

“I heard it through the grapevine”: doctoral student socialization in chemistry and history

Susan K. Gardner

Received: 21 May 2005 / Accepted: 26 May 2006 / Published online: 27 June 2006
© Springer Science+Business Media B.V. 2006

Abstract Twenty doctoral students in the disciplines of chemistry and history were interviewed to better understand the socialization processes that influence their success and how these processes differ by year in the degree program and disciplinary culture. Five major themes emerged describing these socialization processes and how they facilitate or impede degree success, including Ambiguity, describing the programmatic guidelines and expectations that surrounded much of the students' experience; Balance, pointing to the students' need to balance graduate school responsibilities along with external relationships and demands; Independence, describing the students' desire to find equilibrium as they transitioned to the role of independent scholar; Development, highlighting the significant cognitive, personal, and professional development that occurs in these students' graduate experience; and Support, describing the faculty, peer, and financial support needed for the students' success in their degree programs. Suggestions for policy, practice, and further research are discussed.

Keywords Doctoral education · Graduate education · Qualitative · Socialization · Socialization processes

Introduction

Goaded by an unending litany of ambiguous expectations and guidelines in his graduate program, David declares, “You're just supposed to figure it out on your own. They expect you to figure out through the grapevine.” Another student, Gloria, echoes David's frustrations when discussing her experience with her dissertation proposal process. She sighs as she says, “I heard through the graduate student

S. K. Gardner (✉)
Higher Education, Louisiana State University, 121B Peabody Hall,
Baton Rouge, LA 70803, USA
e-mail: gardners@lsu.edu

grapevine that you're supposed to make it up. I didn't really understand. There's no breakdown; there's no guidelines. Nobody tells you what you need to do."

David and Gloria are not alone in their frustration. They are among 20 doctoral students in the disciplines of chemistry and history at one institution who repeatedly discussed feelings of frustration, confusion, and an overall sense of ambiguity pervading their entire graduate experience. Students discussed having to rely on what they termed "the graduate student grapevine" in order to understand what was expected of them, the guidelines they were meant to follow, and their roles in their programs. The students clearly articulated their discontent with the ambiguous processes of graduate school, leading them to a level of dissatisfaction with their overall experience. It is this dissatisfaction, unfortunately, that can impede students' degree success and may even lead students to withdraw from their degree programs altogether (Lovitts, 2001), resulting in doctoral student attrition.

Called a "scandal" and "the central issue in doctoral education in the United States today" (Smallwood, 2004, p. A11), doctoral student attrition, or the rates of students who do not complete their degree programs, has become the focus of considerable research in the United States (Baird, 1993; Berelson, 1960; Council of Graduate Schools, 1990; Golde, 1998; Lovitts, 2001). The number of doctoral students who leave their programs is alarming, with recent projections regarding doctoral attrition ranging from 40% to 70% (Bowen & Rudenstine, 1992; Noble, 1994; Tinto, 1993). In disciplines such as those in the humanities, attrition rates like these translate into only one of every three entering students actually earning the doctorate (Smallwood, 2004).

Why does doctoral student attrition matter? In financial costs, doctoral student attrition is extremely expensive for institutions. In its study of doctoral student attrition, the University of Notre Dame found that it would save \$1-million a year in stipends alone if attrition went down by 10% (Smallwood, 2004). In costs to the individual who leaves, the expense can be immeasurable. Lovitts (2001) states, "The most important reason to be concerned about graduate student attrition is that it can ruin individuals' lives" (p. 6). With such devastating effects, a greater understanding of the reasons for and the influences upon doctoral student attrition is needed.

While numerous studies have attempted to understand issues related to graduate student attrition and retention, including those of Tinto (1993), Baird (1993), and Lovitts (2001), no known studies have attempted to address socialization processes as possible factors in doctoral student success and achievement. Bragg (1976) states that "it is the socialization process that allows education to achieve its goals. Through the sociological process the individual acquires the knowledge and skills, the values and attitudes, and the habits and modes of thought of the society to which he belongs. Thus, the socialization process encompasses all learning—the affective as well as the cognitive" (p. 1). Therefore, if graduate students are to succeed in their future professions, it is due to the learning they acquire throughout the process of graduate school.

Furthermore, the majority of the literature on graduate student socialization focuses on graduate education as a whole, rather than investigating socialization at the degree level (i.e., master's or doctoral) or at the disciplinary or departmental level. The degree level often marks dramatic differences not only in structure but in culture as well (Conrad, Duren, & Haworth, 1998). Equally, the discipline is the home and central reference point to the graduate student (Berelson, 1960; Bowen & Rudenstine, 1992; Heiss, 1970). Golde (2004) points out, "The structures and culture

of the department do, indeed, shape student experience which in turn influences decisions about persistence or attrition” (p. 38). Thereby saying that to truly understand the socialization processes of doctoral students, it is important to look to the discipline and the department.

The purpose of this study is to determine if 20 doctoral students in the disciplines of chemistry and history undergo a common set of socialization processes that contribute to or detract from their success in the degree program. The accounts of these students tell the story of doctoral student socialization in departments of chemistry and history at one American institution, but also lend to a better understanding of what doctoral students, in all disciplines, require for success and satisfaction in their degree programs.

The culture: Land Grant University

In order to understand the accounts of these 20 doctoral students in chemistry and history, it is necessary to first understand their culture. It is culture that leads to a better understanding of the structures, processes, aids, and impediments that influence doctoral student success. Kuh and Whitt (1988) describe culture in colleges and universities as “the collective, mutually shaping patterns of norms, values, practices, beliefs, and assumptions that guide the behavior of individuals and groups ... and provide a frame of reference within which to interpret the meaning of events and actions on and off campus” (p. 12). In regard to doctoral education, the culture of the institution varies as much as that of the discipline (Kuh & Whitt, 1988). According to Golde (1996), “The people and practices in each department combine to form a distinctive culture which affects student experiences” (p. 356), and it is this culture, she concludes, that plays an influential role in doctoral student socialization and attrition. The location of the discipline within the particular institutional culture is manifested organizationally through the department. Clark (1987) speaks to this point, “The department becomes the basic unit of organization because it is where the imperatives of the discipline and the institution converge” (p. 64).

