

**EXAMINING THE PREDICTIVE VALIDITY OF GRE
SCORES ON DOCTORAL EDUCATION: STUDENTS'
SUCCESS AND METHODOLOGY CHOICES IN THE
DISSERTATION PROCESS**

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ABSTRACT

This study examines how GRE scores can be used to better understand Education doctoral candidates' methodology choices for the dissertation as well as their persistence behaviors. Candidates' of one online doctoral education program were examined. Results of a MANOVA suggested that there is no difference in GRE scores based on doctoral candidates' choice of methodology. Although GRE scores did not differ based on methodology choice, results of the regression analysis indicated that the linear combination of candidates' verbal reasoning scores, quantitative reasoning scores, writing scores, and methodology choices accounted for significant variability in the number of semesters it took for them to complete their dissertations. The GRE writing score and methodology choice were the strongest predictors of time to completion.

Statistics over the last 4 decades consistently reveal that 40% to 60% of individuals beginning doctoral degrees fail to persist to completion (Berelson, 1960; Bowen & Rudenstine, 1992; Council of Graduate Schools Ph.D. Completion

Project, 2008). In doctoral programs in education, attrition rates are reported to be as high as 70% (Nettles & Millet, 2006). Further, time-to-degree completion rates for doctoral students enrolled in education programs are longer than rates for doctoral students in all other fields (National Science Foundation [NSF], 2009). Education students also ranked lowest in doctoral student presentations and publications when compared to students in other disciplines (Nettles & Millet, 2006).

While doctoral attrition occurs at all stages of the doctoral journey (i.e., coursework, comprehensive exam, dissertation), candidates in education programs commonly cite the dissertation as the most challenging stage in the process (Spaulding & Szapkiw, 2012). One reason is that the dissertation phase is qualitatively different than the coursework stage given the self-directed nature of the process. Further, the literature suggests that a range of personal attributes are positively associated with persistence, including intelligence, Graduate Record Examination (GRE) scores, Grade Point Average (GPA), intelligence, learning style, and admission interview performance (Lovitts, 2005). Given the challenges associated with dissertation completion, and the time and resources students and institutions expend in the process (Wao, 2010), gauging at the entry stage (i.e., admissions) whether students have the potential to complete a dissertation is vital.

As the length of time it takes doctoral candidates to complete the program is a concern for institutions financially and students both emotionally and financially (Wao, 2010), this study sought to examine the ability of GRE subtest scores as well as other factors to predict length of time in the dissertation process for students in a doctoral program in education. This study also examined how GRE scores affect dissertation methodology choice; thus, understanding how GRE subtest scores can be used to better understand and prepare students for the dissertation process. This knowledge is helpful in selecting students for admittance and preparing them for the dissertation process, and thus, increasing completion rates (Smallwood, 2004).

THEORETICAL FRAMEWORK

As this study is concerned with Education doctoral students' aptitude as related to the completion of the dissertation and, ultimately, the doctoral program, Tinto's (1993) model of persistence serves as the theoretical framework underpinning for this study. Tinto (1993, 2006) purported that students enter higher education institutions with a variety of attributes and experiences. These attributes and experiences result in expectations about the institution at the time of admission and affect the level of social and academic interaction during the program, thus, the commitment to the institution and persistence through the program. In other words, the outcome of doctoral completion may be related to students' attributes, experiences, admission expectations, and integration. Student's attributes refers to a variety of characteristics including student's aptitude.

Tinto (1993) acknowledged the need for discipline specific research on persistence to inform institutional policy and curriculum. This includes research on the doctoral education processes to inform admission policy and course development to subsequently increase completion rates.

LITERATURE REVIEW

Colleges and universities in the United States use a wide range of quantitative measures and secondary qualitative factors to evaluate students as potential candidates to admit into their programs and to predict their ability to succeed in the program. GRE scores are used as a primary admission criterion for doctoral programs across disciplines (Feeley, Williams, & Wise, 2005; Malone, Nelson, & Nelson, 2004; Olson, Meyers, & Wilkum, 2003).

The Predictive Ability of the GRE

Interestingly, the research has rendered mixed results in terms of the effectiveness of GRE scores, including the sub-scales, as predictors of graduate school success. Some studies conclude the scores are inadequate predictors of graduate student performance (Feeley et al., 2005; House, 1998; Milner, McNeil, & King, 1984; Rubio, Rubin, & Brennan, 2003; Stack & Kelley, 2002; Sternberg & Williams, 1997), while others suggest their use is worthwhile (Kuncel, Hezlett, & Ones, 2001; Kuncel, Wee, Serafin, & Hezlett, 2010; Lancholm & Schrader, 1951; Stock, Finegan, & Siegfried, 2009; Wao, 2010). Much of this literature has focused on studies involving graduate school students in general. A review of the literature rendered minimal results pertaining to doctoral admissions and success in the doctoral program.

