

Quantitizing text: using theme frequency and theme intensity to describe factors influencing time-to-doctorate

Hesborn O. Wao · Robert F. Dedrick · John M. Ferron

Published online: 8 December 2010
© Springer Science+Business Media B.V. 2010

Abstract The increasing length of time that students take to attain the doctorate (TTD) is of concern in higher education. Separate focus groups with students and eight faculty members were used to investigate factors perceived to influence TTD in Education. The percentage of participants citing a theme (theme frequency) and the percentage of statements referring to a particular theme (theme intensity) were used to describe the strength of the associations found. Analysis of students and faculty responses suggests that *structure*, defined as the nature and arrangement of program tasks and resources, is strongly associated with TTD whereas *communication*, the way program expectations and requirements are communicated, has a moderate association. Students' responses indicate that the nature of the dissertation committee formed (*committee*) and the desire to work and attain goals despite obstacles encountered (*motivation*) are each strongly associated with TTD whereas faculty responses indicate these associations are moderate and minimal, respectively. Faculty responses indicate that the amount and quality of academic preparation received (*preparation*), and the nature of academic guidance, mentoring and supervision received (*advising*) have at least a moderate association with TTD whereas students' responses suggest the association is at most moderate. Whereas faculty comments suggest that whether a student enrolls part-time or full-time (*enrollment*) is moderately associated with TTD, enrollment did not emerge as a factor among students. Recommendations for practice and further research are provided.

Keywords Cross-case analysis · Doctoral persistence · Focus groups · Higher education outcomes · Time-to-degree · Triangulation

H. O. Wao (✉)

Alliance for Applied Research in Education and Anthropology (AAREA), Department of Anthropology,
University of South Florida, 4202 East Fowler Ave., SOC107, Tampa, FL 33620-7200, USA
e-mail: wao@mail.usf.edu

R. F. Dedrick · J. M. Ferron

Department of Measurement and Research, University of South Florida, Tampa, FL, USA

1 Introduction

Time-to-the-doctorate or *time-to-degree* (TTD) has been increasing in recent years. Less than half of doctoral students complete the degree even after pursuing it from 6 to 12 years. The field of Education experiences longer TTD in comparison to other fields (Bowen and Rudenstine 1992). Between 1980 and 2006, the median duration between starting and completing graduate school increased from 10.7 to 12.7 years in Education compared to 7.7 to 7.9 years in all fields (Hoffer et al. 2007).

Unrecoverable costs to the student, the institution, and society accrue when the doctorate is not attained in a timely manner (National Science Foundation [NSF] 1998). Longer TTD reduces the productive work-life and the expected benefits for graduates. Future students and the public may interpret longer TTD as a reflection of the institution's inability to meet students' needs. Having a better understanding of factors influencing TTD can enable colleges of education to develop and implement strategies that result in timely completion.

Given the importance of doctoral study to research, education, policy, and professional practice, studies have been conducted, mostly using quantitative approaches, to address the chronic problem of increasing TTD. Attempts to employ qualitative approaches have taken various forms including preceding a survey with a focus group as part of the instrument development process (e.g., Maher et al. 2004), complementing quantitative findings with qualitative findings (e.g., Ferrer de Valero 2001), or embedding open-ended items in surveys (e.g., Green 1995; Stolzenberg 2006). Few studies of TDD have used interviews and focus groups (e.g., Maher et al. 2004). In the few studies in which these two qualitative data collection techniques have been used, little information has been provided on how emergent themes are obtained and seldom are the themes quantified to facilitate meta-synthesis of the results with related studies addressing factors influencing TTD.

In this study, we demonstrate the use of focus groups for collecting data on students' and faculty's perceptions of factors associated with TTD. Focus groups allow for soliciting "emic [insider] viewpoints" and help in establishing "meanings [*verstehen*] and purposes" that the students ascribe to their actions, thus giving them a voice (Guba and Lincoln 1994, p. 110). Faculty members serve as the primary agents of integration in a department (Golde 2000) or as "role models and mentors" (McFarland and Caplow 1995, p. 3), thus their voices also are crucial in understanding the factors associated with TTD.

