ENROLLMENT IN DISTANCE EDUCATION CLASSES IS ASSOCIATED WITH FEWER ENROLLMENT GAPS AMONG NONTRADITIONAL UNDERGRADUATE STUDENTS IN THE US

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ABSTRACT

The purpose of this research is to determine whether nontraditional undergraduate students in the US who enroll in distance education classes are less likely to have an enrollment gap (enrollment gap=part year enrollment). Previous research has shown that preference for distance education classes is significantly greater among nontraditional than among traditional undergraduate students; nontraditional students invariably have a greater number of competing demands (work and family) on their time. Since distance education courses provide students with more convenient and flexible class schedules, nontraditional students, who have time or location constraints that prevent them from enrolling in face-to-face classes during a semester or quarter, may be more likely to enroll in distance education classes in order to stay enrolled for the entire academic year. Based upon this rationale, we predicted that enrollment in distance education classes is significantly related to a decreased likelihood of an enrollment gap among nontraditional students. To test this prediction, we used data from the National Postsecondary Student Aid Survey (NPSAS) conducted in 2008. The NPSAS 2008 used a complex survey design to collect data from a nationally representative sample of about 113,500 postsecondary undergraduate students in the US. Results confirm our prediction, and show that enrollment in distance education is significantly related to a decreased likelihood of an enrollment gap among nontraditional students, but not among traditional students. Results also show that five of the seven dropout risk factors (identified by previous research to decrease 6-year graduation rates) are each significantly associated with an increased likelihood of an enrollment gap. These results suggest that the offer of distance education classes could increase degree progress and possibly completion rates for nontraditional undergraduates who are at high risk for dropout.

KEYWORDS

distance education, enrollment gap, student satisfaction, independent students, dependent students

I. INTRODUCTION

Previous research has shown that nontraditional undergraduate students are more likely than traditional students to have time and location constraints that conflict with their schoolwork, and thus have higher rates of degree non-completion and take longer to complete their degree [1, 2]. Because of greater time and location constraints experienced by nontraditional students, researchers predicted that preference for distance education would be greater among non-traditional students than among traditional students; this

prediction was confirmed by empirical analyses of data from the 2004 National Postsecondary Students Aid Survey (NPSAS) [3]. The principal purpose of this research is to examine whether enrollment in distance education classes is associated with a lower probability of an enrollment gap (an enrollment gap indicates a part year enrollment) among nontraditional students in the US.

II. DISTANCE EDUCATION AND STUDENT ATTRITION

Previous research has shown that students enrolled in distance education classes have higher dropout rates than students enrolled in face-to-face classes [4-9]. For example at a large Southeastern University, the College of Business had an average undergraduate drop rate of 9% across all face-to face course sections offered in Spring 2008 but a drop rate of 23.2% across all online sections offered that semester [10]. Previous research has suggested that the dropout rate from distance education classes may be higher because students who enroll in distance education classes have more dropout risk factors [3]. Since distance education classes have high drop out rates, researchers have attempted to identify interventions that increase distance education course completion rates. Thus, previous research showed that face-to-face course orientations before commencement of distance education instruction increases course completion rates [5, 10]. Other researchers have shown that the use of hybrid courses (with both distance education and face-to-face components) have higher course completion rates than distance education classes with no face-to-face component [11]. More recent research showed that the gap in attrition rates between distance education and face-to-face courses decreased between 2001 and 2006 [6]. Many asynchronous learning programs that use the Sloan-C quality framework achieve very high course retention rates – higher than comparable face-to-face courses [12-19]. There does not appear to be any research that has investigated whether enrollment in distance education classes reduces the likelihood of an enrollment gap, particularly among students who are at high risk for dropout. The purpose of this research is to address this gap in the literature. It investigates whether nontraditional students who are at high risk for dropout, are less likely to have an enrollment gap if they enroll in distance education classes. This research also investigates whether traditional students, who are at low risk for dropout, are less likely to have an enrollment gap if they enroll in distance education classes.

