

Demographic and Attitudinal Factors Influencing Doctoral Student Satisfaction

Sabina Nwenyi^[a]; Timothy Baghurst^{[b],*}

^[a]Educator, educational consultant, PhD. New York City, USA.

Research areas: Environmental issues in higher education; evaluation; leadership; and work motivation.

^[b]Assistant professor. College of Education, Oklahoma State University, Stillwater, OK, USA.

Research areas: Modeling dispositions in education; Fitness and skills testing in collegiate physical education programs.

*Corresponding author.

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Abstract

Higher education administrators face challenges in providing a welcoming environment for doctoral students in higher education institutions, as they must identify factors influencing students' satisfaction in order to provide a supportive environment, reduce attrition rates, and promote persistence. Thus, the purpose of this study was to identify predictors of doctoral student satisfaction from demographics and attitudes concerning the campus environment. Participants were 132 (33 male, 99 female) doctoral students from two private nonprofit universities in the New York metropolitan area of the United States who completed either a web-based or paper/pencil survey in which demographics and opinions regarding student satisfaction were sought. Regression analysis on participant attitudes found that university services, advisor, and students were all significant predictor variables. Other demographic predictor variables included years in graduate school, race, and ethnicity. Of particular importance, as doctoral students progress in their program by year, dissatisfaction increases. This could be due to the increasing pressures of successfully completing the dissertation, the progress of which can be heavily influenced by advisor-student relationship. Overall findings may assist education administrators and institutional planners in making campus environments welcoming to students thereby increasing both student satisfaction and retention.

Key words: Campus environment; Higher education; Perception; Attrition; Persistence; Assessment

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INTRODUCTION

The college environment affects student development (Chatman, 2008) and influences student satisfaction, motivation, and persistence (Cohen, 2011; Sum, McCaskey, & Kyeyune, 2010). To provide a welcoming environment in higher education institutions, administrators need to conduct periodic learning environment assessments. Accessibility to higher education has been increasing to include a wider range of citizens, but some leave higher education institutions before graduating or completing any academic or social goals (Griffin & Muñiz, 2011; Maton et al., 2011). It is concerning that attrition rates of doctoral students have been reported at 57% across disciplines (Gardner, 2009), which may be associated with student satisfaction, which influences persistence (Cohen, 2011). Thus, attrition may in part be attributed to the student's lack of satisfaction.

Institutions are developing strategies to increase and retain student enrollment, as the loss of each student represents lost revenue so "attrition from college can be described conceptually in terms of a loss function" (Veenstra, 2009, p.20). An improved quality of life has been found to increase the retention and graduation of graduate students (Corneau, 2007; Grasgreen, 2010). However, Griffin and Muñiz (2011) warned that "doctoral education is the training ground for the professoriate, and homogeneity in this population calls [into question]

our ability to meet the needs of our increasingly diverse student body” (p.58). Corneau posited that graduate students have greater levels of psychological distress than people of similar age, which may contribute to attrition rate. Further, attrition rates for these students are higher for women and minorities (Franco-Zamudio, 2009). Persistence, attrition rate, and success in higher education are influenced by the campus environment (Johnson et al., 2007); therefore, it becomes imperative that support programs and services assist in reducing attrition rates among struggling students (Veenstra, 2009). Feedback from doctoral students may create and maintain a quality environment thus promoting enrollment and retention.

A university environment may affect the quality of learning for different groups of students (Vaccaro, 2010). Several factors influence student perception of the college environment, but graduate student factors for satisfaction differ from undergraduates (Peterson, 2011; Russo, 2011). Student level of satisfaction with the college environment influences enrollment, persistence, and attrition rate in higher education (Cohen, 2011; Johnson et al., 2007; Sum et al., 2010). In the United States, Ph.D. attrition rate is approximately 50% (Petroff, 2011). Petroff reports this percentage to be higher than attrition rates for medical students in residency programs (10%) and students in ABA-approved law schools (13%). Existing studies on graduate student satisfaction are limited (Maton et al., 2011), and learning more about the correlates of a supportive environment as perceived by doctoral students may be useful to institutional leaders wishing to improve the supportive environment for students. Without such knowledge, institutional leaders may be unable to create effective in-class and out-of-class activities that support the needs of diverse doctoral learners and enhance persistence. The creation of a supportive environment based on information from different groups of doctoral students may increase enrollment of each demographic group. Thus, results from this study may be used by higher education leaders to address such problems.

Student ethnocentric perspectives, personal views of themselves as members of groups or society, and the culture of the campus environment all serve to influence student interactions with the environment. Existing research on student experiences and perceptions has primarily focused on undergraduate students. Yet developers often neglect graduate students’ campus environmental needs. According to Sum, McCaskey, and Kyeyune (2010), “. . . Student satisfaction among graduate students is assumed and only usually considered when competition affects enrollment” (p.2). This is unfortunate, as graduate students have attended higher education institutions longer than undergraduate students and presumably know more about the campus environment. Graduate students must be catered to differently, as they generally have different collegiate and life experiences that might impact their expectations and satisfaction

differently to an undergraduate cohort (Bolton, 2006). The lack of attention by institutions to graduate students and programs may in part explain the high attrition rate, and a better awareness of student needs may guide decisions on the campus environment.

