

# **Abstraction of The Effect of Faculty-Student Interaction on the Relationship Between Student Mentoring and Student Success of Adult Learners in an Online Doctoral Program**

## **Introduction**

Even though many studies acknowledged the benefits of both mentoring (Boyd, 1996; Casto, Caldwell, & Salazer, 2005; Edmonds, 1997; Horton, 1996; Moman, 2002; Reid-Martinez & Hunt, 1998; Shapiro, 2004; Summers-Ewing, 1994; Wadia-Fascetti & Leventman, 2000) and faculty-student interaction (Anderson & Carta-Falsa, 2002; Bjorklund et al., 2004; Grooms, 2000, 2003; Lampport, 1993; Pascarella, 1980; Pascarella et al., 1978; Picciano, 2002; Rovai, 2001; Woodside et al., 1999) in the educational environment, there is limited research on the effect faculty-student interaction has on the relationship between student mentoring and student success in online doctoral programs. This study focused on filling this gap and providing a foundation for additional research.

### ***Summary of the Problem***

A doctoral program often entails the metamorphosis of professional and personal individuality (Johnson & Huwe, 2003); however, there are numerous costs including personal, relational, economical, and professional (Grant-Vallone & Ensher, 2000). Though the cost is great to enable this metamorphosis, some doctoral learners may benefit from a professor who will serve as a mentor to advise, guide, and support them as they succeed in the commission of triumphantly completing a scrupulous program and prepare to embark upon a new career (Johnson & Huwe, 2003).

The mentoring relationship requires both the mentor and one who is mentored: a mentee or a protégé. This relationship would imply that interaction is inherently foundational to mentoring because without interaction, mentoring would be impossible. Norman Cohen (1993), who developed a self-assessment instrument for professionals who assume the role of mentor, identified six mentor behavioral functions. Claiming that these functions are essential for developing a satisfying and productive mentoring relationship, he referred to them as *Relationship Emphasis*, *Informative Emphasis*, *Facilitative Focus*, *Confrontive Focus*, *Mentor Model*, and *Student Vision*. Although mentoring necessitates a relationship between two individuals and without interaction this relationship would never emerge, one must question, what are the outcomes of this mentoring relationship?

### ***Purpose of the Study and Rationale***

For at least 100 years, distance education, in which the student and professor are separated by distance and/or time, has been a popular form of instruction (King & Doerfert, 2000). Today in the digital age of the 21<sup>st</sup> century, technological means have resulted in the Internet becoming distance education's most preponderate mode of delivery (Dolezalek, 2003) and as a result of online classes, universities have the opportunity to provide the masses with unparalleled access to knowledge. Most online education programs utilize Computer-Mediated Communication (CMC), in which individuals use networks and computers to communicate with each other. CMC facilitates communication across different time zones/distances and removes the geographic and time impediments of face-to-face communication (Ahern, Peck, & Laycock, 1992; Burgstahler & Cronheim, 2001; Card & Horton, 2000; Kaye, 1981; Price & Money, 2002; Velsmid, 1997; Wildemuth, Sonnenwald, Ballenbacher, Byrd, & Harmon, 2001).

Offering multiple advantages, online education generates experiential and active learning, encourages application and reflection, and facilitates collaboration in learning communities that expand beyond the traditional classroom's boundaries (Eastmond, 1998). Nonetheless, amidst all the benefits of online education, in order to create an atmosphere conducive to learning, professors must carefully and methodically plan. Most educators affirm that frequent faculty-student interaction, which is the belief that intimacy and reciprocal benefits emanate from associating with other individuals, is essential for an environment that enhances personal development and learning (Chickering & Gamson, 1991; Gamson, 1991; Grooms, 2000, 2003; Kuh & Hu, 2001; Rovai, 2001; Sorcinelli, 1991; Vrasidas & McIsaac, 1999). Thus, interaction is a vital factor to most individuals in online programs (Anderson & Carta-Falsa, 2002; Grooms, 2000, 2003; Picciano, 2002; Rovai, 2001).