Land Grant University is a mid-sized research institution located in a rural setting in the United States. The institution is classified as Doctoral/Research Extensive by the Carnegie Foundation (McCormick, 2001), indicating the awarding of more than 50 doctoral degrees per year in at least 15 disciplines. Graduate students make up nearly 10% of the total enrollment of approximately 20,000 students. While the university declares its ranking to be among the top research universities in the United States (Land Grant University Web Site, 2005), the 2005 edition of the U.S. News and World Report Listing of the Best Graduate Schools reports Land Grant to be placed in the top 100 universities in the United States (U.S. News and World Report, 2005).

Like most other universities, Land Grant is divided into several academic colleges, including the College of Sciences, which includes the department of chemistry, and the College of Liberal Arts, under which is housed the department of history. The chemistry department at Land Grant University is made up of 28 faculty members. The department produced the largest number of doctoral graduates at Land Grant in 2002, and has a current enrollment of 49 doctoral students. The chemistry department at this institution, like many others, is arranged into

sub-disciplines: organic chemistry, physical chemistry, analytical chemistry, inorganic chemistry, biological systems, environmental chemistry, materials, and radiochemistry; and within these sub-disciplines, even finer sub-divisions exist (Breslow, 2003). The history department at Land Grant is made up of 25 faculty members and nine adjunct instructors. A total of 40 graduate students are enrolled in the department each year, focusing on nine areas of study including U.S. history, European, Asian, Latin American, environmental, women's history, public history, world history, and American Studies. In both departments, this fragmentation by subject fields leads to a culture separated by knowledge, faculty, and students.

Most graduate students in Land Grant's chemistry program are pursuing doctoral degrees. While a master's degree is offered, most students forego the degree for the doctorate, with some even going so far as to label the master's degree "a distraction." The history program at Land Grant, however, has a large contingency of students who choose to pursue a master's degree. While many of these students ultimately decide to continue with the doctorate, it is not as much of a foregone conclusion as it appears to be within the chemistry department.

Upon entrance to the chemistry department, all graduate students are granted financial support through a teaching assistant (TA) position. Very few students seem to stay with the TA appointment beyond their first year, seeking instead to join the research groups that will continue to support them through a research assistant (RA) position. The RA appointment serves as the foundation for the students' future dissertation research as well as the connection to their research advisor. Indeed, some students even choose to discontinue their TA work during the first year, as the TA appointment is viewed as lower paying, lower status, and often a distraction from the ultimate goal of research. History students, on the other hand, do not have such an exacting and assured path for financial support. As only half of all entering history students will be given the opportunity to receive financial support through a TA appointment, funding remains a pressing concern in the experience of these students. Further, the financial support provided through the TA appointment is not ensured throughout their experience. Students must then reapply for the TA position each year with a capping of this support after 4 years.

The purpose and characteristics of the advising relationship also vary greatly between the two disciplines. Whereas the central component of the doctoral student experience in chemistry rests upon the research group, with the advisor as the "boss" to the larger group of students, the nucleus of the doctoral experience in history is the quality of the relationship the student has with his or her advisor. While many of the history students have chosen their advisors upon application to the degree program, the chemistry students are given their first year to make this decision, facilitated through a series of weekly seminars in which the students can listen to faculty members' presentations of their research and through trial periods in different labs that are of interest to them.

All doctoral students in these departments are expected to pass a preliminary or comprehensive examination at the completion of their coursework as well as a language examination in the department of history. These examinations are major rites of passage for students in the departments and are often described as the most stressful part of the graduate experience. The explicit purpose of the examinations is to determine candidacy status, while the implicit purpose, at least in the eyes of some of the students, is to prepare them for the pressures they will face later as researchers defending their work. For many students, however, these exams have merely

become another meaningless hoop through which they must jump to earn their degrees, with many of them commenting on their confusion over its purposes and structure.

It is the culture in which these graduate students exist that lends to a better understanding of the challenges, aids, and processes that influence their success. However, in order to become a member of the culture, the student must first learn the rules, norms, guidelines, and behaviors necessary for membership. The main process at work to accomplish this goal for these and all doctoral students is socialization (Weidman, Twale, & Stein, 2001). It is socialization that ties them together, defines their roles, and delineates the expectations that exist within their programs. The following literature review will briefly discuss the definition and purposes of socialization and the issue of attrition within the existing research.

Socialization and attrition in doctoral education

Research on the graduate student experience has primarily focused within the areas of socialization (e.g., Kirk & Todd-Mancillas, 1991; Turner & Thompson, 1993; e.g., Weidman et al., 2001), development (e.g., Baird, 1990; Baxter-Magolda, 1998; Girves & Wemmerus, 1988), attrition (e.g., Bowen & Rudenstine, 1992; Golde, 2005; Lovitts, 2001), and retention (Baird, 1993; Nerad & Miller, 1996; Tinto, 1993), and it is this research that aids in understanding the doctoral students' experiences and culture.

Socialization and development

Golde (1998) describes the process of graduate school socialization as one “in which a newcomer is made a member of a community—in the case of graduate students, the community of an academic department in a particular discipline” (p. 56). She continues, “The socialization of graduate students is an unusual double socialization. New students are simultaneously directly socialized into the role of graduate student and are given preparatory socialization into graduate student life and the future career common to most doctoral students” (p. 56). This socialization tends to occur in stages or developmental phases throughout the education of the graduate student (Baird, 1993).

Weidman et al. (2001) describe graduate student socialization as “the processes through which individuals gain the knowledge, skills, and values necessary for successful entry into a professional career requiring an advanced level of specialized knowledge and skills” (p. iii). According to these theorists, socialization for graduate students occurs in four developmental stages: Anticipatory, Formal, Informal, and Personal.