Institutional environment is an important factor in higher education. Kuh et al. (1991) stated that “an institution’s physical, social, and organizational environments can be discouraging, confusing, and alienating, or orderly, predictable, coherent, and encouraging” (p.99). An institution’s ability to create a favorable college environment depends on the understanding of predictors of students’ college environment satisfaction. Students’ experiences are shaped by their interactions with the components of college climate: physical properties, policies, and people. Thus, effectiveness of an institution is related to the quality of college climate in the institution (Abiddin & Ismail, 2009; Kuh et al., 1991). A research study on various groups of students’ satisfaction of the college environment may provide information that enhances decisions for making adjustments to campus environments. Students participate more in provided learning activities when they feel valued and a sense of belonging in their environment (McClellan & Stringer, 2009).

Institutional leaders use climate assessment to assess the state of post-secondary institutions in support of providing a welcoming environment for students (Vaccaro, 2010). Higher education demographics are changing toward more diversity in socio-economic status and ethnic and cultural backgrounds (Griffin & Muñiz, 2011; Morris & McClure, 2011). College climate plays a vital role in minority students’ achievements in higher education, including retention (Vaccaro, 2010).

Academic Affairs, Student Affairs, and Advancement units may find the results useful in developing their strategic plans. An institutional strategic plan provides information on how to achieve institutional goals and objectives. Institutional officials can use the results in developing marketing strategies for attracting and recruiting students, and the results of this study may also help in comparing the results of previous studies in this area to determine if former trends remain valid.

1. THEORETICAL FRAMEWORK

The theoretical framework for examining doctoral students’ level of satisfaction using a survey to gather data was developed using student development and environmental theories. Pascarella and Terenzini (2005) described student environmental theories as college impact models of student change. For instance, in the inputs-environment-outputs (I-E-O) model Astin (1993) emphasized the importance of environmental information on student experiences in assessing and evaluating outputs. A negative campus environment has a negative

influence on students' learning (Vaccaro, 2010), but a welcoming campus environment can enhance student persistence (Johnson et al., 2007). Researchers have demonstrated that students' satisfaction of the campus environment is linked to individual characteristics such as racial and ethnic background (Lopez del Puerto, 2009). Perceptions of the learning environment in higher education institutions are continually changing because of changes in the system. Said, Rogayah, and Hafizah (2009) recommended that leaders make institutional adjustments to the campus environment by conducting periodic assessments of students' perceptions.

Craven (1999), in a study of graduate students in a college of education, acknowledged the gap in existing assessment literature on graduate and professional students, and classified this area of assessment as most neglected. Gardner (2009) explored the factors contributing to attrition in the United States doctoral programs using a qualitative method by interviewing 60 doctoral students and 34 faculty members in high- and low-attrition departments. Identified attributions of attrition were grouped by faculty and doctoral students into themes. The themes from faculty were student lacking (53%), student should not have come (21%), and personal problems (15%). Themes from doctoral students were personal problems (34%), departmental issues (30%), and wrong fit (21%). Higher education leaders can reduce the effect of some of these attributes by obtaining information on the needs of doctoral students through periodic assessments of factors influencing these students' satisfaction.

Prompt response to students' problems increases the chances of achieving their academic potential (Forbes, 2009). Periodic assessment of students' satisfaction of the campus environment will provide information on the problems students are experiencing and offer suggestions on how to solve them. Student satisfaction affects institutional program effectiveness (Barrick, Easterly, & Rieger, 2011), and institutional officials need information on graduate student satisfaction to meet their expectations. Therefore, the purpose of this study was to identify predictors of doctoral student satisfaction from their demographics and attitudes concerning the campus environment. This data allows university administrators to improve the campus environment for these students which may in turn result in higher lower levels of attrition. Because this was an exploratory study, it was guided by two research questions: i) How is participant satisfaction influenced by faculty, students, programs, university services, advisor, and diversity? ii) How is participant satisfaction influenced by their age, gender, ethnicity/race, academic discipline, and years in graduate school?

2. METHOD

2.1 Participants

The population for this study was doctoral students ($N=132$) attending a graduate program in two private, nonprofit universities located in the New York metropolitan area of the United States. The combined doctoral student enrollment at the two research sites was approximately 6,000. Data in this study was collected from a nonprobability purposive sample. A purposive sample targets a particular group of individuals to meet the needs of the study. Vogt (2007) indicated that in purposive sampling, "[a] sample is gathered deliberately, with a purpose in mind, but not randomly" (p.81). Demographics used as independent variables in the present study are diverse and are not equally represented in higher education institutions. Through purposive sampling, heterogeneity sampling was used to sample for broad and diverse groups represented in the research questions.