In the online environment where adult learners are remotely separated from peers and professors, the need for faculty-student interaction is amplified. By providing a human connection, mentoring relationships can inspire feelings of loyalty and contentment that can be critical to the individuals in an online class (Johnsrud, 1994). 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). Several studies acknowledged the benefits of mentoring (Boyd, 1996; Edmonds, 1997; Horton, 1996; Moman, 2002; Reid-Martinez & Hunt, 1998; Shapiro, 2004; Summers-Ewing, 1994; Wadia-Fascetti & Leventman, 2000) and faculty-student interaction (Anderson & Carta-Falsa, 2002; Bjorklund, Parente, & Sathianathan, 2004; Grooms, 2000, 2003; Lampport, 1993; Pascarella, 1980; Pascarella, Terenzini, & Hibbel, 1978; Picciano, 2002; Rovai, 2001; Woodside, Wong, & Weist, 1999) in the educational environment. Some even proposed that interaction and mentoring enhance this environment (Bjorklund et al., 2004; Edmonds, 1997; Pascarella, 1980; Summers-Ewing, 1994). However, still more research is needed to determine the effect of faculty-student interaction on the relationship between mentoring and success of adult learners in the online environment.

### ***Critique of Relevant Literature***

Several studies (Anaya & Cole, 2001; Bjorklund, Parente, & Sathianatha, 2004; Endo & Harpel, 1982; Hagedorn, Perrakis, & Maxwell, 2002; Lundbert & Schreiner, 2004; Pascarella et al., 1977, 1980) acknowledged the importance of interaction in the educational setting. Pascarella et al.'s (1978; 1980) review and analysis of the research between faculty-student informal interaction and different outcomes of college supported the positive association between faculty interaction and intellectual development/student academic achievement. Endo and Harpel (1982) and Hagedorn, Perrakis, and Maxwell's (2002) studies concurred with Pascarella et al.'s conclusion that academic achievement and success of undergraduate students was indeed influenced by faculty involvement. More specifically using a national cross-sectional sample of 836 undergraduate Latino students, Anaya and Cole (2001) concluded that faculty-student interaction influenced students' academic performance. With a sample of 4,501 students of seven different ethnic groups, Lundbert and Schreiner's (2004) study similarly revealed that "the relationships with faculty were stronger predictors of learning than student background characteristics for all groups, but strongest for students of color" (p. 549). Bjorklund, Parente, and Sathianatha (2004) studied 1,500 freshmen engineering students and concluded, "Instructor interaction and feedback was the greatest contributor to all of the learning outcomes" (p. 157).

Some researchers (Lundbert & Schreiner, 2004; Moman, 2002; Petruolo, 1998) very specifically suggested that faculty interaction had a significant effect on students' grade point averages. Lundberg and Schreiner (2004) proposed that this was based upon the self-fulfilling prophecy. For instance, while employed at Harvard University, Dr. Robert Rosenthal conducted several experiments in which researchers informed the teachers that an achievement test indicated several of the students in the classroom were gifted, although in reality they were not (Phillips-Jones, 1982). The students were also told of their "giftedness." At the end of the school year, the researchers implored the teachers to rate the ability of all the students in the classroom. Amazingly, the assumed "gifted" students' performance proved superior to even the truly gifted students. This intriguing occurrence is known as self-fulfilling prophecy, and excellent mentors utilize it dynamically in their protégé's best interest. Mentors who believe their protégés have exceptional potential can often galvanize them to persevere and do their best (Zey, 1991).

In addition to contributing to students' academic success, faculty-student interaction also enhanced students' self-reported improvements in professional skills. In a study of a large Midwestern university, which was ranked by *U. S. News and World Report* as one of the top 25 online Master of Business programs in the United States, Peltier, Drago, and Schibrowsky (2003) identified six dimensions of online virtual communities that students perceived as important, and three of the six dimensions focused on interaction and mentoring. This supported Grooms' (2000) proposition that since students perceive communication and interaction as important elements to the online experience, it would be beneficial to some students if faculty would "recognize man's basic need for communication and make a conscious attempt to facilitate this within their instructional protocol" (p. 10). Researchers (Hagedorn et al., 2002; Lundbert & Schreiner, 2004; Peltier et al., 2003) continue to support the need for faculty-student interaction; however, one must question the effect faculty-student interaction has on the relationship between mentoring and success of online doctoral learners.

