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STUDENTS' PERSISTENCE IN A DISTRIBUTED DOCTORAL PROGRAM IN EDUCATIONAL LEADERSHIP IN HIGHER EDUCATION: A Mixed Methods Study

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The purpose of this mixed methods sequential explanatory study was to identify factors contributing to students' persistence in the University of Nebraska-Lincoln Distributed Doctoral Program in Educational Leadership in Higher Education by obtaining quantitative results from surveying 278 current and former students and then following up with four purposefully selected typical respondents to explore those results in more depth. In the first, quantitative, phase, five external and internal to the program factors were found to be predictors to students' persistence in the program: "program", "online learning environment", "student support services", "faculty", and "self-motivation". In the qualitative follow up multiple case study analysis four major themes emerged: (1) quality of academic experiences; (2) online learning environment; (3) support and assistance; and (4) student self-motivation. The quantitative and qualitative findings from the two phases of the study are discussed with reference to prior research. Implications and recommendations for policy makers are provided.

KEY WORDS: persistence; doctoral students; distributed program; online learning environment.

INTRODUCTION

Graduate education is a major part of American higher education, with more than 1850 million students enrolled in graduate programs (NCES, 2002). Approximately one fifth are graduate students pursuing doctoral

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degrees (NSF, 1998). Out of this number, from 40% to 60% of students who begin their doctoral studies do not persist to graduation (Bowen and Rudenstine, 1992; Geiger, 1997; Nolan, 1999; Tinto, 1993). High failure rate and the ever increasing time to degree are reported as chronic problems in doctoral education (Lovitts and Nelson, 2000; NSF, 1998). In educational majors, attrition from doctoral programs is estimated at approximately 50%. In addition, about 20% give up at the dissertation stage (Bowen and Rudenstine, 1992; Cesari, 1990). Failure to continue in the doctoral program is not only painful and expensive for a student, but is also discouraging for faculty involved, injurious to an institution's reputation, and results in a loss of high-level resources (Bowen and Rudenstine, 1992; Golde, 2000; Johnson, Green, and Kluever, 2000; Tinto, 1993).

Researchers claim a much higher dropout rate among students pursuing their doctoral degrees via distance education (DE) (Carr, 2000; Diaz, 2000; Parker, 1999; Verduin and Clark, 1991). Persistence in DE is a complex phenomenon influenced by a multitude of factors: challenges set by the distance learning environment, personally related internal and external variables, computer literacy, ability to access requisite technology, time management, and absent or questionable support from an employer and/or family (Kember, 1990). The student population is composed of mainly part-time adult students, who often have numerous and demanding commitments to work, family, and social lives (Finke, 2000; Holmberg, 1995; Thompson, 1998). These students tend to be more vulnerable to factors encroaching on their academic progress because their school-related activities often are not primary life objectives.

Although many studies have been done to understand reasons for persistence of doctoral students in traditional campus-based programs (Bair and Haworth, 1999; Bowen and Rudenstine, 1992; Golde, 2001; Haworth, 1996; Kowalik, 1989), there is much less research on doctoral students' persistence in DE (Tinto, 1998), particularly distributed programs (distributed connotes the material is sent electronically to persons at various locations throughout the world and removes the need for participants to be located at a given site at a given time). Existing studies either focused on DE students' persistence in individual undergraduate and graduate courses, or other than distributed distance learning delivery means (Ivankova and Stick, 2003).

Knowledge and understanding of factors contributing to graduate students' persistence in distributed programs may help academic institutions better meet DE students' needs, improve the quality of their academic experiences, and increase their retention and degree completion rate. This is especially important today when postsecondary institutions have to confront the growing problems of revenue generation and

increasing budget cuts and turn to offering graduate programs in distributed environments. Knowledge of the evolving tendencies may serve as a baseline for higher educational administrators in elaborating DE policies, designing and developing graduate distributed programs, and improving distance student support infrastructure.

This article reports on the study conducted to understand students' persistence in the Distributed Doctoral Program in Educational Leadership in Higher Education (ELHE) offered by the University of Nebraska-Lincoln (UNL). The purpose of this mixed methods sequential explanatory study was to identify factors contributing to students' persistence in the ELHE program by obtaining quantitative results from a survey of 278 current and former students and then following up with four purposefully selected individuals to explore those results in more depth through a qualitative case study analysis. In the first, quantitative, phase of the study, the research questions focused on how selected internal and external variables to the ELHE program (program-related, advisor- and faculty-related, institutional-related, student-related factors, and external factors) served as predictors to students' persistence in the program. In the second, qualitative, phase, four case studies from distinct participant groups explored in-depth the results from the statistical tests. In this phase, the research questions addressed seven internal and external factors, found to have differently contributing to the function discriminating the four groups: program, online learning environment, faculty, student support services, self-motivation, virtual community, and academic advisor.

Theoretical Perspective

Three major theories of students' persistence—Tinto's (1975, 1993) Student Integration Theory, Bean's (1980, 1990) Student Attrition Model, and Kember's (1990, 1995) Model of Dropout from Distance Education Courses—served as a theoretical foundation for this study. Tinto's and Bean's models focused primarily on undergraduate campus students and Kember's model was aimed at explaining attrition of distance adult students. Although these models differed in their approach to persistence, they shared similar core elements and complimented each other. Their principle components helped identify critical internal and external factors presumably impacting students' persistence, such as entry characteristics, goal commitment, academic and social integration, and external forces (family, friends and employers).

Extensive literature review also revealed that graduate students' persistence in a program of study seldom is the result of the influence of one

factor. Among those identified were institutional and departmental factors (Austin, 2002; Golde, 1998, 2000; Ferrer de Valero, 2001; Lovitts, 2001; Nerad and Miller, 1996), academic advisors (Ferrer de Valero, 2001; Golde; 2000; Girves and Wemmerus, 1988), support and encouragement (Brien, 1992; Hales, 1998; Nerad and Cerny 1993), motivation and personal goals (Bauer, 1997; Lovitts, 2001; McCabe-Martinez, 1996; Reynolds, 1998), and family and employer relationships (Frasier, 1993; Golde, 1998; McCabe-Martinez, 1996). Based on these factors and the principle components from three theories of students' persistence a set of variables was created to test for the predictive power of internal and external factors on doctoral students' persistence in the ELHE program.

Distributed Doctoral Program in Educational Leadership in Higher Education

The Distributed Doctoral Program in Educational Leadership in Higher Education is offered through the Department of Educational Administration at the University of Nebraska-Lincoln (Stick and Ivankova, 2004). The program was initiated in 1994 and offers students a choice of the PhD or the EdD Degrees in Educational Studies with the emphasis in Educational Leadership in Higher Education. It is possible for students to complete an entire program via distributed means. Innovative teaching methodologies and a distributed learning environment enabled most students to complete their programs of study within a 36- to 60-month period, with minimal disruption to lifestyle, family responsibilities, and employment. Most of the coursework necessary for the degree is provided through distributed learning software, which utilizes the Internet as a connecting link. Most of the program is delivered to students via Lotus Notes and Blackboard groupware, which provides asynchronous and collaborative learning experiences to participants. More than 260 students were enrolled and in varying stages of their programs, with 180–200 active during a given semester. Since 2004 there have been more than 70 students graduated. Some students did partial coursework on campus because either selected courses were not available online, or students wanted the on-campus experience.

METHODS

Study Design

To answer the study research questions, the researchers used a mixed methods approach (Tashakkori and Teddlie, 2003), which is a

procedure for collecting, analyzing and mixing or integrating both quantitative and qualitative data at some stage of the research process within a single study (Creswell, 2005). The rationale for mixing both types of data is that neither quantitative nor qualitative methods are sufficient by themselves to capture the trends and details of situations, such as the complex issue of doctoral students' persistence in the distributed environment. When used in combination, quantitative and qualitative methods complement each other and provide a more complete picture of the research problem (Green, Caracelli, and Graham, 1989; Johnson and Turner, 2003; Tashakkori and Teddlie, 1998).