Participants were chosen by volunteering through a published advertisement in the daily university newspaper at one research site, and by handing out flyers to potential participants before or after classes at the other. The number of participants was determined to be sufficient based on Cohen's (1992) power analysis table using an alpha level of .05, a medium effect size, power of .80, and six independent variables. Sixty-nine respondents (52.3%) completed the paper/pencil version and 63 completed the electronic survey (47.7%). All respondents indicated they were working on an advanced degree at the doctoral level and included males ($n=33$, 25.0%) and females ($n=99$, 75.0%). Respondents indicated they had been working on their graduate degree between 1 and 6 years ($M=3.05$, $SD=1.06$) and were pursuing a number of different doctoral degrees. A majority were in social sciences ($n=47$, 35.6%) or education ($n=41$, 30.3%) and only a few were in communication ($n=3$, 2.3%) and nursing ($n=3$, 2.3%).

Participants were grouped by age from 21-25 to 51 or more years. The largest group of respondents was between 41-45 years of age ($n=34$, 25.8%) followed by 36-40 years of age ($n=29$, 22.0%). Ethnic background data showed that 14 respondents indicated they were Hispanic/Latino (10.6%), and 89.4% reported they were not Hispanic/Latino ($n=118$). Race was reported as White ($n=59$, 44.7%), African American ($n=40$, 30.3%), Asian ($n=17$, 12.9%), Hispanic ($n=13$, 9.8%), American Indian ($n=2$, 1.5%), or Native Hawaiian ($n=1$, .8%).

2.2 Instrument

A 68-item web-based and paper/pencil survey instrument, the *Graduate Students and Graduate Education Survey* (GSGES), was developed from two existing surveys, the *Graduate School Climate Survey* (Report of the University of Texas, 2011) and *Graduate Student Satisfaction*

Survey (Oklahoma State University, 2012). Both surveys were considered relevant because they contain some elements or suggestions for examining the constructs in the present study, but were unacceptably lengthy. The GSGES contained five subscales. To measure the level of satisfaction, two 5-point response scales were developed. The first scale was designed to measure all six subscales using a Likert-style format where responses ranged from *none of the time* (1) to *all of the time* (5). The second scale measured an overall satisfaction scale using responses ranging between *not at all satisfied* (1) to *extremely satisfied* (5).

The faculty subscale has 17 items and is defined as faculty qualifications and concern. The students subscale, with 12 items, is defined as how graduate students interact with and help each other. Attitudes about the graduate programs of the students are measured in the program subscale (6 items). The services and resources provided by universities for graduate students are measured in the university subscale (12 items). The advisor subscale provides statements about the chair of the student's dissertation committee and the process of being guided through a graduate program (15 items). The diversity subscale is defined as the status of culturally diverse students attending graduate programs at the respondent's university (7 items). The dependent variable satisfaction was calculated from the five items in the satisfaction scale which included graduate education, advisor, teaching faculty, graduate experience, and other graduate students.

An expert panel and a pilot study were used to review the GSGES for validity, applicability, ease of use, and meaningfulness of the constructs measured. The panel comprised of five professional experts consisting of a psychometrician, statistician, graduate faculty member, student affairs official, and an assistant provost. The review by the panel indicated the constructs appeared to be adequately measured, and the items in each subscale of the GSGES corresponded with the construct. When agreement was reached among the experts on item placement, a pilot study was conducted using 15 graduate students. Students were asked to complete the survey and note items they did not understand, and ensure the protocol was easy to use and understand. Analysis of pilot data indicated there were a variety of responses across the respondents. No major problems were identified with one exception: a demographic question asking the location of participant's institution was misunderstood by some pilot study participants. Six participants provided the name of their institutions instead of the state in the United States. The question was removed as it was unnecessary in the statistical analysis used to answer the research questions.

A varimax rotation was used, and a Cronbach alpha was derived to establish internal consistency for the six proposed subscales of the GCGES. Reliability analysis was first run on the total GSGES scale, and negative-item-to-total-correlation indicated it was necessary to reverse

code items 16, 23, 26, 27, 59, and 62. The Cronbach alpha for the total GSGES scale was $\alpha = .96$ indicating that the total scale had a very high level of internal consistency and reliability. Psychometric properties of the GSGES show the reliability coefficients were moderate to high. A mean was calculated for each subscale and used in further analysis. Factor analysis of the five satisfaction items indicated there was one and only one scale and accounted for 62.1% of the variance. The calculated Cronbach alpha was $\alpha = .84$ for the satisfaction scale, and it was not necessary to reverse code any of the items. A mean was calculated from the items in the subscale and used in further analysis.

2.3 Procedure

Following Institutional Review Board approval, data were collected for five weeks. The flyer for soliciting participants was advertised for two days in the university daily newspaper at one research site and handed out to potential participants before or after classes at the other research site. The flyer contained an invitation to participate in the study, the purpose of study, criteria, and the researcher's contact information. Both paper/pencil and electronic surveys were used in the study to increase the chances of obtaining the required sample size. Participants completed a consent form for their involvement in the study prior to being able to access either form of the survey. The informed consent agreement and survey, as separate documents, were entered into a secure electronic survey web site at SurveyMonkey.com™.