Risk Factors for Degree Non-Completion. Previous research has identified factors that increase the risk of student attrition [1]. Students who drop out from their undergraduate degree program often have families to support; they usually work full time while they are enrolled and often commute long distances to work or school [20]. Seven risk factors have been identified that are linked to undergraduate student attrition. These risk factors are 1) part-time enrollment, 2) delayed enrollment (first enrollment in postsecondary education not in the same year as graduation from high school), 3) financial independence (either student is≥24 years of age or is married or has children), 4) presence of dependents other than spouse (children or elders), 5) full-time employment, 6) single parent, and 7) not a high school graduate [1]. Traditional students are defined as those students who have none of these risk factors and non-traditional students are defined as those students who have one of more of these risk factors [1]. Based upon number of risk factors, students are classified as minimally nontraditional (one risk factor), moderately nontraditional (two-three risk factors), or highly nontraditional (four-seven risk factors) [1, 2]. Not surprisingly, previous research has shown that non-traditional students have much lower persistence and take longer to complete their program of study [1, 2]. Previous research has also shown that nontraditional students are significantly more likely to enroll in distance education classes and to be more satisfied with distance education classes than traditional students [3]. Since distance education courses provide students with more convenient and flexible class schedules, nontraditional students who have time or location constraints that prevent them from enrolling in face-to-face classes during a semester or quarter may be more likely to enroll in distance education classes in order to stay enrolled for the entire academic year. As a result, we hypothesize that enrollment in distance education classes may be associated with a lower probability of an enrollment gap among nontraditional students. We also hypothesize that since traditional students do not have work or family commitments that impede their progress towards a degree (traditional students by definition do not work full-time and do not have a

spouse or dependents), enrollment in distance education may not be associated with a lower probability of an enrollment gap among traditional students.

One of the challenges of comparing the likelihood of an enrollment gap between students who enroll in distance education classes and those who enroll in face-to-face classes exclusively is that the students who enroll in distance education classes have more dropout risk factors that are likely to increase the likelihood of an enrollment gap [3]. Therefore this study aims to examine whether these dropout risk variables are also associated with greater probability of an enrollment gap and to use these dropout risk variables as covariates for multivariate estimation of the relationship between distance education enrollment and likelihood of enrollment gaps among nontraditional undergraduate students.

III. METHODS

Data Source and Subjects. Data from the 2008 National Postsecondary Student Aid Study (NPSAS:08): Undergraduates were used for this research [21, 22]. The NPSAS:08 Undergraduates obtained data from a sample of about 113,500 postsecondary undergraduates who were enrolled in about 1,400 postsecondary institutions in the US at any time between July 1, 2007 and June 30, 2008. The sample is representative of all undergraduate students, enrolled in postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico, who were eligible to participate in the federal financial aid programs in Title IV of the Higher Education Act.

Variables. The dependent variable that is the focus of this study is whether or not the student had an enrollment gap in AY 2008. The independent variable that is the focus of this study is whether or not the student was enrolled in one or more distance education classes in 2008. (The survey instrument for NPSAS 2008 defined Distance Education as follows – "Distance education courses are primarily delivered off campus using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM, or DVD, or computer-based systems delivered over the Internet. Distance education does not include correspondence courses" [21]). In addition, we use univariate analyses to examine whether the 7 variables that increase dropout risk also increase enrollment gap rates. Three dropout risk variables are related to the student's family/dependent status; these are independent student, presence of dependents, and single parent [1]. (It should be noted that an unmarried student may have strong social ties to a partner that are the equivalent of ties between married persons but there is no variable in the dataset that indicates whether an unmarried student has a partner). The other four dropout risk variables are 1) enrolled part-time exclusively in AY 2008 (Yes versus No), 2) high school diploma (Yes versus No), 3) employed full-time (35 or more hours per week) (Yes versus No), and 4) delayed post-secondary enrollment (Yes versus No).

Statistical Analyses. The estimates reported in this paper were produced using NCES PowerStats™, which provides public access to data from postsecondary studies conducted by the National Center for Education Statistics and enables users to create customized tables and regressions [23]. Standard errors, confidence intervals, and t-statistics are estimated by the method of Balanced Repeated Replication (BRR) [24]. Reporting standards require that estimates of percentages should only be reported if the standard error of the estimated percentage is less than 30% of the estimate [23]. For the analyses reported in this paper, standard errors of estimated percentages ranged from 1% to 5% of the estimate.