1.1 Integrated conceptual scheme of doctoral persistence

Drawing from prior theoretical perspectives (Girves and Wemmerus 1988; Sandler 2000; Strayhorn 2005; Tinto 1993), we developed an integrated conceptual scheme to guide our understanding of the structures and processes that underlie doctoral persistence. Doctoral persistence refers to the pursuit of the doctorate with the goal to complete it in a timely manner despite obstacles encountered. We conceptualized doctoral persistence as a system comprising three interrelated elements: inputs, processes, and output.

Students entering the doctoral program vary by sex, race/ethnicity, age, and prior academic achievement. These factors, which according to Tinto (1993) are related to students' commitment to degree completion, constitute the inputs to the system. Upon entry into the department, students from diverse backgrounds undergo different experiences in terms of academic and social integration (Tinto 1993), to which we add economic integration and personal attributes. These four domains of integration constitute the *process* element.

Academic integration refers to students' experiences as participants in the academic life of an institution or of the work world of the discipline (Golde 2000; Sandler 2000). It includes

satisfaction with one's academic performance, structure of curriculum, and the degree of involvement in program activities. Academic integration is present in both Tinto's and Sandler's models, subsumes academic variables in Strayhorn's model, and mirrors grades and involvement in Girves and Wemmerus's model. *Social integration* refers to the nature and extent of interaction students experience with peers and faculty as they participate in social activities, for example, the ease of forming "close personal relationships" with members of the department (Cabrera et al. 1993, p. 132). It is present in Tinto's and Sandler's models but is represented by the variable, alienation or isolation, in Girves and Wemmerus's model. *Economic integration* refers to the degree to which students' financial needs are met while pursuing the doctorate. Finances may be secured through loans, assistantships, personal savings, grants, and fellowships. Economic integration is labeled economic variables in Strayhorn's model, financial satisfaction/difficulty in Sandler's model, and financial support in Girves and Wemmerus's model. *Personal attributes* include student characteristics such as motivation to complete the doctorate. Except for Sandler's model that included self-efficacy and perceived stress, personal attributes are infrequently featured in doctoral persistence models. We surmise that these attributes also are modified in the process of integration and thus are related to persistence.

We posit that a high level of integration in each of these domains is associated with timely doctorate completion, *ceteris paribus*. We view the domains as being complementary: low levels of integration in one or more domains should be compensated by higher levels of integration in the others in order to attain the doctorate in a timely manner. The ultimate outcome, TTD, thus constitutes the *output* of the system.

2 Methods

2.1 Research design and sampling

We employed a *multiple case study* design (Yin 2003). Participants were Education doctoral students who were admitted into either a Ph. D. or an Ed. D. program between 1990 and 2006 at a southeastern United States public university classified as a research university with very high research activity. Two extreme cases of interest included two doctoral programs where median TTD was among the longest (8 years) and two doctoral programs where median TTD was among the shortest (3.6 years), hereafter referred to as LPs (longer programs) and SPs (shorter programs), respectively. The median TTDs were computed based on secondary data obtained from the College. The units of analysis embedded in the two cases were students and faculty members.

We conducted four student focus groups (two representing each of the cases) and two faculty focus groups (one representing each case). Students in the ABD stage or who had attained the doctorate were eligible to participate. Students representing the LPs included four White females, four White males, and two Asian females. Half took at least seven years to attain the doctorate while the other half were in the ABD stage. The SPs were represented by eight students: one White female, two White males, three African American females, and two Asian females. Six of these students took 5–7 years to attain the doctorate.

Faculty eligible to participate included one who was at least an Associate Professor, had taught graduate level courses, had served on at least three dissertation committees, and had been in the department for at least five consecutive academic years. There were six White males and two White females: three full professors and one associate professor in the LPs; and two full professors and two associate professors in the SPs. Collectively, these faculty

members had been in their respective departments for 8–39 years, had taught at least two graduate level courses, had served as members of 13–100 dissertation committees, and had chaired or co-chaired 12–35 dissertation committees.

2.2 Data collection

Two doctoral students in Education served as moderator and note-taker for student focus groups whereas two assistant professors with experience in qualitative research served as the moderator and note-taker in the faculty focus groups. Data were collected using *questioning routes*, a sequence of questions developed based on information gleaned from the literature. Questions were structured to be open-ended, progressing from simple to complex (key) questions and back to simple (ending) questions. Two examples of key questions in the student focus group with students from the LP included: *Think back to the time you were pursuing the doctorate, make a list of important factors that made you take a long time to attain the doctorate* and *Pick three factors that contributed most to the duration of your time to the doctorate*.