An introductory letter with a link to the informed consent to participate was emailed to the potential electronic participants. Upon receipt of the consent agreement, the respondents who selected the "I accept the above terms" tick box included in the consent form received a confirmation letter for participation with a link to the survey. Only the respondents who provided online consent gained access to the survey instrument. For those who completed the paper/pencil version, two copies of the consent form were mailed to potential participants; one was retained by the participant, and one was signed and returned to the researcher. A survey was mailed to each consenting participant upon receipt of one signed consent form returned in a stamped pre-addressed envelope provided by the researcher.

2.4 Data Analysis

Once data from both sites were merged into one SPSS 19.0 sheet, surveys missing required data were marked and eliminated from the study. Psychometric properties of the GSGES were calculated which included factor and reliability analysis. Once data were assessed to ensure the assumptions of regression had been met, a stepwise multiple regression was used to answer the research questions posited.

3. RESULTS

Research question one asked how doctoral students' satisfaction is influenced by faculty, students, programs, university services, advisor, and diversity. Stepwise multiple regression was used to answer this question. Multicollinearity was acceptable as the VIF was less than 10.0 and the tolerance was less than 1.0 (Stevens, 2009).

Results of the regression analysis indicated there was a statistically significant 3-step model, [$R = .861$; $R^2 = .741$; $R^2_{adj} = .735$; $F(1, 127) = 15.043$, $p < .001$]. The model (Table 1) accounted for 74.2% of the variance in *satisfaction*. *Student satisfaction* was most influenced by *university services*, *advisor*, and *students* which accounted for 55.9%, 15.2%, and 3.1% of the variance respectively (Table 2).

Table 1
Satisfaction Model Stepwise Summary of GSGES Subscales

Model	R	R ²	R ² _{adj}	R ² _{chg}	F _{chg}	df	p
1	.748	.569	.555	.559	163.463	1, 129	< .001
2	.843	.711	.706	.152	67.181	1, 128	< .001
3	.861	.741	.735	.031	15.043	1, 120	< .001

Table 2
Satisfaction Coefficients Summary of GSGES Subscales

Model 3	B	β	t	p	Bivariate	Partial
University Services	.512	.438	7.774	< .001	.748	.568
Advisor	.429	.353	6.032	< .001	.716	.472
Students	.361	.235	3.878	< .001	.689	.325

The second research question sought to determine how participant satisfaction is influenced by participants' age, gender, ethnicity/race, academic discipline, and years in graduate school. In this study, ethnicity was measured as Hispanic or not Hispanic. Race included American Indian/Alaskan, Asian, African American, Native Hawaiian, White, and Hispanic. Academic discipline was the specific degree program the graduate student was taking, and years referred to the number of years the student had been working on the specific degree. Stepwise multiple regression was used to answer this question

with a probability level of $p \leq .05$. Multicollinearity was acceptable as the VIF was less than 10.0 and the tolerance less than 1.0 (Stevens, 2009).

Results of the regression analysis indicated there was a statistically significant 3-step model [$R = .762$; $R^2 = .541$; $R^2_{adj} = .570$; $F(1, 127) = 53.064$, $p < .001$]. The model (Table 3) accounted for 54.1% of the variance in *satisfaction*. The significant predictor variables were *years*, *ethnicity*, and *race* and accounted for 34%, 17.5%, and 6.6% of the variance, respectively (Table 4).

Table 3
Satisfaction Model Stepwise Summary of Descriptive Variables

Model	R	R ²	R ² _{adj}	R ² _{chg}	F _{chg}	df	p
1	.583	.340	.334	.340	66.327	1, 129	< .001
2	.637	.406	.396	.066	14.219	1, 128	< .001
3	.762	.581	.571	.175	53.064	1, 127	< .001

Table 4
Satisfaction Coefficients Summary of Descriptive Variables

Model 4	B	β	t	p	Bivariate	Partial
Years	-.308	-.530	-9.173	< .001	-.582	-.631
Race	.229	.494	7.473	< .001	.289	.553
Ethnicity	.229	.936	7.284	< .001	.2668	.543

4. DISCUSSION

The purpose of this study was to assess doctoral students' satisfaction with aspects of the campus environment. The goal was to identify predictors of doctoral student

satisfaction from demographics and attitudes concerning the campus environment. Results of the study indicate that doctoral satisfaction is influenced by both personal demographics and campus environment.

This study of factors influencing the satisfaction of doctoral students expands on previous student satisfaction research in higher education. The research questions presented in this study identified several areas for further discussion. When considering the influence on level of satisfaction of scores on the subscales of faculty, students, programs, university services, advisor, and diversity for a group of doctoral students, three significant predictor variables were found: university services, advisor, and students. There was no statistically significant correlation for faculty, programs, and diversity. Service quality influences student satisfaction (Hill & Epps, 2010; Marozzi, 2009; Najib, Yusof, & Osman, 2011), and the results of the present study support the findings of Jalali, Islam, and Ku Ariffin (2011) who reported that service quality is related and leads to customer satisfaction.