For this paper, univariate and multivariate analyses are reported. For univariate analyses, the statistical significance of two-group differences were estimated by t-statistics as described [25]. For multivariate analyses, logistic regressions were performed. The independent variables used for this regression model were enrollment in distance education and the dropout-risk factor variables. The dependent variable was whether or not the student had an enrollment gap in AY 2008 (Reference group=No enrollment gap). The prediction was that each of the dropout risk factors would predict the likelihood of an enrollment gap; these dropout risk factors are used in the model to statistically control for the greater probability of dropout risk (and presumably enrollment gap risk) among students who enroll in distance education classes.

IV. RESULTS

Distribution of Risk Factor Levels Across Students. Results show that 30.0% of all students were traditional students in 2008; about 7 out of 10 students were non-traditional students who by definition had one or more dropout risk factors (Table 1). Also, over half of all students had multiple risk factors. Thus, 25.3% of all students were highly nontraditional (had 4-7 dropout risk factors), 27.0% were moderately nontraditional (had 2-3 dropout risk factors), and 17.7% were minimally nontraditional (had 1 dropout risk factor).

Risk Factor Level	% (SE)
Zero (Traditional)	30.0 (0.27)
One (Minimally nontraditional)	17.7 (0.18)
Two-Three (Moderately nontraditional)	27.0 (0.24)
Four-Seven (Highly nontraditional)	25.3 (0.26)

%=percentage of all undergraduate students enrolled in postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico, who were eligible to participate in the federal financial aid programs in Title IV of the Higher Education Act., SE=standard error of estimate

Table 1. Distribution of US Postsecondary Undergraduate Students Across Risk Factor Levels in 2008

Risk Factor Levels and Enrollment in Distance Education Classes. Results show that 20.4% of all postsecondary undergraduate students enrolled in at least one distance education class in 2008 (Table 2). The percentage of nontraditional students enrolled in a distance education class (23.8%) was significantly greater than the percentage of traditional students enrolled in a distance education class (12.5%), $p<0.01$ (Table 2). The percentage of students who enrolled in a distance education class was significantly greater for minimally nontraditional students (17.3%), or for moderately nontraditional students (23.8%), or for highly nontraditional students (29.1%), than for traditional students (12.5%), all p-values less than 0.01 (Table 2). These results indicate that nontraditional students, who have one or more dropout risk factors, were significantly more likely to enroll in distance education classes in 2008. Previous research with data from 2004 (NPSAS 2004) also showed that nontraditional students were more likely to enroll in distance education classes [3].

Risk Factor Level	% (SE)	t
Zero-Seven (All students)	20.4 (0.33)	
Four-Seven (Highly Nontraditional)	29.1 (0.69)**	21.94
Two-Three (Moderately Nontraditional)	23.8 (0.43)**	21.32
One (Minimally Nontraditional)	17.3 (0.41)**	9.34
One-Seven (Nontraditional)	23.8 (0.38)**	23.04
Zero (Traditional)	12.5 (0.31)	Ref

%=percentage of students within risk factor level who enrolled in one or more distance education classes in 2008, SE=standard error of estimate, significance of two-group contrasts (Ref=Reference group), *=p<0.05, **=p<0.001.

Table 2. Percentage of Postsecondary Undergraduate US Students Enrolled in Distance Education Classes in 2008

A. UNIVARIATE ANALYSES: ENROLLMENT GAPS

Risk factor levels and enrollment gaps. Estimates indicate that 38.7% of all postsecondary undergraduate students in the US had an enrollment gap in 2008 (Table 3). Nontraditional students had a significantly greater probability of an enrollment gap (48.5%) than traditional students (15.8%), $p<0.01$ (Table 3). Compared to traditional students (15.8%), the probability of an enrollment gap was significantly higher for highly nontraditional students (54.2%), $p<0.01$, for moderately nontraditional students (50.7%), $p<0.01$, and for minimally nontraditional students (37.9%), $p<0.01$ (Table 3).

Risk Factor Level	% (SE)	t
Zero-Seven (All students)	38.7 (0.25)	
Four-Seven (Highly Non-traditional)	54.2 (0.56)	53.45**
Two-Three (Moderately Non traditional)	50.7 (0.47)	53.64**
One (Minimally Nontraditional)	37.9 (0.67)	27.38**
One-Seven (Non-traditional)	48.5 (0.29)	61.08
Zero (Traditional)	15.8 (0.45)	Ref

%=percentage of students within risk factor level with an enrollment gap (part year enrollment) in AY 2008,
SE=standard error of estimate, significance of two-group contrasts (versus Ref =Reference group) *=p<0.05, **=p<0.001.