The Anticipatory Stage occurs primarily as students enter the program, and need to learn new roles, procedures, and agendas to be followed. These students will tend to seek information and listen carefully to directions. This stage can be described as the student becoming “aware of the behavioral, attitudinal, and cognitive expectations held for a role incumbent” (Weidman et al., 2001, p. 12). The Formal Stage is characterized by the graduate student observing roles of incumbents and older students, while learning about role expectations and how they are carried out.

Students in this stage are primarily concerned about task issues, and communication at this stage is informative through course material, regulative through embracing normative expectations, and integrative through faculty and student interactions. The Informal Stage is described as the stage in which “the novice learns of the informal role expectations transmitted by interactions with others who are current role incumbents” (p. 14). At this stage, the graduate student receives behavioral cues, observes acceptable behavior, and subsequently responds and reacts accordingly. Many of these cues will be received from the students’ cohort, those with whom most interaction occurs at this stage. Through the lessons learned in the Informal Stage, the student will then begin feeling less “student-like” and more professional. Finally, the Personal Stage is the time in which the students’ “individual and social roles, personalities and social structures become fused and the role is internalized” (p. 14). During this final stage, the graduate student accepts a value orientation and relinquishes his or her former ways. The conflict impeding the total role transformation is resolved, and the graduate student will be able to separate from the department in search of his or her own identity.

The process of socialization in graduate school is of the utmost importance to the doctoral student as he or she learns what is expected and what is needed to succeed both in graduate school and in the future profession (Golde, 1998). Indeed, Turner and Thompson (1993) believe socialization to be integral to the success of the graduate student and his or her persistence. The following section will discuss the related themes of attrition and retention in the literature and their application to graduate student socialization and success.

Attrition and retention

Forty to 70% of doctoral students in the United States do not complete their degrees (Berelson, 1960; Bowen & Rudenstine, 1992; Noble, 1994; Tinto, 1993). These rates of attrition are disquieting, particularly when viewed through disciplinary contexts, such as in the humanities, for instance, where they translate into only one in three students actually earning the doctorate (Smallwood, 2004). Recent literature in the field of graduate education points at causes for attrition being multi-faceted; there is no one reason why graduate students decide to leave their programs (Baird, 1993; Golde, 1998; Lovitts, 2001; Tinto, 1993). Factors such as time-to-degree (Baird, 1993), lack of financial stability (Abedi & Benkin, 1987), and dissatisfaction with the degree program (Hartnett & Katz, 1977) are often listed as reasons for student attrition in graduate education. Lovitts (2001) also discovered that the lack of information, the absence of community, disappointment with the learning experience, and the quality of the advisor–advisee relationship were also determinants in attrition.

Support, or the lack thereof, greatly impacts a graduate student’s decision to persist in his or her program. Support for graduate students can come in many forms: financial, familial, peer, faculty, and departmental. Abedi and Benkin (1987) studied a wide range of variables and their potential influence on graduate student time to degree, and found the most important variable to be support, wherein increased amounts of support for the students in the study signified lower rates of time to degree and higher rates of persistence. This support is also thought of in terms of financial support, such as in the form of assistantships, fellowships, scholarships, or

loans. A lack of such support may lead to graduate student attrition (Lovitts, 2001). Support from faculty and peers is also important (Lovitts, 2001), along with peer mentoring (Grant-Vallone & Ensher, 2000), and advising relationships (Bargar & Mayo-Chamberlain, 1983; Fischer & Zigmond, 1998; Girves & Wemmerus, 1988; Lovitts, 2001). Without the network of support provided by peers, faculty, and funding, graduate students may be more apt to leave their programs.

Overall, the tenor of the literature surrounding graduate education and the graduate student experience is predominately negative, pointing to the many issues, problems, and dilemmas that face graduate education and its students. However, the majority of the literature that exists about the doctoral experience views it as a monolithic enterprise. As Golde (1998) points out, the location of primary socialization for the graduate student lies within the department, rather than the entire institution. This study will add to the existing knowledge base by exploring two particular disciplines, those of chemistry and history, at one institution in order to better understand the socialization processes at work within those distinct cultures. In addition, while socialization literature generally speaks to socialization as a developmental process, few studies speak to the individual socialization processes experienced at different years or phases of the graduate education experience. Finally, the literature is clear in stating that doctoral students face a difficult and frequently stressful path in obtaining a degree, but few studies have been conducted to disaggregate the potential causes for this stress and possible reasons for doctoral students' departure from their programs and, conversely, the reasons for their retention and success. This study attempts to fill this gap in the literature through an understanding of these students' experiences, gained through in-depth interviews and observations of their culture and context.

Research design and analysis

This study's qualitative design rests on the conceptual framework of socialization, and the work by Golde (1998) and Weidman et al. (2001). Mortimer and Simmons (1978) describe socialization as a two-fold process: "From the perspective of the group, socialization is a mechanism through which new members learn the values, norms, knowledge, beliefs, and the interpersonal and other skills that facilitate role performance and further group goals. From the perspective of the individual, socialization is a process of learning to participate in social life" (p. 422). This study aims to understand the processes of socialization that occur throughout the degree programs of these 20 graduate students in chemistry and history and that assist them in developing the knowledge, skills, and beliefs needed for success in both the professional and interpersonal spheres of the discipline. It is the framework of socialization paired with a qualitative approach that guide this study and allow for a deeper understanding of the culture and processes that these 20 doctoral students experience. The guiding research question in this study is: what socialization processes do graduate students in chemistry and history experience that contribute to success in their degree programs? The secondary question is: how does year or placement in the degree program affect the socialization processes of doctoral students?

The study's participants were drawn from the departments of chemistry and history at Land Grant University. The disciplines of chemistry and history were chosen for their representation of the natural sciences and humanities, respectively, as well as their placement in the disciplinary model of Biglan (1973), representing both the hard and soft disciplinary perspectives. Hard disciplines, such as chemistry, are generally known for their collaborative cultures, their preference for research over teaching, and the strong relationship of social connectedness to scholarly output. In contrast, soft disciplines, such as history, are known for their more independent nature in research activities, but also for their proclivity for teaching (Becher & Trowler, 2001; Biglan, 1973; Turner, Miller, & Mitchell-Kernan, 2002; Ylijoki, 2000). A desire for such contrasting cultures was sought out for inclusion in this study in order to better examine the differences experienced by the doctoral students in their socialization processes.