This study added to the professional field by focusing on doctoral students and identifying the services that predict doctoral student satisfaction using an instrument designed to measure graduate student experience. Results of this study indicate that even though service quality influences student satisfaction, not every aspect of institutional services predicts student satisfaction. The student-advisor relationship is an important component that contributes to predict doctoral student satisfaction. Thus, administrators need to consider ways to improve the quality of student–advisor relationships, as this study confirms previous findings that it can influence student satisfaction and plays a role in determining student outcomes (Barnes, Williams, & Archer, 2010; Jackson & Cleary, 2011; Zhao, Golde, and McCormick (2007). Leaders should constantly review institutional services for quality using students’ perception of their experiences.

Descriptive variables reported by participants also play a role in student satisfaction. Specifically, years in school, race, and ethnicity were also significant predictors, yet academic discipline, age group, and gender were not. Thus, there is evidence that students’ demographics influence their higher education expectations. These findings support those of Maton et al. (2011), who compared doctoral psychology students’ experiences and perspectives among four ethnic groups and found differences in their levels of satisfaction.

Other researchers found differences among undergraduate students on the level of satisfaction among ethnic/racial groups (Chavous, 2005; Edman & Brazil, 2009; Kelso, 2008; Phillips, 2005; Ruetzler, 2008). Kelso (2008) found significant differences based on a student’s age, gender, and ethnicity. Vaccaro (2010) and Grebennikov and Skaines (2009) also found that differences existed between male and female perceptions of the campus environment. Zhao et al. (2007) found that choice of advisor and advisor behavior influence doctoral student satisfaction, but the relationship varied by discipline. Further, significant differences in satisfaction were found by gender and age. In the present study,

even though there may be a relationship between age, gender, academic discipline and student satisfaction, the relationship was not strong enough to predict doctoral student satisfaction. Further research studies are required to investigate this inconsistency.

Years in graduate school influence satisfaction which supports Russo’s (2011) findings. Russo surveyed doctoral students across different disciplines and found that their level of satisfaction decreased with increasing years of study. The result was 76% satisfaction for the first year, 66.8% for the second year, and 61.3% for the third year. In the present study, years in graduate school was one of the predictors of doctoral student satisfaction. The variable was negatively correlated with satisfaction such that as years in graduate school increased, satisfaction decreased, and accounted for 34.0% of the variance in satisfaction. These results emphasize the need for periodic climate perception assessments across different groups in higher education. Further, administrators need to consider how best to migrate students through their doctoral program as efficiently as possible to avoid further decreases in student satisfaction should they be required to progress beyond the typical third year.

5. LIMITATIONS

Some limitations to the study should be noted, which provide avenues for future research. First, a quantitative-only methodology was used. Although this provides insight from a large number of participants, future studies need to consider a qualitative or mixed-method approach which may provide deeper insight into factors influencing doctoral student satisfaction. Second, a nonprobability purposive sampling technique was used in the study. Participants were chosen by volunteering. A sample of volunteers may have limited participation to individuals who were more motivated than the general population of study and volunteer sample biases might have been present in the study (Miller, Shoptaugh, & Parkerson, 2008). For example, participants may have been motivated specifically because of their satisfaction or dissatisfaction. Thus, future studies should consider using random sampling techniques or determine participants’ level of satisfaction during data collection. Third, data was collected from students in only two institutions in the New York City area. It would be interesting to determine whether such findings are consistent at institutions across the United States.

6. RECOMMENDATIONS AND IMPLICATIONS

6.1 Campus Environment

Existing studies on graduate student satisfaction are limited (Maton et al., 2011), and understanding the role

or influence of the campus environment on student satisfaction is important for higher education stakeholders. Research has demonstrated that students' satisfaction of the campus environment is linked to individual characteristics, including racial/ethnic background (Lopez del Puerto, 2009). As students experience their campus environment, they develop perceptions and these perceptions are influenced by the difference between service quality expectations and reality (Kelso, 2008). Student satisfaction changes with change in the environment. Thus, to increase student retention, higher education leaders should not only meet but exceed students' expectations.

Institutional leaders develop a campus environment by addressing different areas associated with the environment. Results of this study indicated that several campus environment factors predict student satisfaction. Findings may help higher education administrators and planners in developing a supportive campus environment for doctoral students. Developing an effective campus environment is the responsibility of all higher education stakeholders. Knowledge of student development theories enhances the understanding of how the college environment affects students and what should be done to improve students' college experiences. Torres, Howard-Hamilton, and Cooper (2003) posited that student development theories influence higher education officials' thinking and actions in various situations. Therefore, higher education officials need to participate in student development theory training that promotes understanding of student development. Acquiring such knowledge may enhance understanding of students' needs at different levels of development and promote a more welcoming and retaining environment.

6.2 Years in Doctoral Program

It is clear that doctoral students' level of study in part predicts their satisfaction. Higher education officials and planners should be conducting periodic student satisfaction assessments at different levels. Doctoral students' needs appear to change, and services must change with them. Administrators may start by conducting an inquiry on the needs of doctoral students at each stage of their program and use the data to better provide for their educational and developmental needs. These assessments could be used to assess the quality of services and better maintain or improve student satisfaction.