### **Methodology**

#### ***Sample Selection***

Participants in this study were adult online learners who either were currently enrolled or had completed the doctoral program in Regent University's School of Education. Regent University is a Judeo-Christian University in the southeastern part of the United States comprised of nine academic schools, one of which is the School of Education. Although the school opened its doors in 1980, its doctoral program in the School of Education commenced in the fall of 2000. The majority of students who are admitted into the School of Education's online doctoral program are required to attend one week of residency for three consecutive summers, otherwise all coursework is received online through Blackboard via the Internet. Based upon their experience with online doctoral coursework, the total population of 156 learners (140 current students and 16 graduates) was asked to voluntarily complete a two-part questionnaire within an 18-day time period. The sampling frame for the study did not include students who had withdrawn or were currently inactive, which eliminated the threat of mortality due to attrition.

#### ***Instrumentation***

For this study, Cohen's *Principles of Adult Mentoring Scale (PAMS)* (1993) and *Grooms and Bocarnea's Computer-Mediated Interaction Scale (CMIS)* (2003) were used. Cohen developed the *PAMS* in 1993 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 Dimension, Confrontive Emphasis, Mentor Model, and Student Vision*), which 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).

The *PAMS* was slightly modified to more adequately reflect the needs of online doctoral learners. Originally, the instrument contained 55 items; however, the modified version reduced to 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*). Although still in the

developmental stages, the *CMIS* was considered the most appropriate instrument available to measure online faculty-student interaction. Grooms and Bocarnea (2003) developed this instrument based upon the *Computer-Mediated Interaction Questionnaire (CMIQ)*, which was earlier designed by Grooms (2000). Based upon a thorough review of the literature, the *CMIQ* was initially developed to measure adult learners' perceptions related to the importance of online interaction, preferred types of interaction, and three Domains of Interaction (Sociological, Psychological, and Situational). Containing 52 items, 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* (2003) consists of two parts: faculty interaction (62 items) and peer interaction (60 items). The current study focused solely on faculty interaction, and this section of the *CMIS* was modified to reflect learner experience rather than learner expectation. To maintain the reliability of the original 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 ease of the participants in this study, 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, which 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 (Fink, 1995; Leong & Austin, 1996), Cronbach's Alpha was performed on each section (mentoring and interaction) of the modified survey. The reliability coefficient for the total scale of the *PAMS* revealed an alpha coefficient (Cronbach's Alpha) of .9732, while the reliability coefficient for the total scale of the *CMIS* revealed an alpha coefficient (Cronbach's Alpha) 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*).

### **Data Collection and Analysis Procedures**

Participants from the cohort commencing in 2000 to the January cohort of 2005 were solicited through email. An email summarized the study, gave directions for participating, ensured confidentiality, and provided a link to *Survey Suite*, the Internet site where each participant could locate the *Mentoring and Interaction Questionnaire*. A web-based questionnaire was used because recent studies revealed most respondents find the computer-formatted questionnaires more enjoyable and faster than paper-pencil questionnaires (Edwards, Thomas, Rosenfeld, & Booth-Kewley, 1997). In addition, data are automatically entered into a spreadsheet as the respondents complete the survey, often resulting in more accurate data collection. This study yielded a 79% response rate.

The *Statistical Package for Social Science (SPSS) Version 11.5* was used to analyze the data. To answer the research question (What effect does faculty-student interaction have on the relationship between student mentoring and student success in an online doctoral program?), two sets of hypotheses emerged. The first set of two hypotheses dealt with student success as defined by GPA.

H<sub>1-1</sub> Under low faculty interaction, there is a relationship between student mentoring (*Relationship Emphasis, Informative Emphasis, Facilitative Dimension, Confrontive Emphasis, Mentor Model, and Student Vision*) and grade point average.

H<sub>1-2</sub> Under high faculty interaction, there is a relationship between student mentoring (*Relationship Emphasis, Informative Emphasis, Facilitative Dimension, Confrontive Emphasis, Mentor Model, and Student Vision*) and grade point average.