Kuncel, Hezlett, and Ones (2001) performed a meta-analysis that examined that ability of the GRE and undergraduate GPA to predict student performance in graduate school. Over 1,500 studies were included in this meta-analysis and differentiation between masters and doctoral programs was not made. This study, at the time, was unique in that it looked at GRE validity for multiple disciplines and used multiple criterion measures, to include: Graduate Grade Point Average (GGPA), 1st-year GGPA, comprehensive exam scores, faculty ratings, number of publications or conference papers, numbers of times those publications were cited, degree attainment, and time to degree attainment. GRE scores were found to be valid predictors of all performance measures; however, the positive correlation between GRE scores and time to degree attainment was low. Empirically synthesizing the previous study's findings and further examining if GRE scores predict performance of students in both master's and doctoral programs, Kuncel, Wee, Serafin, and Hezlett (2010) conducted a meta-analysis of 100 studies and 10,000 students. Both GRE-V and GRE-Q were found to be

valid predictors of GGPA and 1st-year GGPA in both programs. The researchers opined the GRE was an effective tool for admission decision making.

A few studies have focused on the predictive validity of GRE scores in doctoral programs across disciplines. As aforementioned, results are inconsistent. In a study of 70 doctoral criminology and criminal justice students from 1991 to 2000, Lightfoot and Doerner (2008) found that doctoral students with lower GRE scores typically took longer to graduate. However, students with lower GRE scores were more likely to complete the program than those with higher scores. This potential contradiction led them to determine “the effectiveness of the GRE as a predictor of graduate school success continues to be disputed” (p. 116). Stock, Siedgried, and Finegan (2011) examined Economics Ph.D. students and noted their quantitative GRE (GRE-Q) scores were related to the probability of degree completion. They further found that relatively few students completed in less than 5 years, thus concluding that GRE scores were a better indicator of whether a student completed the program than when. In the discipline of communication, GRE scores were not related to success factors. Feeley, Williams, and Wise (2005) studied 48 Communication Ph.D. students during between 1990 to 2000. Their GRE verbal scores (GRE-V) were not significantly related to GPA, and overall GRE scores were not significantly related to degree attainment. Katz, Chow, Motzer, and Woods (2009) found similar results when looking at GRE subtest scores’ ability to predict student success in a Ph.D. nursing graduate program ($N=31$). There were no significant correlations between any GRE subtest scores or total score and students’ GPA.

In the discipline of education, some evidence exists to support the use of the GRE as an effective predictor of doctoral student success. In a survey of 168 Ed.D. students, 16 students never began the program, 66 graduated, and 54 dropped out. An analysis showed that students who completed the program had higher MPGA, GRE-V, GRE-A, and total GPA scores while the non-graduates had higher UGPA and higher GRE-Q scores (Malone et al., 2004).

The literature most commonly examines GRE scores as primary predictors of two principal measures of academic success, grade point averages (GPAs) and completion. A brief review of each study leads to the general conclusion that GRE scores ability to predict these two principal variables is inconsistent. This review also demonstrates the lack of relevant literature pertaining to this topic and examination of criterion factors beyond the two aforementioned. Studies that focus specifically on doctoral education students are limited, and, after a thorough literature search, no studies that examined the ability of GRE scores to predict methodology choices in the dissertation process, and, thus, inform curriculum and training were identified.

Program Evaluation

Standards set forth by accrediting bodies result in doctoral education programs’ need for continual program evaluation. Specifically, institutions accredited by the

National Council for the Accreditation of Teacher Education (NCATE, 2012) are required to develop assessment systems that continually monitor program effectiveness. Through program evaluation, education administrators and faculty ensure that they are effectively serving doctoral students; that is, effectively preparing students with the skills and knowledge needed to successfully complete the doctoral program and enter the field as competent scholars. Program evaluation involves identifying outcome measures. It involves a focus on the educational processes and the preparedness of students to be successful in each doctoral program stage, including the course work, the comprehensive exam, and the dissertation process. Completing and defending the dissertation, which requires the candidate to work independently and do original research contributing to a field of study, is one of the primary measures used to determine if a student is successful in a doctoral program (Kuncel et al., 2010). Determining the likelihood that a student will be successful in completing the dissertation should begin at the admissions process.