6.3 Multiculturalism

Promoting multiculturalism in higher education institutions is important. Based on this study, ethnicity and race are predictors of student environment; therefore, it is imperative that higher education officials actively promote diversity initiatives and make it part of their mission. Diversity agendas are important for student development (Maton et al., 2011; Pascarella & Terenzini, 2005), and higher education administrators should pay attention to what each group's needs are and provide for them.

6.4 Advisor-Student Relationship

Successful completion of a dissertation is required for graduating from a doctoral program, but it can be an obstacle to graduation (Blum, 2010). The quality of the advisor-student relationship influences the outcome (Barnes, Williams, & Archer, 2010; Jackson & Cleary, 2011; Zhao et al., 2007), and results of the present study support such findings, as the advisor was one factor predicting doctoral student satisfaction. It is interesting to note that as students progress in the program by year, their dissatisfaction increases. This could be due to the increasing pressures of successfully completing the dissertation, the progress of which can be heavily influenced by an advisor. Advisors play a key role in students' development, as they assume a variety of responsibilities for students' success (Peluso, Carleton, Richter, & Asmundson, 2011). Higher education administrators should consider providing doctoral students with several choices in the selection process to make sure that the interests of the student and that of the advisor are compatible. If the relationship is not positive, the process of changing advisors should be simple. Further, advisors should be receiving periodic training on dissertation requirements and methods of developing and maintaining a good advisor-student relationship.

6.5 Student-to-Student Relationships

The quality of relationships that exist among doctoral students also predict their satisfaction. Doctoral student curricula should include several opportunities for students to work together and learn from each other. Curriculum developers should consider including group activities and presentations in the program. Higher education administrators and planners should develop out-of-class social activities for doctoral students in recognition of the profound changes in identity and personal development stimulated by the pursuit of an advanced degree. Social activities may help in building social support networks among these students for sharing problems, seeking solutions, and developing valuable connections for future careers (Townsend et al., 2002).

Banta, Lund, Black, and Oblander (1996) discussed 10 principles of good practice in assessment which included the ongoing nature of assessment practices. Higher education officials should play a vital role in removing the barriers to student satisfaction by conducting periodic assessments on perceptions and responding to doctoral student expectations. These officials should continuously revise policies, practices, and procedures that interfere with satisfying doctoral students. The simple act of surveying doctoral student opinions regarding their level of satisfaction with campus environment is not enough. Leaders can use periodic assessments to maintain and increase enrollments by using the assessment information to improve service quality (Archambault, 2008). Administrators need to make improvements based on student feedback to improve student satisfaction.

CONCLUSION

The college environment affects student satisfaction and persistence (Cohen, 2011). Gardner (2009) reported doctoral students' attrition rates at 57% across disciplines. High attrition rates in graduate school lead to high costs for institutions, faculty, students, and society. Student demographics and level of study influence satisfaction and predictors of graduate student satisfaction differ from undergraduates (Peterson, 2011; Russo, 2011). Existing studies on graduate student satisfaction are limited (Maton et al., 2011), and learning more about the correlates of a supportive environment as perceived by doctoral students may be useful to institutional leaders wishing to improve the supportive environment for students and encourage persistence.

Our results indicated six statistically significant predictors of student satisfaction including university services, advisor, students, ethnicity, race, and years in graduate school. No statistically significant relationship was found for faculty, programs, diversity, age group, academic discipline, and gender. Although not all factors were statistically significant predictors of doctoral student satisfaction, all factors influenced doctoral student satisfaction to varying degrees. Results from this study suggest that the needs of different groups of doctoral students are not the same. Higher education administrators should learn best practices from higher-retention institutions on how to provide for the needs of each group of doctoral students to improve student satisfaction, persistence, and reduce attrition rates. Providing periodic assessments about doctoral students' expectations and perceptions of their campus environment, and responding to the feedback given by these students may be what a higher education institution needs for effective doctoral student development.