This study used a sequential explanatory mixed methods design, consisting of two distinct phases (Creswell, Plano Clark, Guttman, and Hanson, 2003; Tashakkori and Teddlie, 1998). In this design, the quantitative, numeric, data is collected and analyzed first, while the qualitative, text, data is collected and analyzed second in sequence, and helps explain, or elaborate on the quantitative results obtained in the first phase. In this study, the quantitative data helped identify a potential predictive power of selected external and internal factors on the distributed doctoral students' persistence and purposefully select the informants for the second phase. Then, a qualitative multiple case study approach was used to explain why certain external and internal factors, tested in the first phase, were significant predictors of students' persistence in the program. Thus, the quantitative data and results provided a general picture of the research problem, while the qualitative data and its analysis refined and explained those statistical results by exploring the participants' views regarding their persistence in more depth.

The priority (Creswell et al., 2003) in the study was given to the qualitative approach, because it focused on in-depth explanations of the results obtained in the first, quantitative, phase, and involved extensive data collection from multiple sources and two-level case analysis. The quantitative and qualitative phases were connected (Hanson, Creswell, Plano Clark, Petska, and Creswell, 2005) when selecting four participants for qualitative case studies and developing the interview protocol based on the results from the statistical tests from the first phase. The results of the quantitative and qualitative phases were integrated (Creswell et al., 2003) during the discussion of the outcomes of the entire study (see Fig. 1 for a diagram of the mixed methods sequential explanatory design procedures in the study)[1].

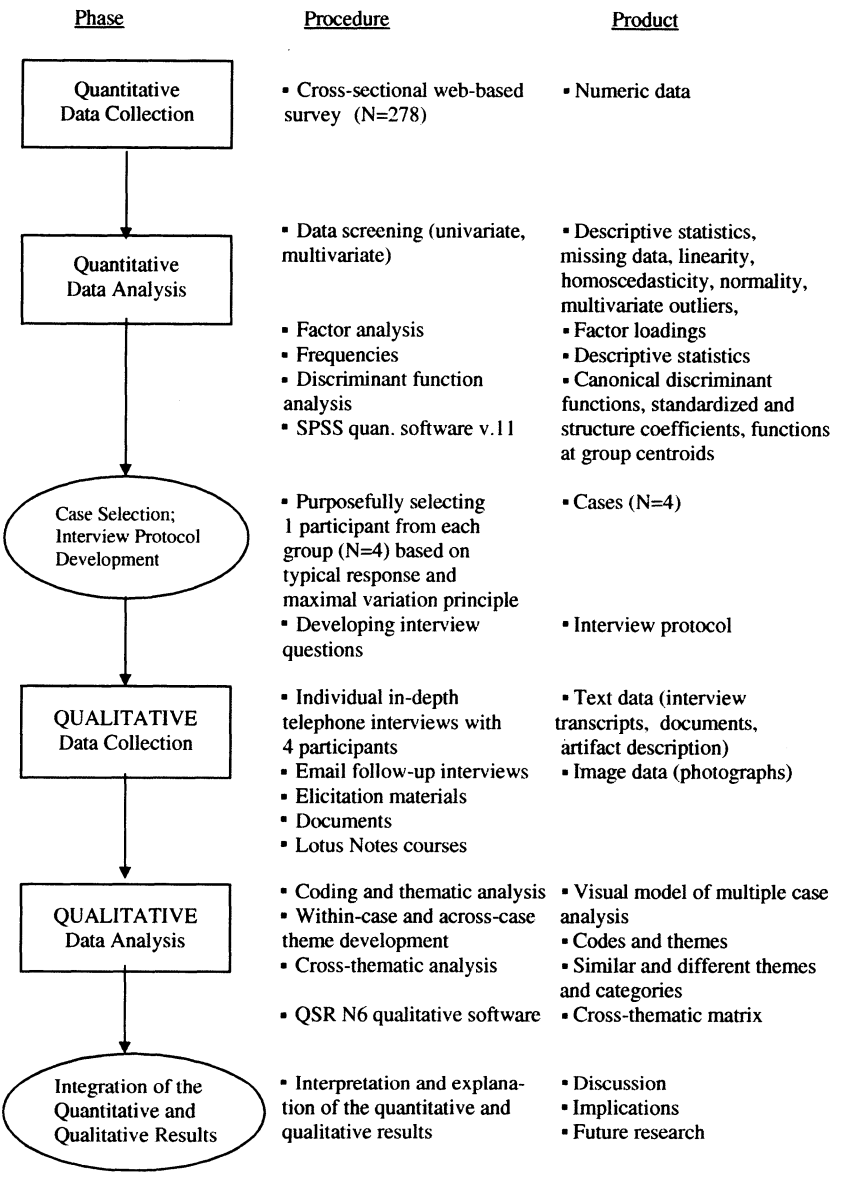

FIG. 1. Visual model for mixed methods sequential explanatory design procedures.

Target Population

The target population in this study were active and inactive students, who were admitted to the ELHE program and taking classes during the spring 2003 semester. Also part of the target population were students who had been graduated with an earned doctoral degree from the program and those who had withdrawn, or had been terminated from the program prior to the spring 2003 semester. Students were referred to as DE students if they had taken half of their classes via distributed means. The students' status varied in terms of progress and/or completion of courses, number of online courses taken, and doctoral degree pursued. Criteria for selecting the participants included: (1) being in ELHE vs. other programs; (2) time period of 1994-Spring 2003; (3) must have done 1/2 of course work online; (4) be either admitted, both active and inactive, graduated, withdrawn, or terminated from the program; (5) for those who just started, they must have taken at least one online course in the program. A total of 278 students met the criteria. The breakdown by their matriculation status in the program was: (1) those admitted and active in the program (n = 202); (2) those admitted but inactive (n = 13); (3) those who were graduated (n = 26), and (4) those who withdrew or were terminated from the program (n = 37) since its inception in 1994. The anonymity of the participants in the first phase was protected by assigning them unique numeric passwords to access the web-based survey. In the second phase, the participants selected for case study analysis were assigned fictitious names, thus keeping the responses confidential. In addition, all the names and gender related pronouns were removed from the quotations used for illustrations.

Quantitative Phase

Data Collection

For the first, quantitative, phase, the cross-sectional survey design (McMillan, 2000) was used. The survey instrument was self-developed and pilot tested on 5% of randomly selected participants. The core survey items formed five 7-point Likert type scales related to five internal and external entities affecting students' persistence, and reflected nine variables, representing a range of internal and external to the program factors: "online learning environment", "program", "virtual community", "faculty", "student support services", "academic advisor", "family and significant other", "employment", and "self-motivation". Table 1 presents the relationship between the survey scales, subscales

TABLE 1. Survey Scales and Predictor Variables in Quantitative Analysis

Survey scales/Factors	Subscales/Predictor variables	Cronbach's alpha	Survey items
Related to ELHE program	Online learning environment	.8503	Q14 a–j
	Program	.8344	Q13 a–g
	Virtual community	.8012	Q13 h–l
Related to faculty and academic advisor	Academic advisor	.9818	Q15 a–m
	Faculty	.9079	Q13 m–r
Related to institution	Student support services	.8243	Q13 s–y
Related to student	Self-motivation	.8948	Q16 a–g
External to ELHE program	Family and significant other	.5829	Q17 a–d
	Employment	.5289	Q17 e–h

and variables, and lists the survey items measuring each variable, as well as reliability indexes for each subscale. The survey items and scales were developed based on the analysis of the related literature, three theoretical models of students' persistence (Bean, 1980, 1990; Kember, 1990, 1995; Tinto, 1975, 1993) and an earlier qualitative thematic analysis study of seven ELHE active students (Ivankova and Stick, 2002). A panel of professors teaching in the program was used to secure the content validity of the survey instrument. Based on the pilot testing, some survey items were revised slightly.

The survey was administered online and was accessed through the URL. Active email addresses of the potential participants were obtained through the UNL Department of Educational Administration and identified through other sources. The participants were recruited via e-mail a week before the beginning of the study. The data collection took place between April 1 and July 18, 2003. The procedure was complicated by having to correct 50 inactive email addresses and locate former students, who had withdrawn or graduated from the program. Technological glitches in the system also presented challenges. Twenty-three participants who were willing to complete the questionnaire, could not access the survey, or failed to complete it in full. A hard copy of the survey was mailed, faxed, or sent as a Word document attachment to such participants. Nineteen such participants returned the completed survey.

