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Mentoring and Faculty-Student Interaction in an Online Doctoral Program

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***A*bstract:** This study analyzed one overarching research question: What effect does faculty-student interaction have on the relationship between student mentoring and student success in an online doctoral program. Both Cohen's (1993) *Principles of Adult Mentoring Scale* and Grooms and Bocarnea's (2003) *Computer-Mediated Interaction Scale* were modified and consolidated into one instrument to measure learners' perceptions of mentoring and faculty-student interaction. Student success was operationalized as grade point average and passing comprehensive examinations on the first attempt, two critical benchmarks of doctoral program completion. While the data from this study did not support that faculty-student interaction moderated the relationship between student mentoring and student success, it did generate a plethora of questions. It also suggested the possibility that the online educational environment transmutes the traditional mentoring functions proposing the probable need for a revised instrument that will adequately measure these variables within the 21st century technologically-rich context.

Keywords: online education, adult learners, doctoral programs, student success, mentoring, interaction, faculty-student interaction

1. Introduction

Across the globe, doctoral programs abound within the walls of academe and when coupled with the ubiquitous nature of 21st century technology, the attraction and feasibility of those programs are ever-expanding. With the growing availability of such opportunities, statistics continue to reveal that even "under highly favorable conditions, no more than three-quarters of adult learners who enter doctoral programs complete their degrees" (Council of Graduate Schools, 2008, ¶2). Cognizant of this sobering statistic, two preliminary questions arise: 1) Other than degree completion, are there additional benchmarks of success at this educational level and 2) What are some of the attributing factors to facilitate that success?

In his report of the *Ph.D. Completion Project*, a 7-year grant-funded project heavily supported by both Pfizer and the Ford Foundation, Scott Jaschik (2007), editor and cofounder of *Inside Higher Ed,* noted that

> With regard to the "main factors" contributing to completion, new Ph.D.'s (who could pick more than one item that applied) ranked the following: 80 percent cited financial support, 63 percent mentoring/advising, 60 percent family support, 39 percent social environment and peer support, 39 percent program quality, and 30 percent professional and career guidance. (¶4)

Focusing on mentoring support, which includes advising as well as professional and career guidance, Johnson and Huwe (2003) espoused the benefit of having a professor to serve as a mentor to advise, guide, and support learners as they tackle the rigorous demands of graduate education. Although mentoring necessitates a relationship between two individuals (i.e., a mentor and a mentee or protégé), without some type of faculty-student interaction, this relationship would never emerge regardless of the environmental context.

1.1 The Online Environment

For more than a decade, online courses, in which the learner and the professor are independent of place and time, have proliferated the landscape of higher education (Grooms, 2009; Hart, 2012; Leners, Wilson, & Sitzman, 2007). In fact, today in the digital age of the 21st century, technological means have resulted in the Internet becoming distance education's most preponderate mode of course delivery (Dolezalek, 2003; Grooms, 2009) and as a result of online classes, universities now have the opportunity to provide the masses with unparalleled access to knowledge.

Galvanizing reflection, provoking active learning, and promoting professional learning communities are but just a few of the advantages of online education (Eastmond, 1998). However, accompanying these benefits, one must also keep in mind that in order to create an atmosphere conducive to learning, professors must acclimatize pedagogical practices for the online milieu (Barczyk, Buckenmeyer, Feldman, & Hixon, 2011). For example, in order to create an environment that promotes learning and personal development, Grooms (2000, 2003) asserted that frequent faculty-student interaction is not only essential, but its need is amplified in the online context.

1.2 Faculty-Student Interaction

Defined as the reciprocal or mutual influence (Eysenck, Arnold, & Meli, 1972) or mutual interdependence (Thibaut & Kelly, 1959) of individuals, several early researchers (e.g., Gresh & Mrozowski, 2000; Grooms, 2000; Miller & Lu, 2003) consistently found that faculty-student interaction was imperative for learners to be successful in the online environment. Serving numerous purposes, this interaction not only fostered course discussion and reflection (Roblyer & Ekhaml, 2000), but it also ameliorated learners' perspectives and advanced them toward attaining their goals (Wagner, 1994). In addition, Daniel and Marquis (1979) advocated that "interaction with others [in the distance learning environment] can temper the otherwise authoritarian style of a course and motivate the student to persevere by providing psychological support" (p. 36).

