Doctoral Students' Perceptions of Characteristics of Effective College Teachers: A Mixed Analysis

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Abstract

The purpose of this study was to determine doctoral students' perceptions of characteristics of effective teachers and to identify antecedent correlates of these perceptions (i.e., gender, race, type of degree sought, and employment status). Participants were 205 doctoral students who were enrolled at a research university in the United States. Using a sequential mixed analysis, a priori themes identified by Onwuegbuzie, Witcher Collins, Filer, Wiedmaier, and Moore (2007) were applied to doctoral students' open-ended responses, comprising responsive, enthusiast, student-centered, professional, expert, connector, transmitter, ethical, and director. The perceptions of doctoral students were found to be multidimensional, suggesting that a blend of attributes is required of the college teaching profession. Findings from this study have important pedagogical implications for administrators, developers of teacher evaluation forms, and instructors of doctoral students.

Keywords: Doctoral students, effective teachers, mixed methods research, mixed research, mixed analysis, effective college teachers, doctoral students' perceptions

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Introduction

Since the early 1920s, administrators representing virtually all universities and colleges worldwide have been using some form of evaluation instrument to measure teacher effectiveness (Guthrie, 1954; Kulik, 2001; Seldin, 1993). These teacher evaluation forms (TEFs) have an impact on decisions regarding teachers' pay, tenure, promotion, and awards (Onwuegbuzie, Witcher, et al., 2007). Indeed, as noted by Washburn and Thornton (1996), TEFs often are used as the sole measure of teacher effectiveness. Additionally, these forms aid students in choosing teachers and courses (Gray & Bergmann, 2003; Marsh & Roche, 1993; Seldin, 1993). Thus, it is vital that data yielded by these TEFS are maximally valid.

Onwuegbuzie, Witcher, et al. (2007) assessed the validity of scores pertaining to a TEF by examining 912 students' perceptions of characteristics of effective college teachers. Their study was informative because they were able to develop themes and meta-themes that produced what they termed as the *CARE-RESPECTED Model of Teaching Evaluation*. This model comprised nine characteristics (i.e., **R**esponsive, **E**nthusiast, **S**tudent-Centered, **P**rofessional, **E**xpert, **C**onnector, **T**ransmitter, **E**thical, and **D**irector) that factored into four meta-themes (**C**ommunicator, **A**dvocate, **R**esponsible, **E**mpowering) that students considered to reflect effective college teaching. These nine themes and four meta-themes are described in Table 1 and Table 2, respectively.

Table 1. Description of Themes Emerging from Students' Perceptions of the Characteristics of Effective College Instructors

Theme	Description
Responsive	Provides frequent, timely, and meaningful feedback to students
Enthusiast	Exhibits passion in delivery of curricula, in particular, and representing the field, in general
Student-Centered	Places students in the center of the learning process, prioritizes instruction in response to student diversity and interests, possesses strong interpersonal skills
Professional	Displays behaviors and dispositions deemed exemplary for the instructor's discipline
Expert	Demonstrates relevant and current content, connects students' prior knowledge and experience with key components of curricula
Connector	Provides multiple opportunities for student and professor interactions within and outside of class
Transmitter	Imparts critical information clearly and accurately, provides relevant examples, integrates varied communication techniques to foster knowledge acquisition
Ethical	Demonstrates consistency in enforcing classroom policies, responds to students' concerns and behaviors, provides equitable opportunities for student interaction
Director	Organizes instructional time efficiently, optimizes resources to create a safe and orderly learning environment

NOTE: These nine themes were rearranged to produce the acronym RESPECTED.
Adapted from Onwuegbuzie, Witcher, et al., 2007.

Table 2. Description of Meta-Themes Emerging from Students' Perceptions of the Characteristics of Effective College Instructors

Meta-Themes	Descriptions
Communicator	Serves as a reliable resource for students; effectively guides students' acquisition of knowledge, skills, and dispositions; engages students in the curriculum and monitors their progress by providing formative and summative evaluations
Advocate	Demonstrates behaviors and dispositions that are deemed exemplary for representing the college teaching profession, promotes active learning, exhibits sensitivity to students
Responsible	Seeks to conform to the highest levels of ethical standards associated with the college teaching profession and optimizes the learning experiences of students
Empowering	Stimulates students to acquire the knowledge, skills, and dispositions associated with an academic discipline or field and stimulates students to attain maximally all instructional goals and objectives

NOTE: These four meta-themes were rearranged to produce the acronym CARE.
Adapted from Onwuegbuzie, Witcher, et al*,* 2007.

Through their model, Onwuegbuzie, Witcher, et al. (2007) hoped to develop an instrument that would provide formative and summative information about the efficacy of instruction. Interestingly, their model has been so popular that from 2007 until 2012, Onwuegbuzie, Witcher, et al.'s (2007) article was the most downloaded article among all articles ever published in the *American Educational Research Journal*. Since this article was published, educational researchers have increased their interest in TEFs. Indeed, prior to Onwuegbuzie, Witcher, et al.'s (2007) study, there were only six notably published studies in this area. These studies are presented in Table 3. The authors of these works identified several characteristics of effective teaching. Table 4 presents articles in the area of TEFs that were identified through the *EBSCOHOST* from 2007 to 2011. To locate these articles, two key phrases were used. The first search involved use of the search phrase "student perceptions of effective teachers," which yielded 153 articles, of which six articles were applicable to the current study, and the second search involved use of the search phrase "evaluation of college teachers," which yielded 116 articles, of which four articles were applicable to the current study. These articles informed the sections that follow.

Table 3. Chronologically Referenced Articles Regarding TEFs

Year Published	Title and Author	Teacher Effectiveness
1999	Student evaluation of university teaching. (Sheehan, 1999)	Informative lectures, tests, papers evaluating course content, instructor preparation, interesting lectures, and degree that the course was perceived as challenging
2001	Students' perceptions of the evaluation of college teaching. (Crumbley, Henry, & Kratchman, 2001)	Teaching style, presentation skills, enthusiasm, preparation and organization, and fairness related to grading
2002	Students' perspectives on teaching and its evaluation. (Spencer & Schmelkin, 2002)	Demonstrating concern for students, valuing student opinions, clarity in communication, and openness toward varied opinions
2003	Students' evaluation of teacher and instructional quality-Analysis of relevant factors based on empirical evaluation. (Greimel-Fuhrmann & Geyer, 2003)	Responsive to student questions and viewpoints, used creative approaches toward instruction, demonstrating a sense of humor and maintaining balance, and fair approach toward classroom discipline
2004	An investigation into excellent tertiary teaching: Emphasizing reflective practice (Kane, Sandretto, & Heath, 2004)	Knowledge of subject, pedagogical skill, interpersonal relationships, research/teaching nexus, and personality
2005	The perceptions of college students on teacher quality: A focus on teacher qualifications. (Okpala & Ellis, 2005)	Caring for students and their learning, teaching skills, content knowledge, dedication to teaching, and verbal skills

Note: Teacher effectiveness, authors, titles, and year of publication were adapted from Onwuegbuzie, Witcher, et al., 2007

Table 4. EBSCOHOST's Boolean Research on "Evaluation of College Teachers"

Years	Number of Articles Published
2011	26
2010	16
2009	35
2008	30
2007	22

Historical Reflection of TEFs

Calkins and Micari (2010) revealed that the first formal student rating systems occurred in the mid 1920s at Purdue University. These rating systems assessed the following effective teaching

traits: (a) fairness in grading, (b) stimulating intellectual curiosity, and (c) personal peculiarities. During this time, university faculty members, who were held in high scholarly regard, had complete autonomy of their classrooms and could disregard student ratings at their discretion. By the 1950s, however, scholarly regard was beginning to be replaced with skepticism during the Post-war era (Calkins & Micari, 2010). The McCarthy proceedings, which aroused suspicion of Communist education occurring at the university level, influenced government officials to use student ratings to control lectures and to target and to release faculty members who were suspected of Communist instruction. Although students believed that they were gaining power and a voice on their campuses, student rating systems became the leading leverage that government officials would use to monitor curriculum and to hold professors accountable for student success (Calkings & Micari, 2010).

As the 1960s and 1970s emerged, student committees at the university level became a persuasive force in teacher evaluation, for university students used the evaluations to determine in which courses to enroll and which courses to avoid. Moreover, if a professor had a poor evaluation, the professor was forced to defend decisions about course materials and teaching methodology (Calkings & Micari, 2010). With tainted authority and perceived ignorance, the professor had to bear the burden of scholarship for the student.