From 278 potential participants 207 responded, which constituted a response rate of 74.5%. All respondents were organized into four groups based on their matriculation status in the program and similarity of academic experiences: (1) students who had completed 30 or fewer credit hours of course work (Beginning Group) (n = 78); (2) students who had completed more than 30 credit hours of course work (Matriculated

Group) (n = 78); (3) former students who had graduated from the program with the doctoral degree (Graduated Group) (n = 26); and (4) former students who either had withdrawn or had been terminated from the program, or had been inactive during the last three terms (spring, fall, summer) prior to the survey administration (Withdrawn/Inactive Group) (n = 25). Reliability and validity of the survey scales and items were established, using descriptive statistics, frequency distributions, internal consistency reliability indexes (Cronbach's alpha, item-total correlation, corrected item-total correlation, and alpha-if-item deleted), as well as inter-item correlations and factor analysis (Ivankova, 2004).

Data Analysis

Both univariate and multivariate statistical procedures were used to analyze the survey data. Survey demographic information and the participants' answers to separate items on each survey sucscale were analyzed using cross tabulation and frequency counts. Discriminant function analysis was used to identify the predictive power of nine selected factors as related to students' persistence in the ELHE program. Prior to the analysis, data screening was conducted at both univariate and multivariate levels, following the procedures outlined by Kline (1998) and Tabachnick and Fidell (2000).

Qualitative Phase

Qualitative Research Design

A multiple case study design (Stake, 1995; Yin, 2003) was used for collecting and analyzing the data in the second, qualitative, phase. The instrumental multiple cases (Stake, 1995) served the purpose of "illuminating a particular issue" (Creswell, 2005, p. 439), such as persistence in the ELHE program. The unit of analysis was a former or current ELHE student. Each case study was bounded by one individual and by the time he or she matriculated in the ELHE program.

Case Selection

A systematic two-stage case selection procedure was developed[2]. During the first stage, typical respondents in each participant group were identified, first, by calculating the summed mean scores and their respective group means for all participants in each of the four groups based on their responses to the survey questions, and then by selecting a few

respondents from each group with the mean scores within one standard error of the mean. During the second stage, one "best informant" from each group was selected using a maximal variation strategy (Creswell, 2005). This procedure yielded one male and three females, displaying different dimensions on such demographic characteristics, as age, gender, residency, and family status, which allowed for preserving multiple perspectives on persistence in ELHE program. All four agreed to participate.

Interview Protocol Development

The content of the interview protocol was grounded in the quantitative results from the first phase of the study. Because the goal of the qualitative phase was to explore and elaborate on the results of the statistical tests (Creswell et al., 2003), we wanted to understand why certain predictor variables differently contributed to the function discriminating four participant groups with regards to their persistence. Five open-ended questions explored the role of five factors ("online learning environment", "program", "faculty", "student support services", and "self-motivation"), which demonstrated statistically significant predicting power for this sample of the ELHE students. Two other open-ended questions explored the role of academic advisor and virtual learning community in students' persistence. Although those two factors did not significantly contribute to the function discriminating four participant groups, their important role in students' persistence in traditional doctoral programs was reported by other researchers (Bowen and Rudenstine, 1992; Brown, 2001; Golde, 2000; Lovitts, 2001). The interview protocol was pilot tested on one participant, purposefully selected from those who had completed the survey in the first phase of the study. As a result, the order of the protocol questions was revised slightly and additional probing questions were developed.

Data Collection

The data was collected from multiple sources to provide the richness and the depth of each case description and included: (1) in-depth semi-structured telephone interviews with four participants; (2) electronic follow-up interviews with each participant to secure additional information on the emerging themes; (3) academic transcripts and students' files to validate the information obtained during the interviews and to get additional details related to the cases; (4) elicitation materials, such as photos, objects, and other personal things, provided by each participant relating to his/her persistence in the program; (5) participants' responses

to the open-ended and multiple choice questions on the survey in the quantitative phase; and (6) selected online classes taken by the participants and archived on a Lotus Notes or Blackboard server. The data collection took place during November–December of 2003.

Qualitative Analysis

Each interview was audio taped and transcribed verbatim (Creswell, 2005). The analysis was performed at two levels: within each case and across the cases (Stake, 1995; Yin, 2003), using the QSR N 6, qualitative software for data storage, coding, and theme development. Steps in the qualitative analysis included: (1) preliminary exploration of the data by reading through the transcripts and writing memos; (2) coding the data by segmenting and labeling the text; (3) verifying the codes through inter-coder agreement check; (4) using codes to develop themes by aggregating similar codes together; (5) connecting and interrelating themes; (6) constructing a case study narrative composed of descriptions and themes; and (7) cross-case thematic analysis. Credibility of the findings was secured by triangulating different sources of information, member checking, inter-coder agreement, rich and thick descriptions of the cases, reviewing and resolving disconfirming evidence, and academic advisor's auditing (Creswell, 1998; Creswell and Miller, 2002; Lincoln and Guba, 1985; Miles and Huberman, 1994; Stake 1995).

RESULTS

Quantitative Phase

Demographic Information

The study participants were compared on the following demographic characteristics: age, gender, and employment while in the ELHE program, Nebraska (NE) residency status, and family status. The typical participants were: between 36 and 54 years of age, predominantly women, employed full-time, mostly out-of-state, and married with children (see Table 2).

Scale Items Frequencies Analysis

Most of the participants were satisfied with their academic experiences in the program. The amount of satisfaction was the greatest among the Graduated participants (92.3%), while satisfaction increased from the Beginning group (57.7%) to the Matriculated group (71.8%). Only 20%

TABLE 2. Demographic Characteristics of Survey Respondents*

Row Pct Total	Group 1: Beginning (n = 78)	Group 2: Matriculated (n = 78)	Group 3: Graduated (n = 26)	Group 4: Withdrawn /Inactive (n = 25)	Total
Age					
26–35	45.7	31.4	5.7	17.1	100.0
36–45	41.6	45.5	6.5	6.5	100.0
46–54	35.7	32.9	18.6	12.9	100.0
Over 55	16.7	37.5	25.0	20.8	100.0
Total	77	78	26	25	206
Gender					
Male	33.3	38.7	15.1	12.9	100.0
Female	40.2	37.5	10.7	11.6	100.0
Total	76	78	26	25	205
Employment					
Full-time	38.0	37.5	12.0	12.5	100.0
Part-time	35.7	42.9	21.4	0	100.0
Unemployed	0	0	0	100.0	100.0
Total	78	78	26	25	207
NE Residency					
In-state	30.6	37.1	16.1	16.1	100.0
Out-of-state	41.3	37.0	10.9	10.9	100.0
International	28.6	57.1	14.3	0	100.0
Total	78	78	26	25	207
Family status					
Married with kids under 18	39.2	36.7	12.5	11.7	100.0
Married with kids over 18	34.9	44.2	11.6	9.3	100.0
Single with kids under 18	44.4	33.3	0	22.2	100.0
Single, never married	22.2	44.5	11.1	22.2	100.0
Single, divorced or separated	50.0	16.7	25.0	8.3	100.0
Single person, widowed	0	100.0	0	0	100.0
Married without children	14.3	57.1	14.3	14.3	100.0
Total	75	77	25	24	201

*Missing data is excluded.

of the Withdrawn/Inactive group reported the program met their needs, and another 20% expressed negative feelings about the program. The majority of participants in the three matriculated groups positively rated their involvement with the online courses and agreed that online courses were more challenging academically. Across the groups, the participants gave more positive ratings to instructors' accessibility and promptness of the feedback, rather than the quality of the feedback and instructors' willingness to accommodate to distance learners' needs.

Most participants were comfortable learning in the online environment (84.3%). Across the groups, the Graduates expressed the highest comfort level with online learning (96.2%), while the Withdrawn/Inactive group was the least comfortable (47.8%). More participants from the Graduated (100.0%) and the Matriculated (81.3%) groups, than from the Beginning (68.8%) and the Withdrawn/Inactive (39.1%) groups were comfortable with participating in online discussions and the course workload. The same pattern of increased comfort level from the Beginning group to the Graduated group was observed when participants rated their learning in the distributed environment as compared to a face-to-face setting. However, the participants differentially benefited from the virtual community. Only two-thirds of the respondents claimed they could establish long-term social relationship with their fellow-students online. The Withdrawn/Inactive group was the least satisfied, had low comfort level (47.8%), and was more negative in rating the effectiveness of learning in the distributed environment (30.4%).

Participants had different experiences with academic advising. The Graduated group had more positive experiences (76.0%), than any other group. Across all the items, the Matriculated participants rated their experiences with academic advising more positively than the Beginning group, which might be due to the fact that they had more opportunities to experience a variety of relations with their academic advisor than those who had completed less than 30 credit hours in the program. In the Withdrawn/Inactive group, fewer participants rated their academic advisor positively (38.0%).