2.3 Data analysis procedures

Transcripts were analyzed in stages. First, they were read in their entirety, with notes taken of *significant statements* that captured a particular theme associated with TTD. Next, using participants' exact words (*in vivo* coding) and the moderator's interpretation of actual events and emotions displayed by participants (*descriptive* coding), we coded the statements such that each code corresponded to a unique statement, and compared each code with the preceding ones to avoid overlaps (Constas 1992; Miles and Huberman 1994). The third stage involved assigning meaning to each statement and aggregating codes containing statements deemed similar in content into emergent themes. Next, each theme was assigned a score of "1" if a participant made a statement classified under it and "0" otherwise (Onwuegbuzie and Teddlie 2003). This process yielded a participant by theme (*inter-respondent*) matrix. Similarly, assigning each theme a score of "1" if it contained a significant statement and "0" otherwise yielded a unit by theme (*intra-respondent*) matrix.

From the inter-respondent matrix, we computed *theme frequency*, the percentage of participants who endorsed a theme and from the intra-respondent matrix:

$$\text{Theme Frequency} = \left[\frac{\text{Number of participants who mentioned a particular theme}}{\text{Total number of participants in the group}} \right] \times 100$$

From the intra-respondent matrix, we computed *theme intensity*, the percentage of statements referring to a particular theme:

$$\text{Theme Intensity} = \left[\frac{\text{Number of statements referring to a particular theme}}{\text{Total number of statements cited for all themes}} \right] \times 100$$

Finally, to obtain a combined measure of consensus in theme endorsement, theme frequency and intensity were transformed into percentile ranks (pR), the percentage of themes that fell below a given theme: $pR = \left[\frac{f_b + 1/2f_w}{N} \right] \times 100$ where f_b = number of themes whose frequency or intensity were less than that of the theme in question; f_w = number of themes with the same frequency or intensity as the theme in question (including theme in question); and N = total number of themes cited by the group being analyzed.

A theme was classified as minimally associated with TTD if the frequency or intensity had a percentile rank $\leq 24\%$. Similarly, a moderate association with TTD corresponded to a percentile rank between 25 and 74% whereas a strong association with TTD corresponded to a percentile rank greater than 74%.

Computing both the theme frequency and theme intensity and ranking these measures constitute an application of quantitative analysis of qualitative data, a strategy that allows for extracting a greater amount of information from the qualitative data (Baldwin 1942). Seldom do qualitative researchers attempt to *quantitize* (transform text into numbers) qualitative data. Exceptions are Bauer (2004) who utilized frequency tables to summarize findings regarding departmental factors perceived to be associated with TTD and Kittell-Limerick (2005) who ranked themes in comparing student and faculty perceptions of factors hindering doctorate completion. However, both studies only focused on theme frequency. For each theme, it is important to know how many participants cited it (frequency) and how many statements were made to describe it (intensity). A theme may be less frequently cited but more intensely cited. An important methodological contribution of the present study is its focus on these two descriptors of a theme, which as shown in the next section, sometimes yield different research findings.

2.4 Credibility of results

We employed various techniques to enhance dependability of our results. The use of different individuals as moderators and note-takers increased the richness of the data gathered and gathering views of students and faculty (data triangulation) enhanced our findings. We also spread the focus group sessions over a period of eight months and informally interacted with the participants during this period, which allowed us to verify accuracy of the data collected. Having the moderators hold post-session reflective dialogues with participants (debriefings) and comparing notes with the note-taker after each session allowed us to gain an accurate understanding of participants' perceptions. By collecting detailed data including near verbatim transcripts on verbal and nonverbal cues, we maximized our ability to obtain accurate description of factors perceived to influence TTD in Education.