In her study of 105 online doctoral learners, Grooms (2000) developed an instrument to ascertain the importance of interaction, while identifying five specific types. She referred to them as *Informational Feedback* (providing general information regarding course content, assignments, and expectations); *Corrective/Evaluative Feedback* (sharing information that guides, directs, and affirms); *Intellectual Discussion* (challenging thoughts, ideas, and beliefs); *Motivation/Support* (listening, providing encouragement, appreciating thoughts and feelings); and *Socializing* (self-disclosure and reciprocity of empathetic information). Later Reid-Martinez and Grooms (2004) and Grooms and Reid-Martinez (2006) unveiled that these five types of interaction are inherent in a fruitful mentoring relationship.

1.3 Mentoring

A mentor is described as an individual who "oversees the career and development of another person, usually a junior, through teaching, counseling, providing psychological support, protecting, and at times promoting or sponsoring" (Zey, 1991, p. 7). Paramount to the learning process (Cameron, 2001; Fulford & Sakaguchi, 2002), mentoring has monumental benefits (Corbett & Paquette, 2011; Howard & Turner-Nash, 2011; Zellers, Howard, & Barcic, 2008). For example, mentoring not only facilitates learning (Garvey & Alfred, 2000), but it also influences career (Gibson, 2004) and professional development (Grogan & Crow, 2004). Emphasizing its significance, Frierson (1997) proclaimed that mentoring is not only essential but it may very well be "the heart of graduate education" (p. 2).

Identifying six mentor behavioral functions, Norman Cohen (1993) developed a self-assessment for professionals who assume the role of mentor. Claiming that these functions are essential for developing a satisfying and productive mentoring relationship, he referred to them as *Relationship Emphasis* (establishing trust), *Informative Emphasis* (providing advice), *Facilitative Focus* (encouraging alternatives), *Confrontive Focus* (challenging the protégé), *Mentor Model* (motivating the protégé), and *Student Vision* (stimulating critical thinking).

In consideration of this literature, one overarching research question arose for this study: What effect does faculty-student interaction have on the relationship between student mentoring and student success in an online doctoral program? From this research question, two sets of hypotheses emerged. The first dealt with student success as defined by GPA.

H_{1-1} Under low faculty interaction, there is a relationship between student mentoring and grade point average.

H_{1-2} Under high faculty interaction, there is a relationship between student mentoring and grade point average.

The second set of hypotheses dealt with student success as defined by passing comprehensive examinations on the first attempt.

H_{2-1} Under low faculty interaction, there is a relationship between student mentoring and passing comprehensive examinations on the first attempt.

$H_{2\text{-}2}$ Under high faculty interaction, there is a relationship between student mentoring and passing comprehensive examinations on the first attempt.

2. Method

To determine the effect of faculty-student interaction on the relationship between student mentoring and student success of online doctoral learners, 156 adults pursuing their doctoral degrees in education at a Judeo-Christian university in the southeastern part of the United States were solicited. With the exception of three one-week residencies, all coursework for these participants was negotiated online through the Blackboard Distributed Learning System via the Internet. To eliminate the threat of mortality due to attrition, the sampling frame for the study did not include students who had previously withdrawn or were on a temporary leave of absence.

While students enrolled in this online doctoral program had seven years to successfully complete each of its three components--two years of coursework, a three-part comprehensive examination, and the dissertation--at the time of this study, not all students had approached their 7-year limit. Taking that into consideration, the study focused on the first two benchmarks of success: grade point average and successful passage of all three portions of the comprehensive examination on the first attempt.