All the participants, except for the Withdrawn/Inactive group (32.0%), were highly motivated to pursue the doctoral degree in the distributed environment. The Graduates were the most motivated group (100.0%), while the Matriculated group (93.6%) was a little more motivated, than the Beginning group (76.9%). More than 50% of the participants were satisfied with the institutional support services. However, their satisfaction differed depending on the particular service and the level of students' matriculation in the program. The Withdrawn/Inactive group was the least satisfied (48.0%).

More than 70% of the participants agreed they had favorable family conditions to support their efforts to pursue the doctoral degree via distributed means. Across all the groups, the Graduated group received the most support (80.8%) and the Withdrawn/Inactive group the least (65.0%). There was more satisfaction for the Matriculated group (77.6%) than for the Beginning group (77.6%). More Graduates also believed their friends encouraged them in their study efforts (60.0%). About 65.6% of the participants received encouragement from their employers to pursue the doctoral degree. The Graduated participants were the most encouraged (76.9%), while the Matriculated group received the least support (63.0%). 61.1% of the Withdrawn/Inactive participants positively rated their employer.

Discriminant Function Analysis

The analysis yielded three discriminant analysis functions. Based on the Wilks' Lambda test, only the first function was statistically significant ($\chi^2 = 98.858$; df = 27; $\rho = .000$), meaning only this function discriminated for this set of variables (Tabachnick and Fidell, 2000). The standardized coefficients for the first discriminant function indicated all nine predictor variables provided their relative unique contribution to group differences as related to students' persistence in the program (see Table 3).

The discriminant variate that best discriminated the four groups was represented by the following linear relationship equation:

$$\begin{aligned} V = {} & 1.187 * \text{program} - 0.078 * \text{online learning environment} \\ & + 0.105 * \text{virtual community} + 0.187 * \text{faculty} - 0.341 \\ & * \text{student support services} - 0.180 * \text{academic advisor} \\ & + 0.224 * \text{self-motivation} + 0.103 * \text{family and significant other} \\ & + 0.116 * \text{employment} \end{aligned}$$

The variable "program" (1.187) contributed the most to the participants' being in a particular group as related to their persistence in the ELHE program. No other variable had a similarly high coefficient. The variable "student support services" (−0.341) had the second largest contribution to the group differences. It was followed by "self-motivation" (0.224), "faculty" (0.187), and "academic advisor" (−0.180). Other variables had low coefficients and contributed very little.

Based on the structure coefficients for the three discriminant functions, five variables "program", "online learning environment",

TABLE 3. Standardized Canonical Discriminant Function Coefficients

	Function		
	1	2	3
Program	1.187	0.458	0.187
Online learning environment	−0.078	0.588	0.065
Faculty	0.187	0.425	−0.608
Self-motivation	0.224	−0.427	0.176
Student support services	−0.341	0.209	0.016
Employment	0.116	0.635	0.151
Virtual community	0.105	0.786	0.163
Academic advisor	−0.180	−0.129	1.076
Family	0.103	−0.080	0.455

"faculty", "self-motivation", and "student support services" had a statistically significant correlation with the discriminant function, and hence, contributed to discriminating the participants as related to their persistence (see Table 4).

"Program" (r = 0.905) and "online learning environment" (r = 0.526) had the highest correlations and made the most contribution to discriminating the four matriculated groups, followed by "faculty" (r = −0.486), "self-motivation" (r = 0.482), and "student support

TABLE 4. Structure Matrix in Discriminant Function Analysis

	Function		
	1	2	3
Program	0.905*	−0.066	0.030
Online learning environment	0.526*	0.037	−0.160
Faculty	−0.486*	0.245	−0.086
Self-motivation	0.482*	−0.331	0.005
Student support services	0.202*	0.097	−0.046
Employment	−0.111	0.542*	0.255
Virtual community	−0.438	0.521*	0.106
Academic advisor	−0.447	−0.034	0.690*
Family	−0.041	0.190	0.339*

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions variables ordered by absolute size of correlation within function.
*Largest absolute correlation between each variable and any discriminant function.

services" ($r = 0.202$). Those differences in function and correlation coefficients made it somewhat difficult to interpret the discriminant function, especially since only one function was generated. However, both statistics indicated the top variable was "program". So, we named this function "ELHE program" and concluded that the nature and the context of the program contributed to discriminating the participants as related to their membership in one of the matriculated groups. This discriminant function also indicated that 88.7% of the participants were classified correctly. "Virtual community", "academic advisor", "family and significant other", and "employment" made no significant contribution to the discriminant function.

Functions at group centroids revealed that on the discriminant function the Withdrawn/Inactive group (1.654) differed from the other three participant groups the most. The Graduate group (−.960) differed from both the Beginning and the Matriculated groups, though less from the Matriculated group and the most from the Withdrawn/Inactive group. The Matriculated group (−.410) differed notably from the Beginning group (.200) (see Table 5).

Qualitative Phase

The analysis of each case and across four cases yielded four themes related to the participants' persistence in the ELHE program: quality of academic experiences, online learning environment, support and assistance, and self-motivation. The description of each case follows.

Gwen

Gwen was 40 years old and in her third year in the ELHE program. She was Dean of Students in a small private college in the Midwest. She

TABLE 5. Functions at Group Centroids in Discriminant Function Analysis

	Function		
Membership in the group	1	2	3
Group 1: Beginning	0.200	0.137	−0.177
Group 2: Matriculated	−0.410	−0.224	0.005
Group 3: Graduated	−0.960	0.302	0.284
Group 4: Withdrawn/Inactive	1.654	−0.043	0.242

Unstandardized canonical discriminant functions evaluated at group means.

was single and had a cat Sam, who was her close friend. At the time of the interview, she had successfully completed 30 credit hours, of which 18 were taken online.

Quality of Academic Experiences

Gwen's persistence in the program was positively affected by the tight structure of the program and ability to plan her coursework. The coursework reportedly challenged Gwen's critical thinking and gave her the opportunity to learn from others: "It ... helped me to think differently, because I have to put that all in writing and share it with everyone." It was also relevant to her professional life. The quality of the coursework was directly related to an instructor's involvement with the course and the feedback he/she provided.

On the other hand, Gwen did not receive any quality feedback from her academic advisor: "I haven't found my advisor to be fulfilling in that role." On the survey in the first phase of the study, she rated advising negatively. Communication with the advisor was rare and not informative. Analysis of the e-mail communication between Gwen and her advisor revealed that approximately 70% of Gwen's messages were left unanswered. Although low quality advising was frustrating for Gwen, she was determined to continue with her efforts to pursue the degree via DE: "I'm not going to let [the advisor] stop my persistence or stop my progress in the program." At the time of the study, Gwen decided to initiate another attempt to switch the academic advisor. The request was being honored.

Online Learning Environment

Learning via distance was convenient for Gwen and provided a lot of flexibility. An intensive work schedule did not allow her to leave work during the day, so the ability to study at her own pace and time positively affected her matriculation in the program: "You have the opportunity to do things ... when they work for you." Learning online fit Gwen's learning style. She liked to write and was cognizant enough to participate extensively in written communications with other students. The online format also gave her the opportunity to learn from other students' work. Gwen was comfortable not seeing her classmates and professors and created mental images of them based on their writings: "I'd be getting an idea of a person's looks or image by their work." She believed a virtual community was established among the students, but it depended on the nature of a course and was limited to one course.

Support and Assistance

Support and encouragement from faculty and students was stimulating. Support from peers ranged from encouragement on a particularly challenging assignment to sharing personal stories and school related experiences. Gwen especially benefited from learning about other distance doctoral students and their problems and concerns: "It's been neat to just connect with other students in the program and learn that they're having similar experiences or, they're just as busy in trying to make everything happen." Advice from the faculty was assignment specific, but also related to the content and logistics of the program. Having been left without an active advisor, Gwen was comfortable asking other instructors academic and dissertation related questions: "They've been very open." Institutional support services played an important role in Gwen's persistence and she highly rated those services on the survey. She also received constant support from her new employer and her colleagues, as well as her parents and three sisters. The photos she provided reflected a loving and caring family, attentive to each other's needs. A cat, named Sam, was another source of support. Gwen admitted both taking care of Sam and his calm attitude kept her "sane and balanced."