Table 3. Relationship between Risk Factor Levels and Likelihood of an Enrollment Gap in 2008

Distance Education and enrollment gaps. Results show that the probability of an enrollment gap was significantly greater for students who enrolled in at least one distance education class (40.3%) than for than for students who enrolled in face-to-face classes exclusively (38.2%), $p<0.01$. (Note: Results displayed in Table 2 indicate that students who enroll in distance education classes have more dropout risk factors than students who enroll in face-to-face classes exclusively). Among traditional students, those enrolled in at least one distance education class had a higher estimated probability of an enrollment gap (16.8%) than students enrolled in face-to-face classes only (15.6%), although the difference was not significant (Table 4). In contrast, among nontraditional students, the probability of an enrolment gap was significantly lower among those enrolled in distance education (DE) classes (45.6%) than those enrolled in face-to-face (F2F) classes only (49.3%), $p<0.01$ (Table 4). Stratification by levels of risk factors showed that the probability of an enrollment gap was lower among nontraditional students enrolled in distance education than among those enrolled in face-to-face classes only regardless of whether the students were highly nontraditional (DE, 49.6%, versus F2F only, 56.1%, $p<0.01$), or were moderately nontraditional (DE, 45.8%, versus F2F only, 52.2%, $p<0.01$) or were minimally nontraditional, (DE, 37.0% versus F2F only, 38.1%), $p>0.10$ (Table 4).

	Students enrolled in at least 1 Distance Education Class		
	No (Ref)	Yes	
Risk Factor Level	% (SE)	% (SE)	t
Zero-Seven (All students)	38.2 (0.29)	40.3 (0.50) ††	3.63
Four-Seven (Highly Non-traditional)	56.1 (0.58)	49.6 (1.11) ††	-5.19
Two-Three (Moderately Non traditional	52.2 (0.54)	45.8 (0.94) ††	-5.90
One (Minimally Nontraditional)	38.1 (0.62)	37.0 (1.52)	-0.67
One-Seven (nontraditional)	49.3 (0.34)	45.6 (0.58) ††	-5.50
Zero (Traditional)	15.6 (0.47)	16.8 (0.90)	1.18

%=percentage of students within risk factor level with an enrollment gap (part year enrollment) in AY 2008,

SE=standard error of estimate, significance of two-group contrast (Distance Ed enrolled students vs No Distance Ed enrolled students, within risk factor level) †=p<0.05, ††=p<0.01.

Table 4. Relationship Between Distance Education Enrollment and Likelihood of an Enrollment Gap by Risk Factor Level

Individual Risk Factors and Enrollment Gaps (Non Traditional Students). Results' displayed in Tables 5 and 6, show that each of the dropout risk factors was positively related to enrollment gap rates among nontraditional students. (Traditional students by definition do not have any of these dropout risk factors). Among nontraditional students, the estimated probability of an enrollment gap was significantly greater for those students enrolled part-time only (62.8%) than for those not enrolled part-time only (33.8%), p< 0.01 (Table 4). Also, the likelihood of an enrollment gap was significantly greater for those students who delayed postsecondary enrollment (51.4%) than for those who did not delay enrollment (45.7%), p< 0.01 (Table 4). Results also show that full-time employment was significantly related to higher enrollment gap rates; the likelihood of an enrollment gap was significantly greater for those students employed full-time (52.5%) than for those who were not employed full-time (45.2%), p< 0.01 (Table 5). Finally, the likelihood of an enrollment gaps was significantly greater for those students with no high school diploma (54.6%) than for students with a high school diploma (47.7%), p< 0.01 (Table 4).

Results show that the probability of an enrollment gap was also related to students' dependency status but was not related to their marital or family status (Table 6). Among nontraditional students with no dependents, the probability of an enrollment gap was significantly lower among those who were dependent (42.2%) than among those who were independent (51.4%), p<0.01. The likelihood of an enrollment gap was not significantly higher among single students with dependents (50.5%), or among married students with dependents (52.9%), than among single independent students with no dependents (51.4%), all p-values greater than 0.20.