Access to the study's participants was made through initial contact with the department chairs. The graduate coordinators then identified a preliminary list of students and these individuals were contacted via telephone and e-mail for their participation in the study. From this initial list of students, snowball sampling (Bogdan & Biklen, 2003) occurred that allowed for further identification of participants for the study. A total of 20 students were finally identified, contacted, and interviewed. The sample consisted of 12 female and eight male students, ranging from the first year in the programs to the sixth. All students in the study were enrolled full-time in their programs at the time of the study.

Each interview was approximately 45–90 min and was guided by a semi-structured interview protocol that addressed each aspect of the students' experience in their doctoral program, including both programmatic and personal experiences. All interviews were taped and later transcribed verbatim, coding for confidentiality of the participants. Due to my own status as graduate student at the time of the study, biases resulting from this status were also duly noted and recorded throughout the interview and analysis portions of the study. All data were analyzed using the constant-comparative method (Bogdan & Biklen, 2003). As themes emerged from the data, they were noted and later used in the coding process through inductive analysis.

The socialization processes of graduate students in chemistry and history

Five major themes emerged from the analysis of the interviews. These themes describe the socialization processes experienced by these groups of students throughout their chemistry and history degree programs. While not all themes were identified by status or year in the program, it was clear that certain themes were more closely tied to an earlier or later time in the program. Similarly, while both groups of students described experiences that were grouped into these shared themes, how these students experienced these themes was often distinctive based upon their different disciplinary culture. Overall, however, it was evident that the experience these students reported was one of contradictions and balance, constantly trying to understand and meet the implicit and explicit guidelines and expectations that were demanded of them, both externally and internally. The five themes identified include (1) Ambiguity; (2) Balance; (3) Independence; (4) Development; and (5) Support.

Ambiguity—riding the torpedo of graduate school

“You’re kind of on this strange torpedo and you’re riding it and you think you know where you’re going, but you don’t, you really don’t. I still don’t know where I’m going” (Paul, chemistry, third year).

Throughout all years of the program, and in both disciplines, the 20 graduate students interviewed in this institution discussed their feelings of uncertainty, a lack of clarity, and overall ambiguity with what they were doing, where they were going, and what was awaiting them. This ambiguity is talked about often in the literature, especially in regard to the dissertation phase (Biaggio, 2002; Green & Kluever, 1997; Huguley, 1988). Indeed, it was often the more advanced students that discussed this feeling of ambiguity rather than the students in the earlier years of their programs. From a disciplinary perspective, the students in chemistry discussed ambiguity in relation to the research enterprise and process, while the students in history remarked upon the ambiguity related to the declining job market in the humanities and what was needed to prepare for this venture. Overall, the students at this institution all shared feelings of ambiguity in regard to the program requirements, guidelines, and paperwork required for advancement in their programs.

For the students in their first and second years, these feelings of ambiguity surrounded issues of program requirements, expectations, and what comes next. Many new graduate students are unsure of the path on which they are about to embark, and these feelings can leave them with unanswered questions that may later impede their progress. James, now a student in his fourth year in chemistry, thinks back to beginning his program and comments, “I don’t think I would have known exactly what to expect before I got here. I think that is the case for a lot of people going to graduate school, they don’t know the questions to ask and they don’t really know what to expect.” Sylvia, another chemistry student, equally remarks, “Nobody explicitly stated what it meant to be in graduate school and it took me probably until last year to really understand what the expectations are and I think that’s one of the big troubles in this department is that they don’t say, ‘All right, this is what is expected of you.’”

Ambiguity is also prevalent in the lives of the students who are making transitions. These transitions occur most often for these students when they begin the program, when they choose their committees or research groups, when they are taking their preliminary examinations, and when they are working on the dissertation research. Rebecca, a first-year student in chemistry, recently joined a research group, leaving her TA duties behind. She remarks, “This is the time when I’ve felt most uncertain in a way, just because I’m trying to figure out exactly where I’m going next.” The guidelines in the program, especially those surrounding the preliminary examinations, are also sources of ambiguity and uncertainty for the students. It was common to hear comments from the students like, “You can flail around for a long time, trying to figure out what’s going on,” or “They kind of make it up as they go along.” Adam, a first-year student in chemistry, expresses his feelings of uncertainty with the preliminary exams (prelims): “I guess prelims is one of those things that I’ve heard about and I want to know how hard they are going to be. Are they going to smoke me? And, you never know; I never know.” Deborah, who recently completed her prelims, talks about the ambiguity of that process in the department: “It’s like everybody had a different vision, even different professors from within the department had a different vision of what prelims are, so that makes it hard.”

The path these graduate students need to follow is another source of ambiguity and uncertainty. Paul, the third year student who commented on the “strange torpedo ride,” also made this comment: “I still have this perception of where I think I’m going; it’s not really initially what I thought was going to happen.” In history, however, the ambiguity of their future rested primarily on the tenuous academic job market. Deborah, a history student now completing her fifth year, says, “The lack of opportunities is a major obstacle. I’m kind of stymied and I didn’t realize that was really part of the game in history departments. I didn’t realize that would have happened or I would have picked a different field.”

For students in the later phases of the program, ambiguity is identified with their research. Sylvia, a chemistry student in her fifth year, describes her concerns with beginning the research endeavor. She says, “Nobody tells you how to do this—nobody teaches you how to do research. You come in and you’re expected to know how to figure out what the next step is. You’re expected to know—if someone presents you with a problem, how you’re going to go about solving it. For me, I didn’t know how to do that.”

The balancing act of graduate school

“I don’t know if other programs are like this, but chemistry seems to be work, work, work all the time. I remember someone saying that they had been over in other departments and seeing the other graduate students and that the chemistry students are just tired” (Scott, chemistry, second year).