Self-Motivation

Gwen was highly motivated to earn a doctoral degree and it positively influenced her persistence in the program. For her securing the terminal degree was both a dream and a personal challenge. She was aware that the process was not smooth and there could be a lot of challenges: "I had just known upfront that it takes a lot of initiative and self thrive to make things happen." Gwen admitted even negative experiences with academic advising would not impact her desire to persist and finish the program. The very idea of moving through the program and being close to completion of her course work was stimulating: "Knowing that ... almost within the next year I'll be starting a new phase of the program ... keeps me motivated."

Lorie

Lorie was 43 years old and in her fourth year in the program. She worked as Academic Dean at a private business school on the Eastern Coast. Lorie had been married for 23 years and had a 23-year old son, who was a college senior. She successfully completed 45 credit hours of course work via distributed means. At the time of the study she was working on her dissertation and writing the comprehensive examination.

Quality of Academic Experiences

Lorrie's persistence in the ELHE program was affected by its high quality. On the survey, she indicated program quality, prestige, and offerings as factors contributing to her persistence. Lorie claimed she was learning more online than if she were in a conventional classroom: "I anticipated that maybe I wouldn't learn the depth that I was accustomed to being in the classroom... But much to my surprise, I found that it was better." She also benefited from the opportunity to learn from other students and tried to read and respond to everybody in class. Lorie found the course work relevant to what she was doing in her professional life. She benefited most from courses when instructors were acting as facilitators, encouraging students to seek knowledge and find the answers themselves. With few exceptions Lorie received positive and constructive feedback from the instructors and it fulfilled her expectations: "It was exactly what I needed to hear."

The quality of advising evolved along with Lorie's matriculation in the program. When her academic advisor retired, it took nearly a month to get the new advisor to respond to Lorie's e-mail messages. Subsequently, the advisor became more responsive and attentive to her needs. Lorie claimed her advisor had a crucial role in the dissertation stage of her program: "I've never done this before ... and [advisor] knows the process, and exactly what the committee is looking for, and what works, and what doesn't."

Online Learning Environment

The distributed learning environment offered Lorie convenience and flexibility of learning and positively enhanced her persistence. "I guess that's probably the thing that supported me, that allowed me to stay in the program, because I travel a lot." A high comfort level with technology made it easy for Lorie to learn in this environment. She also enjoyed writing, was comfortable developing essay-type responses to course assignments and participating in online discussions. She purposefully involved herself in discussions with students she had taken classes with, because she knew their "mannerisms, behavior and responsiveness." Examination of selected archival Lotus Notes classes Lorie had taken revealed she typically interacted with the same group of students. Lorie believed a learning community was established among the virtual students, but it was limited to a particular course and built around some course issues: "It was a community of learners that had a particular interest in a particular subject matter." However, with some students the

relationship extended beyond online interactions and later Lorie was able to meet with two students when she traveled to the states they lived in.

Support and Assistance

Lorie's efforts to pursue the degree via DE were supported at different levels. Because she had to travel a lot for her work, the instructors were responsive and willing to accommodate to Lorie's needs. Support from other students in the program was essential, but limited, although she admitted having good relationships with other students and rated peer support high on the survey. Support from the academic advisor came in the form of guidance with "how-to kinds of things". She pointed out student support services played an important role in her persistence in the program, despite not being highly visible. Unfortunately, Lorie did not provide any information related to support from her family and employer.

Self-Motivation

Motivation played an important role in Lorie's persistence in the program. She had always dreamed of having a doctorate, and her intrinsic motivation was supported by a sense of responsibility for the process and by the very nature of the online learning environment, where one's work was exposed to and evaluated by everybody in class. She also knew her classmates depended on her participation in online discussions or her involvement in virtual group projects: "I knew ... without [my piece of the puzzle] we were all going down." The fact Lorie enjoyed what she was doing in the program added to her intrinsic motivation. She found the process of learning exciting and fascinating: "I enjoyed it. It was like almost my entertainment and my recreation in a twisted way, I guess." A dissertation fellowship added extrinsic motivation to Lorie's persistence in finishing the program.

Larry

Larry was 45 years old when he graduated with the PhD degree from the ELHE program in the Spring of 2001. He successfully completed the program in four years and did most of the coursework online. He was then Dean of Language and Letters in a private religious university in a northwestern state. Larry had been married for more than 25 years and had four children, two graduated from college and one son still in high school.

Quality of Academic Experiences

Larry's persistence in the program was positively affected by its quality. The program was structured and well laid out, "I knew exactly what I needed to do." The course work was relevant and the content covered distinct dimensions of an administrator's work and issues: "The things I was learning ... were just as current as issues that we were facing on our campus." The emphasis of the program on engaged learning and written communication made it even more appealing to Larry. The idea of learning from colleagues from all over the country and other nations in addition to books and other data sources was beneficial. This idea was also reflected in the professional performance portfolio Larry submitted to his advisor as part of the degree requirement.

Faculty feedback varied in its quality and for Larry sometimes lack of faculty commitment to online students was disappointing. He assigned a big role to his academic advisor in his successful matriculation in the program. The advisor provided high quality professional advice and was an instructor in a third of Larry's courses: "Very good personal encouragement and advice on many dimensions." Larry also received quality feedback from his dissertation committee members and believed their role was central in the final stages of his program.

Online Learning Environment

The online format of the ELHE program positively affected Larry's persistence. On the survey, Larry chose family, work schedule, convenience and flexibility of the program offerings as factors important for his decision to persist in the program. Absence of time and place constraints gave Larry the convenience of adhering to his work routine and the opportunity to be with his family and his teenaged children even while taking classes: "I was able to work during the day, come home and have dinner with my family, and then sit in my office during the evening at my home and do my course work." This flexibility gave him emotional freedom to pursue the degree.

Larry's comfort level with online learning was very high. Because he was trained as a journalist and liked writing, he never experienced any problems interacting with his classmates in the discussion threads, or communicating with instructors via electronic means. The structure of the program and the delivery method provided a nice fit to his background, talents, and skills, making it easier to be successful in the program: "... if I were in another program, I think it would have been very difficult." Larry believed a community of virtual learners had been

established, though it was not sustained over the time: "It was really interesting our first semester together, how much time we spent in the cafeteria talking to each other and getting to know each other a little bit better, and how that over time seemed to fade away." The students recognized how demanding it was for everybody to have a full-time position and to pursue a doctoral degree, so the role of the community was not strong.

Support and Assistance

Larry received support and encouragement at different levels. High quality advising and personal friendship with academic advisor created a supporting niche and helped Larry complete the program. Instructors were always ready to waiver the assignment due date understanding the challenges of online learning. Relations with classmates were built on mutual respect and recognition, and the students were sensitive to Larry's religious background and respected his viewpoints. Continuous assistance from different university support services also helped Larry move through the program. Technology help with the course software and platform problems was for the most part "timely", library resources were "invaluable", and the registration and records department staff was always "beyond helpful." Larry also highly rated institutional support services on the survey.

Support also came from sources external to the program, such as family and work. Larry's family had created a supportive environment for him and encouraged his efforts in pursuing the doctorate degree. Larry assigned his mother one of the major roles in his getting the doctorate: "... she's probably my number one supporter in terms of 'I'm so proud of you'." The president of the university where Larry was employed also provided constant encouragement and help, including emotional support, release time, and financial assistance.

Self-Motivation

The innovative character of the ELHE program and the notion of pursuing advanced graduate studies via DE constituted specific value for Larry and raised his motivation. The fact of being among the few faculty with a doctoral degree at the institution that did not have a doctoral requirement added to Larry's recognition and self-esteem. Larry assigned a big role to himself and his personal motivation in his efforts to pursue a doctorate via DE. Only once after successfully finishing all

the course work and passing his comprehensive examination, did Larry considered quitting the program: "I was getting weary of the grind for the two solid years, year round... Just to finish my coursework and my comps. And then you look at that mountain of a dissertation and you're thinking, do I have it in me to even complete that?" It took Larry some "real internal motivation to get going again" in addition to the encouragement from the academic advisor, his family and university president.

Susan

Susan was 54 years old when she withdrew from the ELHE program. She worked as a registrar at a small private religious college in one of the northern states. She successfully completed two online courses in the program and both were related to her major. At the time of the study she had completed two years of a three year doctoral program at a small private university within 40 miles of her home. She was a single person with no children.