In the 1980s, university faculty members began writing research articles arguing against the score validity of student evaluations. One popular experiment that highlighted the score reliability and score validity of student evaluations was the Dr. Fox experiment in which audience members gave a high evaluation to a lecturer based on charisma (Calking & Micari, 2010). Although the debate of score validity continues as it pertains to student evaluations, in general, college instructors agree that there should be a tool to measure their teaching skills; yet, the hope is that the evaluations progress from charisma-oriented tools to skill-oriented measures that probe the learning which occurs in their courses. Although student evaluations have seemingly shattered the intellectually authoritative image of university faculty, the evaluations also have revealed effective teaching practices.

Intrapersonal Perceptions that Influence Students' Evaluations on TEFs

Traditionally, student perceptions of course difficulty, subject interest, and instructor professionalism always have been identified through TEFs and reported in research studies. These documents were generally maintained in files that were only accessible to instructors and their administrators; yet, today, TEFs, whether formal or informal, are available to the masses with the click of a mouse. Interestingly, the aforementioned perceptions only indicated the extrinsic academic evaluations of professors from students' perceptions. Recently, through websites like ratemyprofessor.com, intrapersonal perceptions of professors have been revealed as representing relevant factors that influence students' evaluative perceptions of professors. According to Freng and Webber (2009), one disregarded yet intrapersonal perception utilized in evaluation has been attractiveness. Although seemingly superficial in nature, Freng and Webber's study revealed a positive relationship among instructor attractiveness and likeability, teaching effectiveness, proximity, and approachability that could provide further insight into unique variances in TEFs.

Aside from attractiveness, other disregarded perceptions have been ethnicity and gender. Fiske and Neuberg (1990) assert that students who do not know professors adequately might utilize surface cues such as ethnicity and gender to draw conclusions about them. Moreover, Bavishi, Hebl, and Madera's (2010) study revealed that students regarded African American professors to be less competent than White American and Asian professors. Students also illustrated that they had negative perceptions of ethnic minority professors prior to meeting them, especially African American female professors. Unfortunately, inquiries into these perceptions on TEFs have been

continuously evaded. These and other evaded perceptions might better inform evaluations if given an inclusive role in the development of TEFs.

Effective Teaching and TEFs

TEFs have been widely utilized to reveal anonymous allegations of ineffective teaching methodologies and anonymously to target university faculty; yet, these studies are rarely noted for contributing to an understanding of effective teaching. Hildebrand, Wilson, and Dienst (1971) revealed through their study that instructors' perceptions of effective teaching and students' perceptions of effective teaching were different. In particular, instructors believed that continuing an active role in academia through study and research, having rapport with students, and having wealth of knowledge were attributes of being an effective instructor. In contrast, students believed that how an instructor provides clarity, excitement, and enthusiasm about content were attributes of being an effective instructor. In this study, the opportunity to engage instructors and students in interviews to glean qualitative data and afterwards quantitize (i.e., convert qualitative data into numerical codes that can be analyzed quantitatively or statistically; Miles & Huberman, 1994; Tashakkori & Teddlie, 1998) the qualitative data might have revealed relationships between instructors' beliefs and students' beliefs. For example, an instructor's belief in continuing an active role in academia through study and research might have had strong relationships with a student's ability to comprehend the instructional material; yet, 40 years and several articles later, with very few exceptions (e.g., Onwuegbuzie, Witcher, et al., 2007), researchers have yet to utilize mixed methodologies (cf. Teddlie & Tashakkori, 2009) in the area of TEFs.

Some researchers might argue that several statistical analyses, like factor analyses, have been utilized to determine quantitatively the attributes of effective instructors; however, according to Beyers (2008), "because researchers have not really considered the way students actually fill out the forms, they have often opened the door for misinterpretation" (p. 103). These misinterpretations of evaluations can be detrimental in academia in that effective instructors are reprimanded for rigorous pedagogy, and poor instructors are rewarded for poor pedagogy (Beyers, 2008). Because these evaluations are commonly unchallenged by instructors, researchers like Care (2009) published studies that deem the current TEFs as yielding reliable and valid information, even though score reliability and score validity are not scrutinized. Moreover, with few exceptions (e.g., Onwuegbuzie, Witcher, et al., 2007), researchers did not focus on extracting the voices of students regarding perceived characteristics of effective college instructors.

Of the few studies published regarding students' perceptions of effective/ineffective teachers, the Onwuegbuzie, Witcher, et al. (2007) study has been the most comprehensive, involving a very large sample of college students. However, although the sample comprised slightly more than 200 graduate students, the overwhelming majority of these were master's students. Thus, presently, it is unknown what doctoral students perceive as being characteristics of effective college instructors. With an attrition rate among doctoral students that ranges from 30% to 50% (Bowen & Rudenstine, 1992; Cesari, 1990; McAlpine & Norton, 2006), information regarding effective instruction is paramount.

Framework

Collins, Onwuegbuzie, and Sutton's (2006) methodological framework was used as the framework for the present study. This framework provides a 13-step process that is grouped within three stages:

> the Formulation Stage: (a) determining the mixed goal of the study, (b) formulating the mixed research objective(s), (c) determining the rationale of the study and the rationale(s) for mixing quantitative and qualitative approaches, (d) determining the purpose of the

study and the purpose(s) for mixing quantitative and qualitative approaches, (e) determining the mixed research question(s);

the Planning Stage: (f) selecting the mixed sampling design, (g) selecting the mixed research design;

and the Implementation Stage: (h) collecting quantitative and/or qualitative data, (i) analyzing the quantitative and/or qualitative data using quantitative and/or qualitative analysis techniques, (j) validating/legitimating the mixed research findings, (k) interpreting the mixed research findings, (l) writing the mixed research report, and (m) reformulating the mixed research question(s).

These 13 steps are interactive and recursive. According to Leech, Collins, Jiao, and Onwuegbuzie (2011), "Using these interactive steps to formulate, to plan, and to implement a mixed research study informs the researchers' decisions relative to drawing quality meta-inferences (integration of inferences derived from the quantitative and qualitative study components…) and formulating appropriate generalizations" (p. 863).

The goal of mixed research in this study was to have an organizational impact on universities (Newman, Ridenour, Newman, & DeMarco, 2003). Throughout the United States and beyond, TEFs have an impact on decisions regarding teachers' pay, tenure, and awards (Onwuegbuzie, Witcher, et al., 2007). Thus, as noted by Onwuegbuzie, Witcher, et al. (2007), it is essential to examine doctoral students' perceptions of characteristics of effective teachers and their antecedent correlates.

The objectives of this mixed research study were fourfold: (a) exploration, (b) description, (c) explanation, and (d) prediction (Johnson & Christensen, 2010). Specifically, the objectives of the qualitative phase were exploration and description, whereas the objectives of the quantitative phase were description and prediction. All four research objectives were applicable in the mixed research phase. In this study, the researchers adopted a *dialectical pluralist* stance with respect to the research process, wherein multiple epistemological perspectives were incorporated within the same inquiry (Johnson, 2011).

Using Collins, Onwuegbuzie, and Sutton's (2006) rationale and purpose (RAP) model, the rationale for conducting the mixed research study could be classified as participant enrichment and significance enhancement. According to Collins, Onwuegbuzie, and Sutton (2006), *participant enrichment* refers to the mixing of qualitative and quantitative approaches for the rationale of obtaining an optimal sample (e.g., increasing the number of participants, enhancing the likelihood of securing complete and valid responses). *Significance enhancement* refers to mixing qualitative and quantitative techniques to maximize the interpretations of data (i.e., quantitative data/analysis being used to enhance qualitative analyses and vice versa). With respect to participant enrichment, prior to the study all participants were informed about the importance of completing all instruments as comprehensively and as accurately as possible. With respect to significance enhancement, the researchers collected a combination of qualitative and quantitative data to obtain thick, richer data (Geertz, 1973) both during and after the study than otherwise would have been obtained using only one type of data (e.g., quantitative), thereby enhancing the significance of their findings (Onwuegbuzie & Leech, 2004).

Using Greene, Caracelli, and Graham's (1989) framework, two purposes for mixing qualitative and quantitative approaches were utilized in this study. These were (a) complementarity (i.e., using qualitative and quantitative methods to examine a phenomenon in an attempt to extract more information from the data) and (b) expansion (i.e., increasing the breadth of the study by using different methods to assess different components of the inquiry). The purpose of this study was to replicate and to extend Onwuegbuzie, Witcher, et al.'s (2007) study by examining doctoral stu-

dents' perceptions of characteristics of effective teachers, as well as investigating factors that might have influenced their responses (i.e., gender, race, type of degree sought, and full or part-time employment).