3 Results and discussion

Analysis of student and faculty responses suggested that 13 factors were perceived to be related to TTD. As shown in Table 1, the strength of association of each of these factors with TTD varied by program (longer vs. shorter programs), theme type (frequency vs. intensity), and subgroup (students vs. faculty). Overall, 31% of the associations were classified as strong, 58% were moderate and 11% were minimal. Academic integration had the largest number of factors (five), followed by social integration (three), economic integration (two) and personal attributes (one). Surprisingly, outside of our integrated conceptual scheme of doctoral persistence, two external factors (family and life events) were also identified.

3.1 Academic integration and TTD

3.1.1 Structure and TTD

An overwhelming finding was that, regardless of the program, the *structure* (defined as the nature and arrangement of program tasks and resources) had a strong association with

Table 1 Comparison of emergent themes by programs and by participants

	Longer programs (LPs)				Shorter programs (SPs)				
	Frequency		Intensity		Frequency		Intensity		
	Student (<i>n</i> = 10)	Faculty (<i>n</i> = 4)	Student (130)* ^s	Faculty (83)* ^s	Student (<i>n</i> = 8)	Faculty (<i>n</i> = 4)	Student (134)* ^s	Faculty (156)* ^s	
Academic									
Structure	Strong	Strong	Strong	Strong	Strong	Strong	Strong	Strong	Strong
Communication	Moder	Moder	Strong	Moder	Moder	Moder	Moder	Moder	Moder
Topic	Moder	Strong	Strong	Moder	Moder	Minim	Strong	Minim	Minim
Preparation	Moder	Strong	Moder	Strong	Minim	Moder	Minim	Minim	Strong
Enrollment	–	Strong	–	Moder	–	Moder	–	–	Strong
Social									
Committee	Strong	–	Strong	–	Strong	Minim	Strong	Minim	Minim
Advising	Moder	Moder	Moder	Strong	Minim	Strong	Moder	Moder	Strong
Cohort/Peer	Moder	Minim	Moder	Moder	Moder	Minim	Moder	Moder	Moder
Economic									
Work	Moder	Moder	Moder	Moder	Moder	Moder	Moder	Moder	Moder
Finances	Moder	Moder	Moder	Moder	Moder	Moder	Moder	Moder	Moder
Personal									
Motivation	Strong	Moder	Strong	Moder	Strong	Moder	Strong	Moder	Moder
External									
Family	Moder	Strong	Moder	Moder	Minim	Strong	Moder	Moder	Moder
Life events	Moder	Moder	Moder	Moder	Minim	Moder	Minim	Minim	Moder

Note: “Frequency” indicates theme frequency and “Intensity” indicates theme intensity

“*^s” indicate the number of statements cited, not the number of participants

“–” indicates a theme was not cited by the group/subgroup

“Strong” indicates that a theme was strongly associated with TTD

“Moder” indicates a theme was moderately associated with TTD

“Minim” indicates that a theme was minimally associated with TTD

TTD. That is, structure was both frequently and intensely cited by both faculty and students as playing a pivotal role in the time that students take to attain the doctorate. Examples of student comments included: “...the time schedule forced me on track,” “there really wasn’t any room to deviate from that structure,” and “it was helpful having a structure during the writing phase,” Faculty echoed these sentiments with comments including: “Our curriculum is very structured” and “They [students] don’t have much of a choice, they have to take the courses when they are offered.” The longer TTD experienced in the longer programs might be attributed, in part, to the nature of the existing curriculum structure as intimated by students’ comments: “there is a disconnect between the coursework and dissertation” and “a comprehensive list or guidelines that I can follow, I still haven’t found one.” Faculty, citing structural measures that were being undertaken in the longer programs, corroborated curricular problems cited by students in this group: “we collect feedback from students and constantly revise the program,” and “we are trying to make a better connection, a stronger tie, so that by the time they take their qualifying exams, they have started their dissertation already.” Faculty, however decried the unusually high

number of credit hours required in most programs: "...this is one of the longest degrees in terms of hours so far in the country—it goes forever!" Faculty suggested reducing the number of credit hours by "moving most of work to blended courses where there is less seat time," offering instruction in multiple modes and flexible schedules that accommodate varying students' needs, incorporating research activities into coursework, and ensuring that both coursework and dissertation phases are linked and accorded equal emphasis. Perhaps, by undertaking these structural changes, colleges may increase the odds of timely completion.