The issues of time and the balance of duties were major themes that emerged in these graduate students’ experience. From a disciplinary perspective, history students discussed the balance required with their teaching assistantship in addition to their own coursework and research, while chemistry students talked of the long hours required in the laboratory with their research. Taken together, all of these students watch their faculty mentors and observe how they try, sometimes unsuccessfully, to balance their own time, and are aware that they must manage to do the same.

Students in the earlier phases of their program, like Scott in his second year, need to find a way to balance their TA duties along with their own work and the search for their research group: “[My biggest stressor is] finding time to get things done. I’m still a TA so I still have lab reports to grade, and really, most weeks I have a stack that’s a couple inches thick. [And, then,] keeping up with my own coursework and trying to do homework, and then finding time to go to the lab and do some research. And, at the same time, maybe try to find a minute or two to find a life outside of this.”

Issues of time and balance seemed to reverberate more with the students in the first and second years of the program in terms of their own schedules, but the students in the later phases of their program, like Liam in his fifth year of the chemistry program, are worried about finishing everything they need to finish so they can graduate. He says, “Sometimes I wake up at two in the morning thinking [about] getting loose ends tied up and making sure it’s all going to flow together. Just, you know, I just want everything to be done.” While the chemistry students discussed time more often in regard to completing their research experiments, history students discussed issues of time relating to turnaround time for feedback from their advisors

on their dissertation. Indeed, for many of the history students, turnaround time was actually a primary factor for choosing a good advisor. Issues of time to degree came up quite often in the discussions with the history students, and when disciplines in the humanities generally report the highest rates of time to degree (Bowen & Rudenstine, 1992), it is of little surprise.

For other students, like Brenda in history, the pace and demands of graduate school took them entirely by surprise. She remarks, “I think the only thing I didn’t expect was the time commitment because when you’re in graduate school you feel like you put a lot of other things on hold. I guess I always wanted my degree but I never wanted to be defined by my degree ... it kind of took over my entire life.”

For many of the history students, issues of balance were also relative to their relationships and responsibilities outside of graduate school. Many of these students were older, had families, small children, and significant others with whom they also needed to maintain balance. Rob, a history student, talks about his issue of balance in relation to his family: “I have a wife and three children. It’s awfully painful when your son wants to go out and play catch and you can’t. That’s difficult.” Gloria also has a small child and a husband. She discusses the stress of balancing when she says, “I have to do this whole balancing thing with wife, mother, friend, sister, daughter, teacher, craziness. I think my biggest concern is finding time for that.”

Independence: too much or too little?

“I guess there’s a fine line—what’s too much and what’s too little?” (Michael, chemistry, fifth year).

An interesting theme that emerged from the interviews, and that is not commonly discussed in the literature on the graduate experience, is that of independence. While it is generally known that the purpose of a Ph.D. degree is to produce independent and original scholarship (Council of Graduate Schools, 1990), the conceptualization of the transition to this independence is rarely discussed. Independence, for these students, was often a balancing act itself, with some students wanting more or less independence in their work, particularly in regard to their dissertation research. It is therefore logical that very few of the students in the earlier phases of the program discussed independence, while the majority of advanced students mentioned it frequently. Independence exists for these students as a sort of tension between having not enough or too much, especially in regard to the relationship with their advisor. This concept was demonstrated in phrases like “hands off,” “looking over your shoulder,” and “control freak.”

Adam, in his first year of the chemistry program, is comfortable with a lot of independence as he feels like he is very self-paced and self-motivated, but other chemistry students like Michael, now at the end of his program in chemistry, see the other side of independence as well: “If you are a very independent, self-starting person and you really, really think you can do things on your own, that’s fine. But most people need a little bit of guidance from their advisors, and if your advisor’s not there it can be very frustrating.” Liam, another fifth year student in chemistry, added about his own experience: “If you’re going to be a research scientist then you can’t have somebody holding your hand the whole time. At the same time, though, I think a little more direction in the beginning would have been nice.”

In history, independence is viewed quite differently. While both chemistry and history students look to their advisors for guidance throughout their programs, it was generally the history students that depended almost exclusively on their advisors for this guidance. Once the dissertation work begins, gaining independence from their advisor then becomes even more tenuous for these students. Brenda, a history student now completing her program, explains the balance of independence and dependence: “If someone holds your hand too much you’ll never learn to think for yourself and if someone doesn’t hold your hand enough you’ll fall flat on your face.”

Taken as a whole, the students seek independence in their research and attempt to prove that they are capable to the faculty who will ultimately grant this independence to them. Again, the apparent balance between too much and not enough independence is a constant struggle, especially for those students in the middle phase of their programs. Too much independence for the entering students can be somewhat of a hardship, and not enough independence for the later phase students is frustrating and intrusive.

Development: the other ways you change in graduate school

“All of the professors have been challenging and they know how to constructively criticize and encourage you but at the same time that you go beyond what you would normally do and think about different things in different ways” (Amber, history, second year).

With the conceptual framework of socialization guiding this study, it is not surprising to see the topic itself arise within the interviews. As Kuh and Thomas (1983) forward, socialization is generally the model used to describe the type of development occurring in graduate school. Within this study, the students explicitly discussed two different types of development, both professional and cognitive.

Professional development, generally referred to as professional socialization in the literature, was often described by the students in the study as “grooming.” This grooming occurs throughout the phases of the degree program and consists of the development of a set of skills and dispositions that the students need to obtain before graduating. Without these skills and dispositions, the graduate student is unable to pursue careers or, in the discipline of chemistry, post-doctoral appointments successfully. Faculty initiate much of this grooming, but there also exists a layer of grooming that is initiated by the student. Some of this grooming may also be implicit for those students who had close relatives or parents that went through graduate school and its rigors before, but for those students who are first-generation, many of the skills that need to be developed began occurring in the undergraduate years and are now slowly beginning to be honed.