Research Questions

The research questions in this study were predetermined (Plano Clark & Badice, 2010) because these questions were written based on literature. An overarching question was written because it was dependent on mixed research components (i.e., qualitative and quantitative). The qualitative phase of this study involved the collection and analysis of open-ended responses. From the qualitative responses, themes were created. These themes then were subjected to an array of quantitative analyses. Thus, the quantitative analyses relied on the qualitative analysis (Creswell & Plano Clark, 2007).

Qualitative research question

For the qualitative phase of this study, the following research question was addressed:

1. What do select doctoral students perceive as being characteristics of effective college instructors?

Mixed research questions

The following mixed research questions were addressed:

2. What is the prevalence of each of the perceived characteristics of effective college instructors?
3. How do these perceived characteristics of effective college instructors relate to one another?
4. What is the relationship between select demographic variables (i.e., ethnicity, gender, employment status, type of doctoral degree [Ph.D. vs. Ed.D.]) and the perceived characteristics of effective college instructors?

It was hoped that the results of the present study would contribute to the extant literature on teacher effectiveness and provide information useful for developing more effective TEFs for doctoral students.

Method

Mixed Sampling Design

Participants and setting

Participants in this study were 205 doctoral students who were attending a large, public state university located in the eastern United States. Using the Carnegie Classification (The Carnegie Foundation for the Advancement of Teaching, n.d.), the university was classified as an institution with very high research. All participants were purposively selected (Miles & Huberman, 1994) to fit a criterion sampling scheme (Patton, 2002). All participants were chosen based on representing the specific criteria of being university students pursuing a doctoral degree. Participants were selected by whole classes. The decision about the sample size was made to yield external statistical generalizations (Onwuegbuzie, Slate, Leech, & Collins, 2009). External statistical generalizations, according to Onwuegbuzie et al. (2009), involve making generalizations, predictions, or inferences based on data gleaned from a large representative sample to the population from which the sample was drawn.

By referring to the university's "Schedule of Classes," classes were identified that were offered within the six colleges and represented various day and evening class periods throughout the

week of data collection. Subsequent to classes being identified, the instructors/professors were asked permission for the researchers to survey their classes. All instructors/professors agreed. The largest representations of respondents represented students who were enrolled in a Doctorate of Philosophy program (n = 174). The majority of the sample was female (59.2%). With respect to the reported ethnic representation of respondents, 63.4% were White and the remaining 36.6% were Non White. The participants ranged in age from 22 to 56 years (M= 40.88, SD = 9.81). Pertaining to degree being sought, most of students were pursuing a Ph.D. degree (84.9%), with the rest pursuing an Ed.D. degree (15.1%). The mean grade point average (GPA) of the participants was 3.78 (SD = 0.34) on a 4-point scale. Approximately 50% of these doctoral students were studying on a part-time basis, with diverse specialization areas such as chemistry, biology, marketing, public health, measurement, psychology, and education. The majority of them had completed at least one of the following methodology courses: research methodology, mathematics, and statistics. Because the same 205 participants contributed to both the qualitative and quantitative components of this investigation, the mixed sampling design employed was a sequential design utilizing identical samples (Collins, Onwuegbuzie, & Jiao, 2006).

Ethical considerations

Permission to conduct all phases of the study adhered to all the participating university's research protocols. This study was approved by the Institutional Review Board. Permission was received from select professors/instructors to solicit study participation from students in their classes. Students were given the choice to decline participation in the investigation. No students declined participation.

Mixed Research Design

A fully mixed sequential dominant status mixed research design was used in this investigation (Leech & Onwuegbuzie, 2009). As conceptualized by Leech and Onwuegbuzie (2009), this design involved (a) the qualitative and quantitative approaches being mixed within multiple stages of the research process, namely, the data collection, data analysis, and data interpretation stages, (b) the initial qualitative and quantitative data being collected and analyzed simultaneously, and (c) both phases being given approximately equal weight.

Mixed Data Collection

Instrumentation and procedures

All data collectors underwent a brief data collection training to ensure uniform collection protocols. Each data collector read a set of instructions to participants disclosing all faculty members involved in the study, explaining the intent of the study (to identify students' perceptions of characteristics of effective college teachers), and emphasizing that study participation was at full discretion of the student. The data collectors proctored various classes to include diverse participant feedback from foundation, core, and survey courses for students pursuing doctoral degrees in a spectrum of disciplines.

Informed consent forms and questionnaires were distributed together to all participants during class sessions. Once recruitment of study participants was established, the data collector prompted participants to identify and to rank between three and six characteristics they believed effective college instructors demonstrate or possess. The participants also were asked to provide a reason for their selections. The instrument included items to gather the following demographic information: gender, ethnicity, age, major, year of study, number of credit hours taken, GPA, teacher status, and whether the respondent was a parent of a school-aged child. Time required to com-

plete the questionnaire was between 15 and 30 minutes and was administered in classes over a 5-day period.

Because the instrument contained both open- and closed-ended items, the mixed data collection style used in the present study could be referred to as Type 2 data (Johnson & Turner, 2003). Further, this combination represents one of the 30 between-strategies mixed data collection combinations identified most recently by Teddlie and Tashakkori (2009).

Mixed Analysis

A sequential mixed analysis (SMA) (Onwuegbuzie & Teddlie, 2003; Tashakkori & Teddlie, 1998) was conducted to analyze the themes and meta-themes pertaining to doctoral students' perceptions of characteristics of effective college teachers and to compare these emergent themes and meta-themes to those identified by Onwuegbuzie, Witcher, et al. (2007). This analysis involved the use of both qualitative and quantitative data analysis procedures in a sequential manner—specifically, an iterative manner—beginning with qualitative analyses, followed by quantitative analyses of the qualitative data that stemmed from the qualitative analyses. This sequence of analysis involved abductive reasoning that oscillated between deductive reasoning and inductive reasoning (Morgan, 2007). Further, the goal of the SMA was typology development (Caracelli & Greene, 1993).The SMA consisted of four stages. Each stage is outlined in the following sections.

Stage 1: Confirmatory and exploratory stage

In the first stage, the doctoral students' perceptions of characteristics of effective college teachers were subjected to a thematic analysis using constant comparison analysis (Glaser & Strauss, 1967). However, rather than being inductive, this analysis was iterative, combining both deductive (i.e., a priori) and inductive (i.e., a posteriori) coding, respectively (Constas, 1992). Specifically, to begin, two researchers read the 205 participants' responses (n = 784) to familiarize themselves fully with their content. As a means of assessing inter-rater reliability (Johnson & Christensen, 2010), the two researchers each coded the same 48 responses (6.1%) using SPSS version 16.0 (SPSS Inc., 2007). The coding of the researchers agreed 94.7% of the time. All discrepancies were resolved before coding the remaining responses. Next, the nine a priori themes that were identified by Onwuegbuzie, Witcher, et al. (2007) (i.e., responsive, enthusiast, student-centered, professional, expert, connector, transmitter, ethical, director; see Table 1) were used to code deductively (i.e., confirmatory analysis) each of the participants' responses (i.e., perceptions of characteristics of effective college teachers).

More specifically, the researchers compared each subsequent significant statement with each of the previous codes such that similar clusters were labeled with the same theme name. The researchers also examined all significant statements that were not coded under any of Onwuegbuzie, Witcher, et al.'s (2007) nine themes to determine whether they could be labeled under a new emergent theme. This phase of the constant comparison analysis represented an inductive analysis (i.e., exploratory analysis) that was undertaken in order to ensure that no original statements made by the doctoral students were unaccounted for by the cluster of themes. Using Constas' (1992) framework, the locus of typology development was primarily literature based, stemming from the themes identified by Onwuegbuzie, Witcher, et al. (2007). The source for naming of categories also was primarily literature based (Constas, 1992).

Stage 2: Exploratory and confirmatory stage

The second stage of the SMA involved the use of descriptive statistics (i.e., exploratory stage) to analyze the hierarchical structure of the themes (Onwuegbuzie & Teddlie, 2003). Specifically, each theme was *quantitized* (Tashakkori & Teddlie, 1998) such that if a doctoral student listed a

characteristic of effective teaching that was eventually unitized under one of the nine Onwuegbuzie, Witcher, et al. (2007) themes (or any new emergent theme), then a score of "1" was given to the theme for the student response; a score of "0" was given otherwise. This dichotomization yielded what Onwuegbuzie (2003a, p. 396) referred to as an *inter-respondent matrix* of themes (i.e., *student x theme matrix*), which consisted only of 0s and 1s. By calculating the frequency of each theme from the inter-respondent matrix, percentages were computed to determine the prevalence rate of each theme. These frequencies, which served as manifest effect sizes (i.e., effect sizes that pertain to observable content) (Onwuegbuzie, 2003a), then were compared to the frequencies computed by Onwuegbuzie, Witcher, et al. (2007).