3.1.2 Communication and TTD

Statements made by students and faculty suggested that *communication*, the clarity and timeliness of information related to program expectations and requirements to students, had a moderate association with TTD. Sentiments voiced by students in the LPs tended to be negative indicating that communication might have been a problem in this group: "I didn't have a clear idea of what I needed to do," "I did not realize that so much outside of class work would be necessary," and "I was not given anything near a true indication of what was involved." In stark contrast, students in the SPs expressed satisfaction with how program expectations and requirements were communicated to them: "I experienced an orientation when I joined... we were given all the information about how difficult it was going to be" and "I felt like I was given information to make a decision against, [I] made a decision, and moved on." Our findings suggest that besides clarity and timeliness of program information, diversifying modes of communication may help to meet students' varying preferences and increase the odds of timely completion. This may be achieved by providing a handbook, institutionalizing the orientation, using the Internet, and encouraging students to obtain the information from peers and faculty.

3.1.3 Topic and TTD

A student's remark in this study reflects the centrality of the characteristics of the dissertation topic a student chooses to timely completion: "You really have to hammer out exactly what you gonna do because that [topic] is going to set the stage for your own project." Identifying a stimulating but manageable topic and having a sense of efficacy and passion for the topic have been found to be associated with shorter TTD (Bauer 2004; Lenz 1995; Maher et al. 2004; Seagram 1998). Comments of students and faculty from LPs suggested that the characteristics of the topic chosen had at least a moderate association with the TTD whereas in the SPs, students' comments suggested it had at least a moderate association and faculty perception suggested a minimal association. Negative sentiments conveyed by students from LPs suggested the uncertainty about the topic might have contributed to the long TTD: "I didn't have a clear-cut idea of what I wanted to do," and "Lack of a clear-cut idea of what to do for my proposal made me take longer than anticipated." Similarly, faculty in the LPs noted that students struggled to construct good topics: "They like to think in as simple terms as possible—their idea of research questions reflects this." From the SPs, one student's description of how she crafted her topic, "I made sure that my topic was along the lines of what I wanted to do as my doctoral study, which was along the lines of what I was doing in my daily job," coincided with a faculty's sentiment: "we encourage them to have to think of whatever they are active about—whatever they do their master's thesis on becomes the foundation for their Ph. D. dissertation."

3.1.4 Academic preparation and TTD

According to Kittell-Limerick (2005), lack of solid academic foundation, inability to conduct independent research and poor writing skills are significant barriers to completion of a doctorate degree. In this study, responses of students in the longer programs indicated that the amount and quality of students' academic preparation had a moderate association with TTD whereas faculty perceptions indicated a strong association. Faculty noted that students in the LPs tended to be ill-prepared: "they have a problem with their research tools" and "some people have anxiety about writing and that slows them down," sentiments that coincided with the views of students from the LPs: "I don't understand the difference between reliability and validity," "what may take time too is the writing process itself," and "that [dissertation] really was my first time to do statistical research." Comments from students in the SPs suggested that academic preparation was minimally associated with TTD whereas faculty comments indicated a moderate association. Although research and writing skills are identified as pivotal elements of academic preparation, inherent in students' sentiments was the expectation that faculty should play a major role in imparting these skills whereas faculty expected the students to take the initiative. Faculty suggested that research labs be implemented whereby "students engage in research from the beginning, not just at dissertation stage," and that writing groups be formed at the dissertation stage whereby "people writing dissertations get feedback from each other," and "a writing clinic or a place where students can get some assistance" with writing their dissertation be established.

3.1.5 Enrollment and TTD

Regardless of the program, comments from faculty suggested the enrollment status of a student had at least a moderate association with TTD: "the whole idea of part-time or full-time is a major difference in length," "we have a few full-time students who move much more quickly than part-timers," and "part-time slows them down." Faculty in SPs believed that mandatory full-time enrollment facilitated students' completion of the doctoral degree in a timely manner. Faculty in LPs expressed that when "everybody is part-time", student progress is slower. Interestingly, enrollment did not emerge as a theme among students. The finding that students in programs where full-time enrollment is mandatory tend to have shorter TTD than their counterparts in programs where this is optional is supported by prior studies (Seagram 1998; Stiles 2003). This may prompt colleges to encourage students to enroll full-time, perhaps including summer semesters to increase the odds of timely completion. While this may be a worthwhile effort in the coursework phase, it should be noted that students in the ABD stage, the period when the longest time is spent (Tinto 1993), may not differ in their enrollment status. For instance, in the college where this study was conducted, students in candidacy are required to enroll for at least two credit hours, which technically is considered fulltime enrollment.