Overall, it was the advanced graduate students in years four and five that predominately discussed the concept of grooming. This seems to lie in relation to the skills these students are developing and the next steps they feel they have to take. In the chemistry department, grooming is manifested through what the students describe as “getting into the research mindset,” or adopting a set of dispositions that prepare them to fit appropriately into the chemistry milieu. Michael, a fifth year chemistry student, gives this advice to new graduate students:

My advice is to start getting in the research mindset as soon as possible. Whether that means joining a group and taking a look at what other people do or reading

the literature and trying to even just visualize how they're doing things and the problems that can be associated with that. Because the sooner you get into it, the less of a slap in the face it's going to be once it's hitting you full on.

For students like Todd, a history student now completing his degree, his socialization came primarily through his observations of the faculty interactions and departmental dynamics around him. He explains:

In some ways graduate school for me has been an educational experience, not just in the classroom, but just watching in the department because someday, believe it or not, I'm going to be faculty somewhere and I take all of these things, this sort of interpersonal sort of communication that happens, and try to internalize those and then I'll be able to take those with me later, and hopefully, will reflect on them.

Professional development appears to occur simultaneously with cognitive development as many of the advanced graduate students were able to look back at what they had learned since their undergraduate years and feel that they had grown not only in skill, but in understanding as well. Many of the students mentioned taking a new and active role in their graduate studies, no longer being the passive learners of their undergraduate years. Scott comments, "I'm not studying to remember, I'm studying to learn the material. I'm studying to learn how to use it and apply it to what I'm doing. You first come into an undergraduate class and you study for the tests; it's not like that. You're actually trying to learn, to teach other people or to use it in your research." Brenda, a history student, also discusses her cognitive development in regard to her experience in graduate school: "It really pushed me to be more analytical and it pushed me to think more critically about everything and reach my own decisions instead of as a historian just regurgitating other people's decisions."

Support: faculty and peer

Cited often in the literature (Abedi & Benkin, 1987; Grant-Vallone & Ensher, 2000; Lovitts, 2001) as an important factor for graduate student success and satisfaction is the concept of support. For these graduate students, support came in two different forms: faculty and peer support.

Faculty support

"I guess what I would advise is not necessarily to look for the expert, but to look for the person who's been supportive" (Gloria, history, fifth year).

The connections and relationships made with faculty were frequently remarked upon by the students, as much of their experience centers around their research. Overall, this group of students seemed relatively satisfied with the majority of the faculty and the relationships they had with them. They felt that, in general, they were able to approach most faculties with questions, problems, or even just to chat. Students, however, were also keenly aware of those faculty members that were physically around and visible in the department versus those who were not. The amount and frequency of contact these students were able to have with their faculties were very important to them and mentioned repeatedly by students in both departments. When discussing the concept of choosing an advisor, many remarked that choosing an advisor who was around was

important, and choosing someone who, in Michael's words, is "not always gone on vacation or not always involved in too many committee meetings that they just can't spend time with their students." The amount of contact time seemed particularly necessary in the history department, where these students expect, and almost demand, a certain quality of relationship with their advisors. Many of the students discussed that having support from their advisor was often more important than having someone who is a specialist in their area of study. Todd, a history student, gives this advice about choosing advisors, "Pick somebody who you're comfortable with, because you don't want to pick somebody who's a specialist just because they've got a fancy sort of pedigree or they're famous or something like that; that doesn't do you any good. Pick somebody who's going to be supportive and dedicate a fair amount of time to you."

Peer support

"I needed support from other students" (Claudia, history, fifth year).

I was surprised to see how frequently and regularly the graduate students mentioned peer support. These comments were spread equally across both programs and peer support was mentioned overall much more frequently than the concept of faculty support. These students look to one another for support, friendship, and as was discussed by students like Gloria and David, for guidance in their programs through "the graduate student grapevine."

Starting out in a new graduate program is a rather daunting and nerve-wracking process for many graduate students. These students were able to make early connections with one another at recruitment weekends the department held, during the orientation that occurs the week before classes begin, and through graduate student organizations to which they belong. The students felt that their connections with other graduate students were what got them through the beginning of their program, and like Denise, a fourth year chemistry student, says, "I think talking to the other grad students is probably the most important thing." The students look to one another as mentors, especially the newer graduate students to the more advanced, as illustrated in a comment by Michael: "Rely on the people who've been around the block, so to speak...I think the other graduate students really are positive when trying to basically pick their brains for information and, yeah, they just help you get through things."

Support from other graduate students was also commonly mentioned when discussing the choice of one's research group in the chemistry department. Scott comments, "I think the best advice is to go talk to other graduate students in the group. If they have problems, if they really enjoy the professor, or you know, if they just can't talk to the guy or don't want anything to do with him. I think the students are always a really good measure of what's going on in the lab." Denise, also from chemistry, equally remarks, "Talk to the grad students and find out about what they actually do, like what their day is like and it will give you a hundred times more clear of a picture of what you'd actually be expected to do in the group."

Conclusions

This study sought to understand the socialization processes needed for doctoral student success as experienced by 20 students in the disciplines of chemistry and

history at one research-extensive university in the United States. While the study intended to compare and contrast the socialization processes at work in the distinct cultures of the disciplines of chemistry and history, socialization processes were also present that speak to the larger institutional culture as well as the processes at work throughout the different years or phases in the graduate program. This suggests that socialization is occurring on multiple levels and within distinct contexts that influence the student and his or her satisfaction and success in the degree program. While much of the existing literature on doctoral education discusses socialization as a monolithic concept, it is apparent from this study that socialization in doctoral education exists within at least five distinct, but synergistic cultures: (1) The overall culture encompassing graduate education, its values, and tenets across institutions and disciplines; (2) The institutional culture, which includes general norms and procedures governing the day-to-day working of the graduate enterprise; (3) The disciplinary culture including the distinct norms, habits of mind, and behaviors needed for membership; (4) The departmental culture, which consists of the interpersonal dynamics, history, and mission influencing its members, and (5) The individual culture, witnessed in each student's own background, knowledge, and skills that he or she brings to the graduate enterprise, therefore influencing and being influenced by each of the aforementioned cultures in one way or another. In this manner, this study adds to the existing literature on doctoral education by providing a multi-faceted understanding of the socialization process at work simultaneously throughout the graduate education experience.