Stage 3: Exploratory stage

The third stage of the SMA involved the use of the inter-respondent matrix of themes to conduct a principal components analysis (Acton, Miller, Fullerton, & Maltby, 2009) to examine the underlying structure of the themes (i.e., exploratory stage). In particular, the inter-respondent matrix was transformed to a matrix of bivariate associations that represented tetrachoric correlation coefficients because the themes had been quantitized to dichotomous data (i.e., "0" vs. "1"), and tetrachoric correlation coefficients are justified to use when determining the relationship between two (artificial) dichotomous variables is of interest. Thus, the ensuing matrix of tetrachoric correlation coefficients was the basis of the principal components analysis, which led to the determination of the number of factors underlying the themes. An orthogonal (i.e., varimax) rotation was used. The eigenvalue-greater-than-one rule (i.e., K1) (Kaiser, 1958), *scree* test, and a parallel analysis (Thompson, 1984; Zwick & Velicer, 1982, 1986) were used to determine an appropriate number of factors to retain (i.e., meta-themes) (Kieffer, 1999). These factors, or latent constructs, represented *meta-themes* (Onwuegbuzie, 2003a) such that each meta-theme contained one or more of the emergent themes. As suggested by Onwuegbuzie (2003a), the *trace*, or proportion of variance explained by each factor after rotation, served as an effect size index for each meta-theme. By determining the hierarchical relationship among the themes, the verification component of thematic development not only was empirical and technical, but also was *rational* (Constas, 1992). Then, the meta-themes extracted via the principal components analysis were quantitized such that they were represented by dichotomous data (i.e., "0" vs. "1"), which yielded an inter-respondent matrix of meta-themes.

Stage 4: Confirmatory stage

The fourth stage of the SMA (i.e., confirmatory analyses) involved the correlation between the selected demographic variables (i.e., ethnicity, gender, employment status, type of doctoral degree [PhD. vs. Ed.D.]) and the themes that were extracted in Stage 1 and quantitized in Stage 2 via the inter-respondent matrix. Specifically, a canonical correlation analysis (Cliff & Krus, 1976; Darlington, Weinberg, & Walberg, 1973; Thompson, 1980, 1984) was used to examine the multivariate relationship between the selected demographic variables and the themes. For each statistically significant canonical coefficient, standardized coefficients and structure coefficients were computed, which served as *inferential-based effect sizes* (Onwuegbuzie, 2003a). Similarly, a second canonical correlation analysis was conducted to examine the multivariate relationship between the meta-themes extracted in Stage 3 and the selected demographic variables.

Onwuegbuzie and Teddlie (2003) identified the following seven stages of the mixed analysis process: (a) data reduction, (b) data display, (c) data transformation, (d) data correlation, (e) data consolidation, (f) data comparison, and (g) data integration. In the present study, the researchers used five of Onwuegbuzie and Teddlie's seven stages: data reduction, data display, data transformation, data correlation, and data integration. Specifically, qualitative data were reduced to themes and meta-themes (i.e., data reduction; Stages 1-3), qualitative and quantitative data were displayed in tables and figures (i.e., data display; Stages 1-4), quantitative data (i.e., demographic

data) were correlated qualitative data (i.e., themes) (i.e., data correlation; Stage 4), and quantitative and qualitative findings from the data were integrated (i.e., data integration; Stages 1-4). Finally, Onwuegbuzie and Combs (2010) conceptualized that, optimally, mixed researchers make 13 decisions during any given mixed analysis process, which yielded an inclusive framework for conducting mixed analyses. These 13 sets of decisions are summarized in Table 5.

Table 5. Summary of Onwuegbuzie and Combs' (2010) 13-Criteria Meta-Framework for Mixed Analysis Techniques Used

Criteria	How Criteria were Manifested in the Study
Rationale/purpose for conducting the mixed analysis	Involved complementarity and expansion (Greene, Caracelli, & Graham, 1989)
Philosophy underpinning the mixed analysis	Involved dialectical pluralist assumptions and stances (Johnson, 2011)
Number of data types that will be analyzed	Collected both quantitative and qualitative data (Creswell & Plano Clark, 2010)
Number of data analysis types that will be used	Utilized both qualitative analysis and quantitative analysis (Creswell & Tashakkori, 2007; Onwuegbuzie, Slate, Leech, & Collins, 2007, 2009; Onwuegbuzie & Teddlie, 2003)
Time sequence of the mixed analysis	Involved sequential analysis (Tashakkori & Teddlie, 1998; Teddlie & Tashakkori, 2009)
Level of interaction between quantitative and qualitative analyses	Analyzed data at Stage 1 that informed the analysis of data at Stages 2-4 (Teddlie & Tashakkori, 2009)
Priority of analytical components	Conducted quantitative-dominant mixed analysis (Johnson, Onwuegbuzie, & Turner, 2007; Morse, 2003)
Number of analytical phases	Not linked directly to any phases of the mixed analysis (Greene, 2007; Onwuegbuzie & Teddlie, 2003)
Link to other design components	Not linked directly to any mixed research designs (Creswell & Plano Clark, 2010; Teddlie & Tashakkori, 2009)
Phase of the research process when all analysis decisions are made	Made mixed analysis decisions iteratively (Johnson, Onwuegbuzie, & Turner, 2007)
Type of generalization	Made external analytic generalizations based on Stage 1 analysis and statistical generalizations based on Stage 2-4 analyses (Onwuegbuzie, Slate, Leech, & Collins, 2009)
Analysis orientation	Involved case-oriented analysis at Stage 1 and a variable- and case-oriented analysis at Stages 2-4 (Onwuegbuzie, Slate, Leech, & Collins, 2009)

Criteria	How Criteria were Manifested in the Study
Cross-over nature of analysis	Quantitized qualitative data (e.g., effect sizes; Onwuegbuzie, 2003a; Onwuegbuzie & Teddlie, 2003); and correlated the quantitative and qualitative data (Onwuegbuzie & Combs, 2010)

Results

Mixed Analysis Findings

Stage 1 and Stage 2 findings

The doctoral students provided a total of 784 descriptions of effective teachers within Onwuegbuzie, Witcher, et al.'s (2007) emergent themes: responsive, enthusiast, student-centered, professional, expert, connector, transmitter, ethical, and director. In particular, each of 205 participants listed at least one criterion of effective teachers, with a mean of 3.65 significant statements per doctoral student. This value was higher than the mean of 3.28 reported by Onwuegbuzie, Witcher, et al. (2007). Table 6 displays examples of significant statements extracted from the students' responses for each of the nine underlying themes of effective teachers.

Table 6. Thematic Conceptual Matrix of Effective Teachers with Descriptors

Theme	Descriptor / Exemplar
Director	Use of a variety of teaching methods
	Clear expectations and transparent grading policy
Enthusiast	Passionate about the topic that they are teaching
Transmitter	Able to take complex and make simplistic
	The ability to demonstrate the relevancy of the material
Expert	Thoroughly explaining a topic
	Knowledgeable about their course and content area
Responsive	Gives constructive feedback
	Able to provide timely feedback
	Return e-mails and phone calls promptly
Connector	Relating coursework to practical work
	Available for discussion or assistance
Student centered	Engage students in discussion
	Meeting needs of students
	Approachable by students
Ethical	Show respect to students
	Apply some standards to all students (fair)
Professional	Ability to conduct individual research
	Organizational skills must be good

The prevalence rate of each theme (Onwuegbuzie, 2003a; Onwuegbuzie & Teddlie, 2003) is presented in Table 7. Table 7 also presents the prevalence rates that were in Onwuegbuzie, Witcher, et al.'s (2007) study. It can be seen from this table that, in the present study, the Professional theme received the largest endorsement, with approximately two thirds (66.1%) of the doctoral

students providing one or more traits that were categorized into this theme. This theme was followed by the Ethical theme, which nearly one half (i.e., 47.7%) of the doctoral students endorsed. As recommended by Onwuegbuzie, Collins, and Leech (in press), using Cohen's (1988, pp. 180-183) non-linear arcsine transformation and Cohen's *d* criteria, yielded cut-points of 1% endorsement as representing a small effect size, 7% endorsement as representing a medium effect size, and 16% endorsement as representing a large effect size. Thus, the frequency of all the themes in the present study represented at least moderate effect sizes. The findings that Professional and Ethical themes were the two most endorsed themes was in contrast to the results from Onwuegbuzie, Witcher, et al.'s (2007) study, wherein Student-Centered and Expert were the two most commonly endorsed themes.