2.1 Participant Characteristics

Of the 156 online adult learners solicited, 123 responded yielding a 79% response rate, which was deemed representative of the sampling frame. Ranging in age from 24 to 67 years ($M = 45$), 29 were males and 93 were females; 38 were African-American, 81 were White, 2 were Hispanic, and 2 were Asian.

2.2 Instrumentation

For this study, Cohen's (1993) *Principles of Adult Mentoring Scale* (*PAMS*) and Grooms and Bocarnea's (2003) *Computer-Mediated Interaction Scale* (*CMIS*) were used. Cohen developed the *PAMS* as a "specific self-assessment instrument exclusively designed for higher education faculty to evaluate their competency as faculty mentors of undergraduate adult learners in a college context" (p. 5). The *PAMS* measures six essential behavioral functions (*Relationship Emphasis, Informative Emphasis, Facilitative Focus, Confrontive Focus, Mentor Model*, and *Student Vision)* that Cohen identified based upon his extensive review of the literature as "the behaviors required for a successful faculty mentor-adult learner mentoring relationship" (p. 100).

To most adequately reflect the needs of online doctoral learners, the *PAMS* was slightly modified. First, rather than have the faculty self-assess with the stem "I …", the instrument was altered to incorporate the stem "My professor …" allowing participants to reflect upon their relationship with a faculty member whom they considered a mentor during their doctoral program. Second, the original instrument contained 55 items; however, the modified version contained 51, eliminating statements somewhat irrelevant to online education (e.g., two items related to nonverbal

communication, one related to a school counselor, and another related to television-based courses). Maintaining the intent of the original instrument, a five-point frequency scale was used (1 = *Never*, 2 = *Infrequently*, 3 = *Sometimes*, 4 = *Frequently*, 5 = *Always*).

To measure online faculty-student interaction, the *CMIS* was considered the most appropriate instrument available. Grooms and Bocarnea (2003) developed this instrument based upon Grooms (2000) earlier version entitled the *Computer-Mediated Interaction Questionnaire* (*CMIQ)*. Based upon a thorough review of the literature, the *CMIQ* was initially developed to measure adult learners' expectations related to the importance of as well as their preferred type of interaction (*Informational Feedback, Corrective/Evaluative Feedback, Intellectual Discussion, Motivation/Support,* and *Socializing*). The *CMIQ* had an alpha coefficient (Cronbach's Alpha) of .86 for the entire instrument. Based solely on Grooms' five types of interaction expectations, the revised *CMIS* consists of two parts: faculty interaction and peer interaction. The current study focused solely on faculty interaction, thus only the first half of the instrument was used and this section of the *CMIS* was modified to reflect learner experience rather than learner expectation. Once again, to maintain the original intent of the instrument, a seven-point Likert scale (1 = *Strongly disagree*, 2 = *Somewhat disagree*, 3 = *Slightly disagree*, 4 = *Neutral*, 5 = *Slightly agree*, 6 = *Somewhat agree*, 7 = *Strongly agree*) was used.

For participants' ease, the *PAMS* and the *CMIS* were consolidated into one instrument. To establish face validity and maintain the integrity of the new *Mentoring and Interaction Questionnaire* (*MIQ*), draft copies of the adapted instrument were reviewed and critiqued by four doctoral students in other online doctoral programs that were representative of the sampling frame. The pilot study helped to clarify directions and determine the time needed to complete this new instrument. To measure the internal consistency of the modified items, Cronbach's Alpha was performed on each section (i.e., mentoring and interaction) of the modified survey. The reliability coefficient for the total scale of the *PAMS* revealed an alpha coefficient of .9732, while the reliability coefficient for the total scale of the *CMIS* revealed an alpha coefficient of .9358. Additionally, coefficients of internal consistency for the *PAMS* were .9050 (*Relationship Emphasis*), .9072 (*Informative Emphasis*), .9208 (*Facilitative Focus*), .8709 (*Confrontive Focus*), .9274 (*Mentor Model*), and .9619 (*Student Vision*).