Dropout Risk Factor	Levels	% (SE)	t
Attended part-time only	Yes	62.8 (0.80)**	24.08
	No (Ref)		Ref

		33.8 (0.90)	
Delayed enrollment	Yes	51.4 (0.40)**	10.08
	No (Ref)	45.7 (0.40)	Ref
Worked 35 or more hours per week	Yes	52.5 (0.44)**	12.70
	No (Ref)	45.2 (0.37)	Ref
Absence of high school diploma	Yes	54.6 (0.88)**	7.34
	No (Ref)	47.7 (0.33)	Ref

%=percentage of students within dropout risk factor level who had an enrollment gap (part year enrollment) in AY 2008,
SE=standard error of estimate, significance of two-group contrasts (dropout risk factor present versus risk factor absent) *=p<0.05, **=p<0.001.

Table 5. Univariate Relationship Between Dropout Risk Factors and Likelihood of an Enrollment Gap (Non-Traditional Students)

Dependency Status	Family Status		% (SE)	t
Dependent	No dependents		42.2 (0.69)**	-10.21
Independent	Single dependents	with	50.5 (1.03)	-0.76
			52.9 (0.69)	1.66
	Married dependents	with	51.4 (0.58)	Ref
	No dependents			

%=percentage of students in group who had an enrollment gap (part year enrollment) in AY 2008,
SE=standard error of estimate, significance of two-group contrasts (risk factor present versus risk factor absent) *=p<0.05, **=p<0.001.

Table 6. Univariate Relationship Between Student's Dependency and Family Status and Likelihood of an Enrollment Gap (Non-Traditional Students)

B. MULTIVARIATE ANALYSES: ENROLLMENT GAPS

Multivariate analyses were performed by logistic regression to examine the effects of distance education and dropout risk factors (covariates) on the likelihood of an enrollment gap among nontraditional students. Although being single with dependents, and having dependents are both risk factors for dropout [1, 2], they were not included as covariates in the multivariate logistic regression model as the effects of these dropout risk variables were not associated with the likelihood of an enrollment gap in univariate analyses (Table 6). Results show that enrollment in distance education was significantly related to a lower probability of an enrollment gap (βD=-0.046, OR=0.79, t=-8.55, p<0.01) (Table 7). Results also show that individual risk factors were positively related to the probability of an enrollment gap. Students who enrolled part time were more likely to have enrollment gaps than those enrolled full-time (βD=0.286, OR=3.32, t=17.14, p<0.01) (Table 7). Delayed postsecondary enrolment increased the likelihood of an enrollment gap (βD=0.043 OR=1.21, t=7.73, p<0.01) (Table 7). The probability of an enrollment gap was increased if the students did not have a high school diploma (βD=0.030, OR=1.25, t=5.09, p<0.01) and if the student was financially independent (βD=0.049, OR=1.27, t=6.10, p<0.01) (Table 7). Full-time employment, however, was not significantly related to the probability of an enrollment gap among nontraditional students (βD=0.013 OR=1.02, t=0.83, p>0.20) (Table 7).

Variables		β (SE)	OR (95% CI)	t
Enrolled in distance education class(es)	Yes	-0.046 (0.005)	0.79 (0.75 – 0.84)	- 8.55**
	No (Ref)			
Attended part-time only	Yes	0.286 (0.017)	3.32 (2.86 – 3.84)	17.14**
	No (Ref)			
Delayed postsecondary enrollment	Yes	0.043 (0.006)	1.21 (1.15 – 1.27)	7.73**
	No (Ref)			
Absence of high school diploma	Yes	0.030 (0.006)	1.25 (1.15 – 1.27)	5.09**
	No (Ref)			
Worked 35 or more Hours per week	Yes	0.013 (0.006)	1.02 (0.97 – 1.08)	0.83
	No (Ref)			
Independent student	Yes	0.049 (0.008)	1.27 (1.18 – 1.36)	6.10**
	No (Ref)			

β=standardized regression coefficient, SE=standard error of regression coefficient estimate,
OR=odds ratio, 95% CI=95% confidence interval, t=t-statistic, Ref = reference category.