Table 7 Themes Emerging from Students' Perceptions of the Characteristics of Effective College Instructors Past and Present Studies

Theme	Endorsement Rate (%)	
	Onwuegbuzie, Witcher, et al. (2007)	Present Study
Student-Centered	58.88	42.1
Expert	44.08	29.8
Professional	40.79	66.1
Enthusiast	29.82	14.0
Transmitter	23.46	28.1
Connector	23.25	39.8
Director	21.82	13.9
Ethical	21.60	47.7
Responsive	5.04	37.9

Stage 3 findings

With regard to the principal components analysis, the Kaiser-Meyer-Olkin (KMO) measure suggested excellent sampling adequacy, KMO = .83, being much larger than the cutpoints of .5 (Field, 2009) and .6 (Acton et al., 2009). Further, the anti-image correlation matrix revealed that all KMO values for the individual variables were greater than .7, which, again, exceeds both cut points. Further, Bartlett's test of sphericity indicated that the correlations between the items were sufficiently large for the principal components analysis, $X^2(10) = 476.85$, $p < .0001$.

The eigenvalue-greater-than-one rule (i.e., K1) (Kaiser, 1958) and the *scree* test (Cattell, 1966; Zwick & Velicer, 1986) suggested that three factors be retained. In addition, a parallel analysis was conducted as a validity check to the K1 and scree test (Zwick & Velicer, 1982, 1986). As stated by Thompson (2004), "parallel analysis appears to be among the best methods for deciding how many factors to extract or retain" (p. 34). For the current data of 205 participants and nine variables, a series of (i.e., n = 1,000) random data matrices of size 205 x 5 was generated, and eigenvalues were computed for the correlation matrices for the original data and for each of the 1,000 random data sets. The eigenvalues derived from the actual data then were compared to the eigenvalues derived from the random data, in order to identify the number of components that account for more variance than do the components derived from random data. More specifically, as recommended by many factor analysts (Cota, Longman, Holden, Fekken, &Xinaris, 1993; Glorfeld, 1995), the eigenvalues that corresponded to the 95th percentile of the distribution of random data eigenvalues were generated. Factors or components were retained providing that the

*i*th eigenvalue from the actual observed data was greater than was the *i*th eigenvalue from the random data. The parallel analysis also suggested retaining three factors.

The three-factor solution is presented in Table 8. Using a cutoff correlation of 0.3, recommended by Lambert and Durand (1975) as an acceptable minimum value for pattern/structure coefficients, Table 8 reveals that the following themes had pattern/structure coefficients with large effect sizes on the first factor: Responsive, Connector, Student-Centered, Ethical, and Professional; the following themes had pattern/structure coefficients with large effect sizes on the second factor: Expert, Transmitter, and Director; and the following theme had a pattern/structure coefficient with a large effect size on the third factor: Enthusiast. It should be noted that in addition to having a pattern/structure coefficient with a large effect size on Factor 1, Professional had a significant pattern/structure coefficient on Factor 2 (i.e., cross-loading). Further, in addition to having a pattern/structure coefficient with a large effect size on Factor 2, Director had a significant but smaller pattern/structure coefficient on Factor 3.

Table 8. Summary of Themes and Pattern/Structure Coefficients from the Principal Components Analysis with Varimax Rotation: Three-Factor Solution

	Pattern/Structure Coefficient[1]			
Theme	1	2	3	Communality Coefficient
Responsive	**.84**	.01	.05	.70
Connector	**.83**	.01	.05	.70
Student-Centered	**.81**	.07	.06	.66
Ethical	**.77**	.12	.05	.62
Professional	**.56**	**.51**	.02	.58
Expert	.06	**.69**	.20	.52
Transmitter	.27	**.66**	**-.31**	.60
Director	-.10	**.62**	.17	.43
Enthusiast	.16	.18	**.90**	.87
Trace	3.35	1.41	.91	5.67
% of variance explained	37.20	15.62	10.13	62.95

[1] Coefficients in bold represent pattern/structure coefficients with the largest effect size within each theme using a cut-off value of 0.3 recommended by Lambert and Durand (1975).

The first meta-theme (i.e., Factor 1) was labeled *synergist*. The second meta-theme (i.e., Factor 2) was termed *transformer*. Finally, the third meta-theme (i.e., Factor 3) was denoted as *enthusiast*. The meta-theme of synergist (Factor 1) accounted for 37.20% of the variance, transformer explained 15.60% of the variance, and the enthusiast explained 10.13% of the variance. The total variance explained from these meta-themes was 62.95%. Interestingly, this proportion of total variance explained was greater than that typically explained in factor solutions (Henson, Capraro, & Capraro, 2004; Henson & Roberts, 2006). Moreover, this total proportion of variance could be considered as representing a large effect size. The descriptions of each of the three meta-themes are presented in Table 9. The thematic structure is presented in Figure 1. This figure illustrates the relationships among the themes and meta-themes arising from doctoral students' perceptions of

characteristics of effective college teachers. As can be seen from this figure, the manifest effect sizes pertaining to the meta-themes were as follows: synergist (95.1%), transformer (87.8%), and enthusiast (41.5%).

Table 9. Descriptions of Meta-Themes Pertaining to Perceptions of Characteristics of Effective Teachers[a]

Meta-Themes	Descriptions
Synergist	Acts as an interactive (multidimensional) communicator for nurturing students' acquisition of knowledge
Enthusiast	Demonstrates passion during the process of teaching and learning
Transformer	Provides powerful knowledge and content, imparts relevant information clearly and accurately to improve students' understanding

[a] These three meta-themes were rearranged to produce the acronym SET.

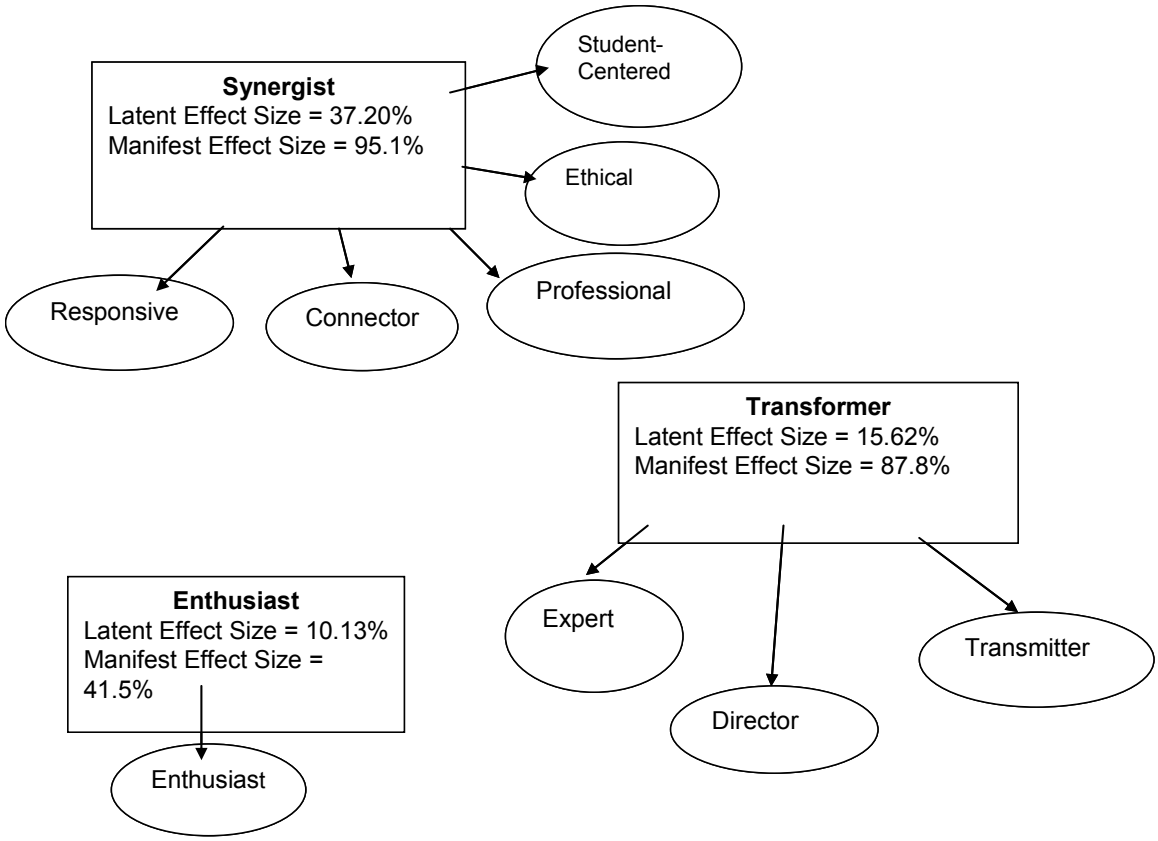

Figure 1. Stage 3: Thematic structure pertaining to doctoral students' perceptions of characteristics of effective college teachers

Stage 4 findings

A canonical correlation analysis was undertaken to examine the relationship between the 9 characteristics themes and the selected four demographic variables (i.e., ethnicity, gender, employment status, type of doctoral degree [PhD. vs. Ed.D.]). The nine characteristics themes were treated as the dependent set of variables, whereas the four demographic variables served as the inde-

pendent multivariate profile. The number of canonical functions (i.e., factors) that can be generated for a given dataset is equal to the number of variables in the smaller of the two variable sets (Thompson, 1980, 1984, 1988, 1990). Because nine themes were correlated with four independent variables, four canonical functions were generated.