2.3 Procedures

Solicited through an email that summarized the study, ensured confidentiality, and provided both the instructions and the link to the *MIQ,* 156 adult learners were asked to voluntarily complete the two-part *MIQ* within an 18-day time period. To curtail the threat of a low response rate, in addition to the initial email, several follow-up emails and phone calls were used.

3. Results

The first set of two hypotheses dealt with student success as defined by GPA. To examine patterns

of relationships between multiple independent variables (Cohen's six mentoring functions) and one dependent variable (GPA), these two hypotheses were analyzed using multiple regressions via *SPSS*. To analyze the second set of hypotheses dealing with student success as defined by passing comprehensive examinations on the first attempt, logistic regression, which is used for making predictions when the dependent variable (passing comps) is dichotomous and the independent variable (Cohen's six mentoring functions) is either continuous or categorical, was employed. The moderating variable was faculty-student interaction. Although Grooms (2000) delineated the construct of interaction into five types (*Informational Feedback*, *Corrective/Evaluative Feedback*, *Intellectual Discussion*, *Motivation/Support, and Socializing*), for the purpose of this study, it was decided to examine the overall construct of interaction, which was dichotomized into those experiencing high faculty-student interaction and those experiencing low faculty-student interaction. Those who experienced high interaction scored above the mean, and learners experiencing low interaction scored either equal to or less than the mean.

3.1 Low Faculty-Student Interaction and Grade Point Average

The first benchmark of success in this doctoral program was grade point average. GPA for the 59 respondents who experienced low faculty-student interaction ($M \leq 4.91$) ranged from 2.55 to 4.0. Based on a 4.0 scale, the mean GPA was 3.68. Of the six mentor behavioral functions, learners experiencing low faculty-student interaction perceived their professors exhibited more of the *Mentor Model* ($M = 2.76$), followed by the *Confrontive Focus* ($M = 2.74$), and less of the *Informative Emphasis* ($M = 2.29$; see Table 1). In other words, those experiencing low faculty-student interaction perceived faculty as more motivating and challenging to them than actually providing advice.

Table 1. Descriptive statistics for GPA and mentor behavioral functions under LFI

Variable	Mean	Standard Deviation
GPA	3.68	.27
Relationship Emphasis	2.64	.94
Informative Emphasis	2.29	.88
Facilitative Focus	2.63	1.01
Confrontive Focus	2.74	.78
Student Vision	2.61	.95
Mentor Model	2.76	.95

Note. N = 59. LFI = Low Faculty-Student Interaction.

Under low faculty-student interaction, Pearson *r* indicated a slight positive relationship between GPA and the six mentor behavioral functions: *Relationship Emphasis* $r(57) = .12$, $p = .19$, *Informative Emphasis* $r(57) = .15$, $p = .13$, *Facilitative Focus* $r(57) = .16$, $p = .12$, *Confrontive Focus* $r(57) = .17$, $p = .10$, *Mentor Model* $r(57) = .15$, $p = .13$, and *Student Vision* $r(57) = .13$, $p = .16$ (see Table 2).

Table 2. Correlations between GPA and mentor behavioral functions under LFI

	RE	IE	FF	CF	MM	SV
GPA	.12	.15	.16	.17	.15	.13
RE		.83*	.83*	.76*	.83*	.85*
IE			.86*	.82*	.79*	.91*
FF				.85*	.86*	.92*
CF					.80*	.89*
MM						.90*

Note. * The correlation is statistically significant at the $p < .05$ level.

Using multiple regression, the data did not support that low faculty-student interaction moderated the relationship between student mentoring and grade point average, ($R^2 = .04$, *adjusted* $R^2 = -.07$, SS = .19, MS = .03, F (6, 52) = .38, $p = .89$). With a 95% constant confidence interval ranging from 3.20 to 3.80 (see Table 3), the overall GPA was not significantly related to the mentor behavioral functions included in this study, thus $H_{1\text{-}1}$ was rejected.

