e.g., games, songs, birthday celebrations, storytelling, dramatizations, and role playing).
   - 1.3.4 identify and discuss various aspects of the target culture (e.g., educational systems or institutions, means of transportation, and various rules).

3. Apply knowledge of the Latin language and classical culture to further knowledge of other disciplines.
   - 1.1.1 use simple vocabulary and phrases to identify familiar objects and concepts from other disciplines.
   - 1.1.2 participate in an activity in the target-language class that

is based on a concept taught in a content class (e.g., shapes or relationships).

4. Compare and contrast the Latin language and classical culture to the student's own language and culture.
   - 1.1.1 know examples of word borrowing from one language to another.
   - 1.1.2 use simple vocabulary and short phrases in the target language.
   - 1.2.1 identify examples and understand the significance of true and false cognates (i.e., words derived from a common original form).
   - 1.2.2 recognize the similarities and differences between his or her native language and the target language in terms of the pronunciation, alphabet, and forms of written expression.
   - 2.1.1 know the similarities and differences between the patterns of behavior of the target culture related to recreation, celebration, holidays, customs, and the patterns of behavior of the local culture.
   - 2.1.2 recognize that there are similarities and differences between objects from the target culture and objects from the local culture (e.g., inside dwellings).
   - 2.2.3 recognize some cultural aspects, viewpoints, and attitudes of people in both his or her own culture and the target culture relating to family, school, work, and play.

5. Demonstrate understanding of how the Latin language and classical culture have influenced various aspects of modern society.
   - 1.2.2 demonstrate an awareness of employment possibilities (and other applications) for those who are able to master the target language.

Appendix M - Member Check – Feedback Letter from Natalie

March 20, 2007

Hi Ray,

I have finally read through the section that you sent me (sorry it took me so long!). Wow, you are a great writer! I know this is a research study, but thank you so much for the positive and encouraging words. (you make me sound like I know what I'm doing :)

I am thrilled with the observations that you made, and the conversations with my students and colleagues seem to have been helpful to you, which I am very happy about. I really can't wait to read the whole work in its entirety, and when I have the chance, to look into some of the theories you cite in your writing. I remember you saying that there will also be a section about how to improve or what other technology could be used in the classroom in addition to the things you observed. Are you still going to include that?

I hope that things are going along well with everything. I did e-mail Dr. Erben several months ago, and I hope to get up to the University during Spring Break. The weeks fly by sometimes… Thanks for everything and let me know if I can do anything else.

Sincerely,

Natalie

Member Check – Feedback Letter from SEVS

March 27, 2007

Ray,

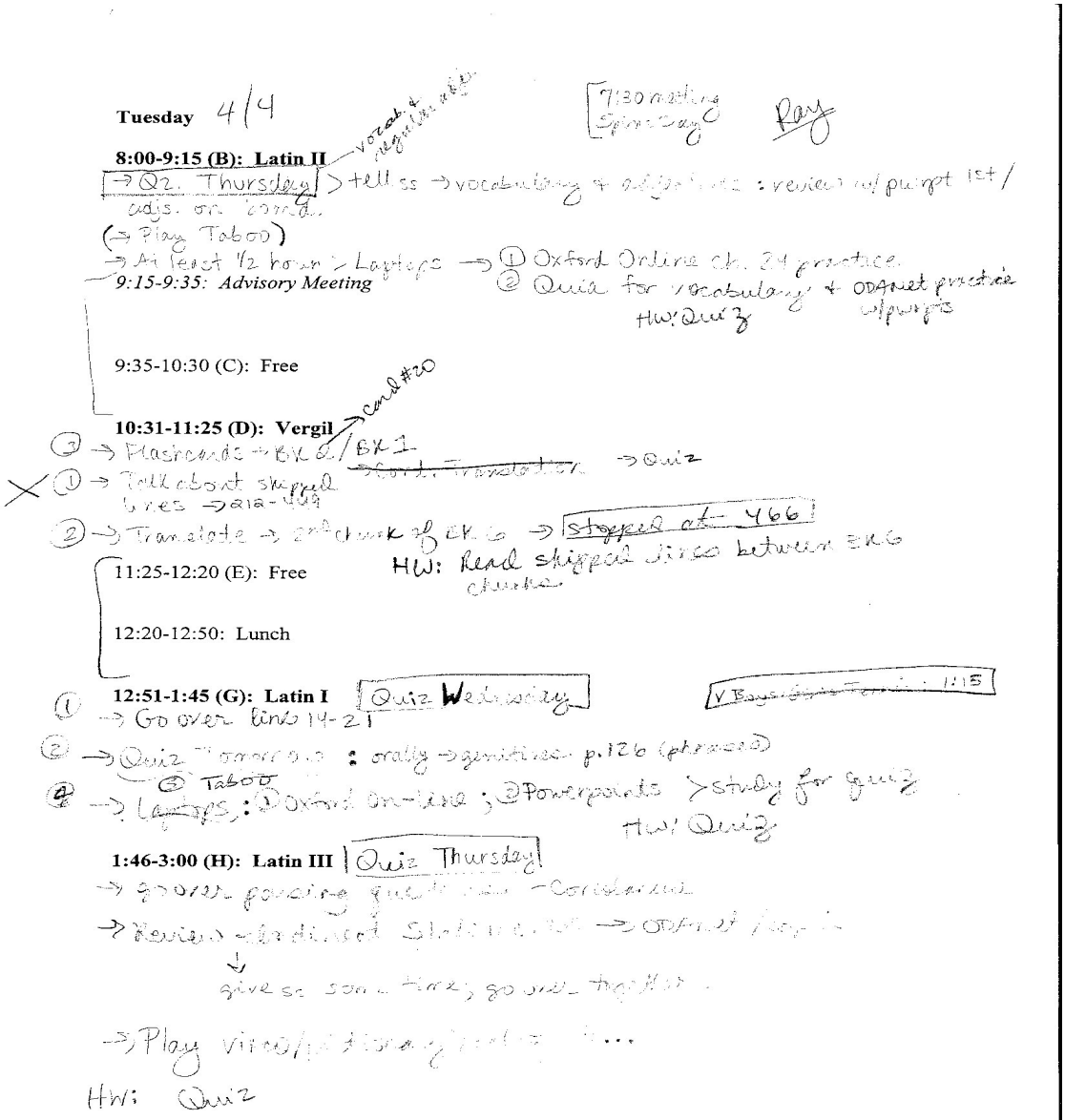
Laura Geer forwarded your draft to me for review. I spoke with Samantha Smith yesterday to get her thoughts. The one item that we would like to be corrected is the number of nationally certified teachers cited on page 16. SEVS currently has 87 teachers who have achieved this distinction, so if you could adjust your report accordingly, that would be great. Other than that, Samantha was very pleased with the report and we would all love to see the final copy!

Regards,

Megan

Data Analyst – SEVS

Appendix N - Sample of Natalie's Daily Lesson Plan



About the Author

Ramón Anthony (Ray) Madrigal is currently the Director of TESOL at Florida College in Temple Terrace, Florida. In addition to his administrative duties, Ray teaches courses in ESOL, Spanish and in Biblical Literature (with exegesis in the original Hebrew and Koinē Greek). Ray's research interests include Second Language Acquisition, Ancient Language Acquisition (especially Latin, Greek and Hebrew), Language Teacher Cognition, Instructional Technology, and Biblical Literature.