The canonical analysis revealed that the four canonical correlations combined were statistically significant ($p < .05$). However, when the first canonical root was excluded, the remaining three roots were not statistically significant ($p = .47$; Canonical $R_{c2}^2 = .07$). Similarly, when the first two canonical roots were excluded, the remaining two roots were not statistically significant ($p = .77$; Canonical $R_{c3}^2 = .04$), and when the first three canonical roots were excluded, the remaining root was not statistically significant ($p = .81$; Canonical $R_{c4}^2 = .02$). Together, these results suggested that the first canonical function was statistically significant and practically significant (Canonical $R_{c1}^2 = .11$) (Cohen, 1988), but the remaining roots were not statistically significant. Thus, only the first canonical function was interpreted.

Table 10. Canonical Solution for First Function: Relationship between Nine Themes and Selected Demographic Variables

Variables	Standardized Coefficient	Structure Coefficient	Structure^2 (%)
Themes:			
Student-Centered	.81*	.55*	30.25
Expert	.39*	.54*	29.16
Professional	.30*	.54*	29.16
Enthusiast	-.20	.05	0.25
Transmitter	.17	.47*	22.09
Connector	-.61*	-.01	0.01
Director	.28	.42*	17.64
Ethical	-.03	.27	7.29
Responsive	-.09	.13	1.69
Demographic Variables:			
Gender	.38*	.39*	15.21
Type of Doctoral Degree (Ph.D. vs. Ed.D.)	-.56*	-.35*	12.25
Employment Status (Full-time vs. Part-time)	-.71*	-.63*	39.69
Ethnicity (White vs. Non-White)	.35*	.60*	36.00

*Coefficients with the effect sizes larger than .3 (Lambert & Durand, 1975).

Data pertaining to the first canonical root are presented in Table 10. This table displays both standardized function coefficients and structure coefficients. Using a cutoff correlation of 0.3 (Lambert & Durand, 1975), the standardized canonical function coefficients revealed that Student-Centered, Expert, Professional, and Connector attributes made important contributions to the set of themes, with Student-Centered making by far the greatest contribution. With respect to the demographic variable set, all four variables (i.e., ethnicity, gender, employment status, type of

doctoral degree [PhD. vs. Ed.D.]) made noteworthy contributions, with employment status making by far the greatest contribution. The structure coefficients pertaining to the first canonical function revealed that Student-Centered, Expert, and Professional attributes again made important contributions to the first canonical variate, alongside Transmitter and Director attributes. Most notably, the square of the structure coefficient indicated that Student-Centered, Expert, and Professional attributes explained 30.3%, 29.2%, and 29.2% of the variance, respectively. With regard to the demographic variable cluster, again all four variables made noteworthy contributions, with employment status making the strongest contribution, explaining 39.7% of the variance. Comparing the standardized and structure coefficients identified Connector as a suppressor variable because the standardized coefficient associated with this variable was large, whereas the corresponding structure coefficient was relatively small (Onwuegbuzie & Daniel, 2003). Suppressor variables are variables that assist in the prediction of dependent variables due to their correlation with other independent variables (Tabachnick & Fidell, 2006). Also, Transmitter and Director suggested multicollinearity because the structured coefficient associated with this variable was large, whereas the corresponding standardized coefficient was relatively small (Onwuegbuzie & Daniel, 2003).

Coefficients in bold represent variables with significant standardized coefficients and structure coefficients using a cut-off value of 0.3 recommended by Lambert and Durand (1975).

A canonical correlation analysis also was undertaken to examine the relationship between the three meta-themes and the four demographic variables. The three meta-themes were treated as the dependent set of variables, whereas the four demographic variables again were utilized as the independent multivariate profile. The canonical analysis revealed that the three canonical correlations combined were statistically significant ($p < .05$). When the first canonical root was excluded, the remaining two canonical roots were not statistically significant ($p = .22$; Canonical $R_{c2}^2 = .04$). Also, when the first two canonical roots were excluded, the remaining canonical root was not statistically significant ($p = .53$; Canonical $R_{c3}^2 = .01$).Together, these results suggested that the first canonical function was statistically significant and practically significant (Canonical $R_{c1}^2 = .25$) (Cohen, 1988), but the remaining roots were not statistically significant. Thus, only the first canonical function was interpreted.

Data pertaining to the first canonical root are presented in Table 11. Using Lambert and Durand's (1975) cutoff, the standardized canonical function coefficients revealed that all three meta-themes made important contributions to the set of themes—with Transformer being the major contributor. With respect to the demographic variable set, three of the four (i.e., ethnicity, gender, employment status) areas made noteworthy contributions, with ethnicity making the largest contribution. The structure coefficients pertaining to the first canonical function also revealed that the Synergist and Transformer meta-themes made important contributions to the set of themes—with Transformer again being the major contributor. The square of the structure coefficient indicated that Synergist and Transformer explained 20.3% and 67.2% of the variance, respectively. With regard to the demographic variable cluster, ethnicity, gender, and employment status each made a noteworthy contribution, explaining 65.6%, 25.0%, and 26.0% of the variance, respectively. Comparing the standardized and structure coefficients identified Enthusiast as a suppressor variable because the standardized coefficient associated with this variable was large, whereas the corresponding structure coefficient was relatively small (Onwuegbuzie & Daniel, 2003).

Table 11. Canonical Solution for First Function: Relationship between Three Meta-Themes and Selected Demographic Variables

Variables	Standardized Coefficient	Structure Coefficient	Structure^2 (%)
Themes:			
Synergist	.31*	.45*	20.25
Transformer	.86*	.82*	67.24
Enthusiast	-.53*	-.26*	6.76
Demographic Variables:			
Gender	.44*	.50*	25.00
Type of Doctoral Degree (Ph.D. vs. Ed.D.)	-.26	-.14	1.96
Employment Status (Full-time vs. Part-time)	-.43*	-.51*	26.01
Ethnicity (White vs. Non-White)	.64*	.81*	65.61

*Coefficients with the effect sizes larger than .3 (Lambert & Durand, 1975).

Coefficients in bold represent variables with significant standardized coefficients and structure coefficients using a cut-off value of 0.3 recommended by Lambert and Durand (1975).

Discussion

Validating/Legitimating the Findings

Validity of findings from qualitative and quantitative phases

As is the case with all quantitative findings, threats to internal validity and external validity prevail (Campbell, 1957; Campbell & Stanley, 1963; Onwuegbuzie, 2003b). With respect to external validity, because the sample represented students at a single university (i.e., threat to population validity and ecological validity) whose perceptions about effective teachers were gathered at a single point in time (i.e., threat to temporal validity), it is not clear the extent to which the present findings are generalizable (i.e., have adequate external validity) to doctoral students from other institutions, particularly students from other regions of the United States. Bearing in mind the uniqueness of this population (i.e., doctoral students), the fact that this study involved more than 200 doctoral participants is noteworthy. Indeed, at the time of the study, the university had a total of 2,226 doctoral students enrolled. Thus, the sample for this investigation represented 9.21% of the total population of doctoral students. As such, the present findings are representative, at least to some degree, of the doctoral students at that institution. Further, the statistical power for 205 participants to detect a multivariate relationship involving the nine themes was very high (i.e., > .95) for the canonical correlation analysis. Finally, the nine themes yielded a case-to-variable ratio of 22.8 to 1, which far exceeds the recommendation of 5 participants per theme as the bare minimum to at least 10 participants per theme (Cattell, 1978; Everitt, 1975; Gorsuch, 1983; Hatcher, 1994; Onwuegbuzie & Daniel, 2003). Thus, the sample size of 205 was more than adequate for all the analyses conducted in the study. Nevertheless, replications of the present study are needed using a wide variety of doctoral students.

With respect to internal validity**,** the biggest threats to the findings were descriptive validity (i.e., factual accuracy of the account) (Maxwell, 1992, 2005) and interpretive validity (i.e., extent that a researcher's interpretation of an account represents an understanding of the study participants' voice and the meanings that they attach to their words and actions) (Maxwell, 1992, 2005). How-

ever, descriptive validity and interpretive validity were enhanced by the fact that all 205 students who provided responses were member-checked and were able to confirm the statements that they made. Also, because some of the researchers were doctoral students themselves, they were able to provide an emic perspective alongside an etic perspective. Further, the fact that all the themes secured endorsement rates that yielded at least moderate effect sizes suggests that data saturation took place.