Admissions Criteria

Identifying admissions criteria that accurately forecast doctoral student success is central to not only the selection of students best suited for attainment of the goal, but for the long-term benefit of the program by allowing it to not only consistently produce high quality candidates, but also inform the appropriate instructional strategies to better support doctoral students in the completion of their program.

In a survey study of 957 colleges and universities, national standardized examination scores were ranked as one of the most important factors for an admission decision (Breland, Maxey, Gernand, Cumming, & Trapani, 2002). The rationale for using a national standardized exam such as the GRE score as an admission criterion into graduate study is related to the research that suggests that the scores can predict achievement (Kuncel et al., 2010; Rubio et al., 2003). GRE scores have been shown to predict first year graduate program GPA, program GPA, and faculty evaluation of doctoral students (Kuncel et al., 2010). Some studies suggest that GRE scores can be used to predict graduate program completion (Ferrer de Valero, 2001). More research, however, is needed to examine how GRE scores can be used to predict other aspects of doctoral candidates' performance and inform curriculum development (Kuncel et al., 2010).

PURPOSE STATEMENT

The influence of selecting the students with the best chance of success and using curriculum and programming to improve persistence is vital given the amount of resources that are put into a doctoral student and the current statistics

on doctoral student attrition. Currently less than half of all students admitted are successful (Wao, 2010) and the time to degree is increasing (Lightfoot & Doerner, 2008). This is even more impacting in the field of education, given education doctorates have consistently had the longest time to degree compared to other fields (NSF, 2009). Therefore, it is in a university's best interest, to devise a method of maximizing the probability that students selected for admission have the best possibility of success. Wao (2010) noted that even in the studies that validated GRE scores as a critical part of the admission decision, they were focused on "whether students completed the doctorate rather than when the doctorate is completed" (p. 229). Additionally, literature on the use of GRE scores to inform faculty and administrators understanding of students in the doctoral program and their choices during the dissertation process that can influence their completion is absent. Previous research and the lack thereof warrants the need for further research to determine the relationship between GRE scores, time to completion, and methodology choice students make in the dissertation process.

Accordingly, the present study examined the following research questions: (a) can verbal reasoning scores, quantitative reasoning scores, writing scores, and dissertation methodology choices predict the number of semesters doctoral candidates take to complete the dissertation process? and (b) is there a difference in GRE scores based on a doctoral candidates' choice of methodology (qualitative or quantitative)?

METHODS

Participants and Setting

The university where the study was conducted is a private, co-educational, accredited institution offering more than 230 programs of study, including undergraduate, graduate, and doctoral programs, offered in residential, online, or blended options. The data collected for this study was archival data from doctoral candidates enrolled in the Doctor of Education (Ed.D.) program specializing in one of two concentrations: Educational Leadership or Curriculum and Instruction (formerly Teaching and Learning). The 60-hour degree completion plan for each concentration includes 12 hours of leadership core courses, 12 hours of research and evaluation core courses, 24 hours of concentration area courses, and 12 dissertation hours. The program uses a blended option requiring one course from each of the aforementioned sections to be done in residence while the remainder of the courses are completed online. Admission requirements for the program included the submission of the graduate application, official college transcripts, with a minimum 3.0 GPA from a regionally or nationally accredited undergraduate degree program, recommendations, and a vita. Applicants were also required to submit evidence of a 900 minimum GRE combined quantitative

and verbal score, and a 4.0 or better on the analytical writing section, or a Miller Analogies Test (MAT) score report. The study sample consisted of candidates who entered the doctoral program between 2005-2011 and the dissertation process between January 2007 and May 2011. The data set included information for 497 candidates. Individuals who took the MAT were excluded from the analysis as well as individuals for whom information about their dissertation methodology (qualitative/quantitative) was not available. Thus, information was analyzed for 307 candidates. Candidates ranged in age from 25 to 69. One hundred and eighty students did not provide the university with information about their age. Five (1.6%) reported being between the ages of 20 and 29, 31 (10.1%) reported being between the ages of 30 and 39, 47 (15.3%) reported being between the ages of 40 and 49, 30 (9.8%) reported being between the ages of 50 and 59, and 10 (3.3%) reported being between the ages of 60 and 69. The candidates were predominately Caucasian ($n = 244$, 79.5%). Twenty-seven (8.8%) were African American, four (1.3%) were Asian, two (.7%) were Latino, and one (.3%) was American Indian. Twenty-eight candidates chose not to report their ethnicity to the university. Gender data was not available.