Table 3. Coefficients: Multiple regression of LFI

	95% Confidence Interval for B		Correlations		
	Lower Bounds	Upper Bounds	Zero-order	Partial	Part
Constant	3.20	3.80			
RE	-.19	.15	.12	-.04	-.04
IE	-.17	.27	.15	.07	.07
FF	-.16	.24	.16	.05	.05
CF	-.14	.29	.17	.09	.09
MM	-.14	.24	.15	.07	.07
SV	-.43	.19	.13	-.11	-.10

3.2 High Faculty-Student Interaction and Grade Point Average

GPA for the 64 respondents who experienced high faculty-student interaction ($M > 4.91$) ranged from 3.03 to 4.0. Based on the 4.0 scale, the mean GPA was 3.70; however, it should be noted that the GPA of high faculty-student interaction and low faculty-student interaction differed by only .02. Of the six mentor behavioral functions, learners experiencing high faculty-student interaction perceived their professors exhibited more *Student Vision* ($M = 3.95$) followed by *Facilitative Focus* ($M = 3.93$). Analogous to the results under low faculty-student interaction, students experiencing high faculty-student interaction perceived their professors exhibited less of the *Informative Emphasis* ($M = 3.34$; see Table 4). In other words, those experiencing high faculty-student interaction perceived that faculty stimulated their critical thinking and encouraged alternatives more

so than providing advice. In comparison, the mean of the six mentor behavioral functions was greater for students who experienced high faculty-student interaction than for the students experiencing low faculty-student interaction.

Table 4. Descriptive statistics for GPA and mentor behavioral functions under HFI

Variable	Mean	Standard Deviation
GPA	3.70	.21
Relationship Emphasis	3.84	.79
Informative Emphasis	3.34	.88
Facilitative Focus	3.93	.90
Confrontive Focus	3.50	.75
Student Vision	3.95	.76
Mentor Model	3.77	.77

Note. N = 64. HFI = High Faculty-Student Interaction

Pearson *r* indicated that under high faculty-student interaction, the mentor behavioral functions and GPA had a small positive relationship: *Relationship Emphasis* $r(62) = -.01$, $p = .47$, *Informative Emphasis* $r(62) = -.11$, $p = .19$, *Facilitative Focus* $r(62) = -.03$, $p = .40$, *Confrontive Focus* $r(62) = -.08$, $p = .26$, *Mentor Model* $r(62) = -.08$, $p = .27$, and *Student Vision* $r(62) = -.08$, $p = .28$ (see Table 5).

Table 5. Correlations between GPA and mentor behavioral functions under HFI

	RE	IE	FF	CF	MM	SV
GPA	-.01	-.11	.03	.17	-.08	-.08
RE		.77*	.74*	.74*	.79*	.80*
IE			.78*	.71*	.79*	.82*
FF				.66*	.81*	.81*
CF					.77*	.82*
MM						.88*

Note. * The correlation is statistically significant at the $p < .05$ level

Once again using multiple regression, student mentoring of the learners experiencing high faculty-student interaction predicted less than 4% of the variance of GPA. The moderating variable, high faculty-student interaction, did not have a significant effect on the relationship between student mentoring and GPA ($R^2 = .04$, *adjusted* $R^2 = -.07$, SS = .10, MS = .02, $F(6, 57) = .36$, $p = .90$). The 95% confidence interval for each mentor behavioral function under high faculty-student interaction contained the value of zero, and therefore overall GPA was not significantly related to these functions for these students either (see Table 6). According to this study $H_{1\text{-}2}$ was also rejected.