Quality of Academic Experiences

Though Susan took only two courses in the program she believed its quality was high and it was tailored to meet students' needs. She appreciated the broad content of the program and the opportunity to choose the area of concentration later. She was mostly satisfied with the feedback she was getting from the faculty regarding her course work and the promptness of their responses. She also benefited from her interactions with the academic advisor. Though Susan did not get far into the program and did not have an opportunity to discuss the future dissertation, she received good and quick advice from her advisor: "When I wrote a couple of times about different things, [the advisor] was quick to answer and gave me good advice." On the survey, Susan highly rated advising. At the same time, Susan was not satisfied with the quality of other doctoral students' postings and feedback. She believed the students did not possess the appropriate writing skills so important in the program with the focus on written interaction: "It was frustrating to try to respond to those people... They really didn't write very well. They didn't express themselves that well." She also did not like the nature of the discussion going online. She thought it was primarily academic and more focused on the exchange of facts, but not the opinion.

Online Learning Environment

Convenience and freedom of time was one of the biggest attractions for Susan in the ELHE program. The focus on writing did not bother her and she was comfortable developing essay-type responses to assignments and responding to other students' postings. However, the asynchronous format of the online courses did not match Susan's learning style. She missed the real time component of face-to-face interactions and could not comply with it: "The whole format of posting my response and then reading other people's responses and responding to them... that was very frustrating to me." On the survey, Susan indicated that the online format was the primary factor influencing her decision to withdraw from the program.

Susan was also concerned with not seeing other students and instructors and not being able to observe their body language. In her new campus-based program this component was present and, reportedly, positively affected her persistence. She also believed there was not much community building in the courses she took. On the survey, Susan indicated lack of personal contact with fellow students as the biggest barrier for her in distance learning. Exploration of two Lotus Notes archival courses she had taken showed little social interaction in the course Virtual Cafeteria. Susan herself did not invest a lot of effort into establishing the online community either. Those two components, online learning environment and lack of personal interaction, were the only reasons for Susan not to continue with the program: "The problem was not with [the university] and it wasn't really with the program. It was with the method. And that would be my primary concern and my primary reasons for leaving the program."

Support and Assistance

Although Susan took only two classes in the program, she sensed the supportive atmosphere created by the faculty, students, and institutional support services. The feedback she received from the faculty, especially personal encouraging notes in one class, was helpful to stay focused on the task. Both instructors were also willing to accommodate to her needs. Susan received quick assistance with the technological problems: "When I contacted them, I did get answers pretty quickly." When she was getting set up to take her first course in Lotus Notes, she got all the help she needed and in a timely fashion. That created a positive atmosphere for her to begin the program.

Self-Motivation

In spite of the fact Susan withdrew from the ELHE program, she was highly motivated to earn a doctoral degree. When Susan realized pursuing the degree in the distributed learning environment did not fit her learning style, she began looking for an alternative doctoral program, where she could have real time communication and meet other doctoral students in person. At the time of the study Susan was working on her EdD in Leadership at another university. Every week, she drove 40 miles one way to meet with her cohort. In addition to enjoying the format of her new program, Susan claimed she had a strong personal responsibility for earning the degree. This sense of responsibility and a long-term wish to have a doctorate acted as a driving force for Susan as she commuted weekly to the class and complied with whatever other difficulties she had to face: "It's me, or it ain't going to get done."

Cross Case Analysis

Four similar themes related to the participants' persistence in the ELHE program emerged in the analysis across four cases: quality of academic experiences, online learning environment, support and assistance, and self-motivation. In spite of being common for all participants, those themes differed in the number and similarity of sub-themes and categories comprising them (see Table 6).

Overall, there were more similarities between the participants who were still in the program, although at different stages, than with those who graduated or withdrew from the program. Factors deemed important for these four participants as related to their persistence in the ELHE program were:

Quality of Academic Experiences

This included quality of the program and relevance of the course work, focus on engaged learning, quality of faculty and student feedback and their involvement with online courses, quality of academic advising and an advisor's commitment to students.

Online Learning Environment

The online environment offered students convenience and flexibility of learning, although it differentially affected students' persistence. The students who persisted had a high comfort level with technology, good

TABLE 6. Themes, Sub-Themes, and Categories Across Cases

Themes, Sub-Themes	Gwen	Lorie	Larry	Susan
Quality				
University		Distance education	Research one	
Program	Well-structured	Well-structured	Well-structured	
	Relevant	Relevant	Relevant	
	Scholarly	Scholarly	Scholarly	
	Learning from others	Learning from others	Learning from others	
	Challenging	Challenging		
		Broad content		
	Delivery	Depth	Clarity of expectations	Broad content
	Good fit	Well-known	Engaged learning	Good
	Reputation		Written dialog	Student' needs
	High standards		Laid out	
Faculty	Feedback	Feedback	Feedback	Feedback
	Involvement	Involvement	Involvement	Involvement
	Prompt			Prompt
		Facilitating	Interactions	
		Readiness to teach online	Commitment	
Students	Feedback		Feedback	Feedback
	Professional		Interactions	Writing skills
	Positive		Varied	Fact based discussion
Advising	Negative	Need	Professional	Helpful
	Useless	Varied	Involvement	Prompt
	Lack of guidance	Knowledge of the process	Diligent	
	Communication		Champion dissertation	
	Switching advisor			
Dissertation Committee Members			Second opinion	

TABLE 6. (*Continued*)

Themes, Sub-Themes	Gwen	Lorie	Larry	Susan
Online learning environment	Convenience	Convenience	Convenience	Convenience
	Flexibility	Flexibility	Flexibility	Flexibility
	Learning style	Learning style	Learning style	Learning style
	Non-physical presence	Non-physical presence	Non-physical presence	Non-physical presence
	Online community	Online community	Online community	Online community
	Comfort with technology	Comfort with technology	Comfort with technology	
		Work schedule	Work schedule	Work schedule
	Mental images	Class size	Emotional relief	Writing component
	Learning via distance	Familiar students	Staying with family	Non-real time
		Meeting in person		Involvement
Support				
University			Cooperation	
Faculty	Willing to accommodate	Willing to accommodate	Willing to accommodate	Willing to accommodate
	Varied	Receptive	Personal relationship	Personal notes
	Responsive			
	Advice			
	Open			
Students	Encouragement		Encouragement	Encouragement
	Sensitive		Sensitive	
	Polite	Using for references	Respect	
	Personal experiences	Limited to course activities	Recognition	
	Sympathies		Best wishes	
	Congratulations			
Academic Advisor	None	Assistance-guidance	Assistance	No need for assistance
		"How-to"	Friendly	
			Encouragement	
			Personal interest	
			Accommodating	

TABLE 6. (*Continued*)

Themes, Sub-Themes	Gwen	Lorie	Larry	Susan
Student support services	Prompt Helpful Convenient Always worked Friendly	Prompt Not helpful Smooth Simple	Prompt Helpful Timely Easily solved Attention Qualified	Prompt Helpful Smooth Straightforward
Family	Encouragement Pride Care Attention		Encouragement Pride Supportive environment	
Employment	Time off Life learning Sharing experiences		Time off Encouragement Advice Extra credit Pushing	
Pet	Watching silently			
Self-motivation	Responsibility Enjoyed Exposure Dream Balancing Personal challenge Credentials Personal drive Extra effort Finishing coursework Staying positive	Responsibility Enjoyed Exposure Dream Balancing Dissertation Dependability Frustration Fellowship	Responsibility Enjoyed Exposure Dissertation Career advancement Recognition Compensation Experience distance learning Doctoral work	Responsibility Enjoyed Wish Accreditation

writing skills and were comfortable interacting with other students online. The virtual community was not very important because it varied with each class and often was limited to a particular course.

Support and Assistance

A supporting and encouraging environment, created by both internal and external entities to the program, positively affected students' persistence. The internal sources of support included: faculty responsiveness and willingness to accommodate to distance learners' needs; peer support and encouragement; academic advisor's assistance and guidance; the institutional student support services infrastructure. Support and encouragement from sources external to the program included families, employment, and pets.

Self-Motivation

This included intrinsic motivation to pursue the doctoral degree in the distributed learning environment, such as personal challenge, responsibility, love for learning, and experiencing the new learning format. Extrinsic factors cited were: career advancement, earning the credentials, recognition, and increase in pay.