3.2 Social integration and TTD

3.2.1 Dissertation committee and TTD

Whereas comments from students indicated that the characteristics of the dissertation committee had a strong association with TTD, in sharp contrast, faculty perceptions suggested the association to be at most minimal. As one student said, "it is probably one of the most

elemental parts of the entire process—making sure you have a group of people you are philosophically aligned with and are compatible.” Characteristics of a good dissertation committee member, according to students, included one who is “available and willing to let you bounce ideas off [them],” “supportive of the study,” “willing to work together,” “has expertise in the area,” “punctual with turnaround time” and “has a positive attitude towards students.” Students in the LPs tended to experience problems with their committees: “choosing professors was problematic,” “getting the four professors to agree on my topic took time,” and “coordinating five different calendars was problematic.” Conversely, positive comments emerged from students in the SPs: “With my major professor, she and I made deadlines as I turned things in,” “We didn’t have a written contract but we worked together on a personal basis,” and “I get drafts back within ten days so it’s making a huge difference to the speed that I can progress.” The finding suggesting that faculty perceived the characteristics of the dissertation committee to be at most minimally associated with TTD was unexpected. What this result may be suggesting is not that faculty do not value the dissertation committee, rather, their comments revolved around individual interactions with students as is evidenced by their perception that advising was related to TTD. Students’ comments, however, included both one-to-one interaction (advising) and one-to-many interaction (committee). Because both interactions are crucial for students’ progress, a committee member should work collaboratively with both the student and other members to help the student attain the doctorate in a timely manner.

3.2.2 *Advising and TTD*

Students’ responses suggested that advising, defined as academic guidance, mentoring, and supervising of students, had at most a moderate association with TTD whereas faculty comments suggested the association was at least moderate. Comments from faculty conveyed varying personalities of ‘advisors’: “some are standoff[ish], some are not,” and “some see mentoring of their students as a critical part of their role and others see it as a pain in the neck.” However, they noted that if faculty “meet monthly with students” and “provide that kind of support [timely feedback to students]” then “those students finish at [a] much more rapid rate.” Negative statements made by students in the LPs indicated the possibility of problems with advising in this group: “I lost my direction [after coursework],” and “I experienced a sense of loss and confusion, confusion in terms of direction.” Whereas the connection between advising and TTD was not a surprising finding, we uncovered interesting views on advising. First, students viewed advising broadly, expecting advice from assigned advisors and from other faculty with whom they interact prior to and during the dissertation stage. Second, faculty acknowledged that faculty attitude towards advisees as well as the value they attach to advising is pivotal for students’ progress. They cited establishing collegial relationships with advisees and creating an atmosphere where students feel safe to discuss issues that affect their progress. Third, both students and faculty were passionate about the timeliness of feedback, a finding that might suggest that students are likely to complete their dissertations in a timely manner if faculty make efforts to provide quality and timely feedback and insist on receiving the same from advisees.

3.2.3 *Cohort/peer and TTD*

Based on students’ responses, being in a cohort was perceived to be at most moderately associated with TTD whereas comments of faculty suggested the association was moderate.

Sentiments voiced by students from SPs emphasized the importance of cohort/peer groups: “We were able to help one another get through course after course till the comps [comprehensive examination],” “I don’t think I could have done it alone,” and “... we got together, we studied, we met in the library, we went to people’s houses— just [a] very supportive [group].” Students’ comments revealed that LPs lacked cohort/peer groups unless students formed their own: “I didn’t have this kind of cohort” and “My department didn’t have a cohort but there were select groups of women—we created our own cohort.” Student-initiated cohort or peer groups, however, are difficult to maintain: “After we finished our coursework, that cohort just left me!” Faculty from SPs echoed students’ comments: “Our students actually go through as a cohort... to help them build the cohesive team,” “So that [cohort] is a support system for us,” and “The cohort model... really helps in motivating students to finish.” The finding that belonging to a cohort was at least moderately associated with TTD may prompt formalizing a cohort system in programs currently experiencing relatively longer TTD, however, it should be noted that doing this might hinder some subgroups of students from pursuing the doctorate. Perhaps, encouraging students to develop informal cohorts in the form of study or research groups might be ideal in programs such as Higher Education that are designed for working professionals and are part-time by nature.