REFERENCES

- Abiddin, N. Z., & Ismail, A. (2009). Identification of resource needs in postgraduate studies. *Research Journal of Social Sciences, 4*, 33-44. Retrieved from <http://www.aensonline.com/rjss>
- Archambault, L. Z. (2008). *Measuring student satisfaction and its impact on student retention: Developing a combined model for use in private, post-secondary institutions* (Doctoral dissertation). Retrieved from Dissertations & Theses @ ProQuest database. (Publication No. 3340886).
- Astin, A. W. (1993). *Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education*. Phoenix, AZ: Oryx.
- Banta, T. W., Lund, J. P., Black, K. E., & Oblander, F. W. (1996). *Assessment in practice: Putting principles to work on campuses*. San Francisco, CA: Jossey-Bass.
- Barnes, B. J., Williams, E. A., & Archer, S. A. (2010). Characteristics that matter most: Doctoral students' perceptions of positive and negative advisor attributes. *NACADA Journal, 30*(1), 34-46. Retrieved from <http://www.nacada.ksu.edu/journal/index.htm>
- Barrick, R. K., Easterly III, R. G., & Rieger, M. W. (2011). Assessment of graduate student productivity and satisfaction. *NACTA Journal, 55*, 54-60. Retrieved from <http://www.nactateachers.org/journal.html>
- Blum, L. D. (2010). The "All-But-the-Dissertation" student and the psychology of the doctoral dissertation. *Journal of College Student Psychotherapy, 24*, 74-85. doi:10.1080/87568220903558554
- Bolton, F. (2006). Rubrics and adult learners: Andragogy and assessment. *Assessment Update, 18*, 5-7. Retrieved from [http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1536-0725/issues](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1536-0725/issues)
- Chatman, S. (2008). Campus climate and diversity: Checking differences. Paper presented at the annual meeting of the California association for institutional research, Pasadena, CA. Retrieved from <http://cshe.berkeley.edu/research/seru/docs/CampusClimateandDiversityCheckingDifferences.pdf>
- Chavous, T. M. (2005). An intergroup contact-theory framework for evaluating racial climate on predominantly White college campus. *American Journal of Community Psychology, 36*, 239-257. doi:10.1007/s10464-0058623-1
- Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155-159. doi:10.1037/0033-2909.112.1.155
- Cohen, S. M. (2011). Doctoral persistence and doctoral program completion among nurses. *Nursing Forum, 46*, 64-70. doi:10.1111/j.1744-6198.2011.00212.x
- Corneau, A. K. (2007). *Doctoral student social support and satisfaction with life* (Doctoral dissertation). Retrieved from Dissertations & Theses @ ProQuest database. (Publication No. 3320378).
- Craven, A. E. (1999). *Assessing the satisfaction of masters and doctoral student with their program in a college of education* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (Publication No. 9937302)
- Edman J. L., & Brazil, B. (2009). Perceptions of campus climate, academic efficacy and academic success among community college students: An ethnic comparison. *Social Psychology of Education, 12*, 371-383. doi:10.1007/s11218-008-9082-y
- Forbes, A. H. (2009). Retention of first year undergraduate students in the context of mass higher education: A new longitudinal interactionist model. *Journal of Hospitality & Tourism Education, 21*, 25-33. Retrieved from <http://scholarworks.umass.edu/jhte/>
- Franco-Zamudio, J. L. (2009). *Graduate student persistence: The effect of perceptions of person-environment fit* (Doctoral dissertation). Retrieved from Dissertation & Theses @ ProQuest database (Publication No. 3367714).
- Gardner, S. K. (2009). Student and faculty attributions of attrition in high and low-completing doctoral programs in the United States. *Higher Education, 58*, 97-112. doi:10.1007/s10734-008-9184-7
- Grasgreen, A. (2010, December). What makes grad students happy? *Inside Higher Ed*. Retrieved from <http://www.insidehighered.com/news/2010/12/07/cgs>