DISCUSSION

The purpose of this mixed methods sequential explanatory study was to identify factors contributing to students' persistence in the ELHE program. In the quantitative phase, five external and internal to the program factors ("program", "online learning environment", "student support services", "faculty", and "self-motivation") were found to be predictors to students' persistence in the program. The qualitative follow up multiple case study analysis revealed that four reasons were pivotal: (1) quality of the program and other related academic experiences; (2) the very nature of the online learning environment; (3) support and assistance from different sources; and (4) student self-motivation. The quality of academic experiences had the most favorable affect on the participants' persistence in the program. Support and assistance they received contributed to their matriculation, while the online format was the cause for quitting the program for one participant. All participants were equally motivated to get the degree.

The way quantitative and qualitative findings highlighted the quality of the program and participants' academic experiences in it, the importance of student support infrastructure, and self-motivation to pursue the doctoral degree in the distributed learning environment were consistent with the basic ideas of Tinto's Student Integration Theory (1975, 1993). At the same time, relative importance of the external factors to

doctoral students' persistence did not fully support Bean's Student Attrition Model (1980, 1990), which claimed factors external to an institution equally affected students' matriculation in college. However, Bean's model was specifically tailored to the undergraduate student population. For doctoral students pursuing the degree in the ELHE program, external factors might have played a secondary role to the internal factors related to the program and the online learning environment. The qualitative and the quantitative findings in this study supported the principle components of Kember's (1990, 1995) Model of Dropout from Distance Education Courses. Although Kember's model was limited to mostly undergraduate non-traditional students and individual DE courses, the idea of academic and social integration as embracing all facets of DE course offerings found reflection in this study. The quality of the program and academic experiences learning in the online environment, the importance of student support infrastructure, and student goal commitment were integral components of students' persistence in the ELHE program.

Program-Related Factors

Program

Quantitatively, most of the participants were satisfied with their academic experiences, the relevance and usefulness of the program, and how the program met their needs. The amount of satisfaction, however, was the greatest among the graduated participants and the lowest among the Withdrawn/Inactive group. A multiple case study analysis revealed all participants had high quality experiences in the program. This quality was reflected in the scholarly character of the program, its high standards, clarity of expectations, relevance, good structure and the opportunity to learn from others. The challenging character of the program, its broad content, and focus on engaged learning also were recognized. Quality of interactions with students and their feedback differentially affected the participants' persistence. Those who successfully matriculated in the program received more meaningful and constructive peer feedback.

These findings were consistent with the limited research on the structure and content of a doctoral program and its impact on students' persistence. Usually students' academic experiences in the program were combined with other academic or institutional related factors, such as departmental orientation, relationship between course work and research skills, attitudes towards students, and student participation

(Ferrer de Valero, 2001; Golde, 1998). Distance students usually are at a loss for recognizing and copying with such ambiguity, and must rely upon guidance from a concerned academic advisor or other students. In a fewer studies devoted to the quality of doctoral student experiences in DE programs (Huston, 1997; Sigafus, 1996; Wilkinson, 2002) the program structure was reported to be one of the contributing factors that positively affected students' experiences. Being able to anticipate or know the "roadmap" provided students with a sense of control. In a qualitative study of one course offered in the ELHE program (Ivankova and Stick, 2005), the focus of the program on engaged learning was cited as one of its quality indices. The participants believed they benefited more due to meaningful interactions between and among the students and instructors.

Online Learning Environment

The quantitative results indicated a majority of the participants were comfortable learning in the online environment, were satisfied with their online learning experiences, and believed learning was at least as effective as in a face-to-face classroom. The more matriculated in the program the participants were, the more positively they rated their online learning experiences. The qualitative findings revealed the participants were attracted by such characteristics of the online environment as its being location and time free, which allowed keeping both work and family schedules intact while taking classes. A second important characteristic was relative flexibility of learning at one's pace and time within the prescribed parameters of the course. However, the online format differentially affected the participants' persistence. For those who successfully matriculated in the program, the asynchronous format positively affected their progress, because, reportedly, it matched their learning style preferences. Factors impeding persistence included the non-real time format of the course related interactions and the focus on written versus oral communication.

These findings are supported by other studies that explored advantages and disadvantages of online learning, although not directly related to the issue of persistence. Flexibility to pursue education at personally convenient times was reported as a great advantage of learning at a distance (Quintana, 1996; Simonson, Smaldino, Albright, and Zvacek, 2000), while the learner-centered focus of online format was argued to lead to increased interaction and more active involvement (Chute, Thompson, and Hancock, 1999; Moore and Kearsley, 2005). The capacity to support interaction in an asynchronous format provided an opportunity for

reflection and deliberation not found in any synchronous learning environment, including face-to-face classrooms (Anderson and Garrison, 1998; Berge and Collins, 1995; Hart and Mason, 1999). In addition, text-based communication contributed to a social "equalizing" effect with less stereotyping and more equitable participation (Harasim, 1990).

Virtual Community

Statistically, "virtual community" did not contribute to the function discriminating among the participant groups. Overall, half of the participants were satisfied with the online community, and two-thirds of the participants believed they were able to establish long-term social relationship with their fellow-students online. Those who had withdrawn or were inactive in the program, more negatively rated their community experiences. The qualitative analysis revealed that although the participants found the virtual community helpful, it was not a very important part of their academic experiences. No participant indicated a strong relationship between the community and his/her persistence in the program, because the community varied with each course, was limited to the course activities, and depended on one's willingness to participate in it. However, within some courses students managed to create a supportive and encouraging environment, both at the academic and personal level. Thus, social integration for those students was bounded by a particular course and particular activities.

These findings, to some extent, contradicted extensive research on the topic of community building in the online learning environment. Hiltz (1998) argued it was possible for people with shared interests to form and sustain relationships and communities through the use of computer-mediated communication. Community building in such an environment was based on collaborative learning and cooperation between and among the participants (Curtis and Lawson, 2001; Harasim, Hiltz, Teles, and Turoff, 1995; Palloff and Pratt, 2003). However, these and other studies mostly explored community building in single distance courses. Although an established virtual community reportedly helped keep students in a course (Brown, 2001; Eastmond, 1995; Garrison, 1997; Hiltz, 1998; Ivankova and Stick, 2005; Palloff and Pratt, 2003), community development was not studied from the angle of students' persistence in the entire program, and specifically a doctoral program. The results from the current study were interpreted as meaning community was a transitory phenomenon and was viewed as one of many "communities" the participants functioned in.

Academic Advisor- and Faculty-Related Factors

Academic Advisor

Although statistically an academic advisor did not have any significant effect on the participants' persistence in the program, about two-thirds of the participants were satisfied with the relationships they had with an academic advisor. More matriculated students had more positive experiences than the Beginning or Withdrawn/Inactive participants. Case study analysis showed that the quality of advising differed across the four participants. In case of the graduated participant the academic advisor's involvement was very high and was reflected in good professional advice, diligent feedback, and guidance with the dissertation. For another participant, who was approaching the dissertation stage in the program, advising was limited to providing knowledge of the process. The one, who had withdrawn from the program, had little exposure to advising, but what had been provided was deemed helpful and prompt. For the fourth participant, who was in the first half of the program, the academic advising experience was negative. Reportedly, there was lack of guidance, communication, and whatever little feedback was provided turned out to be of questionable value. Efficient academic advising also was associated with support and assistance in academic and personal problems, and encouragement toward earning the degree.

The fact that an academic advisor did not significantly affect students' persistence in this study was not consistent with other research on doctoral students' persistence. Ferrer de Valero (2001), Girves and Wemmerus (1988), Golde and Dore (2001), and Lovitts (2001) found that positive relations between a student and academic advisor were important for doctoral students' persistence in traditional campus-based programs. Doctoral students' withdrawal from a program was also reported to be due, in part, to inadequate or inaccurate advising, lack of interest or attention on the part of an advisor, and unavailability of an advisor (Bowen and Rudenstine, 1992; Golde, 2000). The inconsistencies of these findings might be explained by different doctoral student populations studied. Presumably, DE students were more self-sufficient and more focused on earning their degree. Being educational administrators in their professional lives, they might have been more organized and disciplined to persist in their efforts, and for many earning a doctoral degree was a necessary credential for keeping a job or getting promoted. In addition, there were other members of the program faculty always ready to provide the necessary guidance and assistance when an assigned academic advisor was not available.