3.3 Economic integration and TTD

Comments from students and faculty suggested that working while pursuing the doctorate (work) and type and amount of financial support a student receives (finance) were moderately associated with TTD. With respect to work, faculty noted that candidates who accept job offers tend to be preoccupied with work and lose the focus to finish in a timely manner especially if their work schedule is not flexible and involves frequent traveling. Conversely, work facilitates timely completion as students strive to finish quickly in order to secure the promotion if the attainment of the doctorate is a requirement for job promotion. With respect to finances, students on scholarship were perceived to have a tendency to stay focused to finish before the expiration of the scholarship period whereas self-sponsored students tended not to have such urgency, thus having a longer TTD. It may be that most scholarships require full-time enrollment which is associated with timely completion.

3.4 Personal Attributes and TTD

Analysis of comments made by students showed that *motivation*, defined as the drive to work and attain goals despite obstacles encountered in the process, was perceived to be strongly associated with TTD whereas faculty comments suggested that the association was moderate. Motivated students tended to move faster even if they were in the longer programs: “I pushed and pushed my committee,” “My committee was not the type that would be happy to meet ever! It was because of me, I wanted to be done” and “I was very diligent in getting back with them.” Similar positive comments from students in the shorter programs also emphasized the centrality of motivation in timely completion: “I am just a driver... I put a lot of time in it,” “I didn’t take a break, not even [in] summer,” and “If you are motivated... you can go ahead [finish quickly].” Coinciding with students, faculty sentiments revolved around “drive of students—just to get it done” as being important. Given the strong association between motivation and TTD, alongside cognitive admission requirements such as GRE and GPA scores, admissions committee may consider evaluating candidates’ potential for success in the graduate school by assessing admission documents such as statements of personal and

professional goals and letters of recommendation for evidence of trait adjectives, phrases, and sentences depicting candidate's level of motivation, or perhaps asking recommenders to directly address candidates' motivation in their letters.

3.5 External factors and TTD

External factors include *family* obligations and *life events* such as marriage and divorce which occur outside the institution but may affect TTD. Generally, students' responses suggested that external factors were at most moderately associated with TTD whereas faculty perceived the association to be at least moderate. Students with family obligations tended to have a longer TTD than did those who had no or fewer family obligations. Students' comments, "I had three children... which was kind of difficult" and "I chose family as the first thing and that [coursework] took a back seat," paralleled faculty's comments: "we have family tied to these reasons—you can't leave your family behind" and "... family and children sometimes affect one's priorities." Family obligations require time and energy that would otherwise be invested in the pursuit of the doctorate, a finding that coincides with Bauer (2004)'s in which participants stated that doctoral study leaves one with little room to meet family obligations. Students' comments, "marriage made me stop out" and "I got divorced during this timeframe..." corroborated faculty's views that divorce was a common event that slowed students' progress.

4 Conclusions

Whereas our integrated conceptual model of doctoral persistence identified four categories of factors associated with TTD, what emerges from our analysis is that factors associated with TTD are complex: no single factor explains conclusively the duration of the doctorate in Education. Academic integration factors, particularly program structure, seem to be more frequently and intensely cited as having a major influence on TTD compared to other factors. Our analysis also identified two external factors (family obligations and life events) that may have an impact on TTD. In sum, the complexity of the factors signals the need for additional research to illuminate the understanding of the relationship between these factors and TTD not only in Education but also other fields. By addressing the factors that have been identified by both students and faculty as having at least a moderate association with TTD, colleges may begin to reduce the costs to students, institutions, and the society when the doctorate is not attained in a timely manner. The reduction in costs is critical for higher education institutions especially under the current economic uncertainties.