- Grebennikov, L., & Skaines, I. (2009). Gender and higher education experience: A case study. *Higher Education Research & Development*, 28, 71-84. doi:10.1080/07294360802444370
- Griffin, K. A., & Muñiz, M. M. (2011). The strategies and struggles of graduate diversity officers in the recruitment of doctoral students of color. *Equity & Excellence in Education*, 44, 57-76. doi:10.1080/10665684.2011.540961
- Hill, M. C., & Epps, K. K. (2010). The impact of physical classroom environment on student satisfaction and student evaluation of teaching in the university environment. *Academy of Educational Leadership Journal*, 14, 65-79. Retrieved from <http://www.alliedacademies.org>
- Jackson, D., & Cleary, M. (2011). Practical advice to support mid-career doctoral students in nursing: Some considerations for academic supervisors. *Contemporary Nurse*, 36, 171-179. doi:10.5172/conu.2011.38.1-2.171
- Jalali, A., Islam, A., & Ku Ariffin, K. H. (2011). Service satisfaction: The case of a higher learning institution in Malaysia. *International Education Studies*, 4, 182-192. Retrieved from <http://www.ccsenet.org/ies>
- Johnson, D. R., Soldner, M., Leonard, J. B., Alvarez, P., Inkelas, K. K., Rowan-Kenyon, H., & Longerbeam, S. (2007). Examining sense of belonging among first-year undergraduates from different racial/ethnic groups. *Journal of College Student Development*, 48, 525-542. Retrieved from <http://www.jcsdonline.org>
- Kelso, R. S. (2008). *Measuring undergraduate student perceptions of service quality in higher education* (Doctoral dissertation). Retrieved from Dissertations & Theses @ University of Phoenix database. (Publication No. AAT3347346).
- Kuh, G. D., Schuh, J. H., & Whitt, J. E. (1991). *Involving colleges: Successful approaches to fostering student learning and development outside the classroom*. San Francisco, CA: Jossey-Bass.
- Lopez del Puerto, C. (2009). *Relationship between the physical characteristics of higher educational facilities and student attitudes about their graduate school programs* (Doctoral dissertation). Retrieved from Dissertations & Theses @ ProQuest database. (Publication No. AAA3383214).
- Marrozi, M. (2009). A composite indicator dimension reduction procedure with application to university student satisfaction. *Statistica Neerlandica*, 63, 258-268. doi:10.1111/j.1467-9574.2009.00422.x
- Maton, K. I., Wimms, H. E., Grant, S. K., Wittig, M. A., Rogers, M. R., & Vasquez, M. J. T. (2011). Experiences and perspectives of African American, Latina/o, Asian American, and European American psychology graduate students: A national study. *Cultural Diversity and Ethnic Minority Psychology*, 17, 68-78. doi:10.1037/a0021668
- McClellan, G. S. & Stringer, J. (2009). *The handbook of student affairs administration* (3rd ed.). San Francisco, CA: Jossey-Bass.
- Miller, A., Shoptaugh, C., & Parkerson, A. (2008). Under reporting of cheating in research using volunteer college students. *College Student Journal*, 42, 326-339. Retrieved from <http://www.projectinnovation.biz/collegestudentjournal>
- Morris, P. V., & McClure, M. D. (2011). The assessment of changes in intercultural sensitivity among undergrad students in the college of agriculture: Measurement over three semesters. *International Journal of Diversity in organizations, communities, & Nations*, 10(6), 169-181. Retrieved from <http://ijd.cgpublisher.com/>
- Najib, N. M., Yusof, N., & Osman, Z. (2011). The relationship between students' socio-economic backgrounds and student residential satisfaction. *World Academy of Science, Engineering, & Technology*, 80, 1200-1205. Retrieved from <http://www.waset.org>
- Oklahoma State University. (2012). Graduate student satisfaction survey. Retrieved from www.uat.okstate.edu/assessment/surveys
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Peluso, D. L., Carleton, R. N., Richter, A. A., & Asmundson, G. J. G. (2011). The graduate advising relationship in Canadian psychology programmes: Advisee perspectives. *Canadian Psychology*, 52, 29-40. doi:10.1037/a0022047
- Peterson, D. K. (2011). Help, I want to know what my MBA students want: A study of French MBA students. *International Journal of Business & Management*, 6, 3-15. Retrieved from www.ccsenet.org/ijbm
- Petroff, L. (2011). The politics of graduate school. *National Social Science Journal*, 35, 133-138. Retrieved from <http://www.nssa.us/journals.htm>
- Phillips, C. D. (2005). A comparison between African American and white students enrolled in an equal opportunity program on predominantly white college campuses: Perceptions of the campus environment. *College Student Journal*, 39, 298-306. Retrieved from <http://www.projectinnovation.biz/cs.html>
- Report of the University of Texas at Austin Graduate School climate study. (2011). Retrieved from www.utexas.edu/ogs/about/climatestudy/
- Ruetzler, T. (2008). Food, beverage, and service quality: Does culture impact satisfaction with university food services? *Journal of Culinary Science & Technology*, 6, 308-324. doi:10.1080/15428050802523552
- Russo, G. (2011). Graduate students: Aspirations and anxieties. *Nature*, 475, 533-535. doi:10.1038/nj7357-533a
- Said, N. M., Rogayah, J., & Hafizah, A. (2009). A study of learning environment in the Kulliyah (faculty) of nursing, international Islamic university Malaysia. *Malaysian Journal of Medical Sciences*, 16, 11-20. Retrieved from <http://www.mjms.usm.my/>
- Stevens, J. (2009). *Applied multivariate statistics for the social sciences* (5th ed.). London, UK: Routledge Academic.

- Sum, V., McCaskey, S. J., & Kyeyune, C. (2010). A survey research of satisfaction levels of graduate students enrolled in a nationally ranked top-10 program at a mid-western university. *Research in Higher Education Journal*, 7, 1-17. Retrieved from <http://www.aabri.com/rhej.html>
- Torres, V., Howard-Hamilton, M. F., & Cooper, D. L. (2003). *Identity development of diverse populations: Implications for teaching and administration in higher education*. San Francisco, CA: Jossey-Bass.
- Townsend, E., Campbell, C., Curran-Smith, J., McGinn, F., Persaud, D., Peters, P., ...Sheffield, S. L. (2002). Accessibility and interactivity in distance education programmes for health professions. *Journal of Distance Education*, 17, 1-24. Retrieved from <http://www.jofde.ca/index.php/jde>
- Vaccaro, A. (2010). What lies beneath seemingly positive campus climate results: Institutional sexism, racism, and male hostility toward equity initiatives and liberal bias. *Equity & Excellence in Education*, 43, 202-215. doi:10.1080/10665680903520231
- Veenstra, C. P. (2009). A strategy for improving freshman college retention. *Journal for Quality & Participation*, 31, 19-23. Retrieved from <http://asq.org/pub/jqp/>
- Vogt, P. W. (2007). *Quantitative research methods for professionals*. Boston, MA: Allyn and Bacon.
- Zhao, C., Golde, C. M., & McCormick, A. C. (2007). More than a signature: How advisor choice and advisor behavior affect doctoral student satisfaction. *Journal of Further and Higher Education*, 31, 263-281. doi:10.1080/03098770701424983