H<sub>1-1</sub> and H<sub>1-2</sub> were analyzed using multiple regression. This form of analysis allows one to examine patterns of relationships between multiple continuous independent variables and one continuous dependent variable.

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

H<sub>2-1</sub> Under low faculty interaction, there is a relationship between student mentoring (*Relationship Emphasis, Informative Emphasis, Facilitative Dimension, Confrontive Emphasis, Mentor Model, and Student Vision*) and passing comprehensive examinations on the first attempt.

H<sub>2-2</sub> Under high faculty interaction, there is a relationship between student mentoring (*Relationship Emphasis, Informative Emphasis, Facilitative Dimension, Confrontive Emphasis, Mentor Model, and Student Vision*) and passing comprehensive examinations on the first attempt.

H<sub>2-1</sub> and H<sub>2-2</sub> were analyzed using logistic regression. This type of analysis is used for making predictions when the dependent variable is dichotomous and the independent variable is either continuous or categorical. In this study, the independent variable was continuous, while the dependent variable, which was passing comprehensive examinations on the first attempt, was categorical.

## Results and Findings

### Results: 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 this 4.0 scale, the mean GPA was 3.68. Of the six mentor behavioral functions, these students experiencing low faculty-student interaction perceived that their professors exhibited more of the *Mentor Model* (motivating the protégé) ( $M = 2.76$ ); followed by the *Confrontive Focus* (challenging the protégé) ( $M = 2.74$ ) and less of the *Informative Emphasis* (providing advice) ( $M = 2.29$ ).

Under low faculty-student interaction, the Pearson  $r$  indicated a slight positive relationship (Sprinthall, 1997) between GPA and the six mentor behavioral functions: *Relationship Emphasis*  $r(57) = .12, p = .19$ , *Informative Emphasis*  $r(57) = .15, p = .13$ , *Facilitative Dimension*  $r(57) = .16, p = .12$ , *Confrontive Emphasis*  $r(57) = .17, p = .10$ , *Mentor Model*  $r(57) = .15, p = .13$ , and *Student Vision*  $r(57) = .13, p = .16$ .

Multiple regression was used to analyze  $H_{1-1}$ . The data did not support that low faculty-student interaction moderated the relationship between student mentoring and grade point average, ( $R^2 = .04$ , *adjusted*  $R^2 = -.07$ ,  $SS = .19$ ,  $MS = .03$ ,  $F(6, 52) = .38, p = .89$ ). According to the data, 4% of GPA was explained by mentor behavioral functions. The analysis indicated a negative relationship between *Relationship Emphasis* (RE) (establishing trust) and GPA as well as *Student Vision* (SV) (stimulating critical thinking) and GPA. In other words, students with high GPAs rated their experience of receiving *Relationship Emphasis* and *Student Vision* from their professor low. A positive relationship existed between *Informative Emphasis* (IE) (providing advice) and GPA; *Facilitative Focus* (FF) (encouraging alternatives) and GPA; *Confrontive Focus* (CF) (challenging the protégé) and GPA; and *Mentor Model* (MM) (role modeling) and GPA. In essence, students with high GPAs rated their professor's demonstration of *Informative Emphasis*, *Facilitative Focus*, *Confrontive Focus*, and *Mentor Model* high; however, learners with low GPAs rated their professor's display of mentor behavioral functions low.

Under low faculty-student interaction, the overall GPA was not significantly related to the mentor behavioral functions included in this study. The 95% constant confidence interval ranged from 3.20 to 3.80. Thus, the hypothesis--under low faculty-student interaction, there is a relationship between student mentoring (*Relationship Emphasis*, *Informative Emphasis*, *Facilitative Focus*, *Confrontive Emphasis*, *Mentor Model*, and *Student Vision*) and GPA--was rejected.