Instrumentation

The GRE General tests measure verbal and quantitative reasoning, critical thinking, and analytical writing abilities (ETS, 2008). GRE-V assesses the ability to analyze and evaluate written material, identify and recognize relationships between words and concepts. GRE-Q assesses basic mathematical skills, elementary mathematical concepts, and the ability to quantitatively reason and solve problems. The Analytical Writing section assesses critical thinking and analytical writing skills. The exam is administered in computer format only in the United States and Canada, but offered paper-based in areas of the world where computer-based testing is not possible. The computer based version is adaptive, in that the questions vary based on the test taker's ability. The Verbal and Quantitative scores range from 200 to 800, with the higher score indicating higher aptitude. In the Analytical Writing section, each of the two essays is scored by two individuals using a 6-point holistic scale. If the scores differ by more than 1 point, a third scorer is involved; if not, the two scores are averaged and submitted as a single score. While the GRE, as in any single test, cannot definitively predict success in any future endeavor, the reliability of the analytical writing scores is estimated at .72 and the subject tests are intended to have a reliability coefficient of at least .90. The Educational Testing Service does consider the GRE an appropriate criterion for graduate school admission selection decisions.

Procedures

Once institutional IRB approval was granted, we requested that the assessment coordinator for the School of Education provide us with archival data, via

an Excel spread sheet, for doctoral students enrolled in the Doctor of Education program from 2005-2011 and participating in the dissertation process between 2007 and 2011. Demographic data, GRE subtest scores, number of semesters enrolled in the dissertation course, and dissertation methodology were requested. The data was provided with all identifying student information removed.

Research Design and Analysis

Two research questions were examined in this study. A correlation research design utilizing a standard multiple regression analysis was used to determine if the linear combination of candidates' verbal reasoning scores, quantitative reasoning scores, writing scores, and methodology choice predicted the number of semesters it takes a candidate to complete the dissertation.

A causal-comparative design using a one-way multivariate analysis of variance (MANOVA) was used to determine if a difference existed in the verbal reasoning and quantitative reasoning scores based on candidates' dissertation methodology choice (qualitative or quantitative), and an analysis of variance (ANOVA) was used to examine if a difference existed in the GRE writing scores based on candidates' dissertation methodology choice (qualitative or quantitative). Assumption testing was completed for all analyses, and results of the analyses are reported in the next section. An alpha level of .05 was used to determine significance. Effect size was calculated and interpreted based on Cohen's (1988) conventions.

RESULTS

Of the 307 candidates under study, 123 had completed their dissertations. On average, it took candidates 5.62 ($SD = 3.06$) semesters to complete their dissertation. Candidates who conducted qualitative research ($M = 7.00$, $SD = 3.85$, $n = 20$) took significantly longer to complete their dissertations than candidates who conducted quantitative research ($M = 5.35$, $SD = 2.82$, $n = 103$) for their dissertations. All 123 candidates submitted verbal reasoning scores and quantitative reasoning scores; only 74 candidates submitted writing scores.

A standard multiple regression analysis was used to evaluate the null hypothesis that the linear combination of candidates' verbal reasoning scores, quantitative reasoning scores, writing scores, and methodology choices does not predict the number of semesters it takes them to complete their dissertations. A preliminary analysis using normal probability plots of residuals and scatter diagrams of residuals versus predicted residuals was conducted to ensure no gross violations of the assumptions of normality. An analysis of the intercorrelation among variables was used to evaluate the assumption of no multicollinearity; the assumption of no multicollinearity was tenable. Box plots were used to evaluate the assumption of no extreme outliers; the assumption was tenable. No other violations of assumptions were detected.

Results of the regression analysis yielded that the linear combination of candidates' verbal reasoning scores, quantitative reasoning scores, writing scores, and methodology choices accounted for significant variability in the number of semesters it took for candidates to complete their dissertations, $R^2 = .22$, $F(4, 69) = 4.84$, $p < .01$. Since the sample size is smaller, the R-square value can be an over-estimation of the true population value, as such adjusted R-square is reported, $adj R^2 = .18$, as it may be a better estimation of the true population value (Tabachnick & Fidell, 2007). The multiple correlation coefficient was .48.