Legitimation of findings from the mixed research phase

Onwuegbuzie and Johnson (2006) identified nine legitimation types that are pertinent to mixed research. Each of these legitimation types is defined in Table 12, together with an explanation of how they were addressed in the current investigation. It can be seen that nine threats were addressed to some degree. Nevertheless, despite the extremely rigorous nature of the mixed research design, replications of this inquiry are needed to assess the reliability of the current findings.

Table 12. Typology of Mixed Methods Legitimation Types and Approaches Used to Minimize them

Legitimation Type	Description	How Legitimation Type was Enhanced
Sample Integration	The extent to which the relationship between the quantitative and qualitative sampling designs yields quality meta-inferences.	Collecting both qualitative and quantitative data on the same group of student participants
Inside-Outside	The extent to which the researcher accurately presents and appropriately utilizes the insider's view and the observer's views for purposes such as description and explanation.	Capturing the participants' quantitative and qualitative data (i.e., insiders' views) and including doctoral students on the research team (observers' views)
Weakness Minimization	The extent to which the weakness from one approach is compensated by the strengths from the other approach.	Combining descriptive precision (i.e., stemming from qualitative analyses) with empirical precision (i.e., stemming from quantitative analyses)
Sequential	The extent to which one has minimized the potential problem wherein the meta-inferences could be affected by reversing the sequence of the quantitative and qualitative phases.	Collecting quantitative and qualitative data simultaneously (i.e., concurrently)
Conversion	The extent to which the quantitizing or qualitizing yields quality meta-inferences.	Obtaining verification of quantitizing of themes via member checking and analysis of audit trail.
Paradigmatic mixing	The extent to which the researcher's epistemological, ontological, axiological, methodological, and rhetorical beliefs that underlie the quantitative and qualitative approaches are successfully (a) combined or (b) blended into a usable package.	Using a fully mixed research design (Leech & Onwuegbuzie, 2009), as well as by undergoing all major steps of the mixed research process
Commensurability	The extent to which the meta-inferences made reflect a mixed worldview based on the cognitive process of Gestalt switching and integration.	Using a team of researchers that was diverse with respect to research training, research experience, research philosophy, experiences with college teachers, and discipline (e.g., literacy educator, research methodologist)
Multiple Validities	The extent to which addressing legitimation of the quantitative and qualitative components of the study result from the use of quantitative, qualitative, *and* mixed validity types, yielding high quality meta-inferences.	Using techniques (e.g., intercoder agreement, member checking, debriefing) that addressed as many threats to the legitimation of both the qualitative and quantitative findings as possible

Legitimation Type	Description	How Legitimation Type was Enhanced
Political	The extent to which the consumers of mixed methods research value the meta-inferences stemming from *both* the quantitative and qualitative components of a study.	Using rigorous qualitative and quantitative techniques

Note. This table was adapted from Onwuegbuzie and Johnson (2006). Reprinted with kind permission of the Mid-South Educational Research Association and the Editors of *Research in the Schools*.

Interpreting the Findings

Stage 1 and Stage 2 findings

As was the case in Onwuegbuzie, Witcher, et al.'s (2007) study, the present findings revealed that the perceptions held by college students about effective college teachers is multidimensional in nature. Specifically, the nine themes identified by Onwuegbuzie, Witcher, et al. (2007) were replicated in the current investigation, with no additional themes emerging. Thus, as observed by Onwuegbuzie, Witcher, et al. (2007) the nine themes yield the acronym, RESPECTED, which is an appropriate goal towards which college teachers should strive.

As noted previously, the findings that the Professional and Ethical themes were the two most endorsed themes is in contrast to the results from Onwuegbuzie, Witcher, et al.'s (2007) ***[date?]*** study, wherein Student-Centered and Expert were the two most commonly endorsed themes. That the professional theme received the greatest endorsement is consistent with doctoral students' tendency to have experience professionally, which, therefore, influences their expectations of professionalism within the classroom setting. These findings regarding the Professional and Ethical themes suggest that doctoral students at the study institution deem it much more important to enroll in college classes taught by teachers who exhibit behaviors and dispositions that best reflect the underlying discipline, who demonstrate consistency in enforcing classroom policies, who respond to students' concerns and behaviors, and who provide equitable opportunities for student interaction than teachers who place students in the center of the learning process, who prioritize instruction in response to student diversity and interests, and who possess strong interpersonal skills. Thus, although for undergraduate students, in general, the interpersonal context appears to be the most important indicator of effective instruction (Onwuegbuzie, Witcher, et al., 2007), for doctoral students—at least those in the present inquiry—a *synergist context* is paramount. However, it should be noted that the theme Student-Centered is part of the Synergist meta-theme.

Stage 3 findings

When Onwuegbuzie, Witcher, et al. (2007) factor-analyzed responses pertaining to the nine themes, they identified the following four meta-themes: communicator (comprising Responsive, Connector, and Transmitter), advocate (comprising Student-Centered and Professional); Responsible (comprising Director and Ethical), and Empowering (comprising Expert and Enthusiast). In the present study, the principal components analysis configured the nine themes differently for the doctoral students. Specifically, the principal components analysis led to the identification of three meta-themes. Careful deliberation of the definitions and relationships of the themes grouped under each meta-theme resulted in the labels *synergist*, *transformer*, and *enthusiast*.

A synergist, as defined in this study, is a teacher who acts as an interactive (multidimensional) communicator for nurturing students' acquisition of knowledge. The themes grouped under this factor were responsive, connector, student-centered, ethical, and professional. Interestingly, this meta-theme not only contained the two most endorsed themes—it actually contained the five most common themes. Thus, it should not be surprising that this meta-theme was the most dominant, with 95.1% of the sample members endorsing one or more themes that were contained in

this meta-theme, giving credence to the interactive and communicative nature of the synergist meta-theme and its underlying themes.

We defined a transformer, representing the second most common meta-theme, as a teacher who provides powerful knowledge and content and imparts relevant information clearly and accurately for increasing students' understanding. Thus, such a teacher, at least to some extent, optimally leads to a transformation in a students' knowledge base. However, in contrast to the multidimensional of the synergist meta-theme, we view the transformer meta-theme as being representative of a unidirectional interaction, wherein the teacher imparts knowledge and information and manages the direction of the course. The observable, manifest effect size (Onwuegbuzie, 2003a; Onwuegbuzie & Teddlie, 2003) for the transformer meta-theme was 87.8%, indicating that this meta-theme also was endorsed by the vast majority of doctoral students. This meta-theme confirms one of the primary purposes of education and, therefore, teaching: the attainment of knowledge and information. Recent focus on student-centered learning has discredited, to some extent, the role of the teacher as the sage person who imparts wisdom upon students; yet, the sharing of knowledge from a learned person to the less learned still plays an important role in the student-teacher dynamic and its value should not be overlooked.

Finally, an enthusiast, representing the third meta-theme, is a teacher who demonstrates passion during the process of teaching and learning. The meta-theme of enthusiast represented only one theme. Yet, the manifest effect size (41.5%) was still notable. It is our opinion that, at the doctoral level, passion of the instructor for both teaching and the content being taught is assumed. The amount of time and energy that is put into teaching doctoral-level classes would not be maintained by someone who was not passionate about her/his work. However, for a significant proportion of students, the assumption of enthusiasm is not sufficient. Rather, students need to observe this enthusiasm. More research is needed into the specifics of what doctoral students' definition of enthusiasm entails.

An interesting finding pertaining to the meta-themes is that the labels represent the acronym SET. According to The American Heritage College Dictionary (1997, p. 1247), the following definition is given for the word "Set": "A group of persons sharing a common interest." This definition is particularly pertinent to the field of college teaching because college teachers—as do all teachers—share a common goal of educating people. Therefore, the acronym "Set" is extremely apt. Thus, whereas the Onwuegbuzie, Witcher, et al.'s (2007) findings has led them to begin developing a TEF that is based on the various themes and meta-themes comprising the *CARE-RESPECTED* Model of Teaching Evaluation, the present findings suggest that a TEF be developed for doctoral students that is based upon the various themes and meta-themes comprising the *RESPECTED-SET* Model of Teaching Evaluation. In any case, the discrepancies in findings identified between Onwuegbuzie, Witcher, et al.'s (2007) study and the present investigation strongly suggest that a different TEF should be used for doctoral students than is used for other types of college students (e.g., undergraduate students).