References

- Baldwin, A.L.: Personal structure analysis: a statistical method for investigating the single personality. *J. Abnorm. Soc. Psychol.* **37**, 163–183 (1942)
- Bauer, E.R.: An examination of the effect of departmental factors on student completion of doctoral requirements. PhD Dissertation, University of Massachusetts, United States. ProQuest Digital Dissertations database (Publication No. AAT 3133568). Accessed August 30, 2007 (2004)
- Bowen, G.W., Rudenstine, N.L.: *In Pursuit of the Ph.D.* Princeton University Press, Princeton, NJ (1992)
- Cabrera, A.F., Nora, A., Castaneda, M.B.: College persistence: structural equations modeling test of an integrated model of student retention. *J. High. Educ.* **64**, 123–139 (1993)
- Constas, M.A.: Qualitative data analysis as a public event: the documentation of category development procedures. *Am. Educ. Res. J.* **29**, 253–266 (1992)

- Ferrer de Valero, Y.F.: Departmental factors affecting time-to-degree and completion rates of doctoral students at one land-grant research institution. *J. High. Educ.* **72**(3), 341–367 (2001)
- Girves, J.E., Wemmerus, V.: Developing models of graduate degree progress. *J. High. Educ.* **59**(2), 163–189 (1988)
- Golde, C.M.: Should I stay or should I go? Students' descriptions of the doctoral attrition process. *Rev. High. Educ.* **23**(2), 199–227 (2000)
- Green, K.E.: Academic procrastination and perfectionism: a comparison of graduates and ABDs. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA, April 1995
- Guba, E.G., Lincoln, Y.S.: Competing paradigms in qualitative research. In: Denzin, N.K., Lincoln, Y.S. (eds.) *Handbook of Qualitative Research*, Sage, Thousand Oaks, CA (1994)
- Hoffer, T.B., Hess, M.D., Welch, V., Williams, K.: *Doctorate Recipients from United States Universities: Summary Report 2006*. National Opinion Research Center, Chicago (2007)
- Kittell-Limerick, P.: Perceived barriers to completion of the academic doctorate: a Delphi study. PhD Dissertations, Texas A&M University, TX (2005)
- Lenz, K.: Factors affecting the completion of the doctoral dissertation for nontraditional aged women. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA, April 1995
- Maher, M.A., Ford, M.E., Thompson, C.M.: Degree progress of women doctoral students: factors that constrain, facilitate, and differentiate. *Rev. High. Educ.* **27**(3), 385–408 (2004)
- McFarland, R.T., Caplow, J.H.: Faculty perspectives of doctoral persistence within arts and science disciplines. Paper presented at the annual meeting of the Association for the Study of Higher Education, Orlando, FL, November 1995
- Miles, M.B., Huberman, A.M.: *Qualitative data analysis*. 2nd edn. Sage, Thousand Oaks (1994)
- National Science Foundation.: *Summary of workshops on graduate student attrition*. National Science Foundation: Division of Science Resources Studies. (ERIC Document Reproduction Service No. ED427966) (1998)
- Onwuegbuzie, A.J., Teddlie, C.: A framework for analyzing data in mixed methods. In: Tashakkori, A., Teddlie, C. (eds.) *Handbook of Mixed Methods in Social and Behavioral Research*, Sage, Thousand Oaks, CA (2003)
- Sandler, M.E.: Career decision-making self-efficacy, perceived stress, and integrated model of student persistence: a structural model of finances, attitudes, behavior, and career development. *Res. High. Educ.* **41**, 537–580 (2000)
- Seagram, B.C., Gould, J., Pyke, S.W.: An investigation of gender and other variables on time to completion of doctoral degree. *Res. High. Educ.* **39**, 319–335 (1998)
- Stolzenberg, E.B.: The dynamics of the doctoral student-faculty advising relationship: a study across academic fields. PhD Dissertation, University of California, United States (2006)
- Stiles, J.E.M.: The hazard of success: A longitudinal study of time-to-degree among doctoral students using discrete-time survival analysis. PhD Dissertation, Harvard University, United States (2003)
- Strayhorn, T.L.: More than money matters: an integrated model of graduate student persistence. PhD Dissertation, Virginia Tech, United States (2005)
- Tinto, V.: *Leaving College: Rethinking the Causes and Cures of Student Attrition*. 2nd edn. University of Chicago Press, Chicago (1993)
- Yin, R.: *Case Study Research: Design and Methods*. 3rd edn. Sage, Thousand Oaks (2003)