Through the interviews conducted and the interactions I had with these students, a clear set of socialization processes emerged. These processes translate directly to the students' socialization and assist them in continuing toward success in their degree programs. Based primarily on the emergent themes from the interviews, and reinforced by the existing literature on doctoral education, the realization of these processes is contingent upon action by both the department and the student. In this manner socialization is not, as is often suggested by the literature, simply a force being acted upon the student, but a process in which the student is, more often than not, a willing participant. These processes, while identified through a study of chemistry and history graduate students at one institution, can be clearly articulated across all disciplinary walls and may lend to a better understanding of what all doctoral students require for success in their programs in the larger culture of graduate education as a whole.

(1) *Clarity.* Uncertainty, ambiguity, and a lack of direction and focus were topics often discussed by these students. Programs can assist students in clarifying the ambiguity of graduate school through clear guidelines, deadlines, and the identification of both implicit and explicit expectations. The use of the Internet to post this information is invaluable to today's student, but only if he or she is aware that it exists. Educating faculty and staff about these guidelines is also paramount and will allow for clear dissemination of information. Orientation programs and program handbooks are also helpful tools to the graduate student in clarifying details of the program.

(2) *Direction.* Contrary to what is typically the norm in graduate education, students do not want to be left alone to fend for themselves. While these doctoral students discussed the concept of independence, they also tempered that notion with needed support and direction before and during that transition to independence. Relating closely to the process of clarity, students need their faculty and department

to inform them of expectations, to check on their progress, and to assist them through the structures and challenges of graduate school. The advisor plays the major role in giving this direction and students should be given basic information with which to determine the best fit for them when choosing an advisor. Once chosen, the advisor should maintain a regular dialogue with students and ascertain if more direction is necessary. Especially during the dissertation or research phase of the program, when the student suddenly is left with little structure or guidelines, does the concept of direction become most important.

(3) *Support.* Discussed most often by the students, the importance of support to doctoral student success cannot be overstated. While the chemistry students rarely were concerned about financial support due to their placement in assistantships, financial support loomed largely in the minds of the history students. Equally important is the support offered by faculty and the graduate students' peers. Establishing informal events for students and faculty to meet one another and interact throughout the graduate experience will assist in the development of the peer network and will lay the foundation for finding an advisor. Student office space should be set up for regular interaction among the students and encouraging the formation of student organizations is equally helpful in this manner. Faculty, while extremely busy in their own right, must understand that the connections they make with students are among the most important the students will ever make. Being available to the students through visibility within the department and attendance at departmental events will assist in creating the open and welcoming atmosphere that many of these students lauded in their departments.

(4) *Self-Direction.* Closely related to the concept of independence, the students were aware that they were in charge of their own destinies. While not something that the department can control for them, students must realize that graduate education differs greatly from their previous educational experiences. Whereas the educational culture these students have experienced throughout their lives has been highly structured and directed, graduate school is often anything but, leaving the student to suddenly become independent, self-directed, and self-informed. Unfortunately, not all students are aware of the transition that will be required and this may leave them feeling lost, or as one student stated, "flailing around." Again, the department can assist students with clear expectations throughout the program and through peer mentoring programs that allow students to informally question and observe their peers in the expectations required for degree success.

Much work remains in the area of doctoral student socialization. Future studies call for more research with students across disciplines and across institutions in order to better understand the influences of the multiple dimensions of culture on the graduate student experience. While this study focused on an institution in the United States, studies done internationally point to similar circumstances of ambiguity (e.g., Appel & Dahlgren, 2003), the need for direction and support (e.g., Nerad, 1994), and the stresses related to the doctoral education process in general (Swales, 2004). Further understanding of doctoral student socialization could focus on how men and women, students of color, international students, part-time students, and non-traditional students experience these processes differently and how their individual characteristics influence the socialization processes overall. This study determined that clearly identifiable processes exist for success for the students interviewed, which can easily translate across all disciplines when viewed through the cultural lens of graduate education as a whole. It can be hoped that studies such as this will lend

to a greater understanding of the socialization processes doctoral students require for success in their degree programs and will find fewer students having to rely on “the grapevine” for their information, direction, and future success.