Stage 4 findings

Themes. The canonical correlation analysis revealed a multivariate relationship between students' attributes and their perceptions of characteristics of effective college instructors. In particular, the traits professional, expert, and student-centered were related to the following background variables: gender, type of doctoral degree, employment status, and ethnicity. This relationship suggests that these three themes best distinguish college students' perceptions of effective college teachers as a function of gender, doctoral degree, employment status, and ethnicity. Moreover, an inspection of the signs of the coefficients indicates that doctoral students who endorse the traits of professional, expert, and student-centered are more likely to be female, White, Ed.D. students and in full-time employment. Future research should investigate further these links.

***Meta-Themes*.** The canonical correlation analysis involving the meta-themes also revealed a multivariate relationship between students' attributes and the meta-themes that evolved. In particular, the meta-themes synergist and transformer were related to the following background variables: gender, employment status, and ethnicity. More specifically, an inspection of the signs of the coefficients indicates that doctoral students who endorse the meta-themes synergist and transformer are more likely to be female, White, and in part-time employment. Future research should further investigate these links.

The findings that gender, doctoral degree status, employment status, and ethnicity are related in some combination to the themes and meta-themes suggest that individual differences exist with respect to doctoral students' perceptions of the characteristics of effective college teachers, as was the case for Onwuegbuzie, Witcher, et al.'s (2007) sample of predominantly undergraduate students. Therefore, any instrument that omits items that represent any of these themes or meta-themes likely would lead to doctoral students in general and specific types of doctoral students in particular being *disenfranchised* inasmuch as the instructional attributes that these students perceive as being important for optimizing their levels of course performance are not available to them for rating. As concluded by Onwuegbuzie, Witcher, et al. (2007), such an omission "would represent a serious threat to the content- and construct-related validity of the teaching evaluation form" (p. 149).

Disturbingly, the relationships found between the demographic variables and several themes and meta-themes provides support to Onwuegbuzie, Witcher, et al.'s (2007) admonishment that "when interpreting responses to items contained in TEFs, administrators should consider the demographic profile of the underlying class"(p. 149). In any case, future research should examine other factors that might predict these themes and meta-themes. Variables that might be considered include cognitive variables (e.g., study habits), affective variables (e.g., anxiety), and personality variables (e.g., levels of academic procrastination).

Comparison of Findings with the Underlying TEF

At the time of the study, the TEF used at the university where the study took place contained two parts. The first part consisted of twenty 5-point rating scale items (i.e., Excellent, Very Good, Good, Fair, Poor) that elicited students' opinions about their learning experiences, course structure, and assignments. The second part contained eight 5-point Likert-type items (i.e., Excellent, Very Good, Good, Fair, Poor) that elicited students' opinions about (a) the course objectives and assignments, (b) communication of ideas and information, (c) expression of expectations, (d) availability of the instructor, (e) level of respect exhibited, (f) level of stimulation, (g) facilitation of learning, and (h) overall assessment of the instructor. Thus, the two parts of the TEF yielded a total of 28 items.

Unlike in Onwuegbuzie, Witcher, et al.'s (2007) study wherein of the nine themes, five were represented by items on TEF used at the institution where their study took place (i.e., professional, transmitter, connector, director, and responsive), in the TEF used by the current study university eight of the nine themes were represented. That is, only the Ethical theme was not represented by any of the 28 items. Although potentially representing an improvement over the TEF examined by Onwuegbuzie, Witcher, et al. (2007), the omission of the Ethical theme from the 28-item TEF is disturbing, bearing in mind that this theme was the second most endorsed theme. Thus, nearly one half of the sample members are unable to rate their instructors with respect to levels of ethicalness. Further, although eight of the nine themes were presented, the distribution of themes was extremely erratic, as follows: Director was represented by 13 items, Responsive was represented by 4 items, Student-Centered was represented by 3 items, Transmitter was represented by 3 items, Enthusiast was represented by 2 items, Professional was represented by 1 item, Expert was represented by 1 item, Connector was represented by 1 item, and Ethical was not represented by any

items. Ironically, the theme that was represented by the greatest number of items—nearly 50% (i.e., 13/28), namely, Director, was the least endorsed theme by the doctoral sample members (i.e., 13.9% endorsement). Further, the two most endorsed themes, namely, Professional (66.1%) and Ethical (47.7%), between them were represented by only 1 item. The Professional theme was represented by the following item: "Instructor's preparedness for class."

As such, there appears to be a wide gap between what the developers of the TEF at the study university consider to be characteristics of effective instructors and what the doctoral students in the study deem to be the most important attributes. In turn, this gap suggests that criteria for assessing college doctoral students' instructors likely are not being adequately represented in this TEF, which would stunt doctoral students' ability to critique their instructors in an optimal manner—at least at the institution where the study took place. Thus, the overall score validity of the TEF at this institution is questionable, thereby potentially invalidating at least some of the decisions made by administrators about faculty regarding tenure, promotion, and merit pay. It should be noted that this TEF was developed by administrators and select faculty, with no input from students. The present findings and those of Onwuegbuzie, Witcher, et al. (2007) provide compelling evidence of the importance of giving students a voice when developing TEFs—which would yield data-driven TEFs.

Writing the Mixed Research Report

The present findings have provided evidence that it is unwise for administrators to assume that TEF scores have adequate content – and construct-related validity – and that it is unwise not to take into consideration the voices of doctoral students when developing TEFs. Thus, we hope that findings from the present study are disseminated to as many administrators as possible, as well as to instructors and advisors of doctoral students, and to doctoral students themselves.

Reformulating the Mixed Research Question

The inclusion of case studies when investigating a question of this nature would allow researchers to probe more fully the nature of doctoral students' perceptions and would provide deeper insights into the question of what makes a teacher effective. Therefore, the research question presented in this report would remain the same; however, it would be investigated through interviewing a nested sample of doctoral students from the larger sample. In addition, a study that includes the *teachers'* perceptions on characteristics of effective teachers might allow for comparisons with the doctoral students' perceptions. An investigation of this phenomenon from multiple perspectives should improve understanding for researchers and educators alike. Thus, the research question to investigate teachers' perspectives might be stated as follows: What are the perceptions of effective teachers of select teachers of doctoral students?

Conclusion

The present study was unique in at least three ways. First, the present study appears to be the first study to document doctoral students' perceptions of characteristics of effective teachers. Second, this study appears to represent one of only two studies—the only other study being that of Onwuegbuzie, Witcher, et al. (2007)—in which college students' perceived characteristics of effective teachers were compared to what the administrators at the same university considered to be characteristics of effective teachers, as reflected by the TEF. Third, this is one of very few studies in this area, to date, to use mixed research techniques extensively to examine this phenomenon. Thus, the investigators believe that the present study has added incremental validity to the contention that TEFs across institutions that are designed a theoretically and that are not driven by data should be questioned.

The multidimensionality of doctoral students' perceptions of effective teachers is a testament to the blend of attributes required of the teaching profession. By demonstrating the areas of endorsement that doctoral students perceive as effective teachers, findings from this study should be utilized to consider the student-teacher relationship as it is viewed from the student perspective. It is hoped that the information provided in this study will assist instructors of doctoral students, as well as other college-level teachers, in reaching their full teaching potential.

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Biographies

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Brandie Buford is a literacy teacher at Drew Academy in Aldine I.S.D and an emerging and innovative doctoral candidate at Sam Houston State University. While in candidacy, she has had the honor of engaging in 9 local, national, and international presentations in advocacy of leadership, scholarship, research, and literacy. Her research interests include Advanced Placement Achievement of minority students, Retention and Bump Up Achievement, Curriculum and Instruction in Literacy, and Cinematography & Literacy Instruction. Aside from completing her dissertation, she is currently pursuing a career in higher education.

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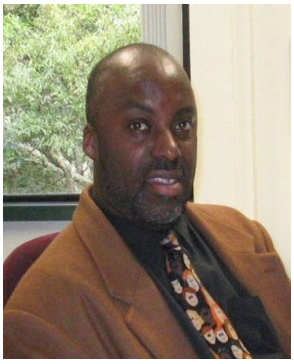

Anthony Onwuegbuzie is a tenured professor in the Department of Educational Leadership and Counseling at Sam Houston State University. He teaches doctoral-level courses in qualitative research, quantitative research, and mixed research. His research areas include disadvantaged and under-served populations such as minorities, juvenile delinquents, and children living in war zones. Additionally, he writes extensively on qualitative, quantitative, and mixed methodological topics. Alongside more than 600 conference/keynote presentations, he has had published more than 330 works, including more than 270 journal articles, 50 book chapters, and 2 books. His current h-index is 47. He is former editor of Educational Researcher. Currently, he serves as co-editor of Research in the Schools.