Table 6. Coefficients: Multiple regression of HFI

	95% Confidence Interval for B		Correlations		
	Lower Bounds	Upper Bounds	Zero-order	Partial	Part
Constant	3.43	4.05			
RE	-.07	.19	-.01	.12	.12
IE	-.18	.06	-.11	-.13	-.13
FF	-.09	.15	-.03	.07	.07
CF	-.15	.11	-.08	.04	.04
MM	-.19	.14	-.08	-.04	-.04
SV	-.20	.18	-.08	-.01	-.01

3.3 Low Faculty-Student Interaction and Passing Comprehensive Examinations

Once the learners successfully complete all required courses for the doctoral program, they are administered a three-part comprehensive examination, which was the second benchmark of success. At the time of this study, 86 of the 123 participants had taken this exam. Of those experiencing low faculty-student interaction, 27 respondents passed all three sections on the first attempt; however, 12 did not. According to the Cox and Snell R^2 (.18) and Nagelkerke R^2 (.26), the mentor behavioral functions accounted for 18% to 26% of students passing the exam. The data revealed a negative relationship between passing comprehensive examinations on the first attempt and *Relationship Emphasis, Informative Emphasis,* and *Mentor Model*; however, positive relationships were distinguished between passing comprehensive examinations and *Facilitative Focus*, *Confrontive Focus*, and *Student Vision* (see Table 7). In other words, students who passed comprehensive examinations on the first attempt rated their professors higher for encouraging alternatives, challenging them, and stimulating their critical thinking than those who did not initially pass, although it was still considered insignificant.

Table 7. Logistic regression: LFI

Variables	B	SE	Wald	*p*	Exp (B)
RE	-.22	.84	.07	.80	.81
IE	-2.69	1.67	2.61	.11	.07
FF	.20	1.17	.03	.87	1.22
CF	1.32	1.17	1.26	.26	3.72
MM	-.99	1.03	.93	.34	.37
SV	1.45	1.77	.68	.41	4.28
Constant	.80	1.63	.24	.62	2.22

The 95% constant confidence interval ranged from .14 to 136.15 (see Table 8). A chi-square goodness-of-fit test was used to evaluate the change in –2 log likelihood to determine if mentor behavioral functions as a whole improved the model fit when predicting passing the comprehensive examination. In this study, the –2 log likelihood was insignificant (χ^2 (6) = 7.87, p = .25), thus $H_{2\text{-}1}$ was rejected.

Table 8. 95% Confidence interval for LFI

Variable	Lower	Upper
RE	.16	4.15
IE	.00	1.77
FF	.12	12.13
CF	.38	36.89
MM	.05	2.80
Constant	.14	136.15

3.4 High Faculty-Student Interaction and Passing Comprehensive Examinations

Of the learners experiencing high faculty-student interaction, 32 respondents successfully passed comprehensive examinations on the first attempt and 15 did not. According to Cox and Snell R^2 (.03) and Nagelkerke R^2 (.04), student mentoring accounted for 3% to 4% of passing the exam. As shown in Table 9, the analysis indicated a negative relationship between passing the comprehensive examination on the first attempt and *Mentor Model* and *Student Vision,* while positive relationships existed between the other mentor behavioral functions (i.e., *Relationship Emphasis*, *Informative Emphasis*, *Facilitative Focus*, and *Confrontive Focus*.).

Table 9. Logistic regression: HFI

Variables	B	SE	Wald	*p*	Exp (B)
RE	.20	.80	.06	.80	1.22
IE	.28	.77	.13	.72	1.32
FF	.21	.69	.10	.76	1.24
CF	.63	.79	.63	.43	1.87
MM	- .39	1.15	.11	.74	.68
SV	- .75	1.38	.29	.59	.47
Constant	-1.21	2.70	.20	.65	.30

The range of the 95% confidence interval for high faculty-interaction was not as extensive as compared to low interaction (see Table 10). According to the results yielded from logistic regression, the data do not support a relationship between student mentoring and passing comprehensive examinations on the first attempt (χ^2 (6) = 1.19, *p* = .98). The chi-square goodness-of-fit test for the

regression models at both high and low interaction did not differ, thus faculty-student interaction did not moderate the relationship between student mentoring and student success, therefore $H_{2\text{-}2}$ was also rejected.