The writing score ($M = 4.51$, $SD = .72$, $t(72) = -2.58$, $p = .012$) and method ($t(72) = 2.27$, $p = .026$) made significant contributions to the prediction of the criterion variable ($M = 5.61$, $SD = 3.19$). The choice of methodology made the strongest unique contribution to the predictor variable, when variance explained by all other variables is controlled (see Table 1). Verbal reasoning ($M = 487.70$, $SD = 69.79$, $t(72) = .94$, $p = .35$) and quantitative reasoning ($M = 569.05$, $SD = 110.46$, $t(72) = 1.03$, $p = .31$) did not significantly contribute to the prediction of the number of semesters it took to complete the dissertation process. Table 2 shows the bivariate, partial, and beta correlations of the predictor variables with number of semesters to complete the dissertation.

Table 1. Descriptive Statistics on Dependent Variables Disaggregated by Group ($N = 307$)

Variable	Quantitative ($n = 222$)		Qualitative ($n = 85$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Verbal	483.33	81.02	491.88	81.46
Quantitative	544.50	107.58	528.47	92.60

Table 2. Contributions of Predictor Variables ($N = 74$)

Variable	Zero-order <i>r</i>	Partial <i>r</i>	B	SE B	B
Verbal reasoning	.14	.12	.12	.005	.005
Quantitative reasoning	.03	.08	.07	.003	.003
Writing score	-.27*	-.26*	-.24	.49	-1.26
Methodology	.39*	.38*	.36	.92	2.08

* $p < .05$.

A MANOVA was conducted to analyze the difference in the linear combination of the verbal reasoning and quantitative reasoning scores based on candidates' dissertation methodology. The mean and standard deviation of the sample ($N = 307$) for verbal reasoning and quantitative reasoning are $M = 485.70$, $SD = 81.10$; $M = 540.07$, $SD = 103.75$. The mean and standard deviation of the sample ($N = 188$) for analytical writing is $M = 4.49$, $SD = .70$. The intercorrelation among variables is reported in Table 3.

Preliminary assumption testing revealed satisfactory results. The descriptive statistics disaggregated by group are reported in Table 1.

The mean verbal reasoning scores for the candidates who choose to conduct qualitative research for their dissertations were higher than the mean verbal reasoning scores of candidates who choose to conduct quantitative research for their dissertations. Those conducting quantitative research had higher quantitative reasoning scores than those conducting qualitative research. Results for the MANOVA, however, yielded no statistically significant difference between the two groups on the combined dependent variables, Wilks' lambda = .99, $F(2, 304) = 1.4$, $p = .25$, partial $\eta^2 = .01$. An ANOVA was used to analyze the difference in GRE writing scores based on methodology choice for dissertation. An ANOVA was chosen as a more robust analysis over a t test due to the unequal sizes of the groups being compared and a slight violation of normality. Results of the ANOVA were not significant, $F(1) = .11$, $p = .74$. The candidates who choose to conduct qualitative research ($M = 4.46$, $SD = .68$, $n = 54$) on average did not score statistically significantly different on the GRE writing exam than candidates who choose to conduct quantitative research ($M = 4.50$, $SD = .71$, $n = 154$).

DISCUSSION

The effectiveness of a doctoral program is gauged by various measures, with the capstone being students' completion of the dissertation. Assessing students' potential in the dissertation process and choices they may make in terms of their methodology begins at the time of admission. Thus, this study examined

Table 3. Intercorrelation among Variables

	Quantitative reasoning	Analytical writing
Verbal reasoning	.26**	.10**
Quantitative reasoning		.10

** $p < .01$.

how admissions criteria, specifically GRE scores, could be used to inform faculty about methodology choices for the dissertation as well as their ability to predict time to complete the dissertation.

Results suggest that there is no difference in GRE scores based on a doctoral candidates' choice of methodology for the dissertation. This suggests that doctoral candidates do not necessarily choose their methodology based on their aptitude of quantitative reasoning, verbal, or writing strengths. Students are allowing other factors to guide their methodology choice, including philosophical assumptions and empirical literature. However, each aptitude serves an important function in the dissertation process. Quantitative aptitude is clearly relevant during the dissertation process as it is important for critical evaluation of the literature and research planning. As a dissertation requires the writing of a manuscript between 100 and 200 pages, and sometimes longer, writing skills are critical. Additionally, verbal communication is vital to navigating communication with the dissertation committee and oral defenses. Thus, as faculty develop doctoral curriculum, it is important to focus improving skills and aptitude in all three areas so that students are well equipped to pursue either methodology as the literature guides.