GPA for the 64 respondents who experienced high faculty-student interaction ( $M > 4.91$ ) ranged from 3.03 to 4.0. Based on this 4.0 scale, the mean GPA was 3.70. However, it should be noted that the GPA of high faculty-student interaction ( $M = 3.70$ ) and low faculty-student interaction ( $M = 3.68$ ) differed by only .02. Of the six mentor behavioral functions, students experiencing high faculty-student interaction perceived that their professors exhibited more of the *Student Vision* (stimulating critical thinking) ( $M = 3.95$ ), followed by *Facilitative Focus* (encouraging alternatives) ( $M = 3.93$ ). Analogous to the results under low faculty-student interaction, students experiencing high faculty-student interaction perceived that their professors exhibited less of the *Informative Emphasis* (providing advice) ( $M = 3.34$ ). In comparison, the mean of the six mentor behavioral functions was greater for the students who experienced high faculty-student interaction than for those experiencing low faculty-student interaction.

The Pearson  $r$  indicated that under high faculty-student interaction the mentor behavioral functions and GPA had a small positive relationship (Sprinthall, 1997); *Relationship Emphasis*  $r(62) = -.01, p = .47$ , *Informative Emphasis*  $r(62) = -.11, p = .19$ , *Facilitative Dimension*  $r(62) = -.03, p = .40$ , *Confrontive Emphasis*  $r(62) = -.08, p = .26$ , *Mentor Model*  $r(62) = -.08, p = .27$ , and *Student Vision*  $r(62) = -.08, p = .28$ .

Multiple regression was used to analyze  $H_{1-2}$ . According to this study, student mentoring of those 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*  $R^2 = -.07$ ,  $SS = .10$ ,  $MS = .02$ ,  $F(6, 57) = .36, p = .90$ ).

A negative relationship was noted between *Informative Emphasis* (providing advice) and GPA; *Confrontive Focus* (challenging the protégé) and GPA; *Mentor Model* (role modeling) and GPA; and *Student Vision* (stimulating critical thinking) and GPA. In other words, students with high GPAs rated their professors' ability to exhibit *Informative Emphasis*, *Confrontive Focus*, *Mentor Model*, and *Student Vision* low. In contrast, a positive relationship existed between *Relationship Emphasis* (establishing trust) and GPA, as well as *Facilitative Focus* (encouraging alternatives) and GPA; henceforth, students with high GPAs rated their professors' ability to exhibit *Relationship Emphasis* and *Facilitative Focus* high.

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. According to this study, high faculty-student interaction did not moderate the relationship between student mentoring (*Relationship Emphasis*, *Informative Emphasis*, *Facilitative Focus*, *Confrontive Emphasis*, *Mentor Model*, and *Student Vision*) and GPA, thus  $H_{1-2}$  was rejected.

### **Results: Passing Comprehensive Examinations on the First Attempt**

Logistic regression was used to analyze  $H_{2-1}$ . In this study of those experiencing low faculty-student interaction, 27 respondents passed comprehensive examinations on the first attempt; however, 12 respondents 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 comprehensive examinations. 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*. In other words, students who passed comprehensive examinations on the first attempt rated their professor's demonstration of these functions higher than those who did not initially pass, although it was still considered insignificant.

The 95% constant confidence interval ranged from .14 to 136.15. 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 comprehensive examinations. In essence, this analysis was used to "see if there [were] statistically significant differences between the observed (or actual) frequencies and the expected (or hypothesized...) frequency" (Vogt, 2005, p. 43). In this study, the  $-2 \log$  likelihood was insignificant ( $\chi^2(6) = 7.87, p = .25$ ). Thus, the hypothesis--under low faculty-student interaction, there is a relationship between student mentoring (*Relationship Emphasis*, *Informative Emphasis*, *Facilitative Focus*, *Confrontive Emphasis*, *Mentor Model*, and *Student Vision*) and passing comprehensive examinations on the first attempt--was rejected.

In this study, of those 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 comprehensive examinations. The analysis indicated a negative relationship between passing the comprehensive examinations on the first attempt and the *Mentor Model* and *Student Vision*, which depicted learners who passed comprehensive examinations on the first attempt rated these mentor behavioral functions low. Positive relationships existed between the other mentor behavioral functions, which included *Relationship Emphasis*, *Informative Emphasis*, *Facilitative Focus*, and *Confrontive Focus*, and passing comprehensive examinations on the first attempt.