References

- Abedi, J., & Benkin, E. (1987). The effects of students' academic, financial, and demographic variables on time to the doctorate. *Research in Higher Education*, 27(1), 3–14.
- Appel, M. L., & Dahlgren, L. G. (2003). Swedish doctoral students' experiences on their journey towards a Ph.D: Obstacles and opportunities inside and outside the academic building. *Scandinavian Journal of Educational Research*, 47(1), 89–110.
- Baird, L. L. (1990). The melancholy of anatomy: The personal and professional development of graduate and professional school students. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 6, pp. 361–392). New York: Agathon Press.
- Baird, L. L. (1993). Using research and theoretical models of graduate student progress. In L. L. Baird (Ed.), *Increasing graduate student retention and degree attainment* (pp. 3–12). San Francisco: Jossey-Bass.
- Bargar, R. R., & Mayo-Chamberlain, J. (1983). Advisor and advisee issues in doctoral education. *The Journal of Higher Education*, 54(4), 407–432.
- Baxter-Magolda, M. B. (1998). Developing self-authorship in graduate school. In M. S. Anderson (Ed.), *The experience of being in graduate school: An exploration* (pp. 41–54). San Francisco: Jossey-Bass.
- Becher, T., & Trowler, P. R. (2001). *Academic tribes and territories* (2nd ed.). Philadelphia, PA: Open University Press.
- Berelson, B. (1960). *Graduate education in the United States*. New York, NY: McGraw-Hill.
- Biaggio, M. (2002). Student perceptions of factors helping and hindering dissertation process. *Paper presented at the American Psychological Association, Chicago, IL*.
- Biglan, A. (1973). Relationships between subject matter characteristics and the structure and output of university departments. *Journal of Applied Psychology*, 57(3), 204–213.
- Bogdan, R. C., & Biklen, S. K. (2003). *Qualitative research for education: An introduction to theories and methods*. Boston, MA: Allyn and Bacon.
- Bowen, W. G., & Rudenstine, N. L. (1992). *In pursuit of the Ph.D.* Princeton, NJ: Princeton University Press.
- Bragg, A. K. (1976). *The socialization process in higher education*. Washington, DC: The George Washington University.
- Breslow, R. (2003). The doctorate in chemistry. *Carnegie essays on the doctorate*. Retrieved January 30, 2004, from <http://www.carnegiefoundation.org/CID/essays.htm>
- Clark, B. R. (1987). *The academic life: Small worlds, different worlds*. Princeton, NJ: Carnegie Foundation.
- Conrad, C. F., Duren, K. M., & Haworth, J. G. (1998). Students' perspectives on their master's degree experiences: Disturbing the conventional wisdom. In M. S. Anderson (Ed.), *The experience of being in graduate school: An exploration* (pp. 65–76). San Francisco: Jossey-Bass.
- Council of Graduate Schools (1990). *The doctor of philosophy degree: A policy statement*. Washington, DC: Author.
- Fischer, B. A., & Zigmond, M. J. (1998). Survival skills for graduate school and beyond. In M. S. Anderson (Ed.), *The experience of being in graduate school: An exploration* (pp. 29–40). San Francisco: Jossey-Bass.
- Girves, J. E., & Wemmerus, V. (1988). Developing models of graduate student degree progress. *Journal of Higher Education*, 59(2), 163–189.
- Golde, C. M. (1996). *How departmental contextual factors shape doctoral student attrition*. Unpublished doctoral dissertation, Stanford University.
- Golde, C. M. (1998). Beginning graduate school: Explaining first-year doctoral attrition. In M. S. Anderson (Ed.), *The experience of being in graduate school: An exploration* (pp. 55–64). San Francisco: Jossey-Bass.
- Golde, C. M. (2004). The role of the department and discipline in doctoral student attrition: Lessons from four departments. Unpublished manuscript.

- Golde, C. M. (2005). The role of the department and discipline in doctoral student attrition: Lessons from four departments. *Journal of Higher Education*, 76(6), 669–700.
- Grant-Vallone, E. J., & Ensher, E. A. (2000). Effects of peer mentoring on types of mentor support, program satisfaction and graduate student stress: A dyadic perspective. *Journal of College Student Development*, 41(6), 637–642.
- Green, K. E., & Kluever, R. C. (1997). The dissertation barriers scale. Paper presented at the American Educational Research Association, Chicago, IL.
- Hartnett, R. T., & Katz, J. (1977). The education of graduate students. *The Journal of Higher Education*, 48(6), 646–664.
- Heiss, A. M. (1970). *Challenges to graduate schools*. San Francisco: Jossey-Bass.
- Huguley, S. (1988). *An investigation of obstacles to completion of the dissertation and of doctoral student attitudes toward the dissertation experience*. Unpublished doctoral dissertation, Pepperdine University.
- Kirk, D., & Todd-Mancillas, W. R. (1991). Turning points in graduate student socialization: Implications for recruiting future faculty. *The Review of Higher Education*, 14(3), 407–422.
- Kuh, G. D., & Thomas, M. L. (1983). The use of adult development theory with graduate students. *Journal of College Student Personnel*, 24(1), 12–19.
- Kuh, G. D., & Whitt, E. J. (1988). *The invisible tapestry: Culture in American colleges and universities*. Washington, DC: The George Washington University.
- Lovitts, B. E. (2001). *Leaving the ivory tower: The causes and consequences of departure from doctoral study*. Lanham, MD: Rowman and Littlefield.
- McCormick, A. C. (2001). *The Carnegie classification of institutions of higher education*. Menlo Park, CA: The Carnegie Foundation for the Advancement of Teaching.
- Mortimer, J. T., & Simmons, R. (1978). Adult socialization. *Annual Review of Sociology*, 4, 421–454.
- Nerad, M. (1994, June). Preparing for the next generation of professionals and scholars: Recent trends in graduate education in Germany and Japan. Paper presented at the invitational seminar of the National Research Council, Office of Scientific and Engineering Personnel.
- Nerad, M., & Miller, D. S. (1996). Increasing student retention in graduate, professional programs. In J. G. Haworth (Ed.), *Assessing graduate and professional education: Current realities, future prospects* (pp. 61–76). San Francisco: Jossey-Bass.
- Noble, K. A. (1994). *Changing doctoral degrees: An international perspective*. Suffolk, Great Britain: Edmondsbury Press.
- Smallwood, S. (2004, January 16). Doctor dropout. *The Chronicle of Higher Education*, p. 19A.
- Swales, J. M. (2004). The Ph.D. defense. In *Research genres: Explorations and applications*. Cambridge, UK: Cambridge University Press.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: The University of Chicago Press.
- Turner, C. S. V., & Thompson, J. R. (1993). Socializing women doctoral students: Minority and majority experiences. *The Review of Higher Education*, 16(3), 355–370.
- Turner, J. L., Miller, M., & Mitchell-Kernan, C. (2002). Disciplinary cultures and graduate education. *Emergences*, 12(1), 47–70.
- U.S. News and World Report. (2005). America's Best Colleges 2005. Retrieved November 21, 2004, from http://www.usnews.com/usnews/edu/college/rankings/brief/natudoc/tier1/t1natudoc_brief.php
- Weidman, J. C., Twale, D. J., & Stein, E. L. (2001). *Socialization of graduate and professional students in higher education: A perilous passage?* San Francisco: Jossey-Bass.
- Ylijoki, O.-H. (2000). Disciplinary cultures and the moral order of studying—A case-study of four Finnish university departments. *Higher Education*, 39, 339–362.