Although GRE scores did not differ based on methodology choice, results of the regression analysis indicate that the linear combination of candidates' verbal reasoning scores, quantitative reasoning scores, writing scores, and methodology choices accounted for significant variability in the number of semesters it took for candidates to complete their dissertations. The GRE writing score and methodology choice were significant and thus the strongest predictors of the criterion variable. The beta coefficient for methodology was .36, which was greater than the beta coefficient of -.24 for GRE writing scores. Thus, methodology is a slightly stronger predictor of the time it takes to complete the dissertation. Choosing to conduct a quantitative dissertation was related to finishing the dissertation in a shorter amount of time. This finding is consistent with researcher's assumption that qualitative research typically requires more time to design, execute, analyze, and report than quantitative (Savenye & Robinson, 2004); however, it is not consistent with past research that has demonstrated that no difference exists between time to degree based on the choice to conduct a quantitative and qualitative design for dissertation (Tierce, 2008, p. 80). Tierce even noted that Ed.D. quantitative candidates took 6 months longer than Ed.D. qualitative candidates to complete their dissertations (p. 81).

As the beta coefficient for GRE writing scores was negative, this indicates that as writing aptitude decreases, length of time in the program increases. Because the dissertation requires a significant amount of scholarly writing, this is not surprising. The association between GRE writing scores and degree completion is a relatively untested relationship. Kuncel et al. (2010) specifically omitted it from their meta-analytic investigation because the writing exam was "sufficiently new" and "relatively few studies have examined its validity" (p. 344). Verbal reasoning scores and quantitative reasoning scores did not significantly contribute

to the prediction of the number of semesters it took to complete the dissertation process. These findings are consistent with the previous studies that indicated insufficient predictive validity of GRE-V and GRE-Q on doctoral students' completion. Woa (2008) demonstrated "no evidence that GRE verbal scores were statistically significant related to the timing of the doctorate attainment" (p. 111). Furthermore, "there was no sufficient evidence indicating that the timing of doctorate attainment was statistically related to the GRE quantitative score" (p. 112). Strayhorn (2005) also purported that the GRE verbal score was not related to doctorate attainment.

The findings of the regression study do not suggest that faculty should guide students to conducting only quantitative dissertations as both methodologies provide unique contributions to the field and are needed. What should be recognized is that a student who chooses qualitative studies and has a low GRE writing score may be at greater risk for non-completion. The findings of the present study also suggest that programs that do not include the GRE writing test as an admissions requirement may want to include it as a criteria. Integrating remedial writing course requirements for those with lower writing scores is recommended. Based on the results of this study, less weight to GRE-V and GRE-Q scores may want to be given in program's admission criteria.

LIMITATIONS AND FUTURE RESEARCH

The present study was limited to a sample from one university in the eastern United States. Further, the sample under study was predominately Caucasian (79.5%) and the doctoral program, while blended, included the majority of the course work completed online. The dissertation process was completed entirely online. Findings may not be generalizable to other institution populations. Institutions should conduct institution specific research to inform their policies and curriculum; this is especially true if the institution has a diverse population or has a residential-only program. With a more diverse sample, analysis could also determine if results differ based on ethnicity and gender.

The predictor variables in this study were limited in scope. Other variables may predict or influence time to complete a dissertation needs to be considered. These variables were not considered in this study. Drawing from Tinto's model, these factors may include level of social integration and academic integration. Other personal attributes may also be considered (e.g., stressors, family, marital status). The impact a blended program has on the relationship and familiarity between the candidate and the dissertation chair and whether that impacts the length of time to dissertation completion should also be studied. Additionally, the specific factors that influence methodology choice may also be investigated via interviews and qualitative analysis.

One evaluative measure at one specific time in the doctoral process was evaluated in this study. As Tinto (1993) suggests, factors that influence completion differ based on stage in the program. The ability of the GRE tests to predict completion and success in various stages of the doctoral process would extend the current study. Further research should also examine additional measurements of success such as professional presentations and publications.

CONCLUSION

The ability of the GRE to either accurately predict doctoral attainment or dissertation methodology choice remains inexact. While the goal of identifying reliable predictors is valid given the amount of resources an institution invests in doctoral students and the low historical percentage of completion, this study confirmed previous work that identifying a single criterion to base admission decisions on is probably unrealistic and unwise. While the GRE scores do not appear to be indicative of methodology choice and there is no direct, reliable relationship between the scores and ultimate success, the aptitudes they indicate are necessary for successful completion and they should continue to be used to inform admissions decisions.

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