The range of the 95% confidence interval for high faculty-student interaction was not as extensive as compared to low faculty-student interaction. 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 ( $\chi^2(6) = 1.19, p = .98$ ). 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, the hypothesis--under high faculty-student interaction, there is a relationship between student mentoring (*Relationship Emphasis*, *Informative Emphasis*, *Facilitative Focus*, *Confrontive Emphasis*, *Mentor Model*, and *Student Vision*) and passing comprehensive examinations on the first attempt--was rejected.

## **Discussion**

### **Strengths of the Research**

This study initiated research in online environments to extend the constructs of mentoring as we know it. Cohen (1993) identified six mentor behavior functions; however, this research revealed a need for a revised mentor model, which would accommodate the changes in institutions brought about by modern technology. With technological advances, more adult learners are selecting online educational program, and with this shift in education, it is important to identify the most effective method to mentor learners. In essence, as varying means of disseminating knowledge continue emerging, the methods for mentoring and interacting with adult learners must be altered. This study is significant because it causes one to ponder the most appropriate way to mentor learners in an online environment.

### **Limitations of the Research**

Since the GPA in the dichotomized groups differed slightly (M difference = .02), it is questionable as to whether or not the results are an accurate reflection of faculty-student interaction moderating the relationship between student mentoring and GPA. One must ponder if a larger sample size with a greater diversity in GPA could make a difference.

Two threats to validity were acknowledged; however, measures were taken to diminish these potential threats. First, in order to curtail the threat of a low response rate, in addition to the initial email, several follow-up emails and phone calls were used. Also, the opportunity to acquire a monetary incentive was offered to those who participated. Second, population was a possible threat to external validity; for instance, the online doctoral learners in the current study were enrolled at a Judeo-Christian University in the southeastern region of the United States.

### **Implications for Practice and Research**

While this study focused on a specific sampling frame of online doctoral learners, these implications should be interpreted circumspectly. Generalizations should only be made to a sampling frame with analogous characteristics. Replications of this study in other online programs could help reinforce its insinuations.

This study opens 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' perception 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 the 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 the 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 in regards to the mode of instruction? For instance, would the quantity and quality of the mentoring and faculty-student interaction received in the different programs have a significant influence on student success?

Third, since mentoring is a biblical concept, it is assumed that it would be prevalent at a Judeo-Christian university; however, a comparison of mentoring and faculty-student interaction at both secular universities and Christian universities could be quite insightful. Is the concept of mentoring and faculty-student interaction more evident at Christian universities? Do Christian universities make a punctilious effort to incorporate mentoring and faculty-student interaction into their programs? Is there a difference in the effect of mentoring and faculty-student interaction on student success at either secular or Christian universities?

Fourth, do the faculties' perceptions of interaction and mentoring affect the students' perspectives? If the faculty received appropriate training on how to enhance mentoring and interaction in online programs, would it improve student success? Would instituting a system of accountability to ensure that mentoring and faculty-student interaction were occurring have a positive influence on student success? If the faculty truly believed their willingness to interact and mentor students had an effect on online adult learners, would it make a difference in the quantity of mentoring and interaction learners received?

Fifth, grade point average (GPA) is commonly used in the literature (Edmonds, 1997; Pascarella et al., 1978) to measure student success and thus was chosen for this study. However, in most doctoral programs, learners must maintain a 3.0 GPA to remain in the program, thus often there is not a wide discrepancy in GPA. This causes one to conjecture if other possible variables such as completion rate might more appropriately measure student success.

Sixth, research revealed that mentoring has an impact on students' graduating in a timely manner (Johnson & Huwe, 2003); however, does it have an effect on doctoral learners completing their dissertation? 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 those who have dropped out of the program 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 desire to get the job done and require less frequent mentoring and interaction than those who cease to persevere? A longitudinal study honing in on the factors affecting completion rate might be insightful.

Seventh, a qualitative study might be beneficial to determine the factors associated with the adult learners' rating of mentoring and faculty-student interaction. An understanding of why some individuals rated mentoring and faculty-student interaction low and why others scored mentoring and faculty-student interaction high would be beneficial. Do the personality types of both the instructors and the learners have an impact on their needs for mentoring and interaction?