Table 7. Logistic Regression - Effects on Likelihood of an Enrollment Gap in 2008 (Non-traditional students)

V. CONCLUSION

The results of this research, obtained with data collected in 2008 from a large nationally representative US sample (NPSAS 2008), show that the majority of postsecondary undergraduate students are nontraditional students (Table 1). These nontraditional students are significantly more likely than traditional students to enroll in distance education classes (Table 2), and to have enrollment gaps in an academic year (Table 3). More than half of moderately and highly nontraditional students, 50.7% and 54.2%, respectively, have an enrollment gap and are not enrolled for part of the academic year. More importantly, results showed that nontraditional students in the US who enrolled in distance education classes had significantly lower probability of an enrollment gap than nontraditional students who enrolled in face-to-face classes only (Tables 4 and 7). In contrast, results showed that traditional students who enrolled in distance education classes had a non-significantly higher probability of an enrollment gap (Table 4). Thus results show that the effect of distance education on decreasing the probability of an enrollment gap was significant for nontraditional students but non-significant for traditional students.

Previous research has shown the distance education programs that utilize the Sloan-C framework can achieve retention rates that are higher than those found in most face-to face education programs [12-19]. The present research shows that nontraditional students who enrolled in distance education classes were less likely to have an enrollment gap, (were less likely to be enrolled for only part of AY 2008) across all types of education institutions in the USA. Thus, this research generalizes the superiority of distance education programs in increasing enrollment throughout the academic year across all types of educational institutions in the US.

The results of this study suggest that nontraditional students and traditional students may be different student segments for customer retention efforts and that researchers should test whether variables that increase retention are effective for both student segments. Given the high attrition rates for nontraditional students, research is urgently needed to identify interventions that increase retention for this student segment. Nontraditional students, especially those who have families (partner and/or children), are likely to have many responsibilities and constraints upon their time [26]. Higher education administrators need to consider the time constraints that nontraditional students experience when retention strategies are developed for this student segment. The results of this study suggest that the offer of distance education classes may significantly increase the degree progress rates for nontraditional students by enabling them to be enrolled for the entire academic year.

Results also showed that 5 out of 7 dropout risk factors also predicted a significantly increased probability

of an enrollment gap (Tables 5 - 7). These results show that variables that have been shown by previous research to [1, 2] predict 6-year graduation rates also predict the likelihood of an enrollment gap; therefore these variables should be used in multivariate models that estimate the effects of distance education (or other interventions) on the probability of an enrollment gap in particular or enrollment persistence in general. Future research needs to investigate whether nontraditional students who enroll in distance education are more likely to graduate in 6 years than those who enroll in face-to-face classes exclusively.

Finally the results of this research illustrate the importance of controlling for dropout risk factors when investigating the effects of distance education on student retention and progress towards degree completion. As displayed in Table 4, across all students, those who enrolled in distance education were more likely to have an enrollment gap (40.3%) than those who enrolled in face-to-face classes exclusively (38.2%). Such a result (with no adjustment for differences in risk factor levels) would be consistent with the claim that distance education enrollment is associated with a greater probability of an enrollment gap. Stratified analyses by risk factor levels, however, shows clearly that nontraditional students who enroll in distance education are significantly less likely to have an enrollment gap (45.6%) than nontraditional students who enroll in face-to-face classes exclusively (49.3%) (Table 4). In contrast, traditional students who enroll in distance education are more likely to have an enrollment gap education (16.8%) than those who enroll in face-to-face classes exclusively (15.6%), although this result is not significant. The results of the present research, using data from NPSAS 2008, and of previous research, with data from NPSAS 2004 [3], show that students at greater risk for dropout are more likely to enroll in distance education classes. Therefore any research that compares course completion or degree progress, or program retention rates between postsecondary students who enroll in distance education versus those who do not enroll in distance education should anticipate that distance education students are likely to have more dropout risk factors. Consequently, such research should use these dropout risk factors as covariates in multivariate analyses of the effects of distance education on student retention or student progress towards degree completion.

VI. ABOUT THE AUTHORS

Manuel Pontes joined the marketing faculty at Rowan University in 2000 to teach courses in the areas of retailing services, marketing, and marketing channels. He has recently published articles about relationship selling, customer service, and medical decision-making from a marketing perspective. Dr. Pontes holds a BS from the University of Bombay, an MS from the Indian Institute of Technology, and a PhD from the University of Florida. He is a member of the Marketing Task Force for the New Jersey Diabetes Council.

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