Table 10. 95% Confidence interval for HFI

Variable	Lower	Upper
RE	.26	5.81
IE	.29	6.00
FF	.32	4.78
CF	.40	8.74
MM	.07	6.52
Constant	.03	7.09

4. Discussion

The data from this study did not support that faculty-student interaction moderated the relationship between student mentoring and student success. Neither low ($M \leq 4.19$) nor high ($M > 4.91$) faculty-student interaction had an effect on the relationship between student mentoring and student success as measured by grade point average and passing comprehensive exams on the first attempt. In analyzing grade point averages, the mean of the mentor behavioral functions was greater for students experiencing high faculty-student interaction than for learners experiencing low faculty-student interaction; therefore, learners experiencing high faculty-student interaction scored their professors' ability to facilitate the mentor behavioral functions higher than those doctoral learners who experienced low faculty-student interaction. Under low faculty-student interaction, there was a negative correlation between passing comprehensive examinations on the first attempt and three of the six mentor behavioral functions: (*Relationship Emphasis* (establishing trust), *Facilitative Focus* (encouraging alternatives), and *Mentor Model* (motivating the protégé). Under high faculty-student interaction, there was a negative correlation between passing comprehensive examinations and two mentor behavioral functions: *Mentor Model* (motivating the protégé) and *Student Vision* (stimulating critical thinking), thus learners expressed that their professors portrayed these mentor behavioral functions less frequently.

One would surmise that since interaction is a significant part of the mentoring relationship, it would be pivotal to student success, thus the results of this study were quite surprising opening a Pandora's Box of inquiries that should be explored in future studies. For the ease of the reader, these suggestions for future research have been clustered.

First, if mentoring components were embedded in the curriculum, would it make a significant impact on adult learners' perceptions as well as academic outcomes, as Reid-Martinez and Hunt (1998) found in their preliminary research on the implementation of this in an existing doctoral

program? With the elements embedded in the curriculum, the professors would not necessarily need to make a conscientious effort to function in the complete mentor role, which is comprised of all six mentor behavioral functions, yet these crucial components would be prevalent in the course design, which would then facilitate each learner receiving the same quantity and quality of mentoring.

Second, although this study focused on mentoring in an online doctoral program, it might be interesting to compare online programs with the traditional face-to-face environment. Would adult learners rate the needs for mentoring and faculty-student interaction differently dependent on the mode of program delivery?

Third, while GPA is commonly used in the literature to measure student success and thus it was chosen as one of the benchmarks for this study, in most doctoral programs learners must maintain a 3.0 to remain in the program, thus discrepancies in this measure are often minimal. This causes one to conjecture if other possible variables such as degree completion rate might more appropriately measure student success.

Fourth, while research revealed that mentoring has an impact on students' completing graduate studies, does it specifically have an effect on doctoral learners completing their dissertations? Would intensive mentoring and faculty-student interaction increase the number of doctoral graduates as well as decrease the amount of time required to complete the dissertation phase of the online program? Would faculty-student interaction moderate the relationship between student mentoring and completing the dissertation phase of the program? Analysis of not only graduates but those who have dropped out might provide information to distinguish the factors that attribute to completing the program. Are the students who remain in the program a self-selecting group that desires to "get the job done" thus requiring less frequent mentoring and interaction than those who cease to persevere? A longitudinal study focusing on the factors affecting completion rate might be insightful.

Last, the development of a different instrument to more accurately measure the functions of online mentoring should be considered. Whereas Cohen's (1993) *PAMS* measures six mentor behavioral functions in the face-to-face environment, an instrument that incorporates Jacobi's (1991) original 15 mentoring functions might further delineate this construct. More so, one must question if it is possible that mentoring functions in an online educational environment differ completely from the ones Jacobi and Cohen identified.

5. Conclusion

Focused on a specific sampling frame of 156 online doctoral learners, these findings should be interpreted circumspectly and generalizations should only be made to groups with analogous characteristics. Replications in other online programs could help reinforce its insinuations. And while this study generated more questions than it answered, it did provide a pivotal piece of research in both the fields of faculty-student interaction and mentoring as they relate to success in an online doctoral program. This reminds us that the field is rich with opportunities to further

explore these concepts in light of our rapidly advancing technology of the 21st century.

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