Eighth, the development of an instrument to more accurately measure the functions of mentoring should be considered. Whereas Cohen's (1993) *PAMS* measures mentor behavioral functions, an instrument that incorporates Jacobi's (1991) 15 mentoring functions might further delineate this construct. Is it possible that mentoring functions in an online educational environment differ completely from the ones Jacobi and Cohen identified? What is the best strategy to mentor adult learners in a seemingly depersonalized individualistic society that networks and builds relationships in new ways using new technologies?

Last, it might be intriguing to analyze the data by various characteristics such as age, cohort, critical thinking skills, external environment, gender, personality traits, psychological types, and other demographical data. Are the perspectives of mentoring and faculty interaction different between Baby Boomers and Generation X? Could the characteristics of the different generations be determining factors in the quantity of interaction and mentoring needed for student success?

### **Conclusion**

In summary, the data from this study revealed that faculty-student interaction did not moderate the relationship between student mentoring (*Relationship Emphasis, Informative Emphasis, Facilitative Focus, Confrontive Emphasis, Mentor Model, and Student Vision*) 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 GPA. The mean of the mentor behavioral functions was greater for students experiencing high faculty-student interaction (*Relationship Emphasis* ( $M = 3.84$ ),

*Informative Emphasis* (M = 3.34), *Facilitative Focus* (M = 3.93), *Confrontive Emphasis* (M = 3.50), *Mentor Model* (M = 3.95), and *Student Vision* (M = 3.77)) than for learners experiencing low faculty-student interaction (*Relationship Emphasis* (M = 2.64), *Informative Emphasis* (M = 2.29), *Facilitative Focus* (M = 2.63), *Confrontive Emphasis* (M = 2.74), *Mentor Model* (M = 2.76), and *Student Vision* (M = 2.61)). In other words, students experiencing high faculty-student interaction scored their professors' ability to facilitate the mentor behavioral functions higher than those students experiencing low faculty-student interaction.

The data in this study also showed that under both high (M > 4.91) and low (M ≤ 4.19) faculty-student interaction, there was no relationship between student mentoring and passing comprehensive examinations on the first attempt. Under low faculty-student interaction, there was a negative correlation between passing comps on the first attempt and three of the six mentor behavioral functions (*Relationship Emphasis* (B = -0.22), *Facilitative Focus* (B = -2.69), and *Mentor Model* (B = -.99)), thus in this group, learners who passed comps did not experience their professor frequently portraying *Relationship Emphasis*, *Facilitative Focus*, or *Mentor Model*. Under high faculty-student interaction, there was a negative correlation between passing comprehensive examinations on the first attempt and two mentor behavioral functions (*Mentor Model* (B = -.39) and *Student Vision* (B = -.75)), so students who passed comprehensive examinations experienced their professor exhibiting *Mentor Model* and *Student Vision* less frequently.

However, the results of this study cause one to speculate on the mentoring functions imperative to adult learners in an online environment that exceed beyond Cohen's six mentor behavioral functions. What aspects of student mentoring and faculty interaction are significant in today's technological society? Has the change in educational delivery methods metamorphosed the concept of mentoring? Using Cohen's (1993) model of mentoring functions, analysis of the effect faculty-student interaction had on the relationship with these behavioral functions and student success revealed the surprising result that interaction was most significant when delineating each of the specific functions, while not with the overall construct of mentoring. These findings were significant as they herald a deeper understanding of the construct within Cohen's mentoring behavioral functions in the university online environment.

Mentoring and interaction are crucial components in an educational setting; however, with technological advances, universities must reconstruct their methods of providing adult learners with the components necessary to be successful. As universities continue to enroll students globally, the most effective method for mentoring and interaction with the learners must be identified. This study revealed the need for continued research in the area of mentoring in an online environment.

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**Tera D. Simmons** received a Doctorate of Education from Regent University in Virginia Beach, VA. She has a Masters of Education in Collaborative Education (K-6) and a Bachelors Degree in Mild Learning and Behavioral Disabilities. She is currently the principal at Greenville Elementary School in Greenville, Alabama