Faculty

In the quantitative analysis, "faculty" was found to significantly contribute to the function discriminating among the four groups as related to their persistence. The degree of satisfaction with different aspects of instructors' teaching in the distributed environment varied. The participants were more satisfied with instructors' accessibility and promptness of feedback, than the quality of their feedback and their willingness to accommodate to distance learners' needs. The qualitative findings revealed that the quality of feedback depended on the readiness of faculty to teach online, their involvement with a course, and commitment to students. Students' persistence was positively affected by support and encouragement they received from the faculty and their ability to provide personal assistance. Such responsiveness was especially important in the absence of any assistance or guidance from an academic advisor.

These findings were supported by other studies of doctoral students' persistence. Lack of persistence in traditional doctoral programs often was attributed to lack of support and encouragement from a department and departmental faculty (Ferrer de Valero, 2001; Golde, 2000; Hales, 1998; Lovitts, 2001; Nerad and Cerny, 1993). Students who perceived support from their faculty were more likely to complete their degrees. However, little research has been conducted on the role of faculty in DE doctoral students' persistence. For example, in Sigafus' (1996) study faculty was cited as the most helpful source of support for those students.

Institution-Related Factors

Statistically "student support services" significantly affected the participants' matriculation in the program. Although more than half of the participants were satisfied with the institutional support services, their satisfaction differed depending on the particular service. The degree of satisfaction was not always consistent across the three matriculated groups, with the exception of the Withdrawn/Inactive participants who were the least satisfied. The case study analysis revealed that although the participants differed in the type and number of services they used and this need depended on the student's status in the program, the support infrastructure was friendly, convenient, and timely, and the procedures were convenient, smooth, and simple.

The importance of having a good support infrastructure for DE students was well established in the literature (King, Seward, and Gough, 1980; Moore and Kearsley, 2005; Rumble, 1992; Simpson, 2000). Availability and access to student support services were found to

be a critical factor in distance students' academic success (Biner, Dean, and Mellinger, 1994; Tinto, 1993; Voorhees, 1987). However, no studies were located that explored the role of institutional support infrastructure in doctoral students' persistence in the distributed learning environment or programs like ELHE.

Student-Related Factors

Quantitatively, "self-motivation" had a significant affect on students' persistence in the program. All participants, except for the Withdrawn/Inactive group, were highly motivated to pursue the doctoral degree via distributed means. Not surprisingly, the Graduates were the most motivated group, while the Matriculated group was more motivated than the Beginning group. The case study analysis revealed that motivation was a strong factor for successful matriculation in the distributed environment. Intrinsic motivation included love for learning, personal challenge, a life long dream, and experiencing the new learning format. Responsibility was sustained by the fact everybody's work was being judged and evaluated by everybody in a class. Balancing work and studies was a challenge to motivation, but the unstructured process of dissertation work, perhaps, was the most daunting. Extrinsic factors also were important for staying on task; however, they were more important for male than female participants.

These findings were supported by other studies of doctoral students' persistence with regards to their motivation to complete the degree. Ferrer de Valero, (2001), Lovitts (2001), and Reynolds (1998) demonstrated that self-motivation was an important factor in obtaining the doctorate in campus-based programs. Students who had a "never give up" attitude, or had positive views of themselves, were more likely to complete the doctorate, especially during the tenuous time between course completion and dissertation work. Motivation and assumption of the responsibility for the learning process were especially important for distance doctoral students. Intrinsic motivation was reported as a significant predictor of success for such students (Huston, 1997), while personal responsibility was found to be a contextual factor helping students matriculate successfully in the online environment (Scott-Fredericks, 1997).

External Factors

Based on the quantitative analysis, external factors, such as "family and significant other", and "employment" did not significantly affect students' persistence in the ELHE program, although two-thirds of the

participants reported being supported by family, significant others, friends, and employers in their efforts to study in the distributed environment. The graduated participants received the most support among the four groups; however, they also claimed to be the most challenged by pressing job responsibilities and work schedules. The qualitative findings revealed different participants had different sources of external support: for some it was family and employment, for others family and pets, and for some there was no apparent support from external sources.

These findings were partially consistent with previous research. Frasier (1993), Girves and Wemmerus (1988), and Siegfried and Stock (2001) also indicated marital status did not affect doctoral students' persistence in campus-based programs. In the AHA Survey of Doctoral Programs in History (The American Historical Association, 2002), only 4% of the history major students indicated family reasons were among the most important factors causing them to drop out from doctoral programs. On the other hand, Golde (1998) found family commitments were crucial barriers leading some participants to quit the program. For traditional campus based doctoral students keeping priorities straight and balancing work and family is more difficult and might result in procrastination or withdrawal from the program. This study focused on doctoral students pursuing degrees in the distributed environment, which offered convenience, flexibility, and the opportunity to keep regular work and family schedules. Free from the constraints of the traditional classroom, DE students could establish priorities, chose suitable time for studies, and enjoy full-time employment. Limited research on the affect of external factors on doctoral students' persistence in the distributed environment also suggested families, friends, and employers among the most helpful sources of support (Huston, 1997; Riedling, 1996; Sigafus, 1996).

Implications and Recommendations

Recognizing that many institutions of post-secondary and higher education offer graduate and professional degrees via distributed means, the results of this study are aimed at numerous stakeholders: policy makers and educational administrators, graduate program developers and instructional designers, institutional faculty and staff, and students, who currently pursue their doctoral degrees in the distributed environment or consider doing so. Knowing the predictive power of external and internal factors to students' persistence in the distributed learning environment may assist programs in developing strategies to enhance doctoral

persistence and eventually degree completion. Specifically, the implications of this study include:

1. The scholarly and challenging character of the program, its relevance and applicability to students' professional activities, high standards and focus on an individual may lead to a more successful matriculation in the program. A distributed program meeting such requirements may have a greater potential for attracting promising applicants, nurturing their scholastic development, and ultimately improving their persistence and graduation rates.
2. To benefit from learning in the distributed environment, students need to be comfortable with technology and have good writing skills. Text-based learning should match their learning style preferences and they should be comfortable interacting with other students and instructors online. Students considering or applying to a distributed program should be informed upfront of the program format and what the expectations are in terms of performance.
3. Students benefit from online courses when an instructor acts as a facilitator of learning, is actively involved with the course, and provides the necessary encouragement and assistance. To fulfill this role, faculty should be prepared to teach online, be ready to provide constant and timely quality feedback, and be flexible to accommodate to distance learners' needs.
4. Institutional student support infrastructure should be in place to assist distance learners with all their needs, problems and concerns. Such infrastructure should include all possible services distance learners might encounter during their matriculation process. Of particular importance is prompt and qualified assistance with possible technology problems, obtaining the course materials, and gaining access to the library reserves and other resources.
5. Students who want to succeed in a distributed learning environment need to be highly motivated, disciplined and organized to successfully balance studies, work, and families. Students' intrinsic motivation should be supported and encouraged by the program quality, user-friendly online format, favorable learning environment, as well as external to the program factors. Extrinsic motivation also is important, but could be different in each particular case.
6. The quality and responsiveness of academic advising in distributed doctoral programs need to be at a high level. Students should receive professional advising and guidance from their academic advisor throughout the entire program. Reasonably consistent contact between a student and an advisor helps ensure a continued progress

in a program. Assistance with academic problems and personal encouragement should be part of a distance advisor–advisee relationship.

7. Online community may enhance students' progress, if it is established and supported throughout the entire program. Faculty may take a lead in launching and facilitating informal interactions with the class alongside with other academic activities. Schools and departments also should reflect upon more strategies to virtually bring distance learners together, such as summer residencies, listservs, and virtual student organizations.

This study provided only one perspective on persistence in the distributed doctoral program—that of the students themselves, excluding other internal and external constituents. Also, the marginal reliability estimates of the two sub-scales measuring "family and significant other" and "employment" are recognized as the limitation to the related findings. Being the only research on students' persistence in a distributed doctoral program, this study leaves some unanswered questions and opens a door for future research on students' persistence in such environments. In-depth exploration of distance students' persistence might help their journey be less stressful and more efficient. The results would be productive for students, institutions, and society.

NOTES

1. The study design was reported elsewhere (Ivankova, 2004; Ivankova, Creswell, and Stick, 2006).
2. A detailed explanation of the case selection procedure for the qualitative phase of this study was reported elsewhere (Ivankova et al., 2006).

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