

ABSTRACT

Title of Dissertation: FORMATS AND FEATURES OF
PROFESSIONAL DEVELOPMENT AS
PREDICTORS OF SELF-REPORTED
CHANGES IN MUSIC TEACHERS'
KNOWLEDGE AND SKILLS

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The purpose of this study was to describe the self-reported professional development activities of music teachers in the United States and to determine whether selected formats and features of professional development experiences commonly available to music teachers were significant predictors of music teachers' self-reported enhancements in knowledge and skills. The *Music Teacher Professional Development Survey* was distributed to a simple random sample of 2,257 music teachers in all 50 States and the District of Columbia. It contained items that pertained to participants' professional development activities during the 2012-2013 school year, asking them to describe one of those experiences in-depth and to rate how that experience affected their knowledge and skills.

A total of 493 teachers responded to the survey, and 326 completed it.

Notable findings indicated that (a) music teachers attended professional development outside of their schools or districts to find professional development relevant to their roles as music teachers, (b) they undertook individual learning to supplement their formal professional development, and commonly spent more than 20 hours during the 2012-2013 school year doing so; and (c) their ideal professional development experiences would be a workshop that involved other music teachers, was relatively short in length, would take place in their own schools or districts, and related to their areas of teaching specialization.

Three professional development formats (in-district professional development workshop, workshop sponsored by a college or university, and graduate coursework) were entered into a fixed coefficients multiple regression model with out-of-district music/ music education conference as the referent group and state membership as fixed variables. Results revealed statistically significant effects for (a) graduate coursework and (b) in-district professional development in comparison to the referent group on participants' ratings of enhanced knowledge and skills. Effects for in-district professional development workshops were negative, suggesting that participants rated their enhancements in knowledge and skills significantly lower than the referent group.

For features of professional development, fixed coefficient multiple regression analysis results indicated that (a) time span, (b) opportunities of active learning, (c) activity type, and (d) content focus were significant predictors of music teachers' ratings of enhanced knowledge and skill.

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KNOWLEDGE AND SKILLS

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Chapter 1: Introduction

Background of the Study

The professional development of teachers has become a topic drawing the interest of several stakeholder groups within the education community, including practitioners, administrators, policymakers and researchers. This attention is partially due to the passage and implementation of the No Child Left Behind Act, *NCLB* (No Child Left Behind, 2002). The law provided several standards concerning the characteristics of professional development:

- It is sustained, intensive, and content-focused – to have a positive and lasting impact on classroom instruction and teacher performance;
- It is aligned with and directly related to state academic content standards, student achievement standards, and assessments;
- It improves and increases teachers’ knowledge of the subjects they teach;
- It advances teachers’ understanding of effective instructional strategies founded on scientifically based research; and
- It is regularly evaluated for effects on teacher effectiveness and student achievement (Yoon, Duncan, Lee, Scarloss & Shapley, 2007, pp. 1-2).

As a response to *NCLB*, several states enacted recertification requirements mandating specific amounts and types of professional development for teachers to maintain their credentials. States also responded with standards for professional development (e.g., Maryland State Department of Education, 2011). In addition,

participation in professional development has been found to be a factor in teacher retention and attrition (Madsen & Hancock, 2002).

The music teacher education profession has also placed increased emphasis on professional development. Specifically, the Society for Music Teacher Education, *SMTE*, has formed two Areas for Strategic Planning and Action, *ASPAs*, devoted to professional development. One is dedicated to professional development for pre-service and early career teachers, and the other focuses on professional development for experienced music teachers (Society for Music Teacher Education, 2011). In addition, the National Association for Music Education, *NAfME*, has diversified its conferences in recent years, having targeted specialized conferences and multi-day institutes to different areas of specialization (e.g., band directors, choral directors, music program leaders, research, music teacher education). This study focuses on professional development formats that are currently available for in-service teachers, and those features of professional development that, according to music teachers' self-reports make some experiences more effective than others in enhancing their knowledge and skills.

The topic of professional development is of significant personal interest to me for several reasons. First, as a music educator for thirteen years, I formed very strong opinions about the relative effectiveness and relevance of certain types of experiences, and was aware of the relative level of change that those experiences brought about in my teaching. Second, in my current position as a fine arts supervisor, I design and oversee professional development for visual and performing arts teachers (including music teachers), and am concerned with providing experiences that those teachers perceive as relevant, but also effective in assisting teachers in their professional growth. Third, as a

researcher, I am interested in contributing to a small knowledge base to inform others charged with the design and implementation of professional development for music teachers.

The nature of music teacher professional development.

A foundational aspect of music teachers' identities is their formative musical experience. Those who become music teachers often have particularly powerful musical experiences in their school years that most commonly come through participation in a performing ensemble, such as a chorus, band, or orchestra. As a result of these experiences as well as the competitive audition process required for entry into music schools, prospective music education students enter undergraduate study with strong identities as performing musicians rather than as teachers (Woodford, 2002). This section will explore (a) the nature of music teachers' musical experiences through aesthetic and praxial views, (b) the dual identities of music teachers, and (c) how experience and identity may play a role in music teachers' values and preferences for professional development.

Music teachers have particularly powerful musical experiences early in their lives, which impact their decision to enter undergraduate study in music, and by extension, music education. Two prominent schools of thought on the nature of these experiences exist. First, Reimer (1970; 1989; 2003) articulated the view of music education as aesthetic education. This view has been the predominant philosophy of music education for the past 40 years. In this line of thinking, musical experience is multidimensional, and the organized sounds of music make the experience special in the ways that sounds do. Reimer (2003) articulated four dimensions of musical experience: (a) feeling, (b)

creating, (c) meaning, and (d) contextual meaning. The feeling dimension suggests that the emotional power of music as its most defining characteristic. The creating dimension included composing, performing, improvising, and listening. The meaning dimension defined music as sounds that are organized to have significance in a particular culture, and that the value of music is a product of individuals' experiences when involved in music. Thus, people derive their own meanings from musical experiences depending on their individual frames of reference.

Second, Elliott (1995) and Elliott and Silverman (2014) articulated the praxial view of music education. This view stated that music is an intentional, diverse human activity, and that music making is an active process called musicing, which takes into account all of the ways of musicing, including (a) performing, (b) improvising, and (c) composing. He advanced the concept of music-as-practicum, where students learn musical concepts through the experience of music making in multiple musical contexts. In Elliott's view, meaning in music is derived from the practice of music as a performer, composer, improviser, or listener.

Given these powerful musical experiences early in their lives, music teachers form early identities as musicians, particularly performers. This strong performer identity is reinforced in colleges, conservatories, and universities, in which many music teacher education programs reside (Froehlich, 2007). This performance foundation also forms, along with pedagogy, the foundation of their teaching to the extent that Bernard (2005) and Jorgensen (2008) referred to music teachers as "musician-teachers". Recent literature has discussed the tensions between the identity roles of musician and teacher (Bernard, 2005; Pellegrino, 2009), and given this strong identity as musician, it may be

unsurprising that professional development in music content is something that these teachers value highly (Bauer, Forsythe & Kinney, 2009; Parsad, Spiegelman & Coopersmith, 2012). Scheib (2006) further elaborated and reinforced this point:

If fine arts teachers hold and value their identities as artists, then it stands to reason that to keep them holistically fulfilled with their arts teaching career, professional development should not only include support of their arts teacher identity, but also their identity as artists. (pp. 8-9)

In Scheib's view, then, the dual identity of music teachers should not only be recognized, but it should be cultivated through professional development. Given their musical experiences in high school and undergraduate study, this view is congruent with music teachers' values for professional development (Bauer et al., 2009; Parsad et al., 2012) that their professional development should contain music content.

Theoretical Framework

Desimone (2009) advanced a model for professional development that sought to address the need to improve measures of the impact of professional development for instructional improvement and student achievement. To do so, she advocated for studying the features rather than the structure of professional development experiences, and identified the consensus that exists in the literature.

Desimone then posited the following model:

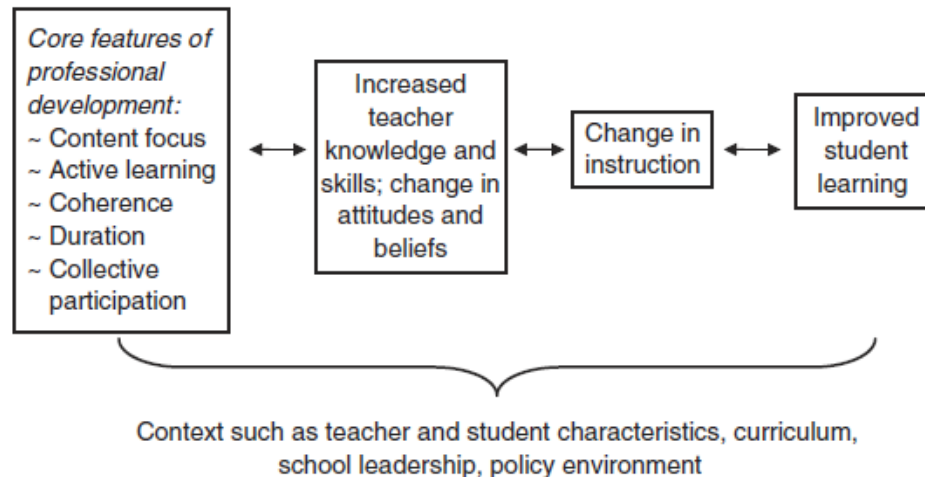


Figure 1. Model for Research in Professional Development (Desimone, 2009).

The current study focuses on the second item above in that it seeks to determine self-reported changes in music teachers' knowledge and skills as a result of participation in given professional development formats. The current study draws upon and extends previous research in several ways. First is a suggestion from previous survey research in music education to compile a description of professional development for music educators in the United States (Bush, 2007; Conway, 2007b; Friedrichs, 2001). Secondly, it extends this literature by testing empirically whether the preferred formats identified by music educators have significant effects on self-reported changes in music teachers' knowledge and skills. Third, it examines whether the features of effective development identified in previous research significantly predict self-reported enhancements in music educators' knowledge and skills.

Within music education, several investigations of music teachers from across the United States have revealed that music teachers valued professional development within the content area of music (Bauer et al., 2009; Bowles, 2003; Bush, 2007; Friedrichs, 2001; Parsad, et al., 2012). Collectively, this literature suggests that music teachers valued certain formats for professional development more than others. There is

agreement among these studies about the highest and lowest valued experiences. For example, music teachers have consistently placed high value on state and national music education conferences and summer workshops sponsored by colleges and universities (Bauer et al., 2009, Bowles, 2003; Bush, 2007) while assigning the lowest value to in-district professional development workshops (Bauer et al., 2009; Bush, 2007).

Additionally, no study to date has attempted to determine whether participation in these valued professional development formats significantly affects teachers' ratings of whether professional development helped to improve their teaching, or whether features of those formats predict teachers' self-reports of enhanced knowledge and skills.

As mentioned above, music teachers have consistently placed high value on those professional development experiences that focus on music content such as professional music education conferences (Bauer et al., 2009; Parsad et al., 2012; Bush, 2007), particularly in their specialty areas (i.e., band, orchestra, choir, general music) (Bauer et al., 2009; Bowles, 2003; Friedrichs, 2001). The present study seeks to determine whether participation in given formats identified as valuable by music teachers in previous literature significantly affect their self-reported enhancements in knowledge and skills.

Research concerning mathematics and science teachers suggests that some teachers may find certain professional development formats more effective than others in bringing about change in their knowledge and skills (Fishman, Marx, Best & Tal, 2003; Garet, Porter, Desimone, Birman & Yoon, 2001; Garet, Birman, Porter, Desimone & Herman, 1999; Jeanpierre, Oberhauser & Freeman, 2005; Penuel, Fishman, Yamaguchi & Gallagher, 2007). Garet et al. (1999) surveyed mathematics and science teachers regarding (a) the types of professional development activities in which they engaged over

the past school year, and (b) the teachers' perceptions of the effectiveness of those activities in enhancing their knowledge and skills for teaching. Through this research, they determined six key features of effective professional development, which they divided into three structural features and three core features. The three structural features, which dictate characteristics of the structure or design of professional development activities are (a) type of professional development, (b) duration of the activity, and (c) collective participation of a department or school staff (Garet et al., 2001). The three core features include (a) a focus on content, (b) opportunities for active learning, and (c) coherence with teachers' overall work and professional development, which are dimensions of the content of the professional development (Garet et al., 2001). Three structural features included (a) type of professional development, (b) duration of the activity, and (c) collective participation of a department or school staff. Three core features included (a) a focus on content, (b) opportunities for active learning, and (c) a focus on content.

The value music teachers place on given types of professional development activities may cause them to respond differently than their mathematics and science counterparts (Garet et al., 2001; Garet et al., 1999) for several reasons. With regard to collective participation, music teachers are often the sole content specialists in their area within a given school, and participation in professional development activities as a member of a department or school staff may not be feasible, practical, or relevant. This possible difference in response may also cause music teachers to rate the effectiveness of given professional development activities differently. In addition, tensions arise when comparing these bodies of literature: music teachers appear to place value on experiences

that research literature described above suggests is too episodic to bring about change in practice.

Professional development for experienced music teachers.

Leading scholars in music teacher education have described the size of the music teacher professional development literature as “small” (Bauer, Forsythe & Kinney 2009; Conway, 2007b). Research within professional development has sought to codify best practices in mentoring early career music teachers (Conway, 2003a; Conway & Christensen, 2006; Conway & Zerman, 2004). Case study methodology has also been utilized to explore collaborative teacher study groups (e.g., Stanley, 2009; Thomas, Wineburg, Myhre, Grossman & Woolworth, 1998). Other researchers have examined teachers’ experiences and perceptions of professional development (Conway, 2008; Eros, 2012; 2011; 2009). Some studies have sought to describe teachers’ values, preferences and perceptions regarding professional development (Bauer et al., 2009; Bowles, 2003; Bush, 2007; Conway, 2008; Eros, 2012; Friedrichs, 2001). Bauer, Reese, and McAllister (2003) explored the effectiveness of a music technology workshop. A glance at the diverse topics of these studies reveals the previously identified fragmentation.

To date, no study in the line of research on professional development for experienced music teachers has sought to objectively describe the professional development activities of music teachers, or explain the relationships between professional development formats and features that teachers reported as valuable to their practice and whether or not those activities predict enhancements in teachers’ or students’ knowledge and skills as a result of participation. Bauer (2007) identified this as a void in the literature:

Importantly, research on the relationship of music teacher professional development to student achievement is essential. There currently is no extant research in this area. Ultimately, for the professional development of music educators to be considered a success, it should positively impact the learning of the students. (p. 20)

A first step in this line of inquiry could be to describe music teachers' professional development experiences, to determine if participation in these formats impact self-reported enhancements in music teacher's knowledge and skills, and whether the features contained in professional development for music teachers predict self-reported enhancements in their knowledge and skills. In addition, a study that describes music teachers' professional development activities at a national level could be of use in compiling a description of the population of American music teachers. Previous survey research (Bauer et al., 2009; Bowles, 2003; Bush, 2007) has described professional development as reported by members of state music education organizations, and only one study has been conducted on a national scale (Parsad et al., 2012). These survey studies asked music teachers about whether their participation in professional development resulted in improvements in teaching, but did not compile a complete description of professional development activities or determine whether the formats and topics of professional development had a relationship to teachers' self-reported enhancements in knowledge and skills. Thus, a study that did so would contribute new knowledge on this topic.

Previous research has also suggested that music teachers may view effective professional development differently based upon their years of experience (Conway,

2008), membership in the National Association for Music Education, *NAfME* (Bauer et al., 2009); and area of teaching responsibility such as band, orchestra, choir, or general music (Bauer et al., 2009; Bush, 2007, Bowles, 2003).

Yoon et al. (2007) suggested that teacher learning and practice mediates the relationship between professional development and student learning. An examination of the formats and features of learning opportunities common to music teachers could provide a more vivid description of the formats through which music teachers acquire new knowledge and skills, as well as features of those experiences that most strongly predict teachers' self-reported enhancements in knowledge and skills.

Professional development formats.

In addition to the paucity and lack of coherence in the research discussed above, there also appears to be disagreement in the literature between music teachers' values for professional development and those types that have been deemed effective in the research literature. Specifically, music teachers have stated values regarding music education conferences, the content and structure of which have been discussed in the literature as being too short to bring about instructional change. An investigation of whether various formats of professional development significantly affect enhancements in teachers' self-reported knowledge and skills could provide an explanation for this previously unexplored question. In addition, no study in the music education literature on professional development has utilized the methods and analysis techniques proposed in the current study.

Music teachers' perceptions of and values for professional development have been researched to a certain extent. For example, there appears to be consistency in

music teachers' professional development values across grade levels (elementary, middle, high school), areas of specialization (e.g., general, choral, instrumental), and geographic areas including California (Friedrichs, 2001), Arizona (Bush, 2007), Ohio (Bauer et al., 2009), Minnesota/ Wisconsin (Bowles, 2003), Michigan (Eros, 2012), and an unpublished study in Maryland (Schneckenburger, 2010). For instance, the most commonly reported structural format for professional development remained the workshop, where music teachers reported to an activity and engaged in learning activities with a clinician for all or part of one day (Parsad et al., 2012). Some workshops may last as long as a week (Bauer et al., 2003), but are still brief in length and time span in comparison to other formats that are distributed over a longer period of time such as graduate coursework. Parsad et al. (2012) reported that 60 to 80 percent of participants' professional development experiences lasted from 0 to 8 hours, depending upon format.

Formats other than the traditional workshop format include (a) mentoring and induction (Conway, 2003a; DeLorenzo, 1992), (b) the National Board Certification process (Standerfer, 2007), (c) distance learning (Walls, Miranda, Powell & Good, 2005), (d) collaborative teacher study groups (Stanley, 2011), and (e) graduate courses and workshops (Bauer et al., 2003; Junda, 1994). These formats have been explored as possibilities for effective professional development, but none of these studies has attempted to determine whether participation in selected formats significantly predicted self-reported enhancements in music teachers' knowledge and skills.

Features of effective professional development.

In addition to music teachers' perceptions about desirable and important professional development, educational research has been conducted regarding the

effectiveness of various features of professional development (e.g., Garet et al., 1999; Garet et al., 2001; Jeanpierre, 2005; Penuel et al., 2007). As previously discussed, six key features of professional development have been identified, including (a) type of activity (traditional or reform-type), (b) duration, and (c) collective participation of all of the members of a school or department, (d) a focus on content, (e) opportunities for active learning, and (f) coherence in teachers' overall programs of learning (Garet et al., 1999; Garet et al., 2001).

Taking into account music teachers' self-reported values and preferences for professional development and features of those formats that contribute to effectiveness, an examination of music teachers' preferred professional development formats and the features for effective professional development that they contain could lend insight into the ability of these professional development formats to affect self-reported enhancements in music teachers' knowledge and skills. Through investigation of this literature, it is evident that the values and preferences of music teachers and features of effective professional development as reported in the educational research literature conflict at times. For instance, music teachers widely reported that they found attendance at professional music/ music education conferences both valuable to their teaching and desirable to attend (Bauer et al., 2009; Bush, 2007; Parsad et al., 2012; Schneckenburger, 2010). However, the episodic nature of this workshop format has been widely decried in the general educational research literature (Hawley & Valli, 1999). A study that determines the effectiveness of various professional development formats including workshops could be of use to those charged with the design and implementation of professional development for music teachers, state and national organizations who seek

to offer quality experiences to their members, and those in the music teacher education community who teach either pre-service or graduate level in-service music educators.

The current study seeks to extend the body of literature on professional development for experienced music teachers by describing professional development for in-service music teachers on a national scale and determining whether certain professional development experiences significantly affect music teachers' self-reports of enhanced knowledge and skills. In addition, it will investigate whether certain core and structural features of professional development are significant predictors of music teachers' self-reported enhancements in knowledge and skills. The remainder of this chapter will outline the purpose of the study, research questions, and research hypotheses. A brief overview of remaining chapters will also be given.

Purpose of the Study

The purpose of this study was to describe the self-reported professional development activities of music teachers in the United States and to determine whether selected formats and features of professional development experiences commonly available to music teachers are significant predictors of music teachers' self-reported enhancements in knowledge and skills.

Research Questions

Research questions for the present study were:

1. What self-reported professional development activities did K-12 music teachers commonly engage in during the 2012-2013 school year and how much time did they spend engaged in those activities?

2. What are the effects of participation in selected professional development formats (out-of-district music/ music education conference, workshop sponsored by a college or university, in-district professional development workshop, graduate coursework) on music teachers' self-reported enhancements in knowledge and skills?
3. Which, if any, of five core and structural features of professional development (type, duration, content focus, active learning, and time span) are significant predictors of music teachers' self-reported enhancements in knowledge and skills?

Null Hypotheses

The null hypotheses investigated in this study were:

Professional development formats.

- a. There are no significant effects for participation in a workshop sponsored by a college or university in comparison to out-of-district music/ music education conferences on self-reported enhancements in music teachers' knowledge and skills.
- b. There are no significant effects for participation in an in-district professional development workshop in comparison to out-of-district music/ music education conferences on self-reported enhancements in music teachers' knowledge and skills.
- c. There are no significant effects for participation in graduate coursework in comparison to out-of-district music/ music education conferences on self-reported enhancements in music teachers' knowledge and skills.

Features of effective professional development.

- a. Professional development type (e.g., traditional, reform-type) is not a significant predictor of self-reported enhancements in music teachers' knowledge and skills.
- b. The number of contact hours is not a significant predictor of self-reported enhancements in music teachers' knowledge and skills.
- c. Time Span is not a significant predictor of self-reported enhancements in music teachers' knowledge and skills.
- d. Content focus is not a significant predictor of self-reported enhancements in music teachers' knowledge and skills.
- e. Active learning is not a significant predictor of self-reported enhancements in music teachers' knowledge and skills.

Definition of Terms

I have defined professional development and professional development format in the following ways for the purposes of this study:

Professional Development: a set of learning activities, the purported purpose of which is to enhance the knowledge and skills of teachers.

Professional Development Format: A type of professional development activity that purports to provide learning experiences for teachers to enhance their knowledge and skills for teaching.

Features of Effective Professional Development:

Garet et al. (1999) investigated key features of effective professional development that included:

- The form or organization of the activity – that is, whether the activity is organized as a **reform type**, such as a study group, teacher network, mentoring relationship, committee or task force, internship, individual research project, or teacher research center, in contrast to a traditional workshop or conference;
- The **duration** of the activity, including the total number of contact hours that participants are expected to spend in the activity, as well as the span of time over which the activity takes place;
- The degree to which the activity has a **content focus** – that is, the degree to which the activity is focused on improving and deepening teachers’ content knowledge in mathematics or science;
- The extent to which the activity offers opportunities for **active learning** – that is, opportunities for teachers to become actively engaged in the meaningful analysis of teaching in learning, for example, by reviewing student work or obtaining feedback on their teaching; and
- The degree to which the activity promotes **coherence** in teachers’ professional development, by encouraging the continued professional communication among teachers, and by incorporating experiences that are consistent with teachers’ goals and aligned with state standards and assessments. (p. 27)

These features will serve as predictor variables to address research question three.

For the dependent variable of the study, I adopted Garet et al.’s (2001) definition for the dependent variable of Enhanced Knowledge and Skills:

Enhanced Knowledge and Skills: The growth in a teacher’s knowledge base and actions that takes place as a result of the teacher’s participation in professional development activities.

Statement of the Problem

Previous research has suggested investigation of the links between professional development and resultant changes in teachers’ knowledge and skills. Conway (2008) stated that there is little research to link professional development and teacher success. In their meta-analysis of over 1,300 studies on professional development, Yoon et al. (2007)

called for more experimental studies that rigorously address professional development's direct effect on teachers. In addition, several authors within music teacher education (Bauer, 2007; Bauer, et al., 2009; Conway, 2008; Conway, 2007b) have discussed a paucity of research in professional development for music teachers. Conway (2003b) stated, "...the research base concerning the professional development experiences of music teachers is quite small. It is sometimes difficult for professional development organizers to base decisions about programs on research evidence of music teachers' needs" (p. 152). While previous research has served to ascertain music teachers' opinions regarding professional development through surveys (Bauer et al., 2009; Bowles, 2003; Bush, 2007); Friedrichs, 2001; Parsad et al., 2012) and interviews (e.g., Conway, 2008; Eros, 2012), no study in music education has attempted to link music teachers' participation in various professional development formats with self-reported enhancements in music teachers' knowledge and skills. The present study attempts to address these gaps in knowledge and research.

The lack of empirical connection of professional development experiences to changes in teachers' knowledge and skills has also been discussed in the educational research literature. In their evaluation of the Eisenhower professional development program, Garet et al. (2001) stated that despite the large body of literature on best practice in professional development, "...relatively little systematic research has been conducted on the effects of professional development on improvements in teaching or on student outcomes" (p. 917). The Eisenhower professional development program is housed in Title II of the Elementary and Secondary Education Act, currently known as No Child Left Behind (2002). Choy, Chen and Bugarin (2006) stated that more research

was needed to link professional development with student performance. In an investigation of the research base on professional development, Scher and O'Reilly (2009) stated, "... the current evidence base is thin" (p. 209). Garet et al. (2011) identified a lack of literature that links professional development to teacher or student outcomes. This lack of literature is somewhat contradictory to the mandate set forth by the No Child Left Behind Act (2002) that professional development be based on the results of scientifically based research.

The current study may contribute to the body of knowledge on professional development for experienced music teachers in several ways. First, it would comprehensively describe music teachers' professional development activities in the United States. Second, it could provide explanations of the effectiveness of these professional development experiences commonly available to music teachers and core and structural features of professional development and their effects on enhancing teachers' knowledge and skills, a mediating step to improving student achievement. Consequently, this study could provide those concerned with the professional development of in-service music teachers with valuable information regarding best practices that enhance music teachers' knowledge and skill, and by extension, student achievement.

Overview of Remaining Chapters

This chapter discussed the background, purpose, and need for the study, stated the research questions, defined terms, and stated the problem. Chapter Two will provide a review of literature related to professional development in music education and in the broader field of education. Chapter Three will provide a description of the methodology

employed for the study while Chapter Four will report the results of the study. Chapter Five will provide a discussion of the results of the study, implications for music education, and make suggestions for further research.

Chapter 2: Review of Related Literature

Introduction

The purpose of this study was to describe the self-reported professional development activities of music teachers in the United States and to determine whether selected formats and features of professional development experiences commonly available to music teachers were significant predictors of music teachers' self-reported enhancements in knowledge and skills.

The literature review was divided into six sections. The first section provided an overview of research within the topic of professional development. The second section reviewed literature pertaining to career stages of teachers. The third section examined music teachers' values and perceptions for professional development. The fourth section, professional development formats, was divided into five subsections: (a) mentoring and induction, (b) the National Board Certification process, (c) distance learning, (d) collaborative teacher study groups, and (e) graduate workshops. The fifth section examined research on features of effective professional development. The sixth section was teacher knowledge and skills; it was divided into two subsections: (a) the knowledge base for teaching and (b) pedagogical content knowledge.

Professional Development in Education and Music Education

Teacher learning is regarded as one of the more difficult variables within professional development to measure (Fishman, Marx, Best & Tal, 2003; Loucks-Horsely & Matsumoto, 1999). Two primary questions that have been investigated in this line of research are (a) the extent to which professional development experiences affect teachers' knowledge and skills, and (b) whether the teachers' new knowledge and skills have an

impact on student learning or achievement (Scher & O'Reilly, 2009). Other studies have investigated which features and formats of professional development contribute to or explain enhancements in teachers' knowledge or skills (Garet et al., 2001). These questions have been addressed in several ways, including efforts to determine features of effective professional development (Fishman et al., 2003; Garet et al., 2001; Garet et al., 1999; Hawley & Valli, 1999) and to set an agenda for research in professional development (Borko, 2004; Desimone, 2009; Wayne, Zhu, Cronen & Garet, 2008).

Borko (2004) described the professional development available to teachers as “woefully inadequate” (p.3) despite the fact that many educational reforms relied on teachers learning new practices. To map the literature on professional development, Borko adopted a situative perspective that allowed for analysis of multiple viewpoints and units of analysis. She described a three-phase model for professional development research with each progressive phase building on the previous one. In phase one, attempts would be made to prove the existence of a given professional development practice at one site with one facilitator. Phase two would test the transferability of activities found in phase one to other contexts with other facilitators. Finally, phase three would describe and compare the effects, implementation, and requirements of effective programs. Borko stated that no literature existed in the third phase, and called for carefully controlled experimental or quasi-experimental studies to determine whether certain professional development programs caused changes in teacher learning. She stated that these experimental designs should be paired with in-depth case studies to examine the mechanisms by which these causes occurred.

Music education research has employed several methodologies to address a diverse range of questions related to professional development. This diversity in both methodology and focus has led to a lack of coherence in the literature in terms of topics. For instance, Conway (2001) conducted case study research on beginning teachers' perceptions of professional development, while Bauer, Reese and McAllister (2003) conducted a longitudinal survey study regarding music teachers' comfort with and use of technology before and after a one-week workshop. While the use of multiple methodologies is desirable for the purposes of deriving complete descriptions, the diversity in research topics has made it difficult to complete a description for designers of professional development.

In addition, the research base is quite small. Bauer (2007) stated, "While the research literature related to the professional development of teachers is quite large...there have been relatively few studies that have systematically examined the professional development of music educators" (p.12). Other researchers have discussed this paucity. Hookey (2002) observed that the attention given to the topic of professional development in music education is less prominent than other topics. Conway (2003a) stated that the evidence base on which designers of professional development may base decisions is "quite small" (p.153). The same author (Conway, 2007b) restated this problem several years later. Few topics have seen several studies devoted to them, and often involve only one to two scholars per topic who have contributed published literature, including doctoral dissertations. The Society for Music Teacher Education (2012) has devoted two of its Areas for Strategic Planning and Action (ASPAs) to this topic. The first is titled *Professional Development for the Beginning Teacher*, and the

other is titled *Professional Development for the Experienced Teacher*. This dual attention to professional development follows research that suggests that the professional development needs of teachers may differ depending upon which stage they are in their careers (e.g., Conway, 2008; Eros, 2012, Eros, 2011). Additionally, professional development research in music education has focused either on early career teachers (e.g., Conway, 2006; Conway & Zerman, 2004) or in-service teachers (e.g., Bauer et al., 2009; Bauer et al., 2003).

Career Stages of Teachers

The existence and delineation of stages in the careers of music teachers has been a topic of recent research. Methodologies employed to study this topic have been qualitative, typically in case study format (e.g., Eros, 2009; Eros, 2012; Eros, 2013), but have also included phenomenology (Conway, 2008). These studies have served to describe the existence of progressive phases in the careers of music teachers, and to discern characteristics of teachers at those stages.

In his dissertation study, Eros (2009) discussed several different conceptions of the teachers' career cycle (Fessler & Christensen, 1992, Huberman, 1993; Steffy, Wolfe, Pasch & Enz, 2000). He found that all of these models contrasted when it concerned the definition of and number of stages in a teacher's career. Contributing factors to this variability between the number of stages could be attributable to the ways that researchers have defined them: (a) through the number of years of teaching experience, (b) a teacher's shift of instructional focus from the teacher to the student, (c) a teacher's chronological age, or (d) a teacher's outlook toward teaching. However, Eros found agreement among these studies on the existence of a "second stage" of a teacher's career

that was based a combination of the above factors. He used this as the basis for multiple case studies of three urban music teachers, two of whom were in their ninth years of teaching, and the third who was in her seventh year. He collected participant data from background surveys, journals, individual interviews, and conducted a focus group interview. He found that in the second stages of their careers, teachers had become concerned with students' personal and educational well-being. Some changes that participants reported between stages in their careers were changes in their confidence levels and professional development needs.

Eros (2012) researched ways that second-stage teachers perceived professional development. He conducted a multiple descriptive case study of three second-stage music educators, where he attempted to address the questions of how second-stage music teachers described their professional development experiences and needs for professional development. Three themes emerged as results. The first was the type of professional development, including formal and informal formats. Subjects reported participation in both formal formats such as graduate study, and informal formats such as conversations with fellow music teachers. The second theme was that the professional development needs of music teachers differed based on their career stage. Participants' responses indicated that this need ranged from an awareness of the need for professional development to a need for specific types. The third theme that emerged was obstacles to professional development. Participants reported (a) lack of administrative feedback, (b) loss of job or position within a district to pursue graduate study, and (c) lack of opportunity to implement new ideas learned through professional development. In

addition, one participant reported receiving one day for professional development per school year and subsequently cited time for professional development as an obstacle.

Conway (2008) studied music teachers' perceived professional development needs at various stages of their careers. Using Steffy et al.'s (2000) career stage model (the model places teacher into one of three categories: novice, professional or expert), she found that the type of professional development that music teachers found valuable could depended upon career stage. Specifically, she found that mid-career teachers discussed the need to seek out professional development, as they did not perceive that their in-district experiences supported their professional growth, and that they had to broaden their ideas of the scope of teaching. Veteran teachers discussed the need for professional development for new opportunities within their careers.

Summary: Career Stages of teachers.

The findings of these studies reveal several paradoxes in the literature: (a) while there is consensus about the existence of various stages within a teacher's career, there is inconsistency within the literature in defining the various stages of a teacher's career, (b) there exists contradiction between the types of professional development that music teachers reported and what the research literature reports as effective, and (c) while the professional development needs of music teachers appear to change over time, the professional development available to them does not address these needs.

Music Teachers' Values and Preferences for Professional Development

One line of research in professional development for music teachers has been a series of survey studies that has sought to ascertain music teachers' opinions of effective and desirable professional development (Bauer et al., 2009; Bowles, 2003; Bush, 2007;

Conway, 2008; Friedrichs, 2001; Parsad et al., 2012; Schneckenburger, 2010; Tarnowski & Murphy, 2003). These studies have sought to compile a description of professional development for music teachers in the United States. Studies have been conducted in Arizona (Bush, 2007), Ohio (Bauer et al., 2009), Wisconsin (Bowles, 2003), California (Friedrichs, 2001), Maryland (Schneckenburger, 2010), Minnesota and Wisconsin (Tarnowski & Murphy, 2003), and nationally (Parsad et al., 2012). Studies also examined music teachers of varying areas of specialization (Friedrichs, 2001; Tarnowski & Murphy, 2003) and career stages (Conway, 2008; Eros, 2012).

Friedrichs (2001) surveyed 242 in-service instrumental music teachers in the state of California. The questionnaire inquired about the types of professional development experiences that the teachers attended and perceived as valuable. He found that the instrumental teachers preferred music-related professional development vs. non-music professional development. Teachers reported several formats as valuable, including (a) hosting a guest clinician or teacher, (b) observing other directors' rehearsals, (c) attending music conferences, (d) concerts, and (e) music workshops. Those activities that the teachers found least valuable or effective were (a) non-music workshops, (b) on-campus in-services, (c) county office workshops, (d) district-sponsored workshops, and (e) non-music conferences. In written comments, teachers reported interactions with colleagues as a valuable form of professional development. Teachers rated in-district or in-school workshops to be of least value.

Bush (2007) surveyed 108 members of the Arizona Music Educators Association about the types of professional development they thought were important. The respondents represented a cross-section of specialties (32 string teachers, 28 choral

teachers, 24 band teachers, and 24 general music teachers) and grade levels (55 elementary, 18 junior high, 19 high school, and 16 split time between grade levels). Of particular note was the response rate (65%). Participants ranked the importance of various opportunities as follows: (a) discussions with fellow music teachers, (b) summer or weekend courses/ workshops, (c) state music educators annual in-service conference, (d) internet resources, (e) professional journals, (f) national in-service conference, (g) discussions with non-music educators, and (h) district-sponsored PD in-service/ workshops. When asked about desirable workshop topics, teachers ranked the following items in order of most to least desirable: (a) New music/ repertoire, (b) technology, (c) student assessment in music, (d) curriculum design based on state music standards, (e) recruiting techniques/ methods, (f) music classroom management, (g) conducting, (h) music education for gifted/ special learners, (i) lesson planning in music, (j) cross-curricular subject integration, (k) grant writing, (l) advanced instrument techniques for teachers, (m) festival information and preparation, and (n) English as a second language in music classrooms. In discussing implications, Bush attributed teachers' low ratings of district-sponsored professional development to the fact that many such activities are for teachers of multiple disciplines, and as such do not address the unique needs of music teachers. Additionally, he discussed that Internet resources were important to music teachers due to the ease of access to materials and other teachers.

Bowles (2003) distributed a survey to members of a state music educators association in the Midwestern United States. The 456 respondents were music teachers of all areas of specialization (general, choral, band, and orchestra). The questionnaire asked about various topics that would be of interest to music teachers when attending

professional development. Participants rated (a) technology, (b) assessment, (c) instrument/ choral literature, (d) standards, (e) creativity, and (f) grant writing as the most desired topics. Bowles found that these preferences were generally consistent across all specialty areas. However, when participants were asked about other opportunities and given the chance to write them in, they chose topics such as (a) general music methods (Orff, Dalcroze, Kodaly, Comprehensive Musicianship), (b) brain research, (c) scheduling, (d) teaching composition, (e) instrument repair, (f) multiage curriculum, and (g) teacher training supervision. When asked about the modes of professional development that they preferred, participants indicated that they desired experiences either sponsored by a college, university or professional music organization. The most preferred times for professional development were either during the summer or weekends throughout the course of the school year.

Tarnowski and Murphy (2003) situated professional development within the teacher shortage, and described that the literature on professional development had been broken down into retraining and revitalization. This study examined teachers' reasons for staying in the profession, as well as the activities that they pursued to build their knowledge and skills. Participants were 281 elementary and middle school general music teachers. 97.9% reported that they entered the music teaching profession because they liked music and 47% cited this as a reason that they remained in teaching. Music teachers ranked the types of professional development activities in which they would participate in the future. These were (a) Orff, (b) teaching with technology, (c) assessment in music, (d) standards-based teaching, (e) Kodály, (f) world music, (g) interdisciplinary approaches, and (h) Dalcroze.

Conway (2008) used a phenomenological design to examine music teachers' perceptions for professional development throughout their careers. Data collected included (a) phenomenological interviews, (b) a focus group interview, and (c) a researcher's log of study interactions, e-mails, and telephone conversations. Nineteen experienced music teachers participated and represented an intensity sample of rich but not unusual cases. Participants reported informal interactions as the most valuable form of professional development, and district professional development sessions as the least valuable. For changes in perceptions over the courses of teachers' careers, three themes emerged: (a) the need to be proactive in finding professional development; (b) learning from others; and (c) broadening the definition of the term "teacher". Teachers' responses also depended upon the stage in their career.

Bauer et al. (2009) designed and distributed an online questionnaire to determine the professional development values and perceptions of music teachers in Ohio ($N = 783$). They asked teachers about their perceptions of graduate study as professional development as well as non-credit-bearing experiences. Additionally, they investigated teachers' motives for pursuing professional development, delivery systems for, and approaches to professional development.

Teachers' top ranked motivations for pursuing professional development were (a) to become better teachers, (b) to become better musicians, and (c) for certification purposes. In open-ended responses, teachers identified (a) networking with other music teachers, (b) visiting with colleagues, (c) interactions with presenters who are leaders in the field, (d) to stay current, and (e) to 'reenergize'. Participants ranked their preferences for the following professional development formats (in order of most preferred to least

preferred): (a) professional music conferences (such as the Ohio conference), (b) music in-services held within their school district, (c) 3-5 day intensive summer workshops, (d) professional conference focused on other aspects of teaching besides music, (e) summer college/ university formal courses, (f) short-term online workshops, (g) after-school workshops at a college or university, (h) online courses, (i) distance learning (not internet-based), and (j) non-music in-services held at their school district. Participants also reported the types of professional development that they found valuable. In descending order, these were (a) Ohio state conference, (b) other music/ music education conferences beyond Ohio or MENC, (c) summer workshops sponsored by a college or university, (d) the MENC national conference, (e) Ohio district-level workshop or conference, (f) school district music in-service, (g) online learning activities, (h) Other non-music or music education conferences, and (i) School district non-music in-service. When asked about topics that they found interesting, teachers chose (in order) (a) rehearsal techniques, (b) literature, (c) music technology, (d) classroom management, (e) pedagogy, and (f) conducting. Some disagreement was found when area of specialization and level of teaching experience were taken into account. For example, less experienced teachers tended to rank teaching topics such as classroom management and literature more highly than experienced teachers who rated music technology and literature as their top choices.

Bauer et al.'s (2009) study was the first to report the perceptions of teachers who were not members of their state music education organizations. Based upon the results of a MANOVA procedure, the researchers found significant differences in the preferences for topics ($F(19,764) = 3.19, p < 0.001, \eta^2 = .09$) in comparison to members. Non-

members also showed significantly greater interest in (a) multicultural education, (b) world music, and (c) music for special learners.

Parsad et al. (2012) surveyed principals and elementary and secondary-level music educators about the types of professional development in which they participated and whether the type of experience improved their teaching to varying extents. Data were collected using the Fast Response Survey System through the National Center for Education Statistics. Principals were asked about the availability of professional development for music specialists. Elementary principals ($N= 1,000$) reported that 61% of schools offered at least one professional development program. Specifically mentioned were (a) off-site conferences (47%), (b) workshops with professional artists or arts groups (34%) and (d) in-school seminars or conferences (25%). At the secondary level, 69% of principals ($N= 1,010$) reported having any kind of music professional development. Principals reported that teachers also participated in (a) off-site conferences (59%), (b) workshops with professional artists or arts groups (41%), and (c) in-school seminars or conferences (27%). Secondary teachers' participation in off-site conferences and workshops with professional artists or arts groups were notably higher than their elementary counterparts (12% and 7% higher, respectively).

In addition, teachers were asked about the effects of professional development on their teaching. They were asked specific questions about attending sessions that focused on the following topics: (a) applied study in performing music; (b) applied study in improvising, arranging, or composing music; (c) developing knowledge about music; (d) connecting music learning with other subject areas; (e) integrating educational technologies into music instruction; and (f) research on arts and student learning (e.g.,

arts and cognition). Elementary teachers most frequently attended professional development on connecting music with other disciplines and instructional technology (64% of music teachers reported attending sessions on these topics). These choices of topic were consistent with the secondary teachers. Teachers of both levels (75% of elementary teachers and 82% of secondary teachers) reported that applied study in performing music was the type of professional development that improved their teaching either to a moderate or great extent.

Summary.

One theme that has emerged from an examination of these surveys is that music teachers prefer professional development to be situated within the discipline of music. Music teachers tend to rate preferences based upon experience level and area of specialization (Bauer, Forsythe & Kinney, 2009; Bowles, 2003; Friedrichs, 2001; Tarnowski & Murphy, 2003). This perceived need to focus on content appears to transcend disciplines as suggested by the similar values of mathematics and science teachers in Garet, et al.'s (2001) study.

Another finding of these studies (Bauer et al., 2009; Bush, 2007; Conway, 2008; Conway, 2003b; Friedrichs, 2001) is that music teachers place high value on discussions and interactions with colleagues as professional development. This value extends to early career music teachers, who, as previously discussed, sought the advice of more experienced music teachers in their areas of specialization (Conway, 2001; Conway & Christensen, 2006; Conway & Zerman, 2004).

Missing from this literature is an empirical examination of whether some of the professional development formats enhance teachers' knowledge and skills. While

examinations of music teachers' opinions regarding effective professional development may inform offerings for conference attendance, it does not take into account whether or not these formats are significant predictors of changing teachers' practice in the classroom. In addition, participants in these surveys have almost exclusively been members of professional organizations in music education. Therefore, the descriptions of professional development fail to take into account the viewpoints of non-members of those organizations. The one exception (Bauer, Forsythe & Kinney, 2009) found significant differences in non-members' preferences for professional development topics, suggesting that the viewpoints of non-members may differ from those of members.

Professional Development Formats

Professional development is delivered in diverse formats, most commonly a workshop that occurs during one school day or part of a day (Birman, Reeve & Sattler, 1998; Parsad et al., 2012). Teachers have long denounced this type of professional development as being of low quality and limited utility (Hawley & Valli, 1999). Research into formats for professional development has sought to describe various formats (e.g., Ingersoll & Strong, 2011; Thomas, Wineburg, Grossman, Myhre & Woolworth, 1998), or to test certain types of professional development for effectiveness in changing teachers' knowledge and skills (e.g., Fishman et al., 2003; Lustick & Sykes, 2006).

Similar research has been undertaken in music education. Bush (2007) stated, "In-service workshops, conferences, meetings, small group work, residency programs, and classes typically constitute how PD is provided for public school music teachers" (p. 10). Music education research into various formats for professional development has

included (a) mentoring and induction of new music teachers, (b) the National Board Certification process, (c) distance learning, (d) professional learning communities or collaborative teacher study groups, and (e) graduate coursework and workshops. Several of these formats have been investigated as alternatives to the traditional types of professional development discussed by Bush, and decried in the literature as ineffective.

Mentoring and induction.

The mentoring and induction of new teachers has been explored as a way of retaining beginning teachers, many of whom leave the profession within the first few years. Mentoring and induction programs have been found to have positive effects on teacher retention through the first year (Smith & Ingersoll, 2004), as well as affecting some measures of teacher performance (Ingersoll & Strong, 2011).

Conway (2001) investigated the perceptions of seven beginning-level (first and second year) teachers of district-sponsored induction programs. She utilized a phenomenological framework and a typical case sample. Conway collected observations, written documents (teachers' journals, materials from induction experiences, and end-of-year questionnaires), and conducted individual and focus groups interviews. She found inconsistency across induction programs. Participants reported dissatisfaction with the first-year induction programs, as they had difficulty in transferring the content of the workshops to the unique setting of the music classroom, and did not find them helpful or useful. In addition, they reported that their assigned mentor teachers ranged from a more experienced music teacher to a mathematics teacher. Some of the topics that the teachers discussed as being of value to them were (a) observing experienced music teachers, (b) receiving observations from music content specialists, (c) focus on curriculum and

assessment in the second year, and (d) the possible roles of higher education and state professional music organizations. The participants all reflected that they wanted induction activities and professional development to address the challenges faced in the music classroom, rather than the “one size fits all” approach that structured induction programs frequently take. Conway stated that the problems faced by beginning music teachers are unique to the discipline, and that beginning music teachers should be paired with more experienced music teachers where mentoring relationships exist. Conway subsequently called for an examination of the perceptions of a larger number of teachers, including those of experienced music teachers.

In a joint study, a university researcher and a first-year instrumental music teacher investigated the teacher’s perceptions of mentoring and induction within the first year of teaching (Conway & Zerman, 2004). The theoretical framework drew from case study design and narrative inquiry. Zerman was purposively selected as a critical case sample. In addition to Zerman, Conway interviewed her mentor and principal. Data collected included (a) a journal, (b) a log of e-mail correspondence between Zerman and her mentor, (c) an end-of year questionnaire, (d) an analysis interview, and (e) interviews of Zerman’s principal and mentor. Conway followed Zerman through the first two years of her teaching career. During her first year, Zerman expressed feelings of being overwhelmed, working long hours, and isolation as the only music teacher in her building. Similar to findings in other studies (Conway, 2001; Conway & Christensen, 2006), Zerman did not perceive her induction program to be particularly relevant. The mentor stated that the content of conversations were generally curricular in nature.

DeLorenzo (1992) surveyed 221 first-year music teachers in Pennsylvania and New Jersey, and asked them about their level of comfort with certain aspects of teaching as well as professional activities that most assisted them in their professional growth. The teachers reported relatively high comfort with establishing working relationships with colleagues and administrators. Areas of reported concern were content-specific, and unique to areas of specialization (e.g., general music, choral, general, instrumental). In the areas of professional assistance, the first-year teachers rated assigned mentor teachers and other colleagues in the field (mean scores of 3.71 and 3.69 on a 5-point Likert-Type scale) as more helpful than (a) building principals, (b) other teachers in the school, (c) their fine arts supervisors, (d) the new teacher orientation programs, or (e) in-service programs.

Conway and Christensen (2006) examined the perceptions of a first-year instrumental music teacher regarding professional development. Specifically, topics explored included (a) district-level in-services, (b) programs offered by state music organizations, (c) programs that the teacher attended, and (d) informal professional development experiences. Using a narrative case study framework, they investigated what the teacher believed was the most powerful form of professional development, suggestions for improvement of the programs, how the teacher described her growth in the first year of teaching, and how that growth came about as a result of those professional development experiences. Conway chose Christensen as a critical case sample. Data collected included observations, interviews, written responses to readings, and a researcher's journal kept by Christensen. The two researchers analyzed the data independently, and then compared their findings. Trustworthiness was established

through triangulation of multiple data sources, multiple investigators, and data collection that spanned a period of time. Furthermore, they discussed that, while not generalizable, the rich description provided made the results transferable. Three themes emerged as a result of the study: (a) views of professional development, (b) isolation, and (c) music festivals and competitions. They found that professional development during the first year of teaching came from three sources: (a) the district, (b) professional organizations, and (c) those experiences that Christensen sought out. She found the instrumental music professional development sessions to be of greatest value. District professional development sessions were largely irrelevant to her teaching situation, and unevenly implemented: these were supposed to be in the form of monthly meetings, but did not occur that frequently. The topics covered in these meetings tended to be overly broad due to the multiple teaching situations represented by the ten first-year participants. Christensen viewed the “Survival Camp” sponsored by the state music organization as relevant, but too short. Some of the more effective experiences that she described included adjudication with a more experienced teacher, interactions with her self-selected mentor, and keeping a journal for reflection purposes. The authors discussed time as a valuable feature of professional development and the importance of content-based professional development for music teachers.

Summary: Mentoring and teacher induction.

These studies suggested themes that are unique to music teachers, including that music teachers perceived professional development as provided by their districts tended to be overly generic, and as such did not address the needs of their specific teaching situations (Conway, 2001; Conway: Christensen, 2006; Conway & Zerman, 2004). In

addition, new music teachers expressed that they needed professional development and mentors not only within their content area, but their area of specialization within music (e.g., general music, chorus, band or orchestra) (Conway, 2001; Conway & Christensen, 2006; Conway & Zerman, 2004). Consequently, these new teachers were dissatisfied with their mentoring experiences, as they perceived mentoring to be ineffective because it did not address their unique needs as music teachers. Programs tended to be implemented unevenly, and addressed general topics to serve a wider range of teachers from other content areas. Participants reported that the principles learned at these workshops were difficult to transfer to the context of the music classroom (Conway, 2001; Conway & Zerman, 2004).

National Board Certification process.

The application process for National Board Teacher Certification through the National Board for Professional Teaching Standards is intended to recognize excellent teaching, but has also been researched as a possible means of effective professional development. There are two areas of National Board Certification for music teachers: (a) early and middle childhood and (b) early adolescence through young adulthood (National Board for Professional Teaching Standards, 2013). The application process includes a portfolio assessment and a computer-based content knowledge assessment. The portfolio assessment consists of four areas: (a) video of the teacher, (b) direct evidence of student achievement, (c) written commentaries that are reflective and analytic in nature, and (d) a written assessment administered at a testing center. The content-based assessment is divided into six sections, and applicants have thirty minutes to complete each section (National Board for Professional Teacher Standards, 2013).

Lustick and Sykes (2006) studied 120 National Board candidates for Adolescent and Young Adult Science certification. They used Hawley and Valli's (1999) *New Consensus Model of Professional Development* as a theoretical framework. The study employed a pretest-posttest quasi-experimental design that used interviews as both the pretests and posttests. Interviews were scored with a rubric that paralleled the thirteen science standards from the Adolescent and Young Adult Science standards from the National Board application process. The researchers found significant increases in content knowledge ($p < 0.005$) and assessment ($p = 0.001$) from pretest to posttest, representing the only two significant findings of the thirteen standards, despite the existence of a statistically significant effect for the whole model of standards ($t(114) = 2.40, p = 0.009$).

Alvarado (2004) used an interpretivist frame and a symbolic interactionist framework to investigate the perceptions of 12 Early Childhood Generalist candidates for National Board Certification. She conducted interviews and reviewed the application portfolios of each candidate. Alvarado found that the application process itself served to refocus teachers on certain aspects of quality instruction that had become automatic for them, such as instructional routines. The process allowed for deep reflection in specific ways that allowed this shift in focus. Additionally, teachers reported that the process was emotional, because it involved reflection and self-assessment of their own work, as well as de-privatizing their practice through collaboration. Participants also stated that the process was situated within their own classroom contexts, as opposed to the decontextualized nature of other types of professional development. In addition, participants reported that the process provided opportunities for deeper reflection on the

effects of their instruction on student learning than other professional development in which they had participated. Based upon these findings, Alvarado made several recommendations for the design of effective professional development. These included (a) that professional development should encourage reflection on one's own practice, (b) that reflection should be based on a clear set of standards, (c) that professional development should promote changes in instruction that affect student achievement, (d) that professional development includes opportunities for collaboration that include standards-based critical reflection, and (e) that professional development utilizes appropriate levels of positive pressure to change instructional practice. Through its standards-based processes of focusing on certain facets of instruction and collaborative nature, Alvarado concluded that the application process could serve as a means of effective professional development.

In the only study that involved music teachers in the application process for National Board Certification, Standerfer (2008; 2003) conducted case studies of three music teachers, two of whom taught high school vocal music, and one who taught middle school general and vocal music. She conducted three interviews with each participant, and used cross-case analysis to derive themes. Data were analyzed through the lenses of learning theory and professional development. Standerfer reported that the initial impetus for these teachers to apply for National Board Certification was financial and professional. However, as a byproduct of the application process, the teachers experienced professional development in the form of improved knowledge and skills and belief structures.

Summary: National Board Certification process.

Results from these three studies suggest that the application process for National Board Certification contains aspects of professional development that result in applicants' growth. An important limitation to consider in this research is that the process is by application, and the professional growth markers discussed above are byproducts, rather than primary outcomes, of the process.

Distance learning.

Technology is a topic that music teachers have ranked highly as a preferred professional development focus (Bauer et al., 2009; Bowles, 2003; Bush, 2007). Additionally, interaction with colleagues has been a form of professional development that teachers have reported as powerful (Bush, 2007; Conway, 2008). One professional development format that harnesses technology and collaboration in music education has been distance learning, or distance education. Distance learning involves students accessing course content and completing course assignments via the Internet (Walls, Powell, Miranda & Good, 2005). Additionally, distance learning may take different forms, including existing entirely online or in a hybrid course that contains some face-to-face content, as well as some online. The concept of distance learning has a history that dates to the early 1700s in correspondence education (Jeffries, 2001) and presaged the current format of online learning via the Internet.

Research on distance learning has been primarily from the viewpoint of music teacher educators (Walls, 2008; Walls et al., 2005). Rees (2002) also discussed that research in distance learning in music education has yet to describe best practices or to focus on teaching and learning in this medium because the concern for music educators

was to understand how this tool might enhance music teaching and learning between people instead of how this particular format enhances collaboration or changes the experience of music teaching and learning. Rees also observed that the technology was relatively new, and research was just beginning to address it.

Walls et al. (2005) provided a rich description of the implementation of a Master of Music Education program utilizing distance education at Auburn University. The rationale for the creation of such a program was that the university was located in a rural area and inconvenient for music educators to attend. Courses described were of the hybrid type described above. Some tools that the researchers discussed were discussion boards, online posting of course documents, and the use of live streaming video as well as archived video recordings of the classes. In addition, the class made use of a platform that allowed distance learners to communicate with the other class participants in real-time. A graduate assistant monitored the stream of questions from distance participants. One major challenge to this format that was discussed was pacing, as the delay in transmission meant that professors, when posing a question, had to allot an appropriate amount of response time to account for the lag caused by digital transmission. Face-to-face meetings in the program were either concerned with administrative aspects of the program (e.g., an orientation day), or performance-related classes such as Choral Conducting.

Walls (2008) sought to evaluate the impact of a graduate distance-learning program on the professional development of in-service music teachers. The primary mode of delivery for the course was the hybrid format. Walls conducted semi-structured interviews with 16 recent program graduates, and administered questionnaires to

incoming and outgoing students. Through transcript and questionnaire analysis, she found that graduates reported changes in (a) teaching philosophy, (b) greater integration of technology into their classroom, (c) refinement of instructional methods, (d) personal growth such as improved research skills and a feeling of belonging to a larger community of music educators, (e) a high level of satisfaction with the program, and (f) positive faculty-student interaction.

Summary: Distance learning.

Music teachers have consistently ranked technology as an important and desirable topic and mode of professional development (Bauer et al., 2009; Bowles, 2003; Bush, 2007). As technology has improved, colleges, universities, and professional organizations (such as *NAfME*) have substantially increased their online offerings, affording a convenient form of professional development, particularly for in-service music educators whose schedules are already demanding, perhaps to the point of being prohibitive for the purposes of class attendance. This may also be an effective format for music teachers, as Barry (2003) found that students taking a music education graduate research seminar via distance learning scored better on content measures than those who took the class with traditional instruction.

Collaborative teacher study groups.

Collaborative teacher study groups, also called professional learning communities, have been presented as an alternative to traditional professional development workshops. A principal reason given for the use of these groups as vehicles for professional development is their ongoing nature that contrasts the episodic workshop format (Darling-Hammond & Sykes, 1999; McLaughlin & Talbert, 2006; Thomas,

Wineburg, Grossman, Myhre & Woolworth, 1998). Goode (1957) observed that professionals in the same field share aspects of community. Thus, a professional learning community may be defined as a group of teachers that meet to study a phenomenon such as student achievement, literature, or pedagogy. This may include teachers from the same school or department, or from many schools that teach the same subject, such as music teachers.

The primary focus of research on collaborative teacher study groups has been to describe the development and implementation of such a group, as well as document the challenges associated with this format. One series of studies (Grossman, Wineburg & Woolworth, 2001; Thomas et al., 1998; Wineburg & Grossman, 1998) sought to describe the design and implementation of the *Community of Learners* project sponsored by the James McDonnell foundation. The goals of the project were to examine pedagogy and create an interdisciplinary humanities curriculum. Thomas et al. (1998) utilized a design experiment to implement a professional learning community for English and social studies teachers at the same high school. The group was comprised of 28 people, including six history teachers, 11 English teachers, a special education teacher, one teacher of English as a second language, four student teachers, and five researchers. The researchers acted as participant facilitators of the group. The group met twice monthly to discuss literature and pedagogy. During this first phase, they found that (a) the level of intellectual discussion around the selected texts rose, (b) teachers experienced some discomfort with their teaching, and (c) teachers reported use of project-based texts in their classrooms.

Based upon their experiences with their project and other existing literature on learning communities, Grossman et al. (2001) proposed a model for teacher community. They used their own project as a case study and discussed four tensions that emerged as a result of program implementation. First were issues associated with the formation of group identity and norms of interaction within the group. Second was navigating conflict within the group, brought about either through differences in teachers, or in conflicting viewpoints. Third was negotiating the “essential tension” between deepening content knowledge and teaching new pedagogical practices. The last was community responsibility for individual growth. In addition, they identified two obstacles to building community: (a) teachers working in an unfamiliar environment and (b) the private nature of the act of teaching.

Stanley (2009) examined the experiences of three music teachers as participants in a collaborative teacher study group. Participants were selected as an intensity sample, representing information-rich cases. Stanley adopted a social constructivist framework to promote the egalitarian relationships between researchers and participants. Data were collected through semi-structured interviews and artifacts from meetings such as completed video protocols, a participant-researcher log, and meeting transcripts. Of particular interest to the study were interactions within the teacher study group. The group met seven times throughout the spring semester of 2008 and centered on the topic of student collaboration in the elementary music classroom. The core activity within the study group was video analysis of teachers’ classrooms. Themes that emerged were (a) collective knowledge generated by the group, (b) the use of video to examine teaching practice, (c) the use of a protocol in examining video, and (d) defining what student work

in music looks like. All of the participants reported (a) increased professional knowledge, (b) positive attitude about the use of video and use of an accompanying protocol, (c) more reflective work in their own teaching, (d) greater understanding of the dynamics of student collaboration, and (e) greater understanding of the teacher's role in fostering student collaboration.

Summary: Collaborative teacher study groups.

In each study reviewed, the concept of teacher community was offered as a job-embedded alternative to the traditional workshop format still prevalent in professional development offerings. In addition, the studies reviewed above discussed (a) the need for the balance between content and pedagogy, (b) establishment of social norms within the group, (c) duration of the experience, and (d) de-privatization of teaching practice. These studies also discussed several social challenges when implementing a study group, suggesting that those may be additional hurdles to overcome when planning such experiences.

Graduate workshops.

Graduate level coursework and workshops are common professional development formats for music teachers. Many states have requirements for certification renewal that include either credit or clock-hour requirements for teacher learning (e.g., Maryland State Department of Education, 2012; New York State Education Department, 2010). Despite these requirements for all teachers, very few studies have been devoted to the topic of graduate workshops or coursework. Many colleges and universities offer workshops in addition to traditional coursework, and music teachers have also found this format to be desirable, effective, and important (Bauer et al., 2009; Bowles, 2003; Bush, 2007).

Bauer et al. (2003) designed a one-week technology workshop with a longitudinal survey design to determine its efficacy as a mode of professional development, and whether participation in the workshop resulted in increased (a) knowledge of technology, (b) comfort with technology, and (c) frequency of technology use. Participants ($N = 63$) were teachers enrolled in summer technology workshops at nineteen colleges and universities in the eastern United States. Survey questionnaires were distributed at the beginning and end of the workshop, as well as several months after the conclusion of the session. The researchers found that, through participation in the workshop, teachers reported statistically significant changes in all three categories. However, results of the follow-up questionnaire revealed (a) a poor response rate in comparison to the total number of workshop participants and (b) a significant lack of retention of the information from the workshop despite the fact that teachers' reported comfort with technology remained higher than at pretest. The authors stated that the drop-off in retention could be mitigated by ongoing support through other forms of professional development such as (a) discussions with colleagues, (b) learning strategies to use technology in teaching, (c) resources for technology and pedagogy, and (d) onsite technical support.

Junda (1994) investigated the effects of a graduate in-service program as professional development. The researcher designed and implemented a two-semester class called *Collaborative Approach to Music Instruction* at Montclair State College. Funding for the project covered 80% of the class tuition for participants. Twelve K-3 general music teachers who were members of both Music Educators National Conference and their state organizations took the class. A precondition for admission into the class was that the researcher had access to the teachers' classrooms for observation purposes.

Interviews were also conducted as a part of this process to determine teachers' commitment level to developing musical skills, ability to participate in group discussions and to sight-read. To ensure fidelity of implementation, teachers were observed in their classrooms five times throughout the school year. The teachers attended the course, which focused on (a) sight-reading methodology, (b) Kodály methodology and philosophy, (c) long-term lesson planning, and (d) assessment. Data sources included videotaped observations, in-class observations, interviews, end-of-semester examinations, and mid-project and end-of-project questionnaires that asked participants about changes in skills, project design, materials and strategies, supervision, videotaping, curriculum development, evaluation, and future projects. Results indicated that (a) teachers' musical skills (defined by their ability to sight-sing in moveable do, to sing in tune, and to correct student errors) changed as a result of participation in the course, (b) teachers' instructional skills changed, including pedagogy and long/ short-term planning, and (c) students' musical skills were positively affected by their teachers' participation.

Summary: Graduate workshops.

Graduate workshops and coursework constitute common professional development formats for music teachers. The mixed findings of these two studies imply that duration may be a determining factor in retention of material. While the one-week workshop may be an effective means of exposure to new topics, graduate coursework that gave teachers the opportunity to practice what they had learned and provided a forum for discussion appears to have brought about more longitudinal changes in teaching practice.

Summary: Professional development formats.

The literature on professional development formats reveals several diverse approaches to formats for delivery of content. Unrepresented but common in the experiences of music teachers is the one-day workshop, such as a district, state, or national music or music education conference. Parsad et al. (2012) reported that 60-80% of music teachers ($N = 65,800$; 80-89% of elementary and 60-84% of secondary) stated that their professional development experiences lasted from 0 to 8 hours, far less time than previous research identified as effective (Yoon et al., 2007). The workshop format appears, then, to still pervade professional development offerings for music teachers. Bauer et al.'s (2003) findings in this area are consistent with subsequent research (Yoon et al., 2007) that professional development needs to be of a sustained nature to impact instructional change. Therefore, the short length of the workshop could explain participants' lack of ability to retain the information long-term.

Many of the formats discussed above (such as the application process for National Board Certification and collaborative teacher study groups) provide more longitudinal alternatives to the workshop approach, but also service less teachers, a tension within professional development delivery itself.

Examination of the literature reveals the scarcity of research that exists in the area of professional development formats for in-service music teachers. In addition, very few topics have had more than a few studies devoted to them, leading to a lack of cohesion. While this body of literature is descriptive, there is a lack of quantitative research that could not only lend a different frame of reference, but could also begin to evaluate

whether certain formats are successful in bringing about enhancements in music teachers' knowledge and skills.

Features of Effective Professional Development

Research on the features of effective professional development has grown out of the evaluation of the Eisenhower Professional Development Program Part B (State and Local Activities), housed in Title II of the Elementary and Secondary Education Act, currently known as No Child Left Behind (Birman, Reeve & Sattler, 1998; Desimone, Porter, Garet, Yoon & Birman, 2002; Garet et al., 1999; Garet et al., 2001).

Garet et al. (1999) mailed the *Teacher Activity Survey* to a national sample of math and science teachers ($N = 1,027$) whose districts received Title II funds through the Eisenhower Professional Development program during the 1997-1998 school year. They measured the quality of funded programs through the use of the six key features of professional development discussed above. They found that, despite extended duration being a marker of quality, 79% of teachers had participated in traditional workshop formats. The average total time that teachers spent in activities during the school year was 25 hours, which had doubled since the 1988-1989 school year, and 25% of these teachers were participating in activities that lasted at least six months.

For collective participation, they found that 20% of teachers participated with other teachers in their department or grade level, suggesting that teachers attended professional development as individuals. Active learning was largely absent from professional development. For coherence, 31% of teachers reported that professional development had built on prior learning or were connected with later sessions. In addition, teachers reported enhancements in their knowledge and skills in six areas.

Sixty-three percent reported enhancements in their knowledge and skills for instructional methods, followed by curriculum (56%), in-depth knowledge of math/ science (48%), approaches to assessment (46%), approaches to diversity (26%), and use of technology (24%). Teachers also rated enhancements higher in those activities that they identified as reform-type, or those formats of professional development (e.g., teacher study group, teacher network, mentoring) that are different from the traditional workshop format. These results suggest that (a) there is a relationship between certain features of effective professional development and enhancement in teachers' self-reported knowledge and skills, and (b) professional development formats that contrast the traditional workshop format may be more effective in bringing about authentic change in teachers' knowledge and skills. The researchers also found six features of professional development that affected self-reported changes in teachers' knowledge and skills, and broke them down into three structural and three core features. Structural features, which they defined as characteristics of the structure or design of professional development, included (a) type of activity (including whether the activity was a traditional workshop format, or a reform-type such as a professional learning community), (b) duration of the activity, and (c) the collective participation of all of the members of a school or department. Core features, which focused on the substance of professional development, included (a) a focus on content, (b) opportunities for active learning, and (c) coherence in teachers' overall programs of learning.

Garet et al. (2001) analyzed data from the 1998 administration of the *Teacher Activity Survey* to determine whether six key features of professional development predicted self-reported enhancements in math and science teachers' knowledge and skills.

Participants were 1,027 mathematics and science teachers. To investigate these relationships, they used scales developed for the 1998 administration, and developed a regression model with the six features (Activity Type, Duration, Collective Participation, Coherence, Opportunities for Active Learning, and Content Focus) as predictors, and Enhanced Knowledge and Skills as the criterion variable. School and teacher characteristics were used as controls within the model. All six of these features were found to be statistically significant at the .05 alpha level.

In a follow-up longitudinal study, Desimone et al. (2002) analyzed data from the *Longitudinal Teacher Survey* that asked about whether participation in professional development over the course of three years affected self-reported changes in teachers' practice in various instructional areas (use of technology, higher order instructional methods, and alternative assessment practices), and whether certain key features of professional development affected change in teachers' practice. They administered the survey in three successive school years (1996-97, 1997-98, and 1998-99) to 207 teachers in 30 schools in 10 districts in five states. Utilizing hierarchical linear modeling, they found that professional development that focused on a given instructional practice tended to increase teachers' use of that practice in the classroom. In addition, they found that a focus on a set of practices versus one single practice had greater effects. For features of quality, they found that collective participation of teachers and active learning had significant, positive effects on strategies for teaching technology. Reform-type activities and active learning had significant, positive effects for related strategies for instruction. Reform-type activities and coherence had significant, positive effects for alternative approaches to assessment.

Jeanpierre, Oberhauser, and Freeman (2005) reported the results of an evaluation of a weeklong summer science workshop that instructed teachers and students on the use of inquiry-based practices. Five groups of teachers attended the workshop with two students over the course of three years. Each group consisted of 8 – 10 teacher and 16-20 students. The researchers used Qual-Quan mixed methodology, where qualitative data collection and analysis occurs first, followed by quantitative analysis. Data collected included (a) pre and post workshop questionnaires that inventoried teachers' use of inquiry-based practices, (b) field notes, (c) data from completed workshop projects, (d) case studies, and (e) a preassessment for teachers. Results indicated that two characteristics of the program helped teachers to build inquiry-based activities into their classrooms: (a) a focus on deep content learning and (b) opportunities for active learning through practice.

Penuel, Fishman, Yamaguchi, and Gallagher (2007) expanded the work of Garet et al. (2001) by including local context and implementation fidelity. Specifically, they studied the effects of various characteristics of professional development on teachers ($N = 454$) who participated in professional development for implementation of the GLOBE science program. Data collection instruments included (a) a survey administered to professional development providers that related to the design of the activities, (b) a survey administered to teachers that was adapted from Garet et al. (2001) that asked teachers questions about the implementation of the program and measure changes in teachers' knowledge, and (c) data from the GLOBE database. The researchers used a hierarchical linear modeling framework due to the fact that individual teachers were nested in professional development sections from given providers. Consistent with Garet

et al. (2001), the researchers found coherence to be a significant predictor of teacher change and enhanced knowledge and skills. Collective participation was found to be a significant predictor of change in teaching practice, as was activity type (reform-type professional development.)

Summary: Features of effective professional development.

The evaluation of the Eisenhower Professional Development program represents an early cohesive effort at examining the effectiveness of professional development on self-reported enhancements in teachers' knowledge and skills, and in change in teaching practice. A possible limitation to the results of these studies is that they rely on self-report data, which can introduce bias into findings. However, the procedures and analysis techniques employed in these studies lend valuable systematic insight into teacher's perceptions regarding professional development, and provide an intermediary step to linking features of professional development to student achievement.

Teacher Knowledge and Skills

The question of the types of knowledge that teachers need to deliver effective instruction has spurred widespread debate among stakeholders in the education community. There appears to be agreement among scholars, administrators, and policymakers that teachers should have a deep understanding of the content that they teach (Darling-Hammond & Bransford, 2005; Grossman, Wilson & Shulman, 1989; Hawley & Valli, 1999). The extent of that content knowledge and its contributions to effective instruction, however, remain a point of contention in modern education and research. In addition to content knowledge, there also appears to be consensus that there are various types of pedagogical knowledge (including (a) classroom management, (b)

sequencing of content for instructional purposes, and (c) knowledge of classroom context) that make contributions to the effectiveness of teaching. In the United States, the subject of what teachers must know and be able to do has been of particular interest in recent decades, and has been motivated by several events. First was the Soviet launch of the Sputnik rocket in 1957. This event ushered in a time when American schooling refocused on science (Crone, 2002). Additionally, the publication of *A Nation at Risk* (1983), which discussed the flagging status of America's schools brought the issue of teacher knowledge to national attention and prompted the work of the Holmes group (1990; 1986). The literature from this time was concerned with teaching behaviors that made some teachers more or less effective than others (e.g., Bennett, 1986; Delamont, 1986; Eisner, 1986; Peterson, Kromrey, Micerri & Smith, 1986; Shuy, 1986), and whether a comprehensive base of teacher knowledge and skills could be derived from extant knowledge on the topic (Good, 1990).

In addition, it appears that the knowledge and skills for teaching music differ from the skill sets demanded of educators of other disciplines. In an earlier review of research on mentoring, participants reported that mentoring and professional development early in their careers to be overly generic and of limited relevance, as these formats attempted to address the needs of all new teachers (Conway, 2001; Conway & Christensen, 2006). This includes mentors in the field of music, and professional development tailored to the discipline of music that addresses their needs as music educators (Conway & Zerman, 2004).

Tensions have arisen around the content, forms, and sources of teachers' knowledge. Scholars have discussed that research environments are necessarily

constrained, and that the results of that research have limited generalizability. The results of experimental research have, in the past, been reduced to checklists that have subsequently been interpreted by policymakers as a checklist of the elements of effective teaching (Shulman, 1986). Several scholars have cautioned against this type of reductionist thought, as it fails to take into account several factors (such as context and teachers' thought processes) that contribute to the complexity of the act of teaching (Hawley & Valli, 1999; Shulman, 1986).

The field of music education has also attempted to codify existing knowledge about teaching. This has prompted the release of several research handbooks (Colwell, 1992; Colwell & Richardson, 2002; Colwell & Webster, 2012a; Colwell & Webster, 2012b; McPherson & Welch, 2012a; McPherson & Welch, 2012b), and chapters within those handbooks on specific topics in music teaching and learning, such as *Taking an acquired skills perspective on music performance* (Lehmann & Davidson, 2002), self-regulation of musical learning (McPherson & Zimmerman, 2012), and teaching instrumental music (Weerts, 1992). University-based researchers have produced most of the existing literature on music teacher knowledge (Bresler, 1993). This section will focus on the research literature pertaining to conceptions of teacher knowledge and skill.

The knowledge base for teaching.

Research on the topic of teacher knowledge and skills over the past three decades has sought to articulate the base of knowledge and skills essential to effective instruction (e.g., Darling-Hammond & Bransford, 2005; Good, 1990; Shulman, 1987; Shulman, 1986). In particular, one conception of teacher knowledge has influenced research and policy in the past twenty-five years (Shulman, 1986; 1987). The most common method

by which this has been attempted is through review of existing literature (Cochran-Smith & Lytle, 1999; Darling-Hammond & Bransford, 2005; Good, 1990; Reynolds, 1989; Shulman, 1986; Shulman, 1987). This approach has been driven by the conception that teaching is a series of behaviors that affect student learning, and that identification and compilation of those behaviors could professionalize the teaching profession. Some studies have attempted to describe the habits of expert teachers (Berliner, 1986), while others have attempted to advance conceptions of a knowledge base (Cochran-Smith & Lytle, 1999; Darling-Hammond, 2006; Good, 1990; Reynolds, 1989; Shulman, 1986; Shulman, 1987). This is evident through the proliferation of handbook chapters in recent years (e.g., Cochran-Smith, 2008; Houston, 1990; Sikula, Buttery & Guyton, 1996). The music education literature has followed a similar course with the release of several research handbooks (Colwell, 1992; Colwell & Richardson, 2002; Colwell & Webster, 2012a; 2012b; McPherson & Welch, 2012a; 2012b). This section will include an examination of the bodies of literature concerning teacher knowledge in education and music education.

Grossman et al. (1989) examined the types of content knowledge that are important for beginning teachers, with the expressed assumption that content knowledge is important for teaching. They stated that content and methods classes existed separately from one another in the university, and that methods classes offered pedagogical content instruction without addressing the content itself, resulting in a lack of substantive content knowledge. They expanded the concept of content knowledge into four parts that affect teaching: (a) content knowledge for teaching, (b) substantive knowledge, (c) syntactic knowledge, and (d) beliefs about the subject matter. Content knowledge included factual

knowledge within a discipline. Substantive knowledge referred to the frameworks of reference or theories that are used to guide inquiry. Syntactic knowledge was knowledge of the ways that new knowledge is brought into a field. While not a type of knowledge itself, they discussed that teachers' beliefs about subject matter are treated as knowledge by teachers, and affect what is and how content is taught.

Darling-Hammond and Bransford (2005) framed their inquiry into the tools for effective teaching for the National Academy of Education by inquiring about the knowledge, skills, and commitments that teachers must have to foster achievement for all students. Their investigation drew on four bases of research on teaching: (a) learning, development, language acquisition, and social contexts; (b) how learning conditions and teaching practices influence learning, (c) how teacher learning affects teaching practices and student achievement, and (d) how teachers learn successful practices. They arrived at three general concepts:

- Knowledge of **learners** and how they **learn and develop** within social contexts,
- Conceptions of **curriculum content and goals**: an understanding of the subject matter and skills to be taught in light of the social purposes of education, and
- An understanding of **teaching** in light of the content and learners to be taught, as informed by assessment and supported by classroom environments. (p. 10; boldface in original).

They parsed these three ideas into types of knowledge for teaching. Under knowledge of learners, they described (a) understanding of learners and learning, (b)

understanding development, and (c) the development and use of language. Under conceptions of curriculum, they listed developing a curricular vision. For the understanding of teaching, they listed (a) teaching subject matter, (b) teaching diverse learners, (c) assessing learning, (d) managing classrooms, and (e) collaborating to create strong schools. They also situated their investigation in what students need teachers to know and be able to do in order to become productive “competent and confident” members of society. They embedded these ideas within two conditions for practice: (a) that teaching has moral as well as technical expectations, and (b) that education in the United States must also support the ideals of democracy.

Darling-Hammond (2006) conceptualized the knowledge base for teaching through review of the literature and the results of mixed methods multiple case studies of five exemplary teacher education programs across the United States. She based her conception of the knowledge base on Dewey’s (1929) ideas that teacher education should prepare teachers as educated knowers and thinkers with the adaptive skills to meet the complexities of the classroom context. She found that exceptional teacher education institutions that she studied shared the following views of teaching: (a) they held knowledge of learners and learning as the main impetus behind making teaching decisions, (b) that content was central to teaching, and that teachers should learn pedagogical content strategies to engage learners and make the content accessible, (c) that teachers designed learner-centered curriculum, (d) that students, content, and curriculum existed in a sociocultural context that influences values and how learning occurs, (e) they placed central emphasis on the roles of assessment (both formative and summative) and feedback in teaching, (f) they cultivated teachers’ abilities as reflective

thinkers and decision makers who are able to revise learning to make it more effective, and (g) they saw teaching as a collaborative activity that takes place within a professional community. Darling-Hammond's findings suggest that (a) there are diverse types of knowledge and skills involved in teaching, (b) that the knowledge and skills used in teaching exist within a context, and (c) that knowledge and skills should be cultivated through practice and collaboration.

Cochran-Smith and Lytle (1999) outlined three images of teacher knowledge. First, knowledge-for-practice involved the generation of knowledge by university-based researchers that contributed to a base of knowledge based upon published research that teachers would need to know and stay abreast of current developments on to continue to grow as a professional. The second was knowledge-in-practice. In this conception, essential knowledge for teaching is embedded in teachers' actions and reflection. In the third, knowledge-of-practice, knowledge about teaching is generated when teachers view their classrooms as sites for their own systematic investigations. They codify this knowledge through collaboration and participation in inquiry communities, or collaborative teacher study groups. Cochran-Smith and Lytle used these three images of teacher knowledge to advance their concept of inquiry as stance. They defined this as "...the positions teachers and others who work together in inquiry communities take toward knowledge and its relationship to practice" (p.288). In addition, they stated that work within a collaborative group affords deeper, richer opportunities for professional development than traditional modes and break down hierarchies within education such as that which exists between teachers and researchers. This, they found, emphasized the

importance of local knowledge for teaching generated as opposed to the university-generated knowledge base.

In music education, a handful of studies have addressed teacher knowledge. Taebel (1980) surveyed 201 music educators in diverse areas of specialization (general music, instrumental, and choral), and asked them to rate the importance of various musical and teaching competencies in terms of their relative effects on student learning on a Likert-type scale from 0 (does not use the competency) to 5 (essential to student learning). The highest rated skill across areas of specialization was aural skills to detect errors in pitch or intonation, followed by error detection skills for rhythm. For teaching skills, the top two ranked across areas of specialization were program and self-evaluation, and classroom climate. Differences were found between choral teachers versus general and instrumental music teachers. Choral teachers tended to rate musical skills more highly, whereas general music teachers tended to rate teaching competencies higher.

Bresler (1993) argued for the inclusion of teachers' voices in the growing body of research on teacher knowledge. Describing the body of literature as dominated by university faculty, she reiterated Cochran-Smith & Lytle's (1990) call for the use of more teacher research to articulate teachers' knowledge and to allow teachers to make meaningful contributions to the research literature. She also discussed that collaborative research between teachers and researchers could also help to bridge the divide between theory and practice, and between producers and consumers of knowledge. She argued that, despite the fact that the *Handbook of Research on Music Teaching and Learning* (Colwell, 1992) devoted several chapters to research on teaching, the chapters were written by researchers and excluded teachers' voices from the work, thus contributing

further to the divide between theory and practice. She also cited institutional expectations of teaching as situated in the act of teaching, rather than in reflection, despite findings that reflection is an important part of a teachers' growth. She presented four studies to illustrate differing teachers' roles in the research process. These included a survey study (Paynter, 1982), a series of case studies (Stake, Bresler & Mabry, 1991), a teacher research study (Wiggins, 1992), and an action research study (Preston, 1989) to elucidate the diverse ways that teachers' knowledge could be articulated through the production of published research. She concluded that teachers, not simply published reports by university researchers, should articulate knowledge for and about teaching.

Pedagogical content knowledge.

Lee Shulman posited the most influential conception of teacher knowledge in the past several decades (1986; 1987). He discussed that the knowledge base at the time was reductionist because it relied heavily on the results of experimental research that produced checklists of desirable teacher behaviors, and as such failed to account for the complexity of the educational context. The categories of teacher knowledge the Shulman identified are:

- content knowledge;
- general pedagogical knowledge, with special reference to those broad principles and strategies of classroom management and organization that appear to transcend subject matter;
- curriculum knowledge, with particular grasp of the materials and programs that serve as "tools of the trade" for teachers;

- pedagogical content knowledge, that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of understanding;
- knowledge of learners and their characteristics;
- knowledge of educational contexts, ranging from the workings of the group or classroom, the governance and financing of school districts, to the character of communities and cultures; and
- knowledge of educational ends, purposes, and values, and their philosophical and historical grounds. (Shulman, 1987, p.8)

Shulman gave particular weight to the concept of pedagogical content knowledge, because, in his view, it was the type that blended disciplinary content and the methods, techniques, and materials that teachers used to foster student understanding. That, Shulman claimed, was knowledge that was unique to teaching.

Shulman identified four sources of teachers' knowledge. The first was scholarship in the content disciplines. The second was the methods and settings of the institutionalized educational process. The third was research on schooling, social organizations, human learning, teaching and development, and other social/ cultural phenomena that affect teaching. The last, and that which Shulman implied was the most underdeveloped, was the wisdom of practice itself. To correct this underrepresentation, Shulman advocated for the use of emerging qualitative methods to create a body of case literature similar to that of other professions such as medicine or law.

Shulman's (1986, 1987) concept of pedagogical content knowledge has also been influential in knowledge research in music education, as it inextricably situated

knowledge for teaching within a specific content area. Millican (2007, 2008) tested the applicability of Shulman's framework to music education, with the addition of the category of administrative knowledge that he described as those "extra-instructional issues" (2007, p. 24) that included finance, travel, inventory, and student information. He then surveyed 214 secondary band and orchestra directors to ascertain the importance of certain categories of Shulman's framework to the daily work of those teachers.

Participants were asked to rank several types of knowledge and skills that reflected Shulman's categories. The participants ranked the following categories as their top choices: (a) pedagogical content knowledge, (b) content knowledge, and (c) general pedagogical knowledge. No significant differences were observed in the ratings between band and orchestra teachers. Significant interactions were observed on individual items within categories in content knowledge, curriculum knowledge, and general pedagogical knowledge with the variables classroom assignment, experience level, and geographic region.

In a follow-up study, Millican (2009) surveyed band and orchestra teachers regarding variables related to general pedagogical knowledge to examine whether relationships existed between rankings of the importance of various aspects of general pedagogical knowledge and variables related to primary teaching assignment, grade level, teaching experience, and school size. Teachers ranked organize and plan instruction, develop rules, routines, procedures, handbooks, etc., enforce classroom rules promptly and consistently, and develop relationships with students as the most important facets of general pedagogical knowledge. Neither school size nor teaching experience influenced these rankings. However, band and orchestra teachers differed in their rankings based on

primary teaching assignment and teaching level. Band directors ranked transitions between activities significantly higher than orchestra directors. Additionally, elementary and middle school directors ranked developing rules, routines, procedures, handbooks, etc. and enforcing classroom rules promptly and consistently significantly higher than their high school counterparts.

Bauer (2013) examined the ways in which music teachers acquired technological pedagogical and content knowledge (TPACK). He developed an instrument to measure music teachers' TPACK to investigate the ways in which music teacher acquire their TPACK, and whether relationships existed between the level of teachers' TPACK and their integration of technology into the classroom. Participants were music teachers ($N = 284$) enrolled in one-week technology workshops at seventeen locations throughout the United States. Results indicated that teachers learned about technology from (a) exploring on their own (81%), (b) summer workshops (69.4%), and (c) music education conferences and conventions (68.3%). A moderate, positive, significant correlation ($r = 0.51, p \leq 0.01$) was found between teachers' level of TPACK and their integration of technology in the classroom, suggesting that teachers who had higher levels of TPACK integrated technology into their classroom more frequently.

Summary: Pedagogical content knowledge.

Pedagogical content knowledge has been the major source of inquiry for music teacher knowledge research, particularly in the past decade. Research has examined music teachers' perceptions of pedagogical content knowledge by specialty area (band or orchestra) as well as the sources of technological pedagogical content knowledge.

Summary: Teacher knowledge and skills.

The review of literature on teacher knowledge and skills illustrates the fact that the process of teaching and learning is a complex one, and that there are many types of knowledge in which teachers must draw to do their jobs effectively. These include (a) content knowledge, (b) pedagogical content knowledge, (c) general pedagogical knowledge such as classroom management and instructional routines, and (d) assessment. Also mentioned in this literature are teachers' beliefs about content (Grossman et al., 1989). Given that teachers' beliefs play a role in their delivery of content, the role of teacher educators and content professors appears pivotal in addressing teachers' misconceptions about content before they propagate these to their students.

Chapter Summary

The literature reviewed in this chapter focused on (a) career stages of music teachers; (b) music teachers' preferences for professional development, (c) formats for professional development, (d) features of effective professional development, and (e) teacher knowledge and skills.

Music teachers' professional development needs appear to vary depending upon what stage of their careers that they are in (Conway, 2008; Eros, 2009; Eros 2012). Career stages are inconsistently defined in the literature (Eros, 2009). However, there appears to be the existence of a transition to a second stage but transition from the beginning of one's teaching career to the second stage appears to include (a) a shift from the teacher to their students, and (b) a shift in confidence, and (c) most significantly for the purposes of this study, a shift in their professional development needs (Eros, 2009).

Through several survey studies, music teachers have voiced their opinions regarding professional development. First is that they preferred that their professional development be situated in the content area of music (Bauer et al., 2009; Bush, 2007; Parsad et al., 2012). Additionally, they preferred that the professional development be held outside of the district and led by an authority on music education (Bauer et al., 2009; Bowles, 2003; Bush, 2007). Music teachers also preferred topics that addressed their area of specialization within music (Bauer et al., 2009; Bowles, 2003; Friedrichs, 2001, Tarnowski & Murphy, 2003). An additional value that teachers held for professional development was the conversations that they have with colleagues (Bush, 2007, Conway, 2008).

Research on professional development formats has described alternatives to the traditional one-session workshop approach. Formats investigated have included (a) mentoring and induction (Conway, 2001; Conway & Zerman, 2004), (b) the National Board Certification Process (Lustick & Sykes, 2006; Standerfer, 2008), (c) distance learning (Walls, 2008; Walls et al., 2005), (d) collaborative teacher study groups (Grossman et al., 2001; Thomas et al., 1998; Wineburg & Grossman, 1998), and (e) graduate workshops (Bauer, et al., 2003; Junda, 1994). Missing from this literature is (a) a description of how widely music teachers engage in formats for professional development and (b) whether they find any of these formats effective in enhancing their knowledge and skills.

The literature on features of effective professional development suggests that there are several features that contribute to the effectiveness of some forms of professional development (Garet et al., 1999, Garet et al., 2001). These features include

(a) type of professional development, (b) duration, (c) collective participation of a department or entire school staff, (d) coherence with a teacher's overall professional development program, (e) opportunities for active learning, and (f) whether the activity had a content focus. These findings conflict with survey studies of music teachers, whose stated values for professional development include traditional workshop formats, thereby violating the type, duration, collective participation, and (possibly) opportunities for active learning features that have previously found to contribute to the effectiveness of professional development in enhancing teachers' knowledge and skills.

The knowledge and skills that teachers must possess to affect student achievement are complex and numerous. Knowledge of subject matter that one is to teach appears to be important but insufficient for effective teaching. Teachers' knowledge is also situated (a) within the teaching profession and (b) within a social and moral context (Darling-Hammond & Bransford, 2005). This knowledge is also embedded in teachers' practice and reflection (Cochran-Smith & Lytle, 1999). Other types of knowledge and skills include (a) pedagogical content knowledge (Shulman, 1987; Shulman, 1986), (b) general pedagogical knowledge (Shulman, 1987), and (c) knowledge of learners and how they learn (Darling-Hammond, 2006). Millican (2007) elaborated on these points, having added administrative knowledge as an additional set of knowledge. Additionally, band and orchestra teachers ranked (a) organizing and planning instruction, (b) developing rules, routines, procedures, handbooks, etc., (c) enforcing classroom rules promptly and consistently, and (d) developing relationships with students was important (Millican, 2009).

For music teachers, pedagogical content knowledge (Shulman, 1986; 1987) appears to be of paramount importance (Bauer, 2013; Millican, 2007, Millican, 2008; Millican, 2009). Program and self-evaluation were highly rated skills across specialties (Taebel, 1980) in addition to classroom climate, suggesting that teachers prioritize reflective practices and classroom management. Teachers also have a unique perspective that has been largely omitted from the research literature, which has been predominantly produced by university-based researchers (Bresler, 1993; Shulman, 1987).

Chapter Two has included an examination of literature related to (a) professional development formats, (b) features of effective professional development, and (c) teacher knowledge and skills. Chapter Three discusses the research methods employed to address the research questions in this study.

Chapter 3: Methodology

Chapter One discussed the need for the study and the contributions that the study could make to the literature concerning professional development for experienced music teachers. Chapter Two examined research literature related to the current study. Chapter Three will discuss the methods employed to address the research questions, including sampling, instruments, design, procedures, and test statistics employed for data analysis.

Researchers in the field of professional development for music teachers have sought to determine teachers' attitudes and preferences regarding professional development. However, no study has addressed whether available formats and features of professional development predict enhancements in knowledge and skills for music teaching as reported by teachers. The purpose of this study was to describe the self-reported professional development activities of music teachers in the United States and to determine whether selected formats and features of professional development experiences commonly available to music teachers are significant predictors of music teachers' self-reported enhancements in knowledge and skills.

Research questions for the study were:

1. What self-reported professional development activities did K-12 music teachers commonly engage in during the 2012-2013 school year and how much time did they spend engaged in those activities?
2. What are the effects of participation in selected professional development formats (out-of-district music/ music education conference, workshop sponsored by a college or university, in-district professional development workshop, graduate

coursework) on music teachers' self-reported enhancements in knowledge and skills?

3. Which, if any, of five core and structural features of professional development (type, duration, content focus, active learning, and coherence) are significant predictors of music teachers' self-reported enhancements in knowledge and skills?

Sample

Sampling procedures.

First, I performed an *a priori* sample size determination analysis to determine the number of respondents needed per predictor to detect an effect with statistical power of 0.8 at the .05 level of significance for research questions two and three, which asked participants about the predictive significance of certain formats and features of professional development on self-reported ratings of music teachers' knowledge and skills. I determined sample size needed using G*Power computer software (Faul, Erdfelder, Lang & Buchner, 2009). For the second research question concerning whether selected professional development formats significantly affected teachers' self-reports of enhanced knowledge and skills, I determined needed sample size to be 85 observations per predictor (see Figure 2 below).

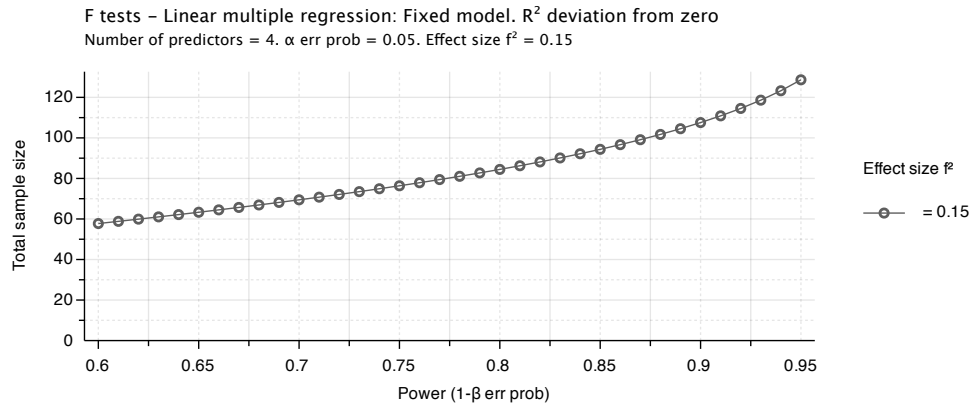


Figure 2. *A priori* sample size determination for research question two: professional development formats.

I performed a similar analysis for the third research question that examined whether features of professional development predicted self-reported enhancements in music teachers’ knowledge and skills. Again, the alpha level was set at .05 and desired power was set at 0.8 with five predictors in the model. Figure 3 displays the results of the analysis. Given these levels, sample size was determined to be 90 participants per predictor variable.

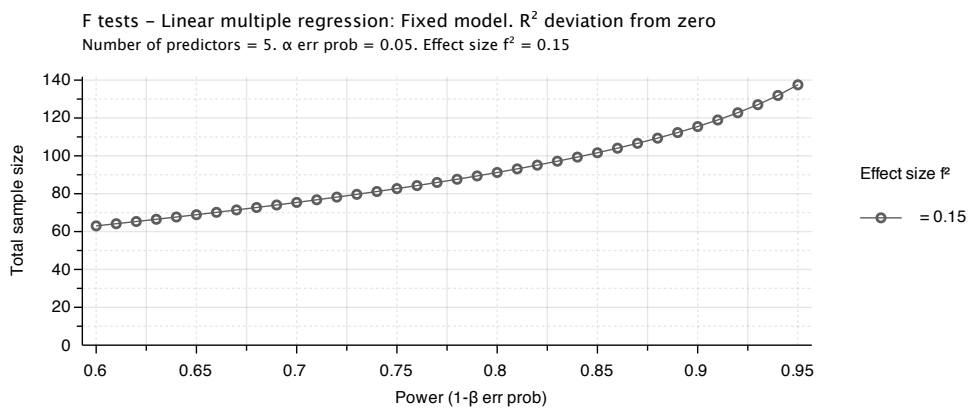


Figure 3. *A priori* sample size determination for research question three: features of effective professional development.

Second, I drew a simple random sample of 4,250 teachers from the 2011-2012 Common Core of Data, *CCD*, file from the National Center for Education Statistics (National Center for Education Statistics, 2013b). The *CCD* is a database that lists every public school and educational program ($N = 103,264$) in the United States and its territories. For the purposes of this study, only the fifty states and District of Columbia were used, as that is where previous research has been focused. Omitting United States territories yielded a pool of 101,675 schools and programs.

A priori sample size determination analysis and response rates from other survey studies in music education (Bauer, Forsythe & Kinney, 2009; Bowles, 2003; Bush, 2007; Friedrichs, 2001; Kancianic, 2006; Tarnowski & Murphy, 2003) helped to determine that an initial sample of 2,250 participants was needed. To attain this sample size, I drew an initial random sample of 4,250 schools and programs. I chose to compile the sample without replacement, as the pool of teachers was of a sufficient size to accommodate the need for an initial sample of 2,250 participants. Thus, each school or program had a 4.2% chance of being selected. The resulting list included schools and programs in all fifty states and the District of Columbia. To ascertain the e-mail addresses of music teachers at these schools, I conducted searches of schools' websites. In situations where more than one music teacher was employed at the school, each teacher was assigned a unique numerical identifier according to their appearance on the list, and one teacher was randomly selected using the Research Randomizer website (2013).

The process of collecting e-mail addresses involved several details. First, some school systems did not have websites or did not list the e-mail addresses or names of staff members, and it was necessary to contact that school via telephone. Additionally, some

school websites listed the name of the teacher, and encouraged e-mail contact through a form. In those cases, I attempted to make contact with the teacher using a pre-written e-mail text (see Appendix A) that invited the teacher to reply to the e-mail if they were interested in participating in the study. In other instances, the principal's e-mail address was listed but not the teacher's, so I contacted the principal using a pre-written text (see Appendix A). If a teacher or principal did not respond within one week, a follow-up e-mail and telephone call were made to their schools. These procedures resulted in the names and e-mail addresses of 2,257 music teachers from all 50 states and the District of Columbia. An e-mail invitation (see Appendix B), which included a link to the questionnaire, was sent to each teacher via SurveyMonkey (SurveyMonkey, 2014).

Instrument

The data collection instrument used for the present study was the *Music Teacher Professional Development Survey, MTPDS* (see Appendix C), a questionnaire I adapted from the *Teacher Activity Survey, TAS* (Garet, Birman, Porter, Desimone, and Herman, 1999). The *TAS* was administered as part of the evaluation of the Eisenhower professional development program for the United States Department of Education. Items focused on the professional development activities of K-12 mathematics and science teachers during the 1997-1998 school year and were directed at mathematics and science teachers in K-12 schools and Title II grantee institutions in higher education. Specifically, the survey items asked participants to (a) describe their professional development experiences within the past year, (b) describe the types of professional activities in which they engaged during the 1997-1998 school year, (c) describe one professional activity in depth from the past school year, and (d) rate the effectiveness of

that activity in terms of enhanced knowledge and skills and student engagement and achievement. The resulting data were subsequently analyzed to determine whether certain structural and core features of professional development significantly predicted self-reported changes in math and science teachers' knowledge and skills (Garet, Porter, Desimone, Birman, and Yoon, 2001). I obtained permission to use the instrument from Dr. Michael Garet of the American Institutes for Research. A copy of the correspondence regarding the survey instrument is included in Appendix D.

Procedures

The procedures of this study were broken down into three periods: (a) pre-survey, (b) distribution, and (c) post-survey distribution. This section describes the procedures implemented during each phase and steps taken to minimize nonresponse.

Pre-survey period.

During the pre-survey period, instruments were pilot tested and reliability and validity for these instruments was established using the procedures discussed below. A simple random sample of 4,250 schools was drawn from the Common Core of Data file (National Center for Education Statistics, 2013b). Music teachers' e-mail addresses were obtained through examination of school websites, e-mails, and follow-up calls to schools.

Distribution period.

During the distribution period, I sent an e-mail text that included a link to the questionnaire to 2,257 music teachers whose schools were drawn from the Common Core of Data file (National Center for Education Statistics, 2013b). Copies of invitation texts are included in Appendix B. Following approved IRB protocol, the invitation explained the purpose of the study, research questions, contact information for the researcher, and

provided a link to the questionnaire. Music teachers were asked to click the link in the invitation e-mail and complete the questionnaire. After one week, I sent a reminder e-mail to teachers that included a second invitation to complete the questionnaire. Two weeks after the initial invitation, I sent a second and final reminder. As an incentive for their participation, teachers had the option to enter a drawing for a \$50 Amazon.com gift card by supplying their e-mail address at the conclusion of the survey. Teachers were informed of this in the invitation e-mail.

Maximizing Response.

I took several steps to maximize response rates. First, participants were given a gift card incentive to complete the survey. The survey content itself asked for non-sensitive information anonymously, reducing the chances of nonresponse (Fowler, 2009). The invitation e-mail also contained a direct link to the survey, increasing ease of use. Reminder e-mails were sent to participants directly. Several steps were taken to avoid the invitation being treated as spam by participants and their e-mail servers: (a) the invitation came from a trusted source from my university e-mail account (Fowler, 2009), (b) subject lines for e-mails were worded in a way that avoided common triggers to spam filters such as “*offer, free, cash, win, promo, prize, and so on*” (Dillman et al., 2009, p.285), (c) e-mails were sent to participants instead of mass mailings: through use of the mail merge feature, all e-mail invitations were addressed to individual teachers by title and last name (e.g., Mr. Smith). Reminders were also sent to individuals. Additionally, correspondence regarding the survey (including invitations) was sent through a university e-mail address.

In an attempt to minimize the number of undeliverable e-mails, invitations were sent to participants directly rather than through a third party such as a distribution list or their immediate supervisor. E-mail addresses were obtained through district websites or via telephone conversation or e-mail with school principal. In cases where this information was not available online, follow-up telephone calls were made to the school or district office to verify information. One e-mail invitation was returned as undeliverable and contained the corrected e-mail address. The correction was made, and the invitation was sent to the corrected address.

Post-survey period.

The post-survey period immediately succeeded the distribution phase. During this time, e-mail addresses entered for the purposes of the drawing for the gift card were separated from the rest of the dataset, and their order was randomized to dissociate responses from respondents for the purposes of preserving anonymity. One e-mail address was selected at random for the \$50 gift card, and the winner was notified and received the incentive via e-mail. Data were subsequently analyzed using the statistical techniques described below.

Timetable

The present study was administered in three phases: (a) pre-survey, (b) distribution, and (c) post-distribution. The pre-survey phase involved procedures that preceded the distribution of the *MTPDS*. Activities during this phase included (a) pilot testing of instruments, (b) selection of participants, and (c) identification of participant e-mail addresses. The distribution period included the dissemination of the invitation e-mail to music teachers, as well as reminder e-mails and answering respondent questions

regarding the survey. During the post-survey phase, the incentive was awarded through random drawing, and data were analyzed. These phases are described in greater detail in the procedures below.

Links to questionnaires were distributed beginning in the spring semester of 2014. After the initial link was distributed, a follow-up e-mail was sent one week after the original while an additional e-mail notification was sent two weeks after the original.

Table 1 shows the timetable for this study.

Table 1

Timetable for Study

Phase	Dates	Activity
Pre-Distribution	2/2013- 2/2014	Pilot Test Sample Compilation
Distribution	3/2014- 4/2014	<i>MTPDS</i> Link Sent Reminder e-mails sent
Post-Distribution	4/2014- 8/2014	Conclusion of Data Collection Drawing for Gift Card Data Analysis

Data Analysis

Research questions asked about (a) the ways that music teachers experience professional development, (b) whether participation in certain professional development formats significantly affect music teachers’ self-reported enhancements in knowledge and skills, and (c) whether certain core and structural features of professional development significantly predict music teachers’ self-reported enhancements in knowledge and skills.

Data were analyzed using SPSS Statistics 21 software.

Description of music teacher professional development.

The first research question asked about the professional development activities that music teachers engaged in and how long they spent engaged in those activities. Section I of the questionnaire asked about teachers' participation in various types of professional development, and the number of hours in which they were engaged in each activity. Data collected from this section were analyzed through descriptive statistics such as (a) percentages, (b) means, (c) standard deviations, and (d) frequencies. Chi-squares analyses were conducted to determine whether significant differences existed in the following responses based on the following variables: gender, membership in the National Association for Music Education (*NAfME*), primary teaching responsibility, number of years teaching experience, level of education, school location, and grade level. Definitions of these variables are listed in Appendix E. Pearson's Chi-square analysis was selected because the procedure determines whether significant differences exist between expected and observed frequencies of given groups with categorical data (Hinkle, Wiersma, & Jurs, 2003).

Professional development formats.

The second research question asked whether participation in certain professional development formats (out-of-district music/ music education conferences, workshop sponsored by a college or university, in-district professional development workshop, or graduate coursework) affected self-reported enhancements in music teachers' knowledge and skills. To analyze whether any of these formats produced significant effects on music teachers' self-reports of enhanced knowledge and skills, fixed coefficients multiple regression analysis was used. Three dummy variables were used with out-of-district

music/ music education conferences used as the referent group. This group was selected as the referent because most participants ($N = 164$) chose to report on this professional development format.

Enhanced Knowledge and Skills, defined in Appendix F, was the criterion variable in a fixed coefficients multiple regression model that included the dummy-coded variables listed above as predictors. The alpha level set for the analysis was 0.05. The model tested was:

$$EKS_{ij} = \alpha_j + \beta_1 In - District_{ij} + \beta_2 Workshop_{ij} + \beta_3 Graduate_{ij} + \gamma_{1...k} States_{ij} + \varepsilon_{ij} \quad (1)$$

where EKS was the dependent measure of Enhanced Knowledge and Skills for the i th individual in the j th state. The intercept (α_j) denoted the fixed effect for the referent group of out-of-district music/ music education conference, $States_{ij}$ represented the fixed effects for states, and ε_{ij} was the error term. Variables, as defined above, were formats that included (a) in-district professional development workshop, (b) workshop sponsored by a college or university, (c) Graduate Coursework, and (d) out-of-district music/ music education conference. Coefficients were estimated for dummy coded states to control for possible state effects, but not reported as state effects fell outside of the scope of the current study.

Features of effective professional development.

The third research question asked whether certain features of professional development predicted self-reported enhancements in music teachers' knowledge and skills. To address this question, fixed coefficient multiple regression analysis techniques were again employed. Predictor variables were (a) Type, (b) Duration, (c) Time Span,

(d) Active Learning, and (e) Content Focus as defined in Appendix F. Coefficients were estimated for dummy coded states to control for possible state effects, but not reported.

For the procedure, a model was constructed with the five professional development features listed above as predictors, and Enhanced Knowledge and Skills as the criterion variable. The alpha level for the analysis was 0.05. The model tested was:

$$EKS_{ij} = \alpha_j + \beta_1 Timespan_{ij} + \beta_2 Contact_{ij} + \beta_3 ALEARN_{ij} + \beta_4 Atype_{ij} + \beta_5 Content_{ij} + \gamma_{1...k} States_{ij} + \epsilon_{ij} \quad (2)$$

In this model, EKS_{ij} was the criterion variable of Enhanced Knowledge of Skills for the i th teacher in the j th state, and α_j was the fixed effect for the referent group of out-of-district music/ music education conference. Time Span, Contact Hours, Active Learning, Activity Type, and Contact Focus were variables as defined in Appendix F. $States_{ij}$ represented the effects of state membership, and ϵ_{ij} was the error term.

Validity

The *MTPDS* was adapted to reflect the discipline of music education and the topics and strategies germane to teaching music, as well as those relevant to the purposes of this study. Alterations to the instrument included changes of the word “math” or “mathematics” to “music”. Additionally, some questions were altered to reflect the discipline of music education. For example, *TAS* Section III question 13 asked about curriculum content areas and question 14 asked about instructional methods. These included mathematics-specific curriculum content areas and instructional methods. Several questions (such as Section II, question 13) were also modified to reflect topics specific to music education. Additional questions concerning participants’ undergraduate degree major, teaching assignment, and teaching responsibilities were added to Section

III. These questions were adapted from a study by Bauer et al. (2009) with permission of the lead author.

Because the distribution and administration of the *MTPDS* was adapted from a paper survey sent via postal mail to an electronic version sent through an online service, the layout of several questions was changed to enhance ease of administration and to decrease completion time. For example, Section I was converted to drop-down menus where the corresponding section of the *Teacher Activity Survey* made use of separate questions. This allowed participants to complete this section more quickly. In some cases, the order of items was changed to accommodate the electronic format. For instance, questions that asked participants to specify additional comments (e.g., Other (please specify) were moved to the last choice in a given list of answer options.

The resulting instrument contained three sections. The first asked respondents to provide an overview of their professional development experiences during the 2012-2013 school year. The second section asked participants to describe one of four types of professional development experiences in-depth. The types of experiences included were (a) out-of-district music/ music education conference, (b) a workshop sponsored by a college or university, (c) in-district professional development workshop, and (d) graduate coursework. The final section included questions pertaining to participants' teaching experiences, schools, education, and primary teaching assignment. As an incentive for completing the questionnaire, a question was added at the end where participants could enter a random drawing for a fifty-dollar Amazon.com gift card. Participants were informed of this incentive in the e-mail invitation.

Pilot test.

I conducted a pilot test of the *MTPDS* to help establish its validity and reliability. An e-mail invitation requesting participation in the pilot study was sent to a convenience sample of 65 music teacher educators, music supervisors, and music educators. The e-mail contained the purpose of the study, research questions, and questions that asked (a) how long it took them to complete the survey, (b) whether the survey covered the range of topics in professional development for music teachers, and (c) if they had any suggestions for improvement of the instrument.

Completed responses were received from 49 (75.8%) participants, which included 38 music educators (77.6%), 6 music teacher educators (12.24%), and 5 music supervisors (10.20%). Respondents were 56.3% female and 43.8% male. Teachers were White (55.1%), African American (30.6%), Asian or Pacific Islander (4.1%), or Hispanic/ American Indian (2% each). Respondents reported from 1 to 37 years of music teaching experience ($M = 16.97$, $SD = 10.16$). Fifty-four percent indicated that they were members of the National Association for Music Education, *NAfME*. Participants reported their highest degrees earned were Doctorate (2%), Master's (64.6%), and Bachelor's (18.8%). The majority (68.6%) of participants indicated that they received their undergraduate degrees in music education, followed by music performance (23.5%), music history (5.9%), music theory/composition (1.2%), and music recording (1.2%). Percentages summed to more than 100% because four participants listed multiple majors.

Participants were asked whether they taught in urban, suburban, or rural settings. Sixty-nine percent of participants indicated that they taught in an urban setting, followed by suburban schools (24.5%), and rural schools (4.1%). Ninety percent taught in public

schools, while 6.1% taught in private schools. Remaining participants did not respond to the question. Fifty-five percent of respondents reported teaching jazz ensemble, 49% strings/ orchestra, 46.9% non-music classes, 42.9% music history or music appreciation, 40.8% music theory including Advanced Placement and International Baccalaureate, 38.8% band, 28.6% group instrumental or voice lessons, and 22.4% general music. When asked about other classes they taught, three participants listed music education methods courses with one response each in the following areas: technology, conducting, guitar, and improvisation.

In addition to completing the questionnaire, pilot test respondents were asked to send e-mail responses to questions in the invitation that were not part of the *MTPDS*. Thirty-eight participants completed responses to e-mail questions. Participants indicated that the questionnaire took an average of 15.77 minutes ($SD = 6.50$) to complete while 94.7% of respondents reported that they felt that the range of professional development was adequately covered within the *MTPDS*. Suggestions were made to include items about whether respondents led professional development, and the opportunity to have discussions with colleagues. Participants were also asked about the ways in which the tool could be improved. The most recurrent comment for improvement of the instrument ($N = 3$) was that the survey was too long. Additionally, supervisors commented that district curriculum and standards should be an option in addition to the listed choices of state and national curriculum/ standards. Other comments mentioned (a) the need to add response options or items pertaining to action research, (b) discussions with colleagues, and (c) topics currently germane to professional development on topics such as the

Common Core State Standards, Student Learning Objective model for value-added teacher evaluation, and professional development outside of the discipline of music.

Participants' written feedback was coded for common themes, and the instrument was examined by the responses for ways of incorporating pilot participants' feedback for the purposes of improving the instrument. Adjustments included clarification of some language, re-inclusion of one item (Question 7i) and the addition of question 7j (see Appendix C), each of which related to the ways in which the professional development experience helped teachers in using new skills in their classroom. Additionally, some items were eliminated (such as those items for the collective participation scale) that contributed to the length of the survey but did not directly address the research questions.

Some possible limitations exist when considering the participants in this pilot. Roughly 22% of respondents were either music teacher educators or music supervisors, and their responses may not be representative of the population of American music educators, despite having been music educators themselves. In addition, a sample size of forty-nine participants may not accurately represent the national population of music teachers. Additionally, pilot respondents were from a single state, and the responses may not be representative of the responses of music teachers from across the United States.

Reliability

Pilot test.

Cronbach's Alpha coefficients for the subscales on the *MTPDS* are reported in Table 2. Statistics were calculated using weighted averages of the terms of each subscale as defined in Appendix F. The .70 reliability coefficient is considered acceptable in

survey research (Kline, 1999). Reliability analysis revealed acceptable coefficients for Coherence ($\alpha = .77$) and Enhanced Knowledge and Skills ($\alpha = .71$).

Table 2

Subscale Reliabilities for Music Teacher Professional Development Survey Pilot

Subscale	Reliability Coefficient
Collective Participation	.06
Active Learning	.61
Coherence	.77
Enhanced Knowledge and Skills	.71

However, the reliability coefficient for Active Learning was slightly below acceptable ($\alpha = 0.61$). This could be due to an item (question 7i) from the original subscale having been deleted in the revision process. Question 7 asked respondents about the ways in which the professional development activity helped them to use new skills in the classroom. Re-inclusion of this item could partially explain the low reliability as reported in this subscale for two reasons: (a) inclusion of more items is associated with increased reliability (Best & Kahn, 2003), and (b) this item was part of a subscale that had acceptable levels of reliability in previous research (Garet et al., 1999; Garet et al., 2001). Additionally, response to items in part of question 7 was low. This suggests that the supports mentioned in the questions were not applicable to the types of professional development that music teachers described. Therefore, one item (Question 7j – see Appendix B) was added that allowed respondents to indicate that no supports listed in question 7 were provided.

The subscale reliability score for Collective Participation was quite low ($\alpha = .06$). This finding was lower than the reliability ($\alpha = .35$) reported by Garet et al. (1999). This could be for two reasons. First, music teachers generally do not collectively participate in professional development as departments, as music teachers within any given school teach very diverse and specialized parts of the content and accordingly select professional development that matches those areas of specialization. Additionally, an extremely high rate of item nonresponse to these items indicated that these data were not missing at random, but could have been due to other unobserved or unmeasured phenomena. The variable was subsequently excluded from the analysis.

Main study.

Reliability coefficients for subscales included in the main study are reported in Table 3. The reliabilities of Active Learning and Enhanced Knowledge and Skills increased by .21 and .07, respectively. The reliability for Coherence fell from .77 to .57. A possible explanation for this could be that, while coherence was a valid scale for the pilot sample, it may not represent the viewpoints of the population of music teachers in the United States. As previously discussed, the pilot sample contained a high percentage of participants who were not working music educators, and this may have skewed the reliability of the pilot findings. As a result of this low reliability, the Coherence subscale was excluded from the final analysis.

Table 3

Subscale Reliabilities for Pilot and Main Studies

Subscale	Pilot Study	Main Study
Active Learning	.61	.82
Coherence	.77	.57
Enhanced Knowledge and Skills	.71	.78

Assumptions

This study utilized several assumptions. The first is that the sample collected represented the population of music teachers in the United States. Simple random sampling techniques were employed to compile the sample, which represented 48 states and the District of Columbia. Therefore, the sample used in this study could support the assumption that the sample represented the target population of music teachers in the United States.

As discussed above, fixed coefficients multiple regression procedures were employed to address the research questions. Six assumptions undergird multiple regression analysis. These include (a) a linear relationship between the independent and dependent variable, (b) that the conditional distributions of the residuals are normally distributed, (c) that the variance of the residuals is constant (homoscedasticity), (d) that the residuals are independent, (e) that the model is specified properly, and (f) that the predictors are measured without error (Cohen et al., 2003). This subsection reports the results of assumption testing for the second and third research questions.

Research question two: professional development formats.

Linearity.

To assess whether a linear relationship existed between the predictor and criterion variables, a scatterplot was graphed that plotted the unstandardized residuals (y- axis) against the unstandardized predicted values (x- axis). A LOESS curve was fitted to the graph to assess the relative linearity of the relationship. Figure G1 in Appendix G displays the results of this assessment. Inspection of this graph reveals two key findings that support the retention of the assumption of linearity. First, the LOESS line is relatively straight. Second, the vast majority of points fall on the plot within two standard errors across the values of the unstandardized residual.

Normality of residuals.

To assess normality of residuals, two assessments were taken. First was examination of unstandardized residuals in a Q-Q plot. Figure G2 in Appendix G displays this plot. The large majority of residual points fall on or close to the trend line, supporting the retention of the normality assumption.

Second, a one-sample Kolmogorov-Smirnov test was performed to statistically assess the normality assumption. The test ($Z = 0.98, p = .293$) was nonsignificant, leading to the retention of the hypothesis that the distribution is normal. The results of these two assessments suggest that the distribution of the residuals was normal, and that the normality assumption was met.

Homoscedasticity.

To assess whether the variance of the residuals was constant, a plot was constructed of the unstandardized residual vs. the unstandardized predicted value. If the

variance is constant, there should be no discernible pattern in the plot. Conversely, a discernible pattern could denote a degree of heteroscedasticity, violating the assumption. Figure G3 in Appendix G displays this plot. The points on this graph appear to scatter randomly and points are scattered evenly throughout the plot, supporting the retention of the assumption of homoscedasticity.

Independence of residuals.

To assess the assumption of independence, a plot was constructed of the unstandardized residual versus case number. Figure G4 in Appendix G displays the results of this assessment. The residuals are scattered in a random fashion, suggesting that there is no systematic relationship between the residuals and the manner in which the data were collected. This finding suggests that the assumption of independence holds for this dataset.

Proper model specification.

The model posited here is based on the results of previous research suggesting that the formats included as categorical predictors are common modes of professional development for music teachers and are modes that music teachers find desirable and effective for improving their teaching practice (Bauer, Forsythe & Kinney, 2009; Bowles, 2003; Bush, 2007, Parsad et al., 2012). Additionally, a fundamental belief in professional development as well as a primary focus of previous research (e.g., Garet et al., 1999; Garet et al., 2001; Yoon et al., 2007) has been the improvement of teachers' knowledge and skills (Bauer, 2007), so the choice of this outcome variable is consistent with past research and policy surrounding professional development.

Predictors measured without error.

Predictors included in this model are categorical, denoting attendance at various types of professional development. These dummy codes create mutually exclusive groups that categorize participants. Additionally, the outcome variable of Enhance Knowledge and Skills had an acceptable reliability coefficient (Cronbach's $\alpha = .78$) for behavioral research (Kline, 1999). While this is the case, caution should be taken when generalizing the results of this research question to the population of music teachers in the United States.

Research question three: features of professional development.

Similar procedures to those described for research question two were used to assess the assumptions of the third research question. Accordingly, this section reports diagnostics and results of procedures to assess (a) linearity, (b) normality of residuals, (c) homoscedasticity, (d) independence of residuals, (e) proper model specification, and (f) measurement error on the predictors.

Linearity.

A plot of unstandardized residuals versus unstandardized predicted values was created with a LOESS line to assess the assumption of linearity. This plot is displayed in Appendix H, Figure H1. The shapes of the LOESS line and plot suggest that there is no systematic relationship between the unstandardized residuals and predicted values, and suggest that the relationship between the independent and dependent variables is linear.

Normality of residuals.

To assess normality of residuals, two assessments were taken. The first was an examination of unstandardized residuals in a Q-Q plot. Figure H2 in Appendix H

displays this plot. The large majority of residual points fall on or close to the trend line, supporting the retention of the normality assumption.

In addition, a one-sample Kolmogorov-Smirnov test was performed to statistically assess the normality assumption. The test ($Z = 0.72, p < .68$) was nonsignificant, leading to the retention of the hypothesis that the distribution is normal. The results of these two assessments suggest that the distribution of the residuals was normal and that the normality assumption was met.

Homoscedasticity.

To assess whether the variance of the residuals was constant, a plot was constructed of the unstandardized residual vs. the unstandardized predicted value. If the variance is constant, there should be no discernible pattern in the plot. Conversely, a discernible pattern could denote a degree of heteroscedasticity, violating the assumption. Figure H3 in Appendix H displays this plot. The points on this graph appear to scatter randomly and points are scattered evenly throughout the plot, supporting the retention of the assumption of homoscedasticity.

Independence of residuals.

To assess the assumption of independence, a plot was constructed of the unstandardized residual versus case number. Figure H4 in Appendix H displays the results of this assessment. The residuals are scattered in a random fashion, suggesting that there is no systematic relationship between the residuals and the manner in which the data were collected. This finding suggests that the assumption of independence holds for this model.

Proper model specification.

This model specifies five predictors (Activity Type, Active Learning, Content Focus, Contact Hours, and Time Span) and one dependent variable (Enhanced Knowledge and Skill). All of the variables in this model are defined from previous research that measured and tested them for reliability (Garet et al., 1999; Garet et al., 2001). Therefore, the variables in this model are those of substantive interest to the current study and have been found to be significant predictors of the dependent variable of Enhanced Knowledge and Skills for teachers, the population of interest.

Predictors measured without error.

Two of the predictors (Active Learning and Content Focus) are dichotomous variables that measure either type of activity (traditional or reform-type) or whether or not the activity had a content focus. Additionally, the variable Time Span was measured on a scale of 1 (less than a day) to 9 (over a year). The variable Contact Hours is a number as entered by participants. The scale for Active Learning was slightly low in the pilot study ($\alpha = .61$), but the reliability improved to acceptability for the main study ($\alpha = .82$).

The dependent measure of Enhanced Knowledge and Skills, as discussed above, also had an acceptable level of reliability ($\alpha = .78$). While the applicable reliability coefficients are at acceptable levels, care must be taken in the interpretation of results measured with less than perfect reliability.

Regression diagnostics.

This section reports the results of regression diagnostics for the second and third research questions. Diagnostics utilized included tests for outliers (including discrepancy, leverage, and influence), as well as tests for collinearity.

Research question two: professional development formats.

Identification of outliers.

Outliers were identified and inspected using the three tests of discrepancy, leverage, and influence. For discrepancy, standardized residuals for each case were inspected. These residuals were chosen because the assumption of normality of residuals was met. Rule-of-thumb values were used consistent with Cohen et al. (2003) that if a case had a standardized residual absolute value of ± 2 standard errors, points were selected for closer inspection. Eight cases exceeded this threshold, and were examined for data entry errors.

Centered leverage values were also checked. These measures reflect an individual's standing in comparison to the average of the set of predictors (Cohen et al., 2003). A cutoff score was calculated for the data set at twice the average leverage value, as the dataset and number of predictor are in the moderate to large range. The mean centered leverage value was 0.15, meaning that the cutoff was $2(0.15)$, or 0.30. Twenty-one cases exceeded this cutoff score, and were inspected for data entry errors in addition to other measures for outliers.

Global and local measures of influence were checked to determine points of influence on the set of predictors as well as individual predictors. To measure global influence, Cook's D was calculated, then plotted against case number to inspect for

influential points. Inspection of the plot revealed two points that were influential. To measure influence by case, Standardized DFBETAS were inspected for each case.

After checks of all of these statistics and inspections of all identified cases, two cases were identified as potential outliers based on their influence statistics. However, given the size of the sample and nonsignificant discrepancy and leverage values for these points, I made the decision to include these points in the final analysis.

Collinearity diagnostics.

Collinearity was checked because the research questions asked about the significance of specific predictors, and thus the independence of predictors needed to be established. To detect the possible presence of collinearity, two related statistics were calculated and checked. The first was Variance Inflation Function (VIF), and the other was Tolerance. The two rule of thumb values of 10 for VIF and 0.1 for tolerance values connote significant collinearity. For the second research question, the values in Table 4 suggest that significant collinearity was not present for the set of predictors.

Table 4

Collinearity Statistics for Research Question Two

Variable	Tolerance	VIF
In-district professional development workshop	.75	1.34
Workshop sponsored by a college or university	.73	1.37
Graduate coursework	.71	1.4

Research question three: Features of effective professional development.

Identification of outliers.

Outliers were identified and inspected using the three tests of discrepancy, leverage, and influence. For discrepancy, standardized residuals for each case were inspected. These residuals were chosen because the assumption of normality of residuals was met. Rule-of-thumb values were used consistent with Cohen et al. (2003) that cases with a standardized absolute value of ± 2 standard errors were selected for closer inspection.

Centered leverage values were also checked. These measures reflect an individual's standing in comparison to the average of the set of predictors (Cohen, et al., 2003). A cutoff score was calculated for the data set at twice the average leverage value, as the dataset and number of predictor are in the moderate to large range. The mean centered leverage value was 0.18, meaning that the cutoff was $2(0.19)$, or 0.38.

Global and local measures of influence were checked to determine points of influence on the set of predictors as well as individual predictors. To measure global influence, Cook's D was calculated and then plotted against case number to inspect for influential points. Inspection of the plot revealed four influential points. To measure influence by case, Standardized DFBETAS were inspected for each case.

After checks of all of these statistics and inspections of all identified cases, the decision was made to exclude four outlying cases from analysis. These cases demonstrated discrepancy, leverage, and influence on one or more predictors, as well as global influence as measured by Cook's D.

Collinearity diagnostics.

To assess collinearity, two related statistics that were generated by SPSS were checked. Rule of thumb values of 10 for VIF and 0.1 for tolerance values connote significant collinearity. For the third research question, the values in Table 5 suggest that significant collinearity was not present for the set of predictors.

Table 5

Collinearity Statistics for Research Question Three

Variable	Tolerance	VIF
Time Span	.64	1.57
Contact Hours	.68	1.46
Active Learning	.65	1.55
Activity Type	.83	1.21
Content Focus	.77	1.30

Limitations and Response Rate

Limitations.

The sample was drawn at random and represented 48 states and the District of Columbia (see Appendix I), but some had very few responses associated with them. Therefore, care should be taken when generalizing the results of this study to the population of music teachers in the United States.

This study is subject to limitations common to survey research and interpretation of self-report data. Additionally, those concerned with experimental research in professional development have also discussed the issue of “ambient PD”: teachers

participate in several professional development experiences throughout the course of a school year, and it is difficult if not impossible to control for or isolate the effects of one experience (Wayne et al., 2008). The formats and lengths of the professional development experiences could also have been limiting in that time has been found to be a possible contributor to the effectiveness of a given professional development experience in terms of the amount of clock hours and the time span over which the experience is distributed (Garet et al., 2001; Yoon et al., 2007). The amount and type of professional development formats were also limiting in the sense that they did not represent all possible professional development formats in which teachers could participate.

Additionally, the mortality rate in the present study was high: 167 of the 493 respondents (33.8%) failed to complete the questionnaire. Therefore, I advise caution when generalizing to the population of music teachers in the United States.

A further limitation exists in that the data collected for the purposes of this study represent a momentary depiction of music teachers' ratings of professional development, and may not represent the evolving fields of education, music education, or trends that may influence teachers' past or future ratings.

A further limitation could exist in comparisons of the participants of the current study to the population of music teachers in that very little there is existing information on population parameters for music teachers. The National Center for Education Statistics (2013a) has estimated the population of music teachers to be 116,920 but demographic information beyond that is spotty, and one study (Gardner, 2010) derives some estimates from the Schools and Staffing Survey from the National Education Statistics, but is

limited to parameters estimated by the Schools and Staffing Survey. Thus, it could be difficult to compare the results of the current study to unknown parameters.

An additional possible limitation could be that of reporting bias in music teachers' *NAfME* membership. More participants may be members of *NAfME* than reported, as they may be members of their state associations, the majority of which are federated affiliates of *NAfME*. Thus, they may have been *NAfME* members and did not realize that fact.

Response rate.

I sent 2,257 e-mail invitations to music teachers whose schools were randomly sampled from the Common Core of Data file from the National Center for Education Statistics (National Center for Education Statistics, 2013b). Follow-up e-mail invitations were sent one week and two weeks after the original. A total of 493 participants (21.8%) responded to the survey.

A case-by-case examination of the data set revealed a large rate of mortality. One hundred sixty-seven (33.8%) of the 493 participants did not complete the questionnaire, although 491 (99.6%) completed Section I. The most common pattern for non-completion was that participants ($n = 85$; 50.8% of incomplete cases) stopped responding at the end of Section I. Eighty-two participants completed through question 11 in Section II. This suggests that data were missing not at random, but that respondents may have perceived that the questionnaire was too long and simply stopped responding.

Given that questions regarding demographics were asked in the final section of the questionnaire, analysis of similarities of the participant pool to the sample by demographic analysis was not possible because only those participants who completed all

three sections of the questionnaire provided demographic data. However, some comparable data points were available through examination of the *Common Core of Data* file (National Center for Education Statistics, 2013b). These points include (a) the proportion of states represented in the study and number of participants in each state, (b) locale codes for school location, and (c) grade levels (elementary, secondary, or combined). Descriptive results for states may be found in Appendix I. States represented and proportions of participants were similar across nonrespondents, all who responded, and those who completed the questionnaire. While all 50 states and the District of Columbia were represented in the initial sample, three states with small numbers of invited participants (Alaska, Hawaii, and New Hampshire) had no participants complete the survey. This created a participant pool that represented 47 states and the District of Columbia.

Table 6 displays the results of comparisons by the previously mentioned data points in the *Common Core of Data*. In terms of grade level, 4.5% fewer participants reported that they taught at the secondary level than nonrespondents. For locale codes, the largest difference occurred between the sample and participants in representation of Rural, distant, which was 3.5% higher in the participant pool. All others were within 1.5 percentage points of each other, suggesting that the participant pool was similar to the sample in terms of these measures.

Table 6

Comparisons of Demographic Variables of Samples within the Current Study

Variable	Completed Responses (<i>N</i> = 326)	All Responses (<i>N</i> = 493)	Nonrespondents (<i>N</i> = 1,764)	All Invited Participants (<i>N</i> = 2,257)
Grade Level				
Elementary	55.2%	56.6%	52.5%	53.4%
Secondary	20.6%	24.1%	25.9%	25.5%
Combined	20.6%	19.3%	21.4%	20.9%
Locale Code				
City, Large	9.6%	8.7%	8.2%	8.3%
City, Midsize	3.3%	2.8%	5.5%	4.9%
City, Small	5.7%	6.5%	6.9%	6.9%
Suburb, Large	26.1%	27.2%	27.5%	27.4%
Suburb, Midsize	2.4%	2.6%	2.2%	2.4%
Suburb, Small	0.9%	1.6%	2.0%	2.0%
Town, Fringe	2.4%	2.6%	1.5%	1.7%
Town, Distant	7.2%	6.7%	7.1%	7.1%
Town, Remote	5.7%	5.7%	4.3%	4.6%
Rural, Fringe	17.1%	16.8%	17.4%	17.3%
Rural, Distant	15.3%	14.4%	11.1%	11.8%
Rural, Remote	4.2%	4.3%	6.1%	5.7%

Due to participant nonresponse, I determined the percentage of missing data for the entire set to be 27.2%. Because of this issue, I made the decision to include all 493 participants in addressing research question one, but dropped the incomplete cases for the inferential analyses in research question two and three. Thus, the sample size for data analysis for research questions two and three was 326 participants. Despite this high rate of mortality, inferential analysis was still robust according to the results of the *a priori* power analysis which suggested that each of research questions two and three required a minimum of 85 and 90 participants per predictor, respectively.

Chapter Summary

A simple random sample was drawn from the *Common Core of Data* file (National Center for Education Statistics, 2013b). The sample contained music teacher names and e-mail addresses from every state and the District of Columbia. *A priori* sample size determination analysis revealed that 85 and 90 responses per predictor were needed to reach a power level of 0.8 for research questions two and three, respectively.

The *Music Teacher Professional Development Survey* was adapted from the *Teacher Activity Survey* from the American Institutes for Research (Garet et al., 1999). Pilot testing revealed acceptable reliability coefficients for Enhanced Knowledge and Skills, Active Learning, and Coherence. In the main study, Enhanced Knowledge and Skills and Opportunities for Active Learning scales were acceptable, but Coherence was below acceptable and was excluded from analysis.

The survey was sent electronically to a sample of 2,257 music teachers. Reminders were sent one and two weeks after the original invitations were sent. Four

hundred ninety-three teachers responded to the questionnaire. Despite steps taken to minimize nonresponse, 167 of 493 responses were not completed. The most frequent pattern of non-completion was that participants completed Section I of the questionnaire then stopped responding, suggesting that participants thought that the instrument was too long. The final analytical sample consisted of 326 participants.

To address the first research question, responses from Sections I and II of the questionnaire were analyzed using descriptive statistics and chi-square analysis to check for differences by selected demographic variables. For the second research question, a fixed coefficients multiple regression model was constructed with dummy coded variables for professional development formats and Enhanced Knowledge and Skills as the dependent variable. For research question three, a fixed coefficients multiple regression model was constructed using the predictor variables of (a) Time Span, (b) Contact Hours, (c) Content Focus, (d) Active Learning, and (e) Activity Type with Enhanced Knowledge and Skills as the dependent variable.

Regression assumptions were checked for the second and third research questions, and were met for each data set. Regression diagnostics were also run for each research question, including tests for collinearity and outliers. In each case, significant collinearity was not present. Tests were run for outliers for research questions two and three. For research question two, all cases were included in the analysis. For research question three, four points were identified that were excluded from the final analysis.

Chapter Four will describe the participants and discuss the results of the study in relation to the three research questions.

Chapter 4: Results

The purpose of the present study was to describe the self-reported professional development activities of music teachers in the United States and to determine whether selected formats and features of professional development experiences commonly available to music teachers were significant predictors of music teachers' self-reported enhancements in knowledge and skills. This chapter describes the sample of respondents and presents the results of the study by research question.

As discussed in Chapter Three, 493 participants completed Section I, and 326 participants completed the entire questionnaire. For the purposes of the analyses reported in this chapter, all 493 responses were used to address research question one, while the 326 completed responses were used to describe the participants and to address research questions two and three.

Participant Demographics

The third section of the *Music Teacher Professional Development Survey* contained items that asked participants about demographic variables including (a) gender, (b) race, (c) years of teaching experience, (d) highest earned degree, (e) undergraduate major, (f) membership in the National Association for Music Education, *NAfME*; (g) school location, (h) public or private settings, and (i) areas of primary teaching responsibility. Collection of these data allowed for comparisons of participants based on these demographic variables. These items were specific to the 2012-2013 school year. Participants ($N = 326$) included teachers from 48 states and the District of Columbia. Appendix I, Table I1 lists the numbers of participants from each state, and Table 7 shows the demographic information in the current study with data from the National Center for

Education Statistics (2013a) on the population of teachers of all subject areas as well as population estimates for music teachers (Gardner, 2010).

Table 7

Comparison of Participant Demographics to National Estimates

Variable	Study Participants	National Music Teachers*	National Data: All Teachers**
Gender			
Male	31.2%	39.0%	23.9%
Female	67.9%	61.0%	76.1%
Teaching Experience (Mean Years)			
0-4 years	9.5%	16.8%	11.9%
5-9 years	21.8%	20.0%	28.4%
10-14 years	13.5%	14.9%	20.3%
15 + years	54.0%	47.3%	39.4%
Education Level			
Bachelor's	41.4%	57.9%	40.9%
Master's	55.3%	40.2%	46.2%
Doctorate	5.0%	0.8%	8.5%
School Location			
Rural	39.9%	-	23.8%
Suburban	39.9%	-	28.5%
Urban	20.2%	-	***
School Type			
Public	99.7%	-	87.9%
Private	0.3%	-	12.1%

*Gardner, 2010

** National Center for Education Statistics, 2013a

***Reporting standards not met (coefficient of variation 50% or greater or response rate below 50%)

Participants reported that they had taught music for an average 2.37 years more than national estimates for all teachers (National Center for Education Statistics, 2013a), and 6.7% more participants reported teaching for 15 or more years than national estimates for music teachers (Gardner, 2010). While larger than national estimates for all teachers, 13.5% less study participants reported possessing, 15.1% more reported having Master's degrees, and 4.2% more reported possessing doctorates than national samples of music teachers (Garnder, 2010). This is consistent with the earlier finding of a higher amount of more experienced teachers in the current sample.

Participants in the current study also reported higher rates of teaching in rural and suburban settings (16.1% and 11.4% respectively) than estimates of the population of music teachers (National Center for Education Statistics, 2013a).

When asked about membership in *NAfME*, 57.4% indicated that they were members, while 42.6% reported that they were not members. *NAfME* claims 49,000 active teacher members (National Association for Music Education, 2014), which is approximately 41.9% of the estimated population of 116,920 music teachers (National Center for Education Statistics, 2013b). Thus, the sample for the current study reported 15.5% higher membership than in the estimated population.

The most common undergraduate major was music education (90.8%), followed by music performance (14.9%), music theory/composition (1.6%), jazz studies (0.6%), and music history (0.6%). Other majors included dual certification programs with elementary education (3%), music therapy (0.01%), educational leadership (0.01%), church music, choral conducting, engineering, French, history, physical education, political science, secondary education, and psychology. When asked about their teaching

setting, 39.9% indicated that they taught in a rural setting, 39.9% in a suburban setting, and 20.2% in an urban setting. The number of public school teachers in this sample is approximately 11.8% higher than national estimates (National Center for Education Statistics, 2013a). Eighty-eight point three percent reported that they had taught in the same school during the 2012-2013 school year.

Participants were also asked to rank their teaching responsibilities on a scale from 0 (indicating that they never taught that class during the 2012-2013 school year) to 3 (primary teaching responsibility). Sixty-four point nine percent listed general music as a primary teaching responsibility, followed by band (33.6%), choir (30.3%), group instrumental/ voice classes (16.8%), jazz ensemble (9.3%), music appreciation (9.3%), strings/ orchestra (7.8%), music history (5.7%), music theory that included Advanced Placement and International Baccalaureate (5.4%), Non-Music Classes (3.9%), and Music Technology (2.7%). Respondents were asked to indicate other classes they taught. Written responses included before or after school choral ensembles, piano, guitar, Mariachi, theatre, and non-music classes such as general education, physical education, and mathematics intervention classes.

Research Question One: Description of Professional Development

The first research question inquired about the nature of the music teacher's professional development activities in the United States and the number of hours they spent during the 2012-2013 school year engaged in those activities. To address this research question, all 493 original responses were utilized, as almost all of these participants answered Section I of the questionnaire before they stopped responding.

Pearson chi-square analyses were conducted at the .05 alpha level to determine whether statistically significant differences existed in participants' responses to questionnaire items by demographic variables. These variables are defined in Appendix

E. Demographic variables included:

- gender (male or female),
- membership in *NAFME* (member or non-member),
- teaching responsibility (general music, choral, band or orchestra, or combinations for multiple assignments),
- teaching experience (in range of years),
- grade level (elementary, secondary, or combined)
- highest degree earned (Bachelor's, Master's, or Doctorate), and
- location of their teaching assignment (urban, suburban, or rural).

Complete chi-square results for this section may be viewed in Appendix J.

Formal types of professional development.

Question one asked whether respondents had participated in certain types of professional development related to their teaching, and to estimate the number of hours in which they had participated in those activities since June 1, 2012. The survey was released on March 28, 2014. Table 8 displays participant responses in rank order by number of teachers that reported participation in each of the modes of professional development listed in question one. Means and standard deviations are included for the number of hours that participants reported engaging in a given activity, as well as the minimum and maximum number of reported hours. While participants most frequently reported participation in out-of-district conferences and institutes focused on a specific

topic, they spent the greatest mean number of hours engaged in taking courses for college credit.

Table 8

Participation in Professional Development Activities by Number of Participants and Hours of Participation

Type of Professional Development	<i>N</i> (Teachers)	<i>M</i> (Hours)	<i>SD</i> (Hours)
Out-of-district workshops and institutes, focused on a specific topic	282	14.18	13.16
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	272	18.56	15.63
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	223	11.76	12.40
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	218	5.75	10.63
In-district workshop or institute	208	13.86	17.94
Served on a committee or task force that focused on curriculum, instruction, or student assessment	160	14.94	16.63
Took courses for college credit	127	24.90	30.02
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	125	15.45	16.88
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	122	8.30	8.65

Chi-square analyses were performed to determine whether statistically significant differences existed in participant responses by (a) professional development format, (b) membership in *NAfME*, (c) school location, (d) level of teaching experience, and (e) primary teaching area. For professional development format, statistically significant differences were found between formats for attending a workshop or institute that focused on a specific topic that was provided by the district ($\chi^2 (8, N = 492) = 15.56, p = .049$), taking courses for which they received college credit ($\chi^2 (8, N = 491) = 56.24, p < .001$), attending out-of-district workshops and institutes focused on a specific topic ($\chi^2 (8, N = 487) = 69.62, p < .001$), and (d) attending out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc. ($\chi^2 (8, N = 489) = 124.91, p < .001$). Complete results may be viewed in Appendix J, Table J1. No significant differences were found for either gender or level of education (see Appendix J, Tables J2 and J3). These findings suggest that music teachers reported participation in these activities in significantly different ways.

Statistically significant differences between *NAfME* members and non-members were found for (a) attending out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc. ($\chi^2 (4, N = 489) = 31.78, p < .001$); and (b) serving on a committee or task force that focused on curriculum, instruction or student assessment ($\chi^2 (4, N = 486) = 18.50, p = .001$). Complete results may be viewed in Appendix J, Table J4. This means that *NAfME* members reported statistically significantly higher rates of participation in these activities than non-members.

Statistically significant differences were found by school location (rural, suburban, or urban) for (a) attending a workshop or institute that focused on a specific topic and was provided by the district ($\chi^2 (6, N = 492) = 28.81, p < .001$), (b) attending out-of-district conferences, provided by professional organizations, regional organizations, the state department of education, etc. ($\chi^2 (6, N = 489) = 15.18, p = .019$); and (c) participating in a teacher study group that met regularly, in face-to-face meetings, to further their knowledge in your discipline or pedagogical approaches ($\chi^2 (6, N = 486) = 15.55, p = .016$). Complete results of this analysis may be viewed in Appendix J, Table J5. This means that suburban music teachers reported statistically significant higher participation in in-district professional development. Rural teachers ($n = 88$) reported statistically significant higher participation in out-of-district conferences, provided by professional organizations, regional organizations, the state department of education, etc. Suburban teachers ($n = 48$) also reported statistically significantly higher levels of participation in teacher study groups than their urban ($n = 20$) or rural ($n = 24$) counterparts.

Statistically significant differences were found by level of teaching experience on taking courses for which they received college credit ($\chi^2 (4, N = 326) = 20.20, p < .001$), attending out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc. ($\chi^2(4, N = 326) = 16.85, p = .032$), and receiving mentoring, coaching, observation, in a one-on-one situation, usually in the classroom or rehearsal setting ($\chi^2(8, N = 326) = 19.47, p = .013$). Complete results of this analysis may be viewed in Appendix J, Table J6. This means that teachers in the four to nine year experience range reported statistically significantly more participation in

taking courses for college credit, and that those teachers with fifteen or more years of experience reported attendance at out-of-district conferences sponsored by professional organizations and to receive mentoring, coaching, or observation.

Significant differences were found by teaching area on (a) attending a workshop or institute that focused on a specific topic and was provided by the district ($\chi^2 (18, N = 326) = 43.26, p = .001$), (b) taking classes for which they received college credit ($\chi^2 (9, N = 326) = 18.28, p = .032$), and (c) attending out-of-district workshops and institutes, focused on a specific topic ($\chi^2 (18, N = 324) = 64.51, p < .001$). Complete results of this analysis may be viewed in Appendix J, Table J7.

A significant difference was found by grade level on serving on a committee or task force that focused on curriculum, instruction, or student assessment ($\chi^2(4, N = 486) = 12.54, p = .014$). Complete results of this analysis may be viewed in Appendix J, Table J8.

Sixty-six participants indicated other means by which they engaged in professional development throughout the school year that were not included in question one. Responses to this prompt are listed in Table K1 in Appendix K by frequency. Most frequently mentioned was attending professional music education association conferences ($N = 7$), followed by collaboration with other music teachers in their district ($N = 6$) that included collaborative planning or district department meetings; and national, regional, or local Orff chapter meetings ($N = 6$). Three participants mentioned *NAfME*.

Individual professional development activities.

Question number Two asked participants about the number of hours they were engaged in various forms of individual professional development, including action

research projects, and individual learning where participants read journals or other publications or browsed the internet. Table 9 displays individual professional development by the numbers of hours indicated. Four hundred twenty-six participants reported that they engaged in some form of individual learning and most commonly spent more than twenty hours engaged in the activity throughout the course of the school year. One hundred twenty-two participants stated that they had participated in an action research project while sixty-five indicated they spent between one and ten hours engaged in an action research activity.

Table 9

Individual Professional Development Activities by Range of Hours

Type of Activity	N	Number of hours				
		1-5	6-10	11-15	16-20	20 +
Individual learning, in which they read journals or other professional publications, browsed the Internet, etc.	426	65	92	40	46	119
Action Research Project, in which they examined their own teaching and their students' learning	122	30	35	9	12	21

Chi-square analyses were performed to examine possible differences in participants' reports by (a) professional development format, (b) membership in *NAfME*, (c) school location, (d) level of teaching experience, (e) primary teaching area (f) gender, and (g) level of education. Statistically significant differences were found by professional development format for conducting an action research project ($\chi^2 (4, N = 475) = 14.08, p = .007$), suggesting that teachers reported significantly different

participation in action research projects based on the professional development experiences that they described in Section II of the questionnaire. Complete results of this analysis may be viewed in Appendix J, Table J9. No statistically significant differences were found for level of teaching experience (see Appendix J, Table J14) or grade level (see Appendix J, Table J16).

Statistically significant differences were found for *NAfME* members ($n = 59$) versus non-members ($n = 26$) on conducting an action research project ($\chi^2 (2, N = 475) = 6.51, p = .039$) and individual learning ($\chi^2 (2, N = 477) = 17.43, p < .001$). Complete results of this analysis may be viewed in Appendix J, Table J12. This suggests that a significantly higher number of *NAfME* members reported participation in action research projects and individual learning in comparison to their non-member peers.

Statistically significant differences were found for gender in individual learning ($\chi^2 (2, N = 477) = 9.32, p = .009$). Statistically significantly more female participants ($n = 206$) reported participation in these activities than their male counterparts ($n = 97$). Complete results of this analysis may be viewed in Appendix J, Table J10.

Statistically significant differences were found for education level on individual learning ($\chi^2 (3, N = 477) = 10.45, p = .015$). This suggests that those with Master's degrees ($n = 166$) were significantly more likely to report this type of activity than their counterparts with Bachelor's degrees ($n = 129$) or doctorates ($n = 5$). Complete results of this analysis may be viewed in Appendix J, Table J11.

Statistically significant differences were found for school location on individual learning ($\chi^2 (3, N = 426) = 11.76, p = .008$). This suggests that those who taught in rural settings ($n = 126$) were more likely to report participation in this item than their

counterparts in urban ($n = 61$) or suburban ($n = 118$) settings. Complete results of this analysis may be viewed in Appendix J, Table J13.

Finally, significant differences were found for teaching responsibility by individual learning ($\chi^2 (9, N = 324) = 19.53, p = .021$). This suggests that general music teachers were more likely to respond to this item. Complete results of this analysis may be viewed in Appendix J, Table J15.

In addition to the types of individual professional development listed in the questionnaire, participants were asked to list other types of individual professional development that they undertook during the 2012-2013 school year. Forty-nine participants responded to this prompt. Table K2 in Appendix K lists written responses by frequency.

Section II: Description of one professional development activity.

Section II of the questionnaire asked participants to identify and describe in-depth one professional development experience. Respondents ($N = 326$) chose from (a) out-of-district music/ music education conference, (b) workshop sponsored by a college or university, (c) in-district professional development workshops, and (d) graduate coursework, including online courses. Table 10 lists participants' choices by frequency.

Table 10

Frequency of Professional Development Formats Selected

Professional Development Format	<i>N</i>	%
Out-of-district music/ music education conference	165	49.5
In-district professional development workshop	100	30.0
Graduate coursework (includes online courses)	31	9.3
Workshop sponsored by a college or university	27	8.1

Chi-square analyses were performed to examine potential differences in participants' selection of the professional development format for Section II by demographics. Significant differences were found by grade level for professional development experience ($\chi^2 (6, N = 309) = 15.00, p = .020$), suggesting that grade level played a role in participants' reporting of participation in given professional development formats. Nonsignificant differences were found for *NAfME* members and non-members in terms choice of professional development format ($\chi^2 (8, N = 326) = 14.11, p = .079$). Other nonsignificant results were found for experience levels ($\chi^2 (12, N = 326) = 20.25, p = .063$), level of education, ($\chi^2 (12, N = 326) = 20.72, p = .055$), and teaching responsibility ($\chi^2 (40, N = 326) = 29.69, p = .884$).

Out-of-district music/ music education conferences.

Participants were asked to describe the activity that they chose at the beginning of Section II in one or two sentences. For out-of-district music/ music education conferences, participants most commonly described their state music educators association conferences. Twenty-one participants listed "state conference", and 73

specified state conferences. The Texas Music Educators Association ($N = 15$) was the most commonly cited. Additional state workshops included state choral directors associations and Texas Bandmasters association conferences. Respondents also reported participation in national-level conferences. Most frequently mentioned were the Midwest Band and Orchestra Clinic ($N = 7$), National Association for Music Education conferences ($N = 4$), and American Orff Schulwerk Association ($N = 2$). Several regional conferences were also mentioned. The most commonly reported were regional Orff Schulwerk conferences ($N = 7$ participants). Other responses included (a) county music education association meetings, (b) regional band, orchestra, or choral workshops, and (c) *NAfME* Northwest and Eastern Division Conferences.

In-district professional development workshop.

Participants who chose in-district professional development workshops most frequently reported meeting with other music teachers in the district ($n = 28$). Five participants reported that these meetings happened as part of a professional learning community, and three mentioned that this was a monthly meeting. The next most commonly reported topic was the Common Core State Standards ($N=7$). Assessment and technology each garnered five responses. Fifty-eight teachers reported content-specific professional development topics included (a) guitar, (b) technology such as Sibelius and Quaver Music, and (c) Orff/Kodaly/Dalcroze. The remaining responses for in-district professional development reflect general trends in contemporary education: (a) best practices, (b) teacher effectiveness, (c) Student Learning Outcomes (d) school-based PD, and (e) literacy across the content areas.

Graduate coursework.

Participants who chose graduate coursework (including online courses) discussed the programs they were enrolled in as well as specific courses in which they enrolled. Ten participants indicated that their courses were for degree-bearing programs including Master's degrees in (a) music education, (b) educational leadership and administration, and (c) education. Four participants indicated that their course took place online. Participants mentioned specific non-degree bearing courses in (a) creating digital audio recordings, (b) digital music media, (c) world drumming, (d) autism, (e) instrumental techniques, (f) Orff Level I and II certification, (g) advanced composition, and (h) conversational solfège.

Workshops sponsored by a college or university.

Twenty-seven participants reported attendance at a workshop sponsored by a college or university. Orff workshops were the most commonly reported activities ($n = 10$). Every other reported workshop was mentioned once and included (a) state conferences, (b) annual conducting workshop, (c) weekend conference on creativity, (d) the Complete Band Director, (e) Recorder Karate, (f) music and movement, (g) a workshop with John Feierabend, (h) OAKE workshops, (i) choral conducting, (j) general music, (k) music technology institute, (l) Ghanaian drumming, and (m) the Cleveland Orchestra Chorus.

Classroom implementation.

Participants were asked whether the activity that they selected gave them the opportunity to use what they had learned in their classroom and obtain feedback or guidance. When asked whether they had this opportunity, 59.2% responded that they did,

whereas 38.7% did not. Question seven asked about the specific ways that the activity helped teachers to use the new skills learned in their classrooms. Table 11 lists the frequencies of responses in descending order.

Table 11

Frequency and Percentage of Classroom Implementation Techniques

Technique	<i>N</i>	<i>%</i>
None of these supports were provided	116	35.6
Met informally with other participants to discuss classroom implementation	108	33.1
Communicated with the leaders of the activity concerning classroom implementation	86	26.4
Met formally with other participants to discuss classroom implementation	70	21.5
Developed curricula or lesson plans which other participants or the activity leader reviewed	65	19.9
Practiced under simulated conditions, with feedback	54	16.6
My teaching was observed by other participants and feedback was provided	28	8.6
My teaching was observed by the activity leaders and feedback was provided	27	8.3
Students' work was reviewed by other participants or the activity leader	27	8.3
Received coaching or mentoring in the classroom	15	4.6

Chi-square analyses were conducted to determine whether statistically significant differences existed on participants' responses by selected demographic variables.

Statistically significant differences were found by professional development format for

(a) practiced under simulated conditions with feedback ($\chi^2 (4, N = 326) = 25.74, p < .001$), (b) met informally with participants to discuss classroom implementation ($\chi^2 (4, N = 326) = 0.005, p = .005$), (c) teaching being observed by activity leaders and feedback was given ($\chi^2 (4, N = 326) = 10.88, p = .028$), (d) communicated with leaders of the activity concerning classroom implementation ($\chi^2 (4, N = 326) = 17.98, p = .001$), (e) developed curricula or lesson plans which other participants or the activity leader reviewed ($\chi^2 (4, N = 326) = 30.69, p < .001$), and (f) none of these supports were provided ($\chi^2 (4, N = 326) = 31.42, p < .001$). Complete results of this analysis may be viewed in Appendix J, Table J17. These findings suggest that the types of supports that participants' experiences differed based on the professional development format in which they participated. Specifically, those who participated in in-district professional development were more likely to respond to report items (a) through (e) above, while statistically significantly more participants in out-of-district professional development workshops reported that no supports for implementation were provided.

Statistically significant differences were found for experience on receiving mentoring or coaching in the classroom ($\chi^2 (4, N = 326) = 48.61, p < .001$), having their teaching being observed by the activity leaders and feedback provided ($\chi^2 (4, N = 326) = 10.71, p = .030$), and communicating with the leaders of the activity concerning classroom implementation ($\chi^2 (4, N = 326) = 10.03, p = .040$). Complete results of this analysis may be viewed in Appendix J, Table J22. These findings suggest (a) that those teachers with less than four years of teaching experience were significantly more likely to report receiving mentoring, (b) that their teaching was observed by the activity leaders,

and (c) teachers of this experience range were more likely to communicate with the activity leader regarding classroom implementation.

Eighteen participants wrote responses that described other means of classroom support. The complete list of responses may be found in Appendix K, Table K3. Most frequently mentioned supports ($n = 4$) were for implementation in classrooms, no support for implementation ($n = 3$), and other support for implementation ($n = 2$).

Length of the professional development activity.

Questions eight through 11 inquired about the duration of the professional development activity selected by participants in question three and the amount of time over which the activity was distributed. Table 12 lists participant responses for the amount of time over which the activity was distributed. While professional development took place throughout the 2012-2013 academic year, these activities most commonly took place in the months of October, November, January, and February. Question 10 asked about the amount of time engaged in the activity. Participants reported mean participation of 17.99 hours ($SD = 14.30$) since June 1, 2012 and that they expected to be further engaged in the activities a mean of 8.99 more hours ($SD = 12.09$). Question 11 asked whether the activity continued after the end of the 2012-2013 school year, and 51.1% indicated that it had.

Table 12

Reported Time Span for each Professional Development Format

Time Frame	<i>N</i>	%
Less than one day	36	10.8
One day	43	12.9
Two-four days	125	37.5
A week	31	9.3
A month	26	7.8
More than a month	62	18.6

Question 12 asked about the emphasis given to various curricular areas in professional development. Responses ranged from 0 (no emphasis) to 2 (major emphasis). Means and standard deviations for each area are listed in Table 13. These results suggest that more emphasis was given to (a) instruction, (b) curriculum, and (c) assessment, with less emphasis being placed on music content, teaching strategies for diverse populations, and leadership development within activities.

Table 13

Level of Emphasis Given to Curricular Areas in Professional Development Activities

Curricular Area	<i>N</i>	<i>M</i>	<i>SD</i>
Instructional Methods	323	1.63	0.61
Curriculum (e.g., units, texts, standards)	322	1.34	0.70
Approaches to Assessment	319	1.29	0.66
Use of Technology in Instruction	322	1.06	0.78
Deepening your Knowledge of Music	324	1.06	0.81
Strategies for Teaching Diverse Student Populations	320	1.02	0.76
Leadership Development	320	0.81	0.79

In addition to the above options for curricular areas, participants wrote in other curricular areas that their activity addressed. Table K4 in Appendix K lists participants' responses to this prompt.

Topics in professional development.

Question 13 asked participants to select the topic of content-related topics as defined by previous literature. Table 14 lists these topics as reported in descending order by frequency.

Table 14

Frequency of Content-Related Topics Reported by Music Teachers

Topic	<i>N</i>	%
Assessment	181	56.2
Elementary or Secondary General Music Topics	156	48.4
Music Literature	148	46.0
Standards-Based Teaching	143	44.4
Conducting or Rehearsal Techniques	134	41.1
Music Technology	132	41.0
World Musics/ Multicultural Music Education	103	32.0
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	96	29.8
Teaching Improvisation	94	28.8
Advocacy	90	28.0
Pedagogies for Specific Instrument/ Voice Part	84	26.1
Early Childhood Music Topics	76	23.6
Teaching Composition	72	22.4
Music for Special Learners	57	17.7
The Activity did focus on Music content	39	12.1
Research Applications to Teaching Practice	35	10.7
Grant Writing	10	3.1

Chi-square analyses were also performed to determine whether differences existed in the reporting of these topics by (a) membership in *NAfME*, (b) gender, (c) education, (d) level of teaching experience, (e) grade level, and (f) school location. No significant differences were found in the location of participants' schools (urban, suburban, or rural: see Table J26) and the professional development topics they reported.

Statistically significant differences were found for *NAfME* members versus non-members in the selection of Music Literature ($\chi^2 (2, N = 326) = 6.93, p = .031$) and Standards-Based Teaching ($\chi^2 (2, N = 326) = 7.98, p = .019$). Complete results of this analysis may be viewed in Appendix J, Table J25. In each of these cases, *NAfME* members were significantly more likely to respond that their professional development experiences covered these topics than their non-member peers.

Statistically significant gender differences were found for (a) conducting or rehearsal techniques ($\chi^2 (2, N = 326) = 7.98, p = .019$), (b) topics for a specific ensemble ($\chi^2 (2, N = 326) = 7.88, p = .019$), and (c) elementary/ secondary general music ($\chi^2 (2, N = 326) = 15.17, p = .001$). Complete results of this analysis may be viewed in Appendix J, Table J23. Females were significantly more likely to report participation in professional development that addressed these topics.

Statistically significant differences were found for education level on (a) music literature ($\chi^2 (3, N = 326) = 8.60, p = .035$), (b) teaching improvisation ($\chi^2 (3, N = 326) = 11.17, p = .011$), and (c) teaching composition ($\chi^2 (3, N = 326) = 15.09, p = .002$). Complete results of this analysis may be viewed in Appendix J, Table J24. Participants reported participation in professional development that addressed these topics in statistically significant ways based upon their educational level.

Statistically significant differences were found for levels of teaching experience on (a) teaching improvisation ($\chi^2 (4, N = 326) = 24.40, p < .001$), (b) teaching composition ($\chi^2 (4, N = 326) = 26.63, p < .001$), (c) early childhood music topics ($\chi^2 (4, N = 326) = 15.86, p = .003$), and (d) elementary or secondary general music topics ($\chi^2 (4, N = 326) = 10.19, p = .037$). Complete results of this analysis may be viewed in Appendix J, TableJ27. In each of these cases, music teachers with more than 15 years of experience were more likely to report that they attended professional development addressing these topics.

Statistically significant differences were also found for teaching responsibilities on (a) grant writing ($\chi^2 (10, N = 326) = 30.63, p = .001$), (b) advocacy ($\chi^2 (10, N = 326) = 22.68, p = .012$), (c) conducting or rehearsal techniques ($\chi^2 (10, N = 326) = 25.85, p = .004$), (d) world musics/ multicultural music education ($\chi^2 (10, N = 326) = 24.10, p = .007$), (e) teaching improvisation ($\chi^2 (10, N = 326) = 19.37, p = .036$), (f) topics for specific ensembles ($\chi^2 (10, N = 326) = 27.81, p = .002$), (g) early childhood music topics ($\chi^2 (10, N = 326) = 23.13, p = .010$), (h) elementary or secondary general music topics ($\chi^2 (10, N = 326) = 64.03, p < .001$), and (i) research applications to teaching practice ($\chi^2 (10, N = 326) = 21.60, p = .017$). Complete results of this analysis may be viewed in Appendix J, Table J28. Teachers tended to report participation in professional development that addressed these topics in significantly different ways depending upon their primary teaching area.

Statistically significant differences were found for grade level on (a) advocacy ($\chi^2 (2, N = 314) = 6.08, p = .048$), (b) conducting or rehearsal techniques ($\chi^2 (2, N = 314) = 23.71, p < .001$), (c) teaching improvisation ($\chi^2 (2, N = 314) = 10.56, p = .005$),

(d) topics for a specific ensemble ($\chi^2 (2, N = 314) = 27.96, p < .001$), (e) early childhood music topics ($\chi^2 (2, N = 314) = 16.50, p < .001$), and (f) elementary or secondary general music topics ($\chi^2 (2, N = 314) = 47.85, p < .001$). Complete results of this analysis may be viewed in Appendix J, Table J32.

Seven participants also wrote in “other” responses that included (a) playing on instruments, (b) use of classroom instruments, (c) the Common Core State Standards, and (d) the International Baccalaureate Curriculum. Complete results for this prompt may be viewed in Appendix K, Table K5.

Use of instructional methods.

Question 14 asked about the ways in which the activity focused on developing participants’ capacity to use given instructional methods in their music teaching. Table 15 displays the responses by descending frequencies. The top three reported results were specific to a teacher’s instructional responsibility and suggest that teachers received professional development targeted to their individual job functions.

Table 15

Instructional Methods Addressed in Professional Development Activities

Instructional Method	<i>N</i>	%
Specific rehearsal techniques or strategies	154	55.4
Technology in music instruction	136	48.9
Teaching techniques for a specific instrument/ voice	123	44.2
Arts Integration	93	33.5
Implementing world music into the music classroom/ rehearsal setting	81	29.1
Tasks that develop composition skills	63	22.7
Student-guided composition projects	55	19.8

Chi-square analyses revealed significant differences in participants' reports of these methods by the professional development format. Differences were found for (a) specific rehearsal techniques or strategies ($\chi^2 (4, N = 326) = 37.78, p < .001$), (b) teaching techniques for a specific instrument or voice ($\chi^2 (4, N = 326) = 18.60, p = .001$), and (c) use of technology in music instruction ($\chi^2 (4, N = 326) = 19.32, p = .001$). Complete results of this analysis may be viewed in Appendix J, Table J33. These findings suggest that there were significant differences between professional development formats in the instructional methods addressed within them.

Forms of assessment.

Question 15 asked whether the activity focused on developing teachers' capacity to use certain forms of student assessment in their instruction. Table 16 displays the percentages of participants that reported various types of assessment. These results

suggest that participants most frequently learned about the topic of performance tasks and systematic observation of students in their professional development experiences.

Table 16

Forms of Assessment Addressed in Professional Development Activities

Form of Assessment	<i>N</i>	%
Performance Tasks or Events	177	56.4
Systematic Observation of Students	116	36.9
Analysis of Student Work for the Purposes of Charting Student Progress	91	29.0
Music Projects (e.g., Compositions)	70	22.3
The Activity did Not Focus on Student Assessment	63	20.1
Objective tests (e.g., multiple choice, true/false, short answer)	60	19.1
Portfolios	33	10.5
Music Reports (e.g., research paper on a composer/genre)	23	7.3
Essay Tests	15	4.8

Chi-square analyses were performed to examine differences between professional development formats. Significant differences were found between professional development formats for (a) objective tests ($\chi^2 (4, N = 326) = 12.19, p = .016$), (b) essay tests ($\chi^2 (4, N = 326) = 10.93, p = .027$), (c) analysis of student work for the purposes of charting student progress ($\chi^2 (4, N = 326) = 9.76, p = .045$), and (d) portfolios ($\chi^2 (4, N = 326) = 16.23, p = .003$). Complete results of this analysis may be viewed in Appendix J, Table J34. These findings suggest that out-of-district conferences focused significantly

more on most forms of assessment, with the exception of essay tests, which participants reported significantly higher at the in-district level.

Participants were also asked to write in other forms of assessment that the professional development activities focused on. A complete list of responses may be viewed in Appendix K, Table K6. Written responses ($n = 13$) included (a) Student Learning Objectives, (b) individual assessment through singing and playing instruments, (c) common music assessments, (d) worksheets, and (e) SmartMusic.

Use of technology.

Question 16 asked whether the professional development activity focused on improving teachers' capacity to use various forms of technology in their teaching. Table 17 lists the percentage of participant responses by type of technology.

Table 17

Types of Instructional Technology Addressed in Professional Development Activities

Form of Technology	<i>N</i>	%
Use of Music Notation Software (Finale or Sibelius)	65	21.9
Music Education Apps for Android or iOS	65	21.9
Digital Media (Presentations, Digital or Audio)	64	21.5
Use of computers for composition purposes	60	20.2
Recording/ Mixing/ Sequencing/ Producing Music	46	15.5
Computers for Drill and Practice on Skill Acquisition (Practica Musica, etc.)	35	11.8
Use of Electronic Instruments or MIDI	26	8.8
The Activity Did Not Focus on Technology	23	7.7
Web Site Design	22	7.4
Use of Assessment Software (Auralia, Musition, Alfred's Essentials, etc.)	20	6.7
Creating a Podcast	15	5.1

Chi-square analyses were performed to examine possible differences by professional development format. Statistically significant differences were found for (a) digital media ($\chi^2 (4, N = 326) = 13.98, p = .007$), (b) music education apps for Android or iOS ($\chi^2 (4, N = 326) = 23.59, p < .001$), and (c) the activity did not focus on technology ($\chi^2 (4, N = 326) = 12.68, p = .013$). Complete results of this analysis may be viewed in Appendix J, Table J35. Participants who attended out-of-district music/ music

education conferences were significantly more likely to report that these technology topics were addressed or that the activity did not focus on technology.

Participants also wrote in responses to other forms of technology that their professional development activity focused on. Four respondents added SmartBoard or Promethean Board training. Other individuals listed use of the iPad (four participants on various topics). Two participants each also listed either iPad apps or no technology component. A complete listing of these responses may be viewed in Appendix K, Table K7.

Leaders of the activity.

Question 17 asked about facilitators of the professional development activity. Table 18 displays the percentages of types of facilitators as reported by participants. Most common responses included either a professional development expert or consultant, or another music teacher.

Table 18

Leaders of Professional Development Activities

Type of Leader	<i>N</i>	%
Professional Development Expert or Consultant	140	43.1
Other Music Teacher	137	42.2
District Staff	45	13.8
State Staff	27	8.3
Music Teacher from your School	25	7.7
Don't Know	8	1.8

A Chi-square analysis was conducted to examine possible differences in the leaders of professional development by professional development format. Statistically significant differences were found for activity leaders on professional development format. These included (a) a music teacher from the participants' school ($\chi^2 (4, N = 326) = 20.41, p < .001$), (b) other music teacher ($\chi^2 (4, N = 326) = 12.44, p = .014$), (c) district staff ($\chi^2 (4, N = 326) = 81.84, p < .001$), (d) state staff ($\chi^2 (4, N = 326) = 25.31, p < .001$), (e) professional development expert or consultant ($\chi^2 (4, N = 326) = 26.95, p < .001$), and (f) other ($\chi^2 (4, N = 326) = 21.46, p < .001$). Complete results of this analysis may be viewed in Appendix J, Table J36. Respondents who participated in an in-district professional development workshop were significantly more likely to report that either a music teacher or district staff led their professional development. Participants who chose out-of-district professional development were significantly more likely to report that the leader was another music teacher, professional development expert or consultant, or state staff.

Participants had the option of writing in additional responses for professional development leaders. A complete list of responses may be viewed in Appendix K, Table K8. College teachers were listed as the activity leaders by 11 participants. Seven participants stated that they themselves had led the activity. Five indicated that other music teachers had led their activities.

Participation in the activity.

Question 18 asked about the nature of respondents' roles as participants in the activity. Two hundred sixty-eight participants (84.8%) reported that they attended the activity as individuals, and 98 (31%) attended as representatives of their departments,

grade levels, or schools. In addition, chi-square analyses were performed to examine possible differences between professional development and the ways that participants reported participating in the activity. Statistically significant differences were found between professional development formats and participants attending as individuals ($\chi^2(4, N = 326) = 12.90, p = .012$). Complete results of this analysis may be viewed in Appendix J, Table J37. This suggests that those who reported participation in out-of-district professional development attended as individuals.

Participants also had the option to report additional roles not listed in the question. A complete listing of responses may be viewed in Appendix K, Table K9. Four teachers responded that they acted as students in the activity. Other individual responses included (a) aspiring students, (b) colleagues in the arts but not through education, (c) school administrators, and (d) teachers as representatives of the Kodaly method.

Types of learning activities.

Question 19 asked about the types of activities participants engaged in during their professional development experiences. Table 19 displays teachers' reported activities by descending percentages. These results suggest that participants, while partaking in multiple types of activities during their professional development, most commonly listened to a lecture or observed a demonstration of a lesson or unit.

Table 19

Music Teachers' Reports of Various Activities During Professional Development

Activity	<i>N</i>	%
Listened to a lecture	204	63.0
Observed a demonstration of a lesson or unit	180	55.6
Participated in whole-group discussion	172	53.1
Participated in small-group discussion	148	45.7
Collaborated as a colleague with musicians	131	40.4
Practiced using student materials	114	35.2
Used technology (computers, multimedia, or the internet)	99	30.6
Developed or reviewed music curriculum materials	79	24.4
Demonstrated a lesson, unit, or skill	65	20.1
Performed as a musician on your major instrument or voice part	59	18.2
Engaged in extended rehearsal or problem solving	45	13.9
Wrote a paper, report, or plan	41	12.7
Scored assessments	32	9.9
Reviewed student work	31	9.6
Gave a lecture or presentation	30	9.3
Led a whole-group discussion	23	7.1
Led a small-group discussion	20	6.2

Chi-square analyses were performed to examine possible differences on participants' responses by professional development format. Complete results for these

analyses may be viewed in Appendix J, Table J38. Significant differences were found for (a) listened to a lecture ($\chi^2(4) = 17.93, p = .001$), (b) observed a demonstration of a lesson or unit ($\chi^2(4, N = 326) = 16.62, p = .002$), (c) participated in a whole-group discussion ($\chi^2(4, N = 326) = 19.45, p = .001$), (d) participated in a small group discussion ($\chi^2(4, N = 326) = 25.51, p < .001$), (e) gave a lecture or demonstration ($\chi^2(4, N = 326) = 18.01, p = .001$), (f) demonstrated a lesson, unit, or skill ($\chi^2(4, N = 326) = 24.41, p < .001$), (g) led a whole- group discussion ($\chi^2(4, N = 326) = 10.75, p = .030$), (h) led a small-group discussion ($\chi^2(4, N = 326) = 18.03, p = .001$), (i) wrote a paper, report, or plan ($\chi^2(4, N = 326) = 122.52, p < .001$), (j) developed or reviewed music curriculum materials ($\chi^2(4, N = 326) = 11.10, p = .025$) (k) reviewed student work ($\chi^2(4, N = 326) = 9.64, p = .047$), and (l) scored assessments ($\chi^2(4, N = 326) = 10.59, p = .032$). These results suggest significant differences in the types of class activities that participants reported based upon the professional development format in which they participated.

Participants were able to add responses not found in the question. Teachers reported elements of active participation, such as (a) participating in a demonstration in the role of student, (b) participating in the lesson and activities, (c) participation in whole and small group activities, and (d) performing on various percussion instruments.

Complete responses may be viewed in Appendix K, Table K10.

Follow-up activities.

Question 20 contained several items about teachers' subsequent actions as a result of participation in the professional development activity. Table 20 displays the percentage of responses to questions that asked participants about the actions that they

took as a result of the professional development activity. Participants most frequently responded that they developed a plan to integrate what they learned into classroom practice.

Table 20

Actions Taken as a Result of the Professional Development Activity

Action	<i>N</i>	%
Developed a plan to integrate what you learned into your classroom practice as part of this activity	245	73.6
Discussed what you learned with other teachers in your school or department who attended the activity	209	62.8
Discussed what you learned with other teachers in your school or department who did not attend the activity	178	53.5
Discussed what you shared or learned with administrators (e.g., principal or department chair)	167	50.2
Communicated with participants of the activity who teach in other schools	158	47.4

Coherence with teachers’ work and professional development.

Question 21 asked participants about the extent to which various activities aligned with their overall work and professional development. Participants were asked to rate these on a scale that ranged from 0 (not applicable) to 5 (great extent). Table 21 displays participants’ mean ratings in descending order. These findings suggest that the reported activities were consistent with participants’ work and overall professional development from a moderate to a great extent.

Table 21

Ratings of Consistency with Participants' Work and Overall Professional Development

Item	<i>N</i>	<i>M</i>	<i>SD</i>
Consistent with your own goals for your professional development	325	4.20	1.13
Designed to support state or district standards/ curriculum frameworks	325	4.03	1.35
Designed to support state or district assessment	325	3.46	1.61
Consistent with your school's or department's plan to change practice	325	3.24	1.58
Followed up with activities that built upon what you learned in this professional development activity	324	3.24	1.54
Based explicitly on what you had learned in earlier professional development experiences	322	3.16	1.43

Forms of evaluation.

Question 22 asked about the ways in which the activity was evaluated. Table 22 lists responses by descending percentages. The two most common types of administration were (a) that participants completed a survey, and (b) that no discernible evaluation took place. These are also the least costly options for evaluation that were listed in terms of time and human resources.

Table 22

Evaluation Methods for Professional Development Activities

Evaluation Method	<i>N</i>	%
Participants completed a survey	144	44.2
No discernible evaluation took place	121	37.1
Student outcomes in my classroom were evaluated	35	10.7
My classroom was observed	31	9.5
Participants were interviewed to provide feedback	26	8.0
The session was observed by an evaluator	26	8.0

Chi-square analyses were performed to examine possible differences by professional development format. Complete results of this analysis may be viewed in Appendix J, Table J39. Statistically significant differences were found by professional development format that no discernible evaluation took place ($\chi^2(4, N = 326) = 9.57, p = .048$). This suggests that those teachers who participated in out-of-district music/ music education conferences ($n = 161$) reported significantly more frequently that no discernible evaluation of their professional development took place in comparison to their counterparts who selected graduate coursework ($n = 22$), in-district professional development workshop ($n = 94$), and workshop sponsored by a college or university ($n = 25$).

Participants also wrote in other types of evaluation. Other reported evaluation items included (a) project paper to conclude the course ($N = 3$), (b) grading by

instructors ($N = 3$), (c) performances ($N = 2$), and (d) tests ($N = 2$). Complete responses may be viewed in Appendix K, Table K11.

Enhanced knowledge and skills.

Question 23 asked participants the extent to which they felt their knowledge and skills were enhanced in given areas as a result of their participation in the professional development activity. Teachers rated each area on a scale that ranged from 1 (Not at All) to 5 (Great Extent). Table 23 lists participants' ratings by descending mean.

Table 23

Participants' Self-Reported Enhancements in Knowledge and Skills

Area	<i>N</i>	<i>M</i>	<i>SD</i>
Instructional methods	322	3.71	1.14
Curriculum (e.g., units, texts, standards)	322	3.28	1.29
Approaches to assessment	318	3.21	1.25
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	321	3.21	1.29
Adapting teaching to meet national, state, or district assessment requirements	323	3.16	1.29
Deepening knowledge of music	324	2.97	1.41
Learning about national, state, or district standards in curriculum frameworks in professional development	319	2.84	1.32
Use of technology in music instruction	320	2.79	1.45
Learning about national, state, or district assessments in professional development	322	2.74	1.34
Strategies for teaching diverse student populations	321	2.68	1.33
Leadership development	321	2.68	1.38

Chi-square analyses were performed to determine whether significant differences existed in participants' reporting by (a) professional development format, (b) *NAfME* membership, (c) school location, (d) level of education, (e) level of teaching experience, (f) primary teaching area, (g) gender, and (h) grade level. No significant differences were found in participant's knowledge and skills ratings by topic for (a) *NAfME* members

versus non-members, (b) school location, and (c) level of teaching experience (see Appendix J, Tables J43 – J45).

Statistically significant differences were found in responses by professional development format on (a) curriculum (e.g., units, texts, standards) ($\chi^2 (16, N = 326) = 33.69, p = .006$), (b) instructional methods ($\chi^2 (16, N = 326) = 49.13, p < .001$), (c) use of technology in music instruction ($\chi^2 (16, N = 326) = 27.46, p = .037$), (d) strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities) ($\chi^2 (16, N = 326) = 38.40, p = .001$), (e) deepening knowledge of music ($\chi^2 (16, N = 326) = 66.59, p < .001$), and (f) leadership development ($\chi^2 (16, N = 326) = 34.10, p = .005$).

Complete results of this analysis may be viewed in Appendix J, Table J36. These findings suggest that participants who participated in one professional development format experienced significantly different content than if they participated in another.

A statistically significant difference was found by level of education on deepening knowledge of music ($\chi^2 (12, N = 326) = 26.22, p = .010$). Complete results of this analysis may be viewed in Appendix J, Table J38. This suggests that those participants who held Bachelor's degrees responded that their professional development activity deepened their knowledge of music to varying degrees.

A statistically significant difference was found for area of primary teaching responsibility on learning about national, state, or district standards in curriculum frameworks in professional development ($\chi^2 (40) = 66.22, p = .006$). Complete results of this analysis may be viewed in Appendix J, Table J42. These findings suggest that

participants whose areas of specialization were general music and choral/ general music were more likely to rate their professional development highly in this area.

Additionally, a significant by gender difference was found on strategies for teaching diverse student populations ($\chi^2 (8, N = 326) = 23.92, p = .002$). Complete results of this analysis may be viewed in Appendix J, Table J37. This finding suggests that significantly more female participants responded that their knowledge and skills were enhanced to varying degrees in this area than their male counterparts.

Statistically significant differences were found for grade levels on adapting teaching to meet national, state, or district standards or curriculum framework requirements ($\chi^2 (2, N = 309) = 19.52, p = .012$). Complete results of this analysis may be viewed in Appendix J, Table J47. This finding suggests that statistically significantly more elementary level participants reported enhanced knowledge and skill in this area.

Four participants wrote in other areas their knowledge and skills were enhanced as a result of their participation in the professional development activity. Three stated that they received no professional development in their district while the final respondent stated that their knowledge and skills were enhanced as it pertained to International Baccalaureate music courses.

Ideal forms of professional development.

The final question of Section II gave participants the opportunity to design and describe their ideal professional development activity. Two hundred fifty-two participants wrote responses to this prompt. Responses were coded according to the information asked for in the question: (a) what would it be? (b) who would participate? (c) how long would it be? (d) where would it take place? These questions are addressed

in the subsections below. Additionally, the responses were coded for themes that were not addressed in the initial question. Those themes are also discussed below and include (a) professional development topics, (b) barriers to professional development, and (c) opportunity to collaborate or share ideas with other music teachers.

What would it be?

Participants were asked to describe their ideal conception of professional development activity, and what it would be. This subsection reports those responses. A large number of respondents ($N = 70$, 35.9%) indicated a workshop. In addition, five of the 70 teachers (7.1%) specified that they would like it to be sponsored by a college or university, and two specified they desired a weekend workshop.

Twenty-six (13.3%) respondents indicated they would like a session to share best practices with their music teaching colleagues. Twenty-five (12.8%) indicated that they would like time to collaborate with other music teachers while 13 (6.7%) noted a preference for a conference format. Ten (5.1%) described a collaborative teacher study group and nine (4.6%) described curriculum workshops. Other responses included (a) observing other teachers ($N = 5$; 2.6%) and (b) graduate courses ($N = 2$; 1%).

Participants also discussed specific features of their ideal professional development experiences. Twenty-two (8.7%) stated that they wanted their professional development to be ongoing, with regular meetings over the course of the school year (e.g., monthly, bimonthly, quarterly). Nineteen (7.5%) stated that their professional development should provide opportunities for active learning, in contrast to traditional lecture-style workshops. Eleven teachers (4.4%) described the need for follow-up after professional development sessions. Possible follow-up activities included (a) additional

sessions, (b) feedback observations that checked for fidelity of implementation, (c) follow-up sharing sessions to discuss implementation, and (d) e-mail and online conversations.

Who would participate?

One hundred ninety-five music teachers wrote responses for the question of who would participate in their ideal professional development activity. The majority reported that they would like music teachers to participate in their professional development activity ($N = 159$, 81.5%). Other responses were less frequent: (a) All teachers ($N = 16$, 8.2%), (b) Administrators/ Central Office/ School Board Members ($N = 7$, 3.6%), (c) Students ($N = 5$, 2.6%), (d) all arts teachers ($N = 3$, 1.5%), (e) new teachers ($N = 2$, 1%), (e) and politicians/ lawmakers ($N = 2$, 1%). This suggests that participants placed high value on professional development with other music teachers.

How long would it be?

Eighty-eight participants responded regarding the length of their ideal professional development activity, and were coded using the same scheme as for the predictor variable of duration in research question three. The most commonly reported desired length was less than one day ($N = 26$; 29.5%). One day was also frequently reported ($N = 25$, 28.4%). Twenty-two respondents desired a length of two to four days (24.4%). Less frequently reported were activities of longer duration, such as (a) a week ($N = 10$, 5.1%), (b) three weeks ($N = 2$, 2.3%), (c) over one year ($N = 2$, 1%), and (d) 10 to 12 months ($N = 1$, 0.5%). These findings suggest that participants valued professional development that was relatively short in length.

Where would it take place?

One hundred teachers responded to a prompt that asked about the location of their ideal professional development activity. Thirty-eight teachers (38%) responded that they would like their activities to be located in a school or classroom. Some teachers elaborated on this point, stating that it was for space or equipment considerations. Twenty teachers (20%) reported that their ideal professional development would take place in their own districts. Ten (10%) reported that they would like their professional development to be at a college or university. Seven (7%) wanted their PD to be local, while six (6%) wanted it to be at a central location. Five (5%) mentioned online opportunities, and two (2%) mentioned a convention. Several other individuals voiced differing locations, including (a) a large room, (b) a major city, (c) alternating cities, (d) a computer lab, (e) a place away from the classroom, (f) a conference center, and (g) specific geographic locations.

These responses revealed that a combined 71% of respondents reported that they desired professional development that was convenient to them, meaning that it was located in their (a) classroom or school, (b) within their own school district, (c) local, or (d) at a central location. This suggests that teachers valued professional development that was situated in the environments in which they taught, and that were convenient to travel to.

Emergent themes in ideal professional development.

Through participants' responses to question 24, several themes emerged through the coding process. These themes included (a) professional development topics, (b) barriers to professional development, and (c) collaboration with other music teachers.

Topics.

Two hundred twenty-three participants discussed specific topics that would be covered in their ideal professional development activity. A complete listing of participants' responses may be viewed in Appendix L. Topics were recorded, and then coded for themes. The most frequently reported topic ($N = 30$, 13.5%) was teaching techniques for their area of specialization (choral, instrumental, general music). Of those, Orff, Kodaly, and Dalcroze were most strongly represented. Comprehensive Musicianship through Performance was also mentioned twice. Curriculum and technology were the next most frequently mentioned ($N = 25$ for each, 11%). For curriculum, participants discussed topics such as vertical alignment of the curriculum in their district, and aligning their curricula to standards. Assessment was next, with 17 (7.5%) participants.

Barriers to professional development.

Participants mentioned four specific barriers to professional development. The most commonly listed barrier was a lack of music-specific professional development ($n = 11$). Perhaps related to this was curricular priorities in other disciplines ($n = 7$). These two ideas could overlap because of priorities in other subjects leading to the lack of professional development in music. One participant described their experience as such: "The PD that I participate in my district is strictly toward core standards. I'd like to see music developed to both teach music and support core standards" (Participant 46). The cost of professional development was discussed by participants ($N = 4$), specifically that teachers had to pay for their professional development themselves with no reimbursement, and that the available professional development was "very expensive as

well” (Participant 70). The final barrier discussed was geographic location ($N = 4$) in terms of teachers’ proximity to professional development opportunities. This may also explain teachers’ preferences to have their professional development either in their district, area, or in a central location as discussed above.

Collaboration with other music teachers.

Forty-one music teachers discussed the opportunity to share their ideas with other music teachers and the time or opportunity to collaborate as part of their ideal professional development experience. Participant 119 stated, “I feel I get more out of going to events by seeing colleagues and discussing the millions of professional development topics out there!” Other than the workshop format, collaboration and sharing time was the most frequently reported attribute to teachers’ ideal professional development.

Summary: Ideal forms of professional development.

When asked about their ideal professional development activity, participants desired workshops relatively short in length. They indicated that they would like to attend professional development with other music teachers and would like the opportunity to collaborate with their colleagues. They wanted their ideal professional development to take place in a school or within their district or in a central location that would be convenient for travel purposes. They desired topics that addressed their specific needs as music teachers and wanted the experience to be affordable.

Summary: Research question one.

It was clear that all responding participants took part in multiple forms of professional development throughout the 2012-2013 school year, and those experiences

took several forms. In describing these activities, the majority of participants described participation in shorter experiences of two to four days that took place outside of their classrooms, most commonly at a state music association conference. An additional finding shows the rising importance of the use of teacher collaborative study groups or professional learning communities, as well as the increasing role of the Internet as a platform for professional development. Another clear finding was the large role of state music educators associations in providing relevant professional development.

When asked about their ideal forms of professional development, teachers indicated that they wanted it to be a workshop that would take place in a school that would allow music teachers time to collaborate with their colleagues, and would allow for the opportunity to observe each other's teaching. Teachers also preferred topics that were tailored toward their particular area of teaching, such as general music, band, orchestra, or choir. Music technology also emerged as an important topic to teachers.

Research Question Two: Professional Development Formats

The second research question asked whether certain professional development formats (out-of-district music/ music education conference, in-district professional development workshop, workshop sponsored by a college or university, or graduate coursework) significantly affected participants' self-reported enhancements in knowledge and skills. To address this question, fixed-coefficients multiple regression analysis was utilized.

The model included three dummy-coded predictors for (a) in-district professional development, (b) workshop sponsored by a college or university, and (c) graduate coursework. Out-of-district music/ music education conference was treated as the

reference group. Enhanced Knowledge and Skills was the dependent variable.

Additionally, dummy variables were added to control for possible state effects in the model. The alpha level for the model was set at 0.05. The model for the analysis was:

$$EKS_{ij} = \alpha_j + \beta_1 In - District_{ij} + \beta_2 Workshop_{ij} + \beta_3 Graduate_{ij} + \gamma_{1...k} States_{ij} + \varepsilon_{ij} \quad (3)$$

Table 24 lists the numbers of participants in each format. There were widely disparate numbers of participants in each, ranging from 164 in the largest to 27 in the smallest, so this fact should be taken into consideration when interpreting any group differences.

Table 24

Number of Participants by Professional Development Format (N = 326)

Format	N	%
Out-of-District Music/ Music Education Conference (Referent Group)	164	50.3
In-District Professional Development Workshop	99	30.4
Graduate Coursework	31	9.5
Workshop Sponsored by a College or University	27	8.3

Table 25 lists the results of this procedure. The overall model was significant ($R^2 = 0.27$, $F(49, 274) = 2.09$, $p < .001$). There appeared to be statistically significant mean differences between participating in an in-district professional development workshop and an out-of-district music/ music education conference ($\beta = -0.35$, $t(274) = -2.92$, $p = .04$). Results suggest that participants rated in-district professional development workshops an average of 0.35 points lower than those who participated in out-of-district

music/ music education conferences on items pertaining to enhanced knowledge and skills. Additionally, statistically significant differences existed in teachers' mean ratings of Enhanced Knowledge and Skills for Graduate Coursework as compared to Out-of-District Music/ Music Education Conferences ($\beta = 0.59, t(274) = 3.08, p = .002$). This means that participants rated Graduate Coursework an average of 0.59 points higher on Enhanced Knowledge and Skills than those who participated in Out-of-District Music/ Music Education Conferences. The comparison between Workshops Sponsored by a College or University and Out-of-District Music/ Music Education Conferences was statistically nonsignificant. Thus, there appeared to be statistically significant differences in teachers' mean ratings of Enhanced Knowledge and Skill for certain formats in comparison to the referent group of Out-of-District Music/ Music Education Conference.

Table 25

Fixed Coefficient Multiple Regression Analysis Results for Research Question Two:

Professional Development Formats

Variable	β	SE	β^*	t	p	spr^2	pr^2
Intercept	3.33	0.85	-	3.91	<.001*	-	-
Workshop Sponsored by a College or University	0.05	0.20	-0.02	-0.19	.793	.0002	.0002
In-District Professional Development Workshop	-0.35	0.12	-0.17	-2.92	.004*	.03*	.02*
Graduate Coursework	0.59	0.19	0.19	3.08	.002*	.03*	.03*

Notes. $R^2 = 0.272, F(49, 274) = 2.09, p < .001$. * $p < .05$.

Estimates of effect.

This section discusses the effect size estimates for research question two, as well as magnitude of effects and variance explained for the various professional development formats through (a) standardized regression coefficients, (b) semipartial correlations, and (c) partial correlations.

As stated above, the $R^2 = .27$ for the overall model and was statistically significant. This means that the overall model explained approximately 27% of the variance in teachers' reported enhancements in knowledge and skills. Using Cohen et al.'s (2003) convention of a large effect for R^2 of 0.26, the R^2 for the current research question (0.27) could be interpreted as large. Additionally, f^2 was calculated as a population effect size estimate for R^2 . f^2 was defined as $f^2 = \frac{R^2}{1-R^2}$. A large effect is considered to be above 0.35 (Cohen et al., 2003). The f^2 for the current model was $\frac{0.27}{1-0.27}$, or 0.37, also suggesting a large overall effect for R^2 in the population.

To assess the effects of individual predictors, standardized beta coefficients were examined. Moderate effects were found for Graduate Coursework ($\beta^* = 0.19$) and In-District Professional Development Workshops ($\beta^* = -0.17$). The standardized beta coefficient for Workshop Sponsored by a College or University was too small for meaningful interpretation ($\beta^* = -0.02$).

Squared semipartial correlation coefficients were calculated to examine the amount of variability that each predictor explained in the dependent variable of Enhanced Knowledge and Skills, controlling for the effects of other predictors in the model. In the current model with dummy-coded predictors, this number represents an estimate of the reduction in population variance if a given format was combined with the referent group

of Out-of-District Music/ Music Education Conference (Grissom & Kim, 2012). Two of these findings were significant, In-District Professional Development Workshops ($r^2_{(EKSIDist.ODist)} = .03$) and Graduate Coursework ($r^2_{(EKSGrad.ODist)} = .03$), meaning that they explained three percent of the variance in Enhanced Knowledge and Skills, combining the variability of these variables with the referent group. Workshop Sponsored by a College or University ($r^2_{(EKSWksp.ODist)} = .0002$) was nonsignificant.

Squared partial correlations were also calculated to examine each format's squared point-biserial correlation. This estimated the amount of variance explained by being in a given format versus the referent group (Grissom & Kim, 2012). Two statistically significant squared partial correlations were found. Graduate Coursework ($r^2_{(EKS Grad.IDist ODist)} = .03$) accounted for three percent of the variance in Enhanced Knowledge and Skills, controlling for the associations between the referent group and Enhanced Knowledge and Skills. Participation in an In-District Professional Development Workshop ($r^2_{(EKS IDist.ODist Grad Wksp)} = .02$) explained two percent of the variance in teachers' ratings on Enhanced Knowledge and Skills, controlling for the associations between the referent group and Enhanced Knowledge and Skills. Nonsignificant results were found for the format of Workshops Sponsored by a College or University ($r^2_{(EKS Wksp.ODist)} = .0002$).

Research Question Three: Features of Effective Professional Development

The third research question asked whether certain features of professional development significantly predicted self-reported enhancements in music teachers' knowledge and skills. This question was addressed through use of a fixed coefficients multiple regression model. The alpha level for the analysis was set at $\alpha = .05$. Five

predictors (Activity Type, Active Learning, Content Focus, Time Span, and Contact Hours) were entered into a model with Enhanced Knowledge and Skills as the dependent variable and dummy-coded state variables to control for possible state effects. The model for the analysis was

$$EKS_{ij} = \alpha_j + \beta_1 Timespan_{ij} + \beta_2 Contact_{ij} + \beta_3 ALEARN_{ij} + \beta_4 Atype_{ij} + \beta_5 Content_{ij} + \gamma_{1...k} States_{ij} + \varepsilon_{ij} \quad (4)$$

Descriptive statistics are listed in Table 26. Three categorical variables (Activity Type, Content Focus, and Time Span) were included as predictors, but preclude descriptive analysis due to the fact that the variables were dichotomous and only denoted group membership.

Table 26

Descriptive Statistics for Variables in Research Question Three

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Enhanced Knowledge and Skills	262	3.06	0.94
Contact Hours	262	27.21	22.36
Active Learning	262	2.80	3.44

The overall regression model was statistically significant ($R^2 = .42$, $F(48,213) = 3.27$, $p < .001$). Table 27 lists the results for individual predictors in the model. Inspection of unstandardized beta coefficients revealed that four predictors had statistically significant effects on participants' self-reported enhancements in knowledge and skills. The unstandardized regression coefficient (β) for Time Span was 0.09 ($t(261) = 3.11$, $p = .002$, meaning that for every unit increase in time span, teachers' ratings of

enhancements in their knowledge and skills increased by 0.09 points. The unstandardized regression coefficient (β) for Active Learning was 0.06 ($t(261) = 3.37, p = .001$), meaning that for every unit increase in Active Learning, teachers' ratings of enhancement in their knowledge and skills increased by 0.08 points. The unstandardized regression coefficient (β) for Activity Type was - 0.28 ($t(261) = -2.01, p = .04$) meaning that, depending on whether an activity was traditional or reform type, resulted in a decrease of 0.28 points in teachers' ratings of enhancement in their knowledge and skills. Finally, the unstandardized regression coefficient (β) for content focus was 0.72 ($t(261) = 4.48, p < .001$), meaning that if the activity had a content focus, teachers' ratings of enhancement in their knowledge and skills increased by 0.69 points.

One predictor, Contact Hours, was found to be nonsignificant at the 0.05 alpha level. The unstandardized regression coefficient (β) was -0.001 ($t(261) = -0.25, p = .803$), meaning that for every unit increase in contact hours, teacher's ratings of enhancement in their knowledge and skills resulted in a nonsignificant decrease of 0.001 points.

Table 27

Fixed Coefficients Multiple Regression Analysis Results for Research Question Three:

Features of Effective Professional Development

Variable	β	SE	β^*	t	p	spr^2	pr^2
Intercept	2.05	0.83	-	2.47	.014*	-	-
Time Span	0.09	0.03	0.20	3.11	.001*	.04*	.03*
Contact Hours	-0.001	0.003	-0.02	-0.25	.803	.0003	.0002
Active Learning	0.06	0.02	0.22	3.37	.001*	.05*	.03*
Activity Type	-0.28	0.13	-0.12	-2.06	.041*	.02*	.01*
Content Focus	0.72	0.16	0.27	4.47	<.001*	.09*	.05*

Notes. $R^2 = 0.424$, $F(48, 213) = 3.27$, $p < .001$. * $p < .05$.

Estimates of effect.

This section discusses the effects for the overall model for research question three, as well as variance explained and magnitude of effects for individual predictors through inspection of (a) standardized beta coefficients, (b) semipartial and partial correlations.

The $R^2 = .42$ for the overall model was statistically significant. This means that the model explained approximately 42% of the variance in participants' reported enhancements in knowledge and skills. Using Cohen et al.'s (2003) convention of a large effect for R^2 of .26, the R^2 for the current study (.42) could be interpreted as large.

Additionally, f^2 was calculated as a population effect size estimate for R^2 . f^2 was defined as $f^2 = \frac{R^2}{1-R^2}$. A large effect is considered to be above 0.35 (Cohen et al., 2003). The f^2

for the current model was $\frac{0.42}{1-0.42}$, or 0.72, also suggesting a large overall effect for R^2 in the population.

To assess the effects of individual predictors, standardized beta coefficients were examined. Large effects were found for Content Focus ($\beta^* = 0.27$). Moderate effects were found for Time Span ($\beta^* = 0.20$), Active Learning ($\beta^* = 0.22$), and Activity Type ($\beta^* = -0.12$). The standardized beta coefficient for Contact Hours was too small for meaningful interpretation ($\beta^* = -0.02$).

Squared semipartial correlation coefficients were calculated to examine the amount of variability that each predictor explained in the dependent variable of Enhanced Knowledge and Skills, controlling for the effects of other predictors in the model.

Content Focus ($r_{EKS(Content.timespan,contact,ALEARN,AType)}^2 = .09$) explained nine percent of the variance in Enhanced Knowledge and Skills, controlling for all other predictors in the model. Active Learning ($r_{EKS(ALEARN.timespan,contact,AType,content)}^2 = .05$) explained five percent of the variance in teachers' ratings of Enhanced Knowledge and Skills, controlling for all other predictors in the model. Time Span

($r_{Timespan.Contact,ALEARN,AType,Content}^2 = .04$) accounted for four percent of the variance in Enhanced Knowledge and Skills, controlling for all other predictors. Activity Type ($r_{AType.Timespan,Contact,ALEARN,Content}^2 = .02$) accounted for two percent of the variance in Enhanced Knowledge and skills, controlling for all other predictors in the model.

Findings for contact hours were nonsignificant.

Squared partial correlations were also examined to determine each predictor's unique contribution to the variability in teachers' self-reported knowledge and skills while controlling for the association between the other predictors and the criterion

variable (Grissom & Kim, 2012). Four statistically significant squared partial correlations were found. Content Focus ($r^2_{(EKS\ content.Time\ span\ contact\ ALEARN\ Atype)} = .05$) accounted for five percent of the variance in Enhanced Knowledge and Skills, controlling for the associations between all other predictors and the criterion variable. Time Span ($r^2_{(EKS\ Timespan.contact\ Atype\ ALEARN\ content)} = .03$) and Active Learning ($r^2_{(EKS\ ALEARN.contact\ Atype\ content)} = .03$) each explained three percent of the variance in teachers' ratings on Enhanced Knowledge and Skills, controlling for the associations between all other predictors in the model and Enhanced Knowledge and Skills. Activity Type ($r^2_{(EKS\ AType.Timespan\ contact\ ALEARN\ content)} = .01$) accounted for one percent of the variance in Enhanced Knowledge and Skills, controlling for the relationships between all other predictors in the model and Enhanced Knowledge and Skills. Nonsignificant results were found for Contact Hours.

Chapter Summary

Four hundred ninety-three music teachers from a random sample of 2,257 responded to the *Music Teacher Professional Development Survey*. Respondents represented a cross-section of gender, race, teaching experience, undergraduate major, membership in the National Association for Music Education, teaching responsibilities, and geography.

Research question one asked about the professional development activities of music teachers in the United States. Participants reported that they most often attended out-of-district workshops, institutes and conferences. Teachers elaborated that they most frequently attended conferences held by their state music associations. They spent the most amount of time engaged in graduate coursework and out-of-district conferences.

Respondents also reported on the types of individual professional development in which they participated. Four hundred twenty-six teachers reported spending time undertaking individual learning, in which they read journals or other publications, browsed the Internet, etc. Twenty-four percent reported spending more than 20 hours engaged in these activities.

Participants were asked to describe their conceptions of the ideal professional development experience. Results indicated that respondents wanted other music teachers to participate in their professional development and that they desired a workshop that lasted all or part of a day that gave the opportunity to collaborate and share with other music teachers. The teachers wanted their ideal professional development to take place either in a school or in their school districts. Additional themes that emerged from participants' written responses was that they (a) preferred topics that related to their area of specialization (e.g., general, choral or instrumental music), (b) reported lack of music-specific professional development, other curricular priorities, cost, and geography as barriers to professional development; and (c) that participants highly valued collaboration with their music teaching peers.

Research question two asked whether certain professional development formats in which music teachers commonly engaged significantly affected self-reported enhancements in music teachers' knowledge and skills. Three dummy codes were created and entered into a fixed-coefficients multiple regression equation with Enhanced Knowledge and Skills as the dependent variable. Out-of-district music/ music education conference was treated as the reference group. The overall model was statistically significant, and explained 27.2% of the variance in Enhanced Knowledge and Skills.

Statistically significant differences in participants' mean ratings on enhanced knowledge and skills were found for in-district professional development workshops (significantly lower) and graduate coursework (significantly higher) in comparison to the referent group of out-of-district music/ music education conference. The difference between Workshops Sponsored by a College or University and the referent group was nonsignificant. The overall effect size for R^2 in the population was large.

Research question three asked whether certain features of effective professional development were significant predictors of self-reported enhancements in music teachers' knowledge and skills. Five predictors (Time Span, Contact Hours, Opportunities for Active Learning, Activity Type, and Content Focus) were entered into a fixed-coefficients multiple regression model with Enhanced Knowledge and Skills as the dependent variable. The overall model was statistically significant, and explained 42.4% of the variance in Enhanced Knowledge and Skills. In addition, four predictors were found to be statistically significant: (a) Time Span, (b) Opportunities for Active Learning, (c) Activity Type, and (d) Content Focus. Contact Hours was found to be nonsignificant. The overall effect size for R^2 in the population was large.

This chapter reported the results of the study. Chapter five will discuss the findings of each research question in comparison to the research literature, discuss implications for music education, and make recommendations for future research on professional development.

Chapter 5: Discussion and Recommendations

This chapter provides a restatement of the purpose and research questions that guided the study, a summary of the study, discussion, conclusions, implications for music education, and recommendations for future research.

Purpose of the Study

The purpose of this study was to describe the self-reported professional development activities of music teachers in the United States and to determine whether selected formats and features of professional development experiences commonly available to music teachers are significant predictors of music teachers' self-reported enhancements in knowledge and skills.

Research Questions

Research questions for this study were:

1. What self-reported professional development activities did K-12 music teachers commonly engage in during the 2012-2013 school year and how much time did they spend engaged in those activities?
2. What are the effects of participation in selected professional development formats (out-of-district music/ music education conference, workshop sponsored by a college or university, in-district professional development workshop, graduate coursework) on music teachers' self-reported enhancements in knowledge and skills?
3. Which, if any, of five core and structural features of professional development (type, duration, content focus, active learning, and coherence) are significant

predictors of music teachers' self-reported enhancements in knowledge and skills?

Summary of the Study

The *Music Teacher Professional Development Survey, MTPDS*, was pilot tested and reliability was established for the scales in the questionnaire. Pilot participants ($N = 49$) were (a) music teachers ($N = 38$), (b) music teacher educators ($N = 6$), and (c) music supervisors ($N = 5$). In addition to completing the questionnaire, participants provided feedback on ways to improve its content and layout for use as the tool for the main study. Acceptable levels of reliability were found for all scales with the exception of Collective Participation, which was subsequently excluded from use in the main study.

A link to the *Music Teacher Professional Development Survey* was sent via e-mail to 2,257 music teachers whose schools were drawn via simple random sampling from the *Common Core of Data* set (National Center for Education Statistics, 2013). Reminder e-mails were sent one and two weeks after the original. A total of 493 participants (21.8%) responded to the questionnaire while 326 (14.4%) completed it. The most common pattern of incompleteness was that participants completed section I and stopped. Almost all participants ($N = 491$, 99.6%) completed Section I. Therefore, the 493 section I responses were used in the analysis of section I and the 326 responses were used for sections II and III, as well as the inferential analyses in research questions two and three.

Research question one asked participants questions about their professional development experiences that contributed to a description of the professional development activities of music teachers in United States. Results indicated that participants most frequently attended out-of-district conferences, most commonly their

state music educators' association conference, and that these experiences lasted two to four days for a mean of 14.18 hours ($SD = 13.16$). Most ($N = 426$) also reported that they spent time engaged in individual learning such as reading journals or other professional publications and browsing the Internet. When asked about the characteristics of their ideal professional development experiences, teachers responded that it would be less than a day to a day-long workshop with other music teachers. It would be located in a school building, classroom or at a location in their school district. Topics would be tailored to their area of specialization (e.g., chorus, band, orchestra, general music). They would have time to collaborate or share ideas with other music teachers. Barriers to professional development included (a) a lack of music-specific professional development offerings in their district, (b) a focus on curricular areas other than music, (c) the cost of professional development activities, and (d) geographic location.

Research question two asked about the effects of professional development format on music teacher's ratings of Enhanced Knowledge and Skills. A fixed coefficients multiple regression model was constructed with three dummy coded predictors (in-district professional development, workshops sponsored by a college or university, and graduate coursework) with a referent group (out-of-district music/ music education conference) and dummy coded states to control for possible state effects. A large overall effect for the model was found. The model accounted for 27.2% of the variance in the dependent variable of Enhanced Knowledge and Skills. Results revealed statistically significant differences in participants' mean ratings of Enhanced Knowledge and Skills between (a) in-district professional development and (b) graduate study in comparison to

the referent group of out-of-district music/ music education conference. The difference between Workshops sponsored by a college or university and the referent group was nonsignificant.

Research question three asked whether certain features of professional development significantly predicted music teachers' ratings of Enhanced Knowledge and Skills. A fixed coefficients multiple regression model revealed overall model significance and a large overall effect. The model accounted for 42.4% of the variance in participants' ratings of Enhanced Knowledge and Skills. Four predictors were found to be statistically significant: (a) Time Span, (b) Opportunities for Active Learning, (c) Activity Type (Traditional or Reform-Type), and (d) Content Focus. Contact Hours was found to be nonsignificant.

Conclusions

Description of music teacher professional development.

- Participants most frequently reported participation in professional development outside of their districts, including out-of-district workshops and institutes and conferences provided by professional organizations.
- Participants undertook individual learning to supplement their formal professional development, and commonly spent more than 20 hours during the 2012-2013 school year doing so.
- Participants' ideal professional development experiences would be a workshop that involved other music teachers that was relatively short in length (less than one to four days), would take place in their own schools or home districts, and relate to their areas of teaching specialization.

Professional development formats.

- Participants rated graduate coursework significantly higher than the referent group of out-of-district music/ music education conference on enhancing their knowledge and skills for teaching.
- Participants rated in-district professional development significantly lower than the referent group of out-of-district music/ music education conference on enhancing their knowledge and skills for teaching.

Features of effective professional development.

- Time Span (the amount of time over which an activity was spread), Activity Type, Content Focus, and Opportunities for Active Learning were features of effective professional development that significantly predicted enhancements in participants' ratings of Enhanced Knowledge and Skills.
- The length of a professional development activity (Contact Hours) was not a significant predictor in participants' self-reports of enhanced knowledge and skills. This finding contradicts previous research conducted with mathematics and science teachers.

Discussion

Description of music teacher professional development.

Previous research in professional development for music teachers has sought to ascertain their values and opinions regarding professional development (Bauer et al., 2009; Bush, 2007, Bowles, 2003; Conway, 2008; Friedrichs, 2001; Parsad et al., 2012; Tarnowski & Murphy, 2003). Respondents in the current study reported that they participated in several forms of professional development during the 2012-2013 school

year, supporting Wayne, Yoon, Zhu, Cronen, and Garet's (2008) concept of "ambient PD", meaning that music teachers experience multiple forms of professional development in a year, and that it may be difficult to isolate the effects of one of those experiences. Respondents most frequently reported participation in out-of-district workshops and institutes ($N = 282, 57.2\%$) and, when asked to elaborate, described conferences held by their state music education associations. This finding is consistent with previous research (Bauer et al., 2009; Bush, 2007; Friedrichs, 2001) that has suggested that music teachers found state music conferences valuable, important, and desirable to attend. Additionally, participants in both the current study and previous research have compared out-of-district conferences with in-district professional development, which in many instances they have reported to be too general and not addressing their specific needs as music teachers (Bush, 2007; Conway, 2008; Conway & Christensen, 2006; Conway & Zerman, 2004). Another plausible explanation for participants' lack of value for in-district professional development may be that in-district professional development workshops focus on priorities in other tested curricular areas such as reading and mathematics. Evidence of this was found in the current study in participants' responses to question 24, which asked about teachers' ideal professional development experiences. Seven teachers specifically mentioned priorities in other academic areas as a barrier to professional development, while others specified that they received no in-district professional development for music teachers. Further evidence was found in addition to the statistically significantly lower findings for in-district professional development workshops for research question two in comparison to the referent group of out-of-district music/ music education conferences. Eight teachers in the current study specified that priorities in other

academic areas was a factor in the lack of music-specific professional development. An additional 11 reported a lack of any music-specific professional development.

Several chi-square analyses were conducted to determine whether statistically significant differences existed between groups of participants based on demographic variables identified in previous studies (Bauer et al., 2009; Bush, 2007; Friedrichs, 2001). These variables included (a) the professional development format participants identified to describe in question three, (b) gender, (c) membership in *NAfME*, (d) area of teaching responsibility, (e) number of years of teaching experience, (f) highest degree earned, (g) location of teaching assignment, and (h) grade level.

Participants most commonly reported attending out-of-district workshops/ institutes ($N = 282$), and conferences ($N = 272$), and 164 chose this type of experience to describe in-depth in Part II of the questionnaire. Chi-square results were statistically nonsignificant across all demographic areas as listed above, with the exception of grade level. This suggests that music teachers universally valued this format, but that grade level may have played a role in their professional development experiences throughout the course of the school year. This finding supports previous research (Bauer et al., 2009; Bowles, 2003; Bush, 2007; Friedrichs, 2001; Parsad et al., 2012) that suggests that music teachers, regardless of demographic characteristics, valued this type of experience.

Gender played a statistically significant role in teachers' reports of participation in individual professional development activities, specifically individual learning. Gender also factored into participants' reports of the topics of conducting or rehearsal techniques, topics for a specific ensemble, and elementary or secondary music topics. This could be due to differences in gender percentages at given grade levels, where more female

teachers teach at lower grade levels, and lower grade levels also involve more general music components than upper grade levels, which are more performance oriented. In addition, gender played a statistically significant role in teachers' reports of enhanced knowledge and skills for teaching diverse student populations. In each of these cases, significantly more females than males reported participation in and/ or selection of these activities. None of the existing literature has reported findings by gender. A possible explanation for this could be that the teaching force (as with the participant pool in the study) consisted of nearly twice as many females as males (61.0% Female and 31.0% Male (Gardner, 2010); 67.9% and 31.2% in the current study), and as such may be significantly different. Other differences could be explained by the possible confounding of gender with other demographic variables (e.g., grade level and area of specialization). For instance, mentioned above was the stratification of female and male teachers by grade level. The significant findings by grade level for some aspects of professional development (discussed below) could either mask or confound gender effects based upon the grade level with the greatest concentration of female teachers. The relatively low number of statistically significant comparisons in the current study suggests that gender was not a strong factor in participant's selection, reporting and ratings of professional development activities. Thus, gender did not appear to play a strong role in the reporting of participants' professional development activities.

Membership in *NAfME* also played a statistically significant role in some reports of participants' professional development activities. Specifically, statistically significant differences were found in the reporting of members and non-members on attendance at out-of-district conferences, serving on a committee or task force, individual learning

(such as action research and other activities such as reading journals or publications or browsing the internet), and meeting informally with participants to discuss professional development activities. In each of these cases, significantly more members reported participation in these activities. A possible explanation for *NAfME* members reporting higher participation in out-of-district conferences is the availability of such conferences through *NAfME*: the organization sponsors several national and state-level conferences annually for its members, where non-members may not participate in these experiences. In addition, several committees or task forces may be administered at the state level, possibly in cooperation with the *NAfME* state organization, and as such may afford members additional opportunities. Additionally, *NAfME* membership played a significant role in participant reporting on topics for professional development including music literature and standards-based teaching. *NAfME* has led work in standards writing at the national level, including articulation of the original *National Standards for Arts Education* (Music Educators National Conference, 1994) and the recent revision (National Coalition for Core Arts Standards, 2014). Conferences sponsored by the organization also provide professional development that addresses the standards. Thus, a possible reason for the differences found between members and non-members could be that members have access to involvement in the writing process through their membership and professional development that supports implementation. These findings support previous research (Bauer et al., 2009) suggesting that the views and values placed on professional development between *NAfME* members and non-members may differ. The current study also extends this literature in that it asked a wider range of questions that were analyzed by membership, and represents a higher number and percentage of

non-members than previous research (42.6%, $N = 131$) in the current study versus 7% ($N = 55$) in previous research (Bauer et al., 2009). The sampling frame also consisted of a national sample of teachers in contrast to previous research (Bauer et al., 2009; Bowles, 2003; Bush, 2007; Friedrichs, 2001). These prior studies focused on *NAfME* members in given states. Thus, the professional development views of non-members may be more accurately represented in the current study. Given this perspective, it appears that some differences existed in the current study between *NAfME* members and non-members in their reported professional development experiences.

Several significant differences in respondents' reports of participation in various professional development experiences were found by area of participants' teaching responsibility (e.g. chorus, band, orchestra, general music, or combinations of these). Specifically, teachers differed by area on their reports of participation in (a) in-district workshops, (b) taking courses for college credit, and (c) out-of-district workshops focused on a specific topic. Teachers also differed by teaching area on the types of individual learning undertaken. Most importantly, they differed in nine of 17 listed possible topics for professional development. Differences within participants' reported topics by teaching area generally outlined topics endemic to specific areas of specialization. For instance, significantly more participants who taught general music reported early childhood music and elementary/ secondary general music topics, while teachers of performance ensembles reported significantly higher participation in professional development that covered conducting/ rehearsal techniques and topics for specific ensembles. Statistically significant differences were also found by teaching responsibility concerning enhancement of their knowledge and skills in terms of learning

about national, state, or district standards in curriculum frameworks. These findings support previous research (Bauer et al., 2009; Bowles, 2003) suggesting that teachers' perceptions, values, and preferences for professional development may differ based upon their area of teaching responsibility.

Differences were also found for teachers by the number of years that they had been teaching. Specifically, experience factored into participants' reports of (a) taking courses for college credit, (b) out-of-district conferences, and (c) receiving mentoring or coaching. Significantly more teachers with zero to nine years of teaching experience reported that they had received mentoring or coaching, suggesting that this mode of professional growth is focused on teachers of that experience range. This could be due to the common practice of assigning mentors to newer teachers, with removal of those supports after a predetermined number of years. Respondents also reported differently based on experience in individual learning, including reading journals or publications or browsing the Internet. In this case, teachers with more than 15 years of experience reported significantly higher participation. This could be due to what Conway (2008) called the broadening of the idea of professional development and teaching in that veteran teachers must seek out new perspectives and ideas based upon their career stage. Statistically significant differences were also found for teaching experience on communicating with the leaders of professional development activities concerning classroom implementation. Significant differences were also found for teaching experience by topic, including (a) teaching improvisation, (b) teaching composition, early childhood music topics, and (c) elementary or secondary general music topics. These findings support previous research that has suggested that music teachers may experience

professional development differently depending upon which stage in their career they currently reside (Conway, 2008; Eros, 2011; Eros, 2012).

Level of education, as measured by highest degree earned, was a weak factor in determining participants' responses. Statistically significant differences were found for individual learning, which included reading journals or publications as well as browsing the Internet. Significantly more participants with Master's degrees reported participation in this activity. This, however, could be explained by the representation of teachers in the sample who possessed Master's degrees: 56.1% of the current sample reported possession of a Master's degree. Additional findings included differences on topics, including teaching improvisation and teaching composition. For teaching improvisation, significantly more respondents with Bachelor's degrees responded that their professional development activities focused on this topic, while significantly more teachers with Master's degrees reported that their professional development included the topic of teaching composition. Possible reasons for this could be that those teachers in the sample with Bachelor's degrees experienced changes in music teacher education curricula that focused on creative processes, or were addressing needs for their teaching not addressed in their music teacher education programs. No study to date has compared participants' responses by level of education, and the findings of the present study suggest that it may not be a strong factor in respondents' participation in given professional development activities, selection of topics or ratings of enhanced knowledge and skills.

School location (e.g., urban, suburban, rural) was also investigated as a possible factor in participants' reports of their professional development activities. Statistically significant differences were found for participation in (a) in-district workshops, (b) out-

of-district conferences, and (c) teacher study groups. In each of these cases, teachers in suburban settings reported significantly more participation in these professional development formats than their counterparts in urban or rural settings. This could be due to the financial resources available to suburban districts for the purposes of professional development in comparison to their rural and urban counterparts. Differences were also found for individual learning, including reading journals or publications and browsing the Internet. In this case, rural teachers reported at significantly higher levels than their counterparts in urban or rural settings. This finding could be due to the more geographically isolated contexts in which music teachers in these areas live and work. While reported in other studies as part of demographic analyses (Bauer et al., 2009; Bush, 2007; Friedrichs, 2001; Tarnowski & Murphy, 2003), no study to date has used school location as a comparison variable to determine whether differences exist in the professional development experiences of those who teach in urban, suburban, or rural settings. These findings suggest that school location may not be a strong factor in teacher's reports of given professional development activities.

Statistically significant differences were also found by grade level (elementary, secondary, or combined) on their reports of serving on a committee or task force that focused on curriculum, instruction, or student assessment. In this case, significantly more teachers in secondary or combined assignments reported participation in this activity. This could have occurred because many of the schools with the combined designation were either K-8 schools, or traditional middle schools serving grades six through eight. No previous literature has reported differences by grade level. Significant differences were also found by grade level for professional development format selected. This

suggests that the grade level in which a teacher works may affect their choices for professional development format. This could be due to the unique demands of music teaching positions at various grade levels. For instance, the job functions of an elementary instrumental music teacher may differ from that of their counterparts at the secondary or combined level, and they may select professional development experiences differently based on the unique demands of their job. Further support was found in differences reported by grade level on the professional development topics that participants reported. Significant differences were found for (a) advocacy, (b) conducting or rehearsal techniques, (c) teaching improvisation, (d) topics for a specific ensemble, (e) early childhood music topics, (f) elementary or secondary general music topics, and (g) music for special learners. This finding lends further support that teachers select professional development in part based on the grade level that they teach. Participants also reported significant differences in how their knowledge and skills for teaching were enhanced for adapting their teaching to meet national, state, or district standards or curriculum framework requirements. Elementary teachers reported statistically significantly higher numbers of participation in this type of professional development. This could be due to the fact that elementary music teachers tend to be generalists, a fact that was corroborated in the primary teaching responsibilities in the current study. As such, their curriculum documents tend to be more involved than that of their counterparts at the secondary level, and as such they may seek out professional development that addresses the need to ascertain the essential learning embedded in given documents.

Professional development formats.

Music teachers have identified the formats that they valued most for professional development in previous research (Bauer et al., 2009; Bush, 2007; Bowles, 2003; Conway, 2008; Friedrichs, 2001; Parsad et al., 2012; Tarnowski & Murphy, 2003). The finding in the current study of participants' selection and ratings of state music educators' conferences as high-quality professional development was particularly salient, as roughly one-half ($N = 164$, 50.3%) of those who completed the questionnaire reported attending this format. Statistically nonsignificant differences were found in participants' reporting by gender, *NAfME* membership, teaching experience, education level, or school location, suggesting that music teachers' choices of describing these experiences transcended demographic variables, with the exception of grade level, which was significant. This finding confirms the results of previous studies (Bauer et al., 2009; Bowles, 2003; Bush, 2007; Friedrichs, 2001) in which music teachers rated their state music conferences as important, valuable, or desirable to attend. The current study found statistically significant differences between participants' ratings on graduate coursework and out-of-district music/ music education conferences. The descriptions and significantly lower ratings of in-district professional development workshops in comparison to out-of-district music/ music education conferences parallels previous research (Bauer et al., 2009; Bush, 2007; Conway, 2008) that described teachers' in-district experiences as overly general, as those charged with teacher professional development attempted to cover topics that address concerns for teachers of all disciplines. Three studies (Bauer et al., 2009; Bush, 2007; Conway, 2008) placed in-district workshops near or at the bottom of music teachers' ratings. A possible reason for some of the negative comments and ratings

regarding in-district professional development workshops identified in previous research (Conway, 2008; Conway, 2001; Conway & Christensen, 2006; Conway & Zerman, 2004) could be that teachers did not find this mode of professional development particularly effective because, in some cases, it did not directly pertain to their work as music teachers. Evidence of this was found in the current study in participants' written responses to question 24 in that 11 teachers cited a lack of music-specific professional development, or a focus on other curricular areas (eight teachers), such as the Common Core State Standards.

Features of effective professional development.

The current study sought to determine whether any of five features of effective professional development (Garet et al., 1999; Garet et al, 2001) significantly predicted self-reported enhancements in music teachers' knowledge and skills. Four of these predictors were found to be statistically significant in the current study: (a) time span, (b) activity type, (c) content focus, and (d) opportunities for active learning. Content focus was the strongest predictor of variability in ratings, meaning that participants placed the highest value on content as a characteristic of effective professional development. This is further support for the idea that music teachers value professional development that contains a focus on music content above all other features of professional development.

Previous educational research has also sought to identify those features of professional development that make some experiences more or less effective in others in bringing about enhancements in teachers' knowledge and skills (Garet et al., 1999; Garet et al., 2001; Yoon et al., 2007). These studies focused on teachers of mathematics and science, and found that six features significantly predicted teachers' ratings of enhanced

knowledge and skills: (a) the number of hours engaged in the activity, (b) the time span over which the activity was spread, (c) the type of activity (whether it was traditional, such as a workshop or reform-type, such as a teacher study group) (d) a focus on content, (e) coherence with teachers' work and overall program of professional development, and (f) the collective participation of an entire department or school.

Three findings from the current study stand in contrast to previous research (Garet et al., 1999; Garet et al., 2001). First, the predictor of collective participation was found to be unreliable. While the low reliability of the scale is consistent with previous research, the data collected during the pilot phase of this study suggested that this was not a consistent measure. This may be due to the fact that music teachers are often the only content specialists in their school buildings and, as such, are not part of a department that would seek professional development as a unit. Second, the reliability coefficient for the scale of coherence ($\alpha = 0.57$) was below the acceptable level of 0.70, and was excluded from final analysis. The low response to these items and subsequent low reliability coefficients suggest that the items may not have reflected participants' experiences in professional development. Third, the predictor of contact hours was found to be statistically nonsignificant. This finding connotes that participants may not place high value on the length of a given professional development experience being a feature of effective professional development. This is consistent with the finding that teachers most frequently reported on their state music conference, which falls under the number of contact hours that has been determined to be effective by previous research (Garet et al., 1999; Garet et al., 2001; Yoon et al., 2007).

Summary of findings.

For the first research question, participants in the current study reported several types of formal and informal professional development. Participants most frequently reported attending out-of-district workshops, institutes, and conferences, especially those held by state music educators associations. They reported spending the greatest mean number of hours on graduate coursework. In addition, participants reported undertaking individual learning, in which they read journals, browsed the Internet, etc. They commonly spent more than 20 hours engaged in these activities throughout the course of the 2012-2013 school year.

Chi-square analyses suggested that the type of professional development format could affect the types of activities that respondents could experience as a result of participation. Four demographic variables were found to have several instances of statistically significant differences among groups of teachers. These were (a) area of teaching responsibility (e.g., chorus, band, orchestra, or a combination of these), (b) number of years of teaching experience, (c) grade level, and (d) membership in *NAfME*. Members of this organization were significantly more likely to report participation in service-related activities such as serving on a curriculum task force than their non-member peers. Three demographic variables, while finding some statistically significant differences, were weaker than others and included (a) participants' gender, (b) the location of participants' schools, and (c) participants' levels of education.

Participants were also asked to describe their ideal professional development experiences. Respondents indicated that they would like to attend the professional development with other music teachers and that they wanted the format to be a workshop

that lasted all or part of a day. They desired professional development that took place either in their schools or school districts. Themes that emerged from text analysis included (a) that music teachers preferred professional development topics that directly related to their areas of specialization (e.g., chorus, band, orchestra, general music), (b) barriers to professional development that included lack of music-specific professional development, cost, and proximity to experiences; and (c) that participants valued the opportunity to collaborate with their fellow music teachers.

The second research question asked whether participation in certain formats for professional development significantly affected participants' self-reported ratings of enhanced knowledge and skills. Fixed coefficient multiple regression analyses revealed overall model significance, and that participants rated graduate course work significantly higher than the referent group of out-of-district music/ music education conference. Further results indicated that participants rated in-district professional development workshops statistically significantly lower than the referent group in increasing their knowledge and skills. The difference in ratings between workshops sponsored by a college or university and the referent group was statistically nonsignificant.

The third research question asked whether certain features of effective professional development predicted participants' ratings of enhanced knowledge and skills. Results indicated overall model significance and large effects. In addition, four of the five predictors (Time Span, Activity Type, Content Focus, and Opportunities for Active Learning) were determined to be statistically significant. The length of the professional development activity, measured in clock hours, was found to be nonsignificant according to participants.

What is effective professional development in music education?

The results of this study have provided a rich description of (a) professional development of the professional development experiences of music teachers in the United States, (b) what those teachers conceive their ideal professional development experiences to be, (c) music teachers' ratings of the ability of certain professional development formats to enhance their knowledge and skills, and (d) features of professional development that predict music teachers' knowledge and skills. A synthesis of these findings and ideas could contribute to a description of what effective professional development for music teachers could include.

Based on the results of this study, professional development for music teachers should:

- include a focus on music content,
- take place in a workshop format that lasted all or part of a day,
- allow time and space for music teachers to collaborate,
- address teachers' areas of specialization (e.g., chorus, band, orchestra, general music),
- address a diverse array of topics,
- take place in teachers' districts or schools,
- be spread over time (such as an academic year),
- allow opportunities for active learning, and
- be of a reform-type activity (e.g., teacher study group).

This list suggests certain formats, topics, and features of professional development that music teachers identified as aspects of their experiences that have made them

effective in enhancing their knowledge and skills for teaching. The strongest finding in the current study was the level of significance that teachers place on content in determining the effectiveness of their professional development experiences. An apparent paradox is that the results of the study suggest short workshops spread over time, given that teachers overtly state value for conference-type experiences, yet state that they valued professional development experiences that were distributed over time. This may connote that the content of state-level conferences is of high value to music teachers, but they understand the learning value of experiences that are distributed over time. In addition, topics desired depended upon most strongly upon participants' level of experience and area of specialization, particularly pedagogies for specific instruments or voice parts or topics for a specific ensemble.

Implications for Music Education

Findings from previous research (e.g., Bauer et al., 2009; Bowles, 2003; Bush, 2007; Conway, 2008), along with those in the current study, support that music teachers perceived that they must seek professional development that addressed their needs as music teachers outside of their school district. One possible implication, then, is that there is a continued need for school districts to offer professional development experiences that are specific to music teachers' needs as teachers and content specialists so that the professional development available to these teachers (sometimes the only professional development that they receive throughout the course of the school year) may more directly pertain to their teaching situations.

A related finding within the literature (Bauer et al., 2009; Bowles, 2003; Bush, 2007; Friedrichs, 2001; Parsad et al., 2012) was that teachers placed high priority on their

state music education conferences. State music education associations, then, should continue to lead through their high-quality offerings that assist teachers in remaining current on important pedagogical topics. They may look to expand and diversify these offerings through other avenues as well, perhaps through the formation of state-level or regional teacher study groups focused on a given topic. For these organizations, it could provide a low-cost alternative and afford the teachers involved the convenience of attending professional development close to their workplaces. Technology could also play a role through the use of Google Hangouts to hold virtual study groups that could also overcome the challenge of geography. Some state organizations (such as the New York State School Music Association) also offer for-credit experiences for additional fees for attending conferences, assisting teachers in meeting their recertification requirements.

In describing their own conceptions of the ideal professional development experience in the current study, the majority of teachers described an experience that mirrored the duration, content, and layout of these conferences. Therefore, an additional implication is that those people and organizations charged with providing professional development experiences for music teachers need to provide specialized professional development experiences that are relatively short in length and address their given areas of specialization. This structure mirrors in-service offerings commonly found in school districts and offered by state organizations. In particular, district staff concerned with professional development for music teachers could increase the relevance of their offerings by offering content-specific professional development, particularly that which allows music teachers to collaborate. These types of professional development may include sessions at in-service days, teacher study groups that run throughout the course of

the school year, and weekend clinics with expert music educators (some of whom may teach in the district).

While a larger financial consideration, providing music-specific professional development may also include the district paying fees associated with state conference attendance. Implementation of content-based professional development may also work to overcome the negative perceptions of music teachers of the relative utility of in-district professional development (Bauer et al., 2009; Bush, 2007; Friedrichs, 2001). This view appears to have changed little over the course of the past twenty years, as similar implications were discussed by others, particularly for early career music teachers (Conway, 2001; Conway & Christensen, 2006; Conway & Zerman, 2004; DeLorenzo, 1992). A possible explanation for this lack of change over time is that providing specialized professional development for content area teachers is expensive, and the intervening time between the studies cited above and the current study saw a national economic recession, thus limiting financial resources for the purposes of professional development.

An additional intervening event that could provide explanation is the implementation of the accountability clauses of the No Child Left Behind law that placed emphasis on assessing student achievement in reading and mathematics, and narrowed curricular focus in schools. However, recent literature (Elpus, 2014) suggests no significant differences in the number of students enrolling in high school music courses over the course of the enactment of this law. These two events over the course of the past decade could have contributed to changes in available funding for teacher professional development.

State music/ music education conferences and graduate coursework were the highest rated formats for professional development by music teachers, perhaps because they address the very issue identified above in that they provide music-specific professional development. One possible implication for those charged with professional development for music could be the implementation of collaborative teacher study groups. Educational research (Grossman et al., 2001; Stanley, 2009; Thomas et al., 1998; Wineburg & Grossman, 1998) has suggested that this vehicle could serve as a collaborative, low-cost professional development paradigm for districts. Additionally, this was mentioned as a preferred format by several participants in the current study. This model contains many of the features of professional development that previous research has identified as effective, while still focusing on content-specific pedagogy that music teachers have rated as valuable. This could also address music teachers' desires to discuss content and pedagogical issues with their colleagues (Bauer et al., 2009; Bush, 2007; Conway, 2008; Friedrichs, 2001).

This study also contrasts previous research with mathematics and science teachers (Garet et al., 1999, Garet et al., 2001) in its findings regarding collective participation of a department and coherence. This finding implies that music teachers may perceive their professional development needs differently from those of other teachers, particularly with respect to the focus on content, but also the length of the experience that they value. Further support for this idea is found in the fact that the findings of the current study and previous research conducted on the features of effective professional development with mathematics and science teachers (Garet et al., 1999; Garet et al., 2001) conflict as discussed above. Specifically, music teachers favored professional development

experiences such as conference sessions that previous studies found to be too short in length to result in meaningful instructional change. This implies that music teachers found different aspects of professional development to determine the effectiveness of their professional development to different degrees than their counterparts in other disciplines.

NAfME, state-level, and other professional music education organizations could provide important bridges to this gap through their conference offerings. *NAfME* has started to provide conference experiences that include traditional workshop sessions but are offered around a cohesive theme by area of specialization. Two examples are (a) the biennial research and music teacher education conference in St. Louis, and (b) the annual in-service conference held in Nashville. The 2015 theme for that conference is “Empower Creativity” (National Association for Music Education, 2014a). Given that theme, strands will be created for choral, band, orchestral, and general music educators that incorporate this theme into the content of the conference sessions.

Music educators placed high value on collaborating with other music teachers. Professional organizations looking to structure their conferences may explore ways of affording opportunities for collaboration within traditional structures such as sharing sessions. Another opportunity that *NAfME* has implemented is that of online spaces (such as discussion boards) where teachers of similar areas of specialization may interact.

Most (86.4%) participants reported that they engaged in some forms of individual learning throughout the year that included reading journals or other publications, or browsed the Internet. They also reported they commonly spent 20 or more hours engaged in those activities. Professional organizations could vet and diversify the

offerings dedicated to this purpose. *NAfME* has developed a Learning Network that offers webinars in several areas of interest: (a) advocacy, (b) band, (c) choral, (d) composition, (e) general interest, (f) general music, (g) guitar, (h) IN-ovations, (i) jazz, (j) orchestral, (k) special learners, and (l) teacher evaluation. This model allows individual teachers to target their learning experiences to fit their needs (National Association for Music Education, 2014b). Another example could include the American Orff-Schulwerk Association Website (American Orff-Schulwerk Association, 2014), which contains teaching videos produced by experts that members may access. This website also contains a bank of lesson plans. These examples provide music educators with high-quality options to customize their individual professional learning. Professional organizations are well advised to increase the scope and diversity of these types of offerings.

Data from the current study suggest that music educators commonly seek professional development outside of their school districts, despite their stated preferences that their ideal professional development experiences would be located at their school or in their district. One policy implication, then, is that teachers of all disciplines receive content-specific professional development. While the No Child Left Behind Act (2002) identified the arts as core academic subjects, participants in the current study ($N = 8$) have reported instances where music education related professional development had been pre-empted due to priorities in tested areas. This suggests a larger equity issue, especially when taking into consideration the current climate of teacher evaluation via student achievement measures. If all teachers are to be evaluated in part by these measures (such as Student Learning Outcomes or New York APPR process) then

content-specific professional development should play a role in familiarizing educators with the process as well as in providing support for identified instructional gaps.

Recommendations for Future Research

Bauer (2007) called for more research to be conducted on all aspects of professional development for music teachers. One suggestion for future research would be further examination of state effects on teachers' ratings of Enhanced Knowledge and Skills. While outside the scope of the current study, there appeared to be a sizeable effect for the state in which a teacher resided. For the analysis of question two, the omnibus F -test shrank from 8.37 to 2.09, while multiple R^2 increased from 0.076 to 0.272 with the inclusion of states in the model. Similarly, analysis of research question three revealed that the omnibus F -test shrank from 14.35 to 3.27, and that multiple R^2 increased from 0.219 to 0.424 with the inclusion of states in the model. In each case, overall statistical significance was not affected by the inclusion of states (for both models, $p < 0.001$). These findings suggest that the state in which a music teacher works could partially explain music teachers' ratings of enhanced knowledge and skills as a result of participation in professional development formats and the features of effective professional development that a given format possesses. This could be due to the state-based nature of education policy in the United States and the influence of state education agencies, as well as the relative strength of given music educators associations. In addition, the examination of differences in teachers' ratings at the state level could lend insight into best practices for state music associations, whose conferences were held in high esteem by teachers in the current study, as well as in previous research (Bauer et al., 2009; Bush, 2007; Friedrichs, 2001; Parsad et al., 2012).

More rigorous empirical methods (such as experimental and quasi-experimental designs) will further elucidate the effectiveness of given professional development conditions. Additionally, in-depth qualitative exploration of the implementation of new concepts learned in professional development may play a role in elucidating the processes by which teachers incorporate new techniques into their instruction. Penuel et al. (2007) echoed earlier calls for random assignment of teachers to professional development conditions to reduce threats to the internal validity of studies. Desimone (2009) also argued for the use of a common conceptual framework in professional development studies that measured the features of professional development suggested by previous literature. The use of more rigorous methods and clearer conceptual frameworks may indeed clarify what appear to be some conflicting opinions regarding effective professional development between mathematics and science teachers (Garet et al., 1999; Garet et al., 2001) and the music teachers surveyed in the current study. It may also provide an objective examination of the effects of effective professional development, as well as to test fidelity of implementation in the classroom (Penuel et al., 2007). When selecting methods for further research, care should be taken that the methods chosen lead to advancing knowledge on the topic of professional development rather than simply following a formula to arrive at causality or for the use of methods merely for their own sake.

Future research efforts should also continue to explore the features of professional development that affect changes in teachers' knowledge, skills, and practice. Desimone (2009) cited this as an important step in developing a common conceptual framework to improve impact studies in professional development. The results of the current study

with music teachers also conflicts with the findings of previous studies in mathematics and science education (Garet et al., 1999; Garet et al., 2001; Jeanpierre et al., 2005; Penuel et al., 2007) with regard to collective participation and coherence, suggesting that features of effective professional development may be viewed differently by teachers of given disciplines. These findings could differ from previous research because music teachers may perceive that different features of professional development affect the ability of professional development to enhance their knowledge and skills. This finding also punctuates the need for more rigorous methodologies (beyond survey methods) to investigate these features as discussed above.

Another possible strand of research could investigate the ways in which music teachers implement the content learned in professional development into their daily classroom work. If a fundamental motivation behind professional development is change in teaching practice (Fishman et al., 2003; Jeanpierre et al., 2005; Desimone, 2009), research should seek to determine whether certain formats and features of professional development bring about actual change in classroom practice. While some research has been conducted using teachers' self-reports, the use of qualitative methods to observe classrooms could lend valuable insight into teachers' application of concepts, and the levels of fidelity to which they implement them.

Several researchers (Fishman, et al., 2003; Penuel et al., 2007; Yoon et al., 2007) have stated that an important goal of research on professional development must be the measuring of the impact of those experiences on student achievement. Bauer (2007) echoed this need for research on music teachers. While some studies (Fishman et al., 2003; Penuel et al, 2007) have attempted to make this link and others (Yoon et al., 2007)

have attempted to delineate patterns within existing research, this premise still appears to hold. Therefore, future research into formats and features for effective professional development should link given practices to student outcomes, the eventual goal of teacher learning.

Appendices

Appendix A. *Correspondence E-mails for Teachers and Principals.*

Dear [Teacher]:

Hello! My name is Brian Schneckenburger, and I am a Candidate for the Doctor of Philosophy degree in Curriculum and Instruction/ Music Education at The University of Maryland, College Park, under the advisement of Dr. Michael Hewitt. I am contacting you today to ask for your participation in a study on professional development for music teachers that I am conducting as part of my program. Your school was drawn at random from a database of all of the schools in the United States. The purpose of the study is to describe the self-reported professional development activities of music teachers in the United states, and to determine whether selected formats and features of professional development experiences commonly available to music teachers are significant predictors of music teachers' self-reported changes in knowledge and skills. The research questions guiding this study are:

1. According to music teachers, what professional development formats or activities do music teachers commonly engage in, and how much time did they spend during the 2012-2013 school year engaged in those activities?
2. Does participation in certain professional development formats (out-of-district music/ music education conference, workshop sponsored by a college/ university, in-district professional development workshop, graduate coursework) predict music teachers' self-reported enhancements in knowledge and skills?
3. Which, if any, of six core and structural features of professional development (reform type, duration, collective participation, content focus, active learning, and coherence) are significant predictors of music teachers' self-reported enhancements in knowledge and skills?

Your participation in this study could provide valuable information and insight into the effectiveness of various types of professional development that are currently available to music teachers. Your role in this research would be to complete an online survey to be sent in a subsequent e-mail. I am asking for your assistance in this project so that I may reach a large, representative sample of music teachers from diverse teaching backgrounds to assemble a vivid description of professional development.

As an incentive for your participation, you will have the opportunity to enter a drawing for a \$50 amazon.com gift card. If you are interested in participating in this study or have any questions, please simply reply to this e-mail. Thank you for your time and consideration.

Sincerely,

Brian K. Schneckenburger
Ph.D. Candidate, Music Education
The University of Maryland
Telephone: (443) 935-8603
E-mail: bschneck@umd.edu

Dear [Principal]:

Hello! My name is Brian Schneckenburger, and I am a Ph.D. candidate in music education at the University of Maryland. I am contacting you today because I am conducting research on professional development for music teachers, and your school was randomly selected from a national database of schools. I was wondering whether your school employed a music teacher, and if so, I could contact that person via e-mail for the purposes of inviting them to participate in a brief online survey. Thank you in advance for any assistance.

Sincerely,

Brian Schneckenburger
Ph.D. Candidate, Music Education
The University of Maryland
Telephone: (443) 935-8603
E-mail: bschneck@umd.edu

Appendix B. *Invitation and Reminder E-mails.*

Dear [Teacher]:

Hello! This is a research project being conducted by Brian Schneckenburger, Ph.D. candidate in Curriculum and Instruction/ Music Education at the University of Maryland. You are being invited to participate in this research because you are an in-service music educator, and we are studying music teachers' self-reports of the effectiveness of various types of professional development.

The purpose of the study is to describe the self-professional development activities of music teachers in the United States, and to determine whether selected formats and features of professional development experiences commonly available to music teachers are significant predictors of music teachers' self-reported changes in knowledge and skills. The research questions guiding this study are:

1. According to music teachers, what professional development formats or activities do music teachers commonly engage in, and how much time did they spend during the 2012-2013 school year engaged in those activities?
2. Does participation in certain professional development formats (out-of-district music/ music education conference, workshop sponsored by a college/ university, in-district professional development workshop, graduate coursework) predict music teachers' self-reported enhancements in knowledge and skills?
3. Which, if any, of five core and structural features of professional development (reform type, duration, collective participation, content focus, active learning, and coherence) are significant predictors of music teachers' self-reported enhancements in knowledge and skills?

Your participation in this study could provide valuable information and insight into the effectiveness of various types of professional development that are currently available to music teachers. I am a music educator who has served for thirteen years as a public school instrumental music teacher, and am concerned with effective professional development after my own experiences. Your role in this research would be to complete an online questionnaire about professional development that you have engaged in over the past year by clicking on the following link, or pasting it into your browser:

<https://www.surveymonkey.com/s.aspx>

I am therefore asking for your honest responses to assist in determining whether selected formats and features of development are effective.

As an incentive for your participation, you will have the opportunity to enter a drawing for a \$50 Amazon.com gift card. To do so, simply provide your e-mail address at the end of the survey. Notification of winning is the only reason for which your e-mail address will be used. A name will be drawn at random, and the winner will be notified via e-mail.

Questions regarding this research may be directed via e-mail to bschneck@umd.edu, or at the telephone number listed below. Thank you for your time and consideration.

Sincerely,

Brian K. Schneckenburger
Ph.D. Candidate, Curriculum and Instruction/ Music Education
The University of Maryland
Telephone: (443) 935-8603
E-mail: bschneck@umd.edu

Your participation in this research is entirely voluntary. To opt out of this research project, please click the following link: <https://www.surveymonkey.com/optout.aspx>

Dear [Teacher]:

Hello! One week ago, you were sent an invitation to participate in a survey being conducted about professional development for music teachers. To date, we haven't received your response.

Your participation in this study could provide valuable information and insight into the effectiveness of various types of professional development that are currently available to music teachers. To access the questionnaire, please click on the following link, or paste it into your web browser:

<https://www.surveymonkey.com/s.aspx>

As an incentive for your participation, you will have the opportunity to enter a drawing for a \$50 Amazon.com gift card. To do so, simply provide your e-mail address at the end of the survey. A name will be drawn at random, and the winner will be notified via e-mail.

Please contact me using the information below with any questions. Thank you for your participation in this study.

Sincerely,

Brian K. Schneckenburger
Ph.D. Candidate, Curriculum and Instruction/ Music Education
The University of Maryland
Telephone: (443) 935-8603
E-mail: bschneck@umd.edu

Your participation in this research is entirely voluntary. To opt out of this research project, please click the following link: <https://www.surveymonkey.com/optout.aspx>

Dear [Teacher]:

Hello! This is a final reminder to complete your survey regarding professional development for music teachers. We haven't received your response yet, and hope that you will consider participating while there is still time left!

Your participation in this study could provide valuable information and insight into the effectiveness of various types of professional development that are currently available to music teachers. To access the questionnaire, please click on the following link, or paste it into your web browser:

<https://www.surveymonkey.com/s.aspx>

Please also remember that upon completion of the survey, you will have the opportunity to enter a drawing for the \$50 amazon.com gift card.

Please contact me using the information below with any questions, and thank you for your participation.

Sincerely,

Brian K. Schneckenburger
Ph.D. Candidate, Curriculum and Instruction/ Music Education
The University of Maryland
Telephone: (443) 935-8603
E-mail: bschneck@umd.edu

Your participation in this research is entirely voluntary. To opt out of this research project, please click the following link: <https://www.surveymonkey.com/optout.aspx>

Appendix C. *Music Teacher Professional Development Survey.*

Introduction/ Consent

This is a research project being conducted by Brian Schneckeburger at the University of Maryland, College Park. You are being invited to participate in this research because you are an inservice music educator, and the project explores music teachers' self-reports of the effectiveness of various formats and features of professional development that are commonly available to music educators.

You will be asked to complete an online questionnaire about your experiences in professional development over the course of the 2012-2013 school year, including questions about different types of professional development in which you have participated over the past year and your views on the relative effectiveness of various aspects of your professional development in enhancing your knowledge and skills as a teacher. The survey will take 15 to 20 minutes to complete.

We will do our best to keep your personal information confidential. To help protect your confidentiality, your data will be assigned a numerical code for analysis purposes. Only group results will be reported.

There are no known risks associated with this project.

Your participation will help us to describe the current types of professional development available to music educators on a national scale. It will also provide insights into the formats of professional development and the features of effective professional development that predict changes in music teachers' knowledge and skills.

Questions regarding this research may be directed to myself or my advisor:

Brian Schneckeburger, PhD Candidate, Music Education
The University of Maryland
2601 Wendover Road
Parkville, MD 21234
Telephone: (443) 935-8603
E-mail: bschneck@umd.edu

Advisor:
Dr. Michael Hewitt, Music Education Division
2110 Clarice Smith Performing Arts Center
School of Music
The University of Maryland
College Park, MD 20742
Telephone: (301) 405-5504
E-mail: mphewitt@umd.edu

Clicking the button below indicates that:

- you are at least 18 years of age;
- the research has been explained to you;
- your questions have been answered; and
- you freely and voluntarily choose to participate in this research project.

Thank you for your participation!

(Continued)

Section I: Professional Development Activities

There are three parts to this questionnaire that will ask you about your professional development activities during the 2012-2013 school year.

Below are definitions of terms used throughout the survey:

"District" refers to the central governing entity for a group of associated schools. For example, central/unified/ independent school district, county school system, etc.

"Professional Development" is a set of learning activities, the purported purpose of which is to enhance the knowledge and skills of teachers.

The questions on the following pages ask about professional development that you have participated in relative to your music teaching. When considering your answers, please consider the following guidelines:

* Please report all professional development you participated in since June 1, 2012.

These categories of professional development in the questions below are being treated as mutually exclusive so please report hours for each activity under one category only.

For example, if you attended a workshop at a conference, please report the hours either as a workshop or conference but not both.

(Continued)

1. In the past year, did you participate in any of the following types of professional development related to your music teaching?

	Did you participate?	Number of Hours Since June 1, 2012
Did you attend a workshop or institute that focused on a specific topic and was provided by the district? (Example: Music and Literacy Connections)	<input type="text"/>	<input type="text"/>
Did you take courses for which you received college credit?	<input type="text"/>	<input type="text"/>
Did you attend out-of-district workshops and institutes, focused on a specific topic?	<input type="text"/>	<input type="text"/>
Did you participate in teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally?	<input type="text"/>	<input type="text"/>
Did you attend any out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.?	<input type="text"/>	<input type="text"/>
Did you receive mentoring, coaching, observation, in a one-on-one situation, usually in the classroom/ rehearsal setting?	<input type="text"/>	<input type="text"/>
Did you receive professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher?	<input type="text"/>	<input type="text"/>
Did you serve on a committee or task force that focused on curriculum, instruction, or student assessment?	<input type="text"/>	<input type="text"/>
Did you participate in a teacher study group that met regularly, in face-to-face meetings, to further your knowledge in your discipline or pedagogical approaches?	<input type="text"/>	<input type="text"/>

Other forms of organized professional development related to your music teaching. (Do not include reading or other work that you have done on

(Continued)

your own.)

(Continued)

Section I: Professional Development Activities

2. Since June 1, 2012, did you participate in any of the following types of individual professional development related to your music teaching?

	Did you participate?	Number of Hours Since June 1, 2012
Action research project, in which you examined your own teaching and your students' learning.	<input type="checkbox"/>	<input type="checkbox"/>
Individual learning, in which you read journals or other professional publications, browsed the internet, etc.	<input type="checkbox"/>	<input type="checkbox"/>
Other forms of individual professional development related to your music teaching.	<input type="text"/>	

(Continued)

Section II: Description of One Professional Development Activity

The following questions ask you to identify and describe a professional development activity in which you participated over the past year.

In answering questions about the identified activity, please include all components of the activity, even if they occurred at different times during the year. (For example, if the activity was a summer institute with follow-up during the school year, include both the summer institute and the follow-up with your answers.)

3. Please select a professional development format from the drop-down menu below. You will provide an in-depth description of this activity through your responses to the questions in this section. If you have participated in more than one of these formats, please select that which you have most recently participated in.

Professional Development
Format

4. Please describe the activity in question 3 in one or two sentences.

5. Which of the following best describes the activity? Choose only one response. If more than one response fits the activity, pick the response that describes the aspect of the activity in which you spent the most time.

- a. Participation in an in-district workshop or institute
- b. Taking graduate coursework
- c. Attendance at an out-of-district workshop or institute
- d. Participation in a teacher collaborative or network
- e. Attendance at an out-of-district conference
- f. Working in an internship or immersion activity
- g. Working with a mentor, coach, lead teacher, or observer
- h. Use of a teacher resource center
- i. Participation on a teacher committee or task force
- j. Participation in a teacher study group
- k. Other (please specify)

(Continued)

Section II: Description of One Professional Development Activity

6. As part of the professional development activity, including any preliminary and follow-up sessions, did you have the opportunity to try out what you learned in your classroom and obtain feedback or guidance?

1. Yes
 2. No

7. How did this professional development activity help you to use new skills in your classroom? (Check all that apply.)

- a. Practiced under simulated conditions, with feedback
 b. Received coaching or mentoring in the classroom
 c. Met formally with other activity participants to discuss classroom implementation
 d. My teaching was observed by the activity leader(s) and feedback was provided
 e. My teaching was observed by other participants and feedback was provided
 f. Communicated with leaders of the activity concerning classroom implementation
 g. Students' work was reviewed by other participants or the activity leader
 h. Met informally with other participants to discuss classroom implementation
 i. Developed curricula or lesson plans which other participants or the activity leader reviewed
 j. None of these supports were provided

k. Other (please specify)

(Continued)

Section II: Description of One Professional Development Activity

8. Over what period of time did the activity take place, including the primary activity and any formal preliminary or follow-up sessions?

- a. Less than one day
- b. One day
- c. Two-four days
- d. A week
- e. A month
- f. More than a month

9. In what month or months did the activity (including any preliminary or follow-up sessions) take place? Check the appropriate months below.

- | | | |
|---|--|-------------------------------------|
| <input type="checkbox"/> June 2012 | <input type="checkbox"/> November 2012 | <input type="checkbox"/> April 2013 |
| <input type="checkbox"/> July 2012 | <input type="checkbox"/> December 2012 | <input type="checkbox"/> May 2013 |
| <input type="checkbox"/> August 2012 | <input type="checkbox"/> January 2013 | <input type="checkbox"/> June 2013 |
| <input type="checkbox"/> September 2012 | <input type="checkbox"/> February 2013 | |
| <input type="checkbox"/> October 2012 | <input type="checkbox"/> March 2013 | |

10. Amount of time engaged in the activity:

	Number of Hours
Between June 1, 2012 and the present, including the main activity and any preliminary activities or formal follow-up sessions, how many hours were you engaged in this activity overall?	<input type="text"/>
How many hours do you expect to be engaged in this activity between now and the end of the school year?	<input type="text"/>

11. Did this professional development activity continue after the end of the 2012-2013 school year?

- 1. Yes
- 2. No

(Continued)

Section II: Description of One Professional Development Activity

12. How much emphasis did the activity give to each of the following areas?

	0 - No Emphasis	1 - Minor Emphasis	2 - Major Emphasis
a. Curriculum (e.g., units, texts, standards)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Instructional Methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Approaches to assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Use of technology in instruction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Deepening your knowledge of music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Leadership development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Other (please specify)	<input type="text"/>		

(Continued)

Section II: Description of One Professional Development Activity

13. Did the activity focus on any of the following content-related topics? (Check all that apply.)

- a. Grant Writing
- b. Assessment
- c. Advocacy
- d. Conducting or Rehearsal Techniques
- e. Music Literature
- f. World Musics/ Multicultural Music Education
- g. Teaching Improvisation
- h. Teaching Composition
- i. Standards-Based Teaching
- j. Pedagogies for Specific Instrument/ Voice Part
- k. Music Technology
- l. Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)
- m. Early Childhood Music Topics
- n. Elementary or Secondary General Music topics
- o. Research Applications to Teaching Practice
- p. Music for Special Learners
- q. The activity did not focus on music content
- r. Other (please specify)

(Continued)

Section II: Description of One Professional Development Activity

14. Did the activity focus on developing your capacity to use any of the following instructional methods in your music teaching? (Check all that apply.)

- a. Specific rehearsal techniques or strategies
- b. Student-guided composition projects
- c. Tasks that develop music composition skills
- d. Arts Integration
- e. Implementing world music into the music classroom/ rehearsal setting
- f. Teaching techniques for a specific instrument/ voice
- g. Technology in music instruction

15. Did the activity focus on developing your capacity to use any of the following forms of student assessment in your music teaching? (Check all that apply.)

- a. Objective tests (e.g., multiple choice, true/ false, short answer)
- b. Essay tests
- c. Performance tasks or events
- d. Systematic observation of students
- e. Music reports (e.g., research paper on a composer/ genre)
- f. Music projects (e.g., compositions)
- g. Analysis of student work for the purposes of charting student progress
- h. Portfolios
- i. The activity did not focus on student assessment
- j. Other (please specify)

(Continued)

16. Did the activity focus on improving your capacity to use any of the following forms of technology in your teaching? (Check all that apply.)

- a. Use of computers for composition purposes
- b. Recording/ mixing/ sequencing/ producing music
- c. Creating a podcast
- d. Web site design
- e. Use of music notation software (Finale or Sibelius)
- f. Use of assessment software (Auralia, Musition, Alfred's Essentials, etc.)
- g. Digital media (presentations, digital video or audio)
- h. Computers for drill and practice on skill acquisition (Practica Musica, etc.)
- i. Use of electronic instruments or MIDI
- j. Music education apps for Android or iOS
- k. The activity did not focus on technology
- l. Other (please specify)

(Continued)

Section II: Description of One Professional Development Activity

17. Who led this activity? (Check all that apply.)

- a. Music teacher from your school
- b. Other music teacher
- c. District staff
- d. State staff
- e. Professional development expert or consultant
- f. Don't know
- g. Other (please specify)

18. Which of the following descriptors characterize the participants in this activity? (Check all that apply.)

- a. Teachers as individuals
- b. Teachers as representatives of their departments, grade level, or school
- e. Other (please specify)

(Continued)

Section II: Description of One Professional Development Activity

19. Which of the following did you engage in during the activity? (Check all that apply.)

- a. Listened to a lecture
- b. Observed a demonstration of a lesson or unit
- c. Participated in whole-group discussion
- d. Participated in small-group discussion
- e. Gave a lecture or presentation
- f. Demonstrated a lesson, unit, or skill
- g. Led a whole-group discussion
- h. Led a small-group discussion
- i. Engaged in extended rehearsal or problem solving
- j. Wrote a paper, report, or plan
- k. Practiced using student materials
- l. Developed or reviewed music curriculum materials
- m. Reviewed student work
- n. Scored assessments
- o. Collaborated as a colleague with musicians
- p. Used technology (computers, multimedia, or the internet)
- q. Performed as a musician on your major instrument or voice part
- r. Other (please specify)

(Continued)

Section II: Description of One Professional Development Activity

20. The following questions ask about your actions as a result of participation in this activity.

Select Yes or No

Did you develop a plan to integrate what you learned into your classroom practice as part of this activity?

Have you discussed what you learned with other teachers in your school or department who attended the activity?

Have you discussed what you learned with other teachers in your school or department who did not attend the activity?

Have you discussed what you shared or learned with administrators (e.g., principal or department chair)?

Outside of formal meetings held as a part of the activity, have you communicated with participants of the activity who teach in other schools?

(Continued)

Section II: Description of One Professional Development Activity

21. To what extent was the professional activity:

	1 - Not at all	2 - Minor Extent	3 - Neutral	4 - Moderate Extent	5 - Great Extent	na - Not Applicable
a. Consistent with your own goals for your professional development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Consistent with your school's or department's plan to change practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Based explicitly on what you had learned in earlier professional development experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Followed up with activities that built upon what you learned in this professional development activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Designed to support state or district standards/ curriculum frameworks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Designed to support state or district assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Continued)

Section II: Description of One Professional Development Activity

22. How was the activity evaluated? (Check all that apply.)

- a. Participants completed a survey
- b. Participants were interviewed to provide feedback
- c. The session was observed by an evaluator
- d. My classroom was observed
- e. Student outcomes in my classroom were evaluated
- f. No discernible evaluation took place
- g. Other (please specify)

(Continued)

Section II: Description of One Professional Development Activity

23. To what extent do you feel that your knowledge and skills have been enhanced in each of the following areas as a result of your participation in the identified professional development activity?

	1 - Not at All	2 - Minor Extent	3 - Neutral	4 - Moderate Extent	5 - Great Extent
a. Curriculum (e.g., units, texts, standards)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Instructional methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Approaches to assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Use of technology in music instruction (e.g., multimedia, composition, web)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Deepening knowledge of music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Leadership development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Adapting teaching to meet national, state, or district assessment requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Adapting teaching to meet national, state, or district standards or curriculum framework requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Learning about national, state, or district assessments in professional development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Learning about national, state, or district standards in curriculum frameworks in professional development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

l. Other (please specify)

(Continued)

Section II: Description of One Professional Development Activity

24. If you had the opportunity to design the ideal professional development activity, what would it be? Who would participate, How long would it be? Where would it take place? Please write your description in the space below.

(Continued)

Section III: Teacher Background and Workload

Reminder: Please answer these questions in terms of the 2012-2013 school year.

25. Please indicate your gender.

1. Female
 2. Male

26. Please indicate your ethnicity/ race. (Check one response.)

1. American Indian or Alaskan Native
 2. Asian or Pacific Islander
 3. African American, not of Hispanic origin
 4. White, not of Hispanic origin
 5. Hispanic
6. Other (please specify)

27. How many years of teaching experience do you have?

Years of Teaching Experience

a. Teaching

b. Teaching Music

28. What is your highest earned degree?

- a. Bachelor's
 b. Master's
 c. Doctorate

29. Do you belong to the National Association for Music Education (NAfME, formerly MENC)?

1. Yes
 2. No

30. What was your undergraduate degree major? (Check all that apply.)

- Music Education Music Performance Music theory/ composition Music history Jazz Studies Sacred Music

Other (please specify)

(Continued)

31. The school district in which you teach could best be described as

- 1. Urban
- 2. Suburban
- 3. Rural

32. Do you teach in a public or private school setting?

- 1. Public
- 2. Private

33. Did you teach in the same school during the 2012-2013 school year?

- 1. Yes
- 2. No

(Continued)

Section III: Teacher Background and Workload

34. Indicate the extent to which you taught the following music classes during the 2012-2013 school year. (Check one on each line.)

	0 - None/ Never	1 - Rarely	2 - Occasionally	3 - Primary Responsibility
a. Band	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Strings/ Orchestra	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Choir	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Jazz Ensemble	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Group Instrumental/ Voice lessons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. General Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Music History	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Music Appreciation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Music Theory (including AP, IB)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Music Technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Non-music class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

k. Other (please specify)

(Continued)

Section III: Teacher Background and Workload

Entry for \$50 Amazon.com Gift Card

35. To enter the drawing for the \$50 Amazon.com gift card, please enter your e-mail address in the space below.

(Continued)

Appendix D. *Permission E-mail Messages for Survey Instruments.*

Subject: RE: AIR Contact Form: Teacher Activity Survey from Evaluation of Eisenhower Program
Date: Monday, June 4, 2012 12:00:31 PM ET
From: Gareth, Mike
To: Brian Keith Schneckenburger
CC: Yoon, Kwang_Suk

Hi,

Thanks for your note. I'll look forward to hearing more about your dissertation. Will it involve PD in music education?

I'm cc'ing my colleague Kwang Yoon, who can provide the surveys, which you can definitely use. Our only request is that you cite their source in the Eisenhower evaluation, of course.

Thanks,

Mike

From: bschneck@umd.edu [mailto:bschneck@umd.edu]
Sent: Monday, June 04, 2012 11:50 AM
To: Gareth, Mike
Subject: AIR Contact Form: Teacher Activity Survey from Evaluation of Eisenhower Program

AIR Contact Form: Teacher Activity Survey from Evaluation of Eisenhower Program

Name: Brian Schneckenburger

Email: bschneck@umd.edu

Message:

Dear Dr. Gareth: Hello! My name is Brian Schneckenburger, and I am a doctoral candidate in curriculum and instruction/ music education at the University of Maryland, College Park. I am contacting you today in interest of learning more about the Teacher Activity Survey that you and your colleagues used in your evaluation of the Eisenhower program. Is there a way that I could review a copy of the instrument, and what would the process be if I were interested in obtaining permission to use/ alter the instrument for the purposes of use in a dissertation study? Thank you very much for any assistance, and for the work that you do. Sincerely, Brian Schneckenburger PhD Candidate, Music Education The University of Maryland, College Park

Subject: Re: Your questionnaire from 2009

Date: Wednesday, June 27, 2012 3:00:13 PM ET

From: William Bauer

To: Brian Keith Schneckenburger

Hi Brian,

Thanks for the copy of your results. We are glad to grant you permission to use the instrument again.

Best Regards,

Bill Bauer

William I. Bauer, Ph. D.

Director of Music Education & Associate Professor

216.368.2431

<http://billbauer.net>

On Wed, Jun 27, 2012 at 2:40 PM, Brian Keith Schneckenburger <bschneck@umd.edu> wrote:

Dear Dr. Bauer:

Hello! My name is Brian Schneckenburger, and I am a doctoral candidate in Music Education at the University of Maryland, where Dr. Michael Hewitt is my advisor. I am writing today for two reasons:

1) In 2009, you approved my use and alteration of the survey instrument that you and Drs. Forsythe and Kinney used for your study published in 2009. In gratitude, I have enclosed a copy of my final report. While my response rate was terrible, the findings mirror past studies.

2) The second reason that I am writing is to ask your permission to again use this instrument. I am in the process of writing my study proposal, and would like specifically to use some of the language from it concerning demographics and topics.

Thank you for any assistance, and best wishes for a relaxing summer.

Sincerely,

Brian K. Schneckenburger
Ph.D. Candidate, Music Education
The University of Maryland
[443.935.8603](tel:443.935.8603) (Cell)

Appendix E. *Codes for Chi-Square Analyses.*

Variable	Symbol	Coding
Gender	Gender	1 = Male, 2 = Female
Membership in the National Association for Music Education	NAfME Member	1 = Member, 2 = Non-Member
Primary Teaching Responsibility	Teaching Area	1 = Band (Includes jazz, lessons), 2 = General Music, 3 = Choral Music (includes lessons), 4 = Orchestra (includes lessons), 5 = Band/ General Music, 6 = Vocal/ General Music, 7 = Instrumental Music (band, orchestra, lessons), 8 = Performance Classes (Chorus, Band, Orchestra), 9 = Strings/ General Music, 10 = Multiple classes (Instrumental, Choral, General)
Number of Years Teaching Experience	Years Teaching	1 = Less than 4 Years, 2 = 4-9 Years, 3 = 10-14 Years, 4 = 15 or more years
Level of Education	Education	1 = Bachelor's, 2 = Master's, 3 = Doctorate
School Location	Location	1 = Urban, 2 = Suburban, 3 = Rural
Professional Development Format	PD Format	1 = Out-of-district music/ music education conference, 2 = In-district professional development workshop, 3 = Workshop Sponsored by a College or University, 4 = Graduate Coursework
Grade Level	Grade Level	1 = Elementary (only grades Pre-K through 6), 2 = secondary (only grades 7 through 12), 3 = combined (any combination of elementary and secondary grades)

Appendix F. *Variable Definitions for Music Teacher Professional Development Survey.*

Variable	Symbol	Coding
Format	Format	1= out-of-district professional music/ music education conference, 2= workshop sponsored by a college or university, 3= in-district professional development workshop, 4=graduate coursework (includes online courses)
Type	AType	Activity Type (1=Traditional, 2=Reform) Defined as follows: If Q5a=1 or Q5b=1 or Q5c=1 or Q5e=1 then AType=1 Else AType=2
Time Span	Time_Span	1= < a day, 2= a day 3= 2-4 days, 4= a week, 5= a month, 6= 2-5 months, 7= 6-9 months, 8= 10-12 months, 9= over a year. Derived from a combination of Q8 cat and Q9
Contact Hours	contact_hrs	Hours Defined as Q10a+Q10b
Active Learning	ALEARN	$ALEARN = (Q7a+Q7c+Q7f+Q7h+Q7i) + 1.25*(Q7b+Q7d+Q7e+Q22d) + (Q19e+Q19f+Q19g+Q19h+Q19j) + 1.25*(Q19m+Q19n+Q7g+Q22e)$
Coherence	COHERENCE	$COHERENCE = 1.5*(Q21e+Q21f) + (Q21a+Q21c+Q21d) + (Q20c+Q20d+Q20e)$
Collective Participation (Pilot test only)	SCH_BASE	$SCH_BASE = 0 \text{ to } 2$ $Q18c+Q18d$
Content Focus	Content	If Q13q=1 the Content= 0, all else content=1
Enhanced Knowledge and Skills	EKS	$EKS = (Q23a+Q23b+Q23c+Q23d+Q23e+Q23f)/6$

Note. Q= Question Number.

Appendix G. *Regression Assumption Tests for Research Question Two.*

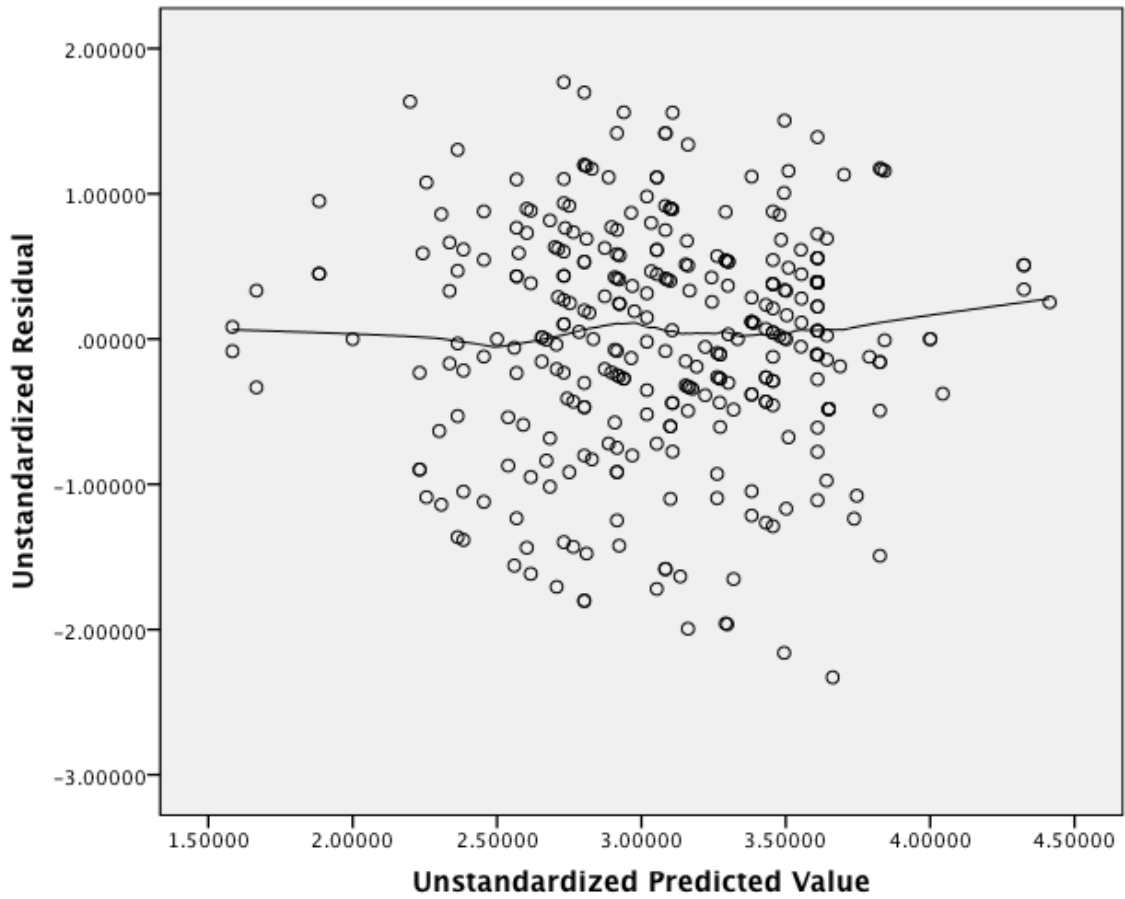


Figure G1. Linearity Assessment Plot with Loess Line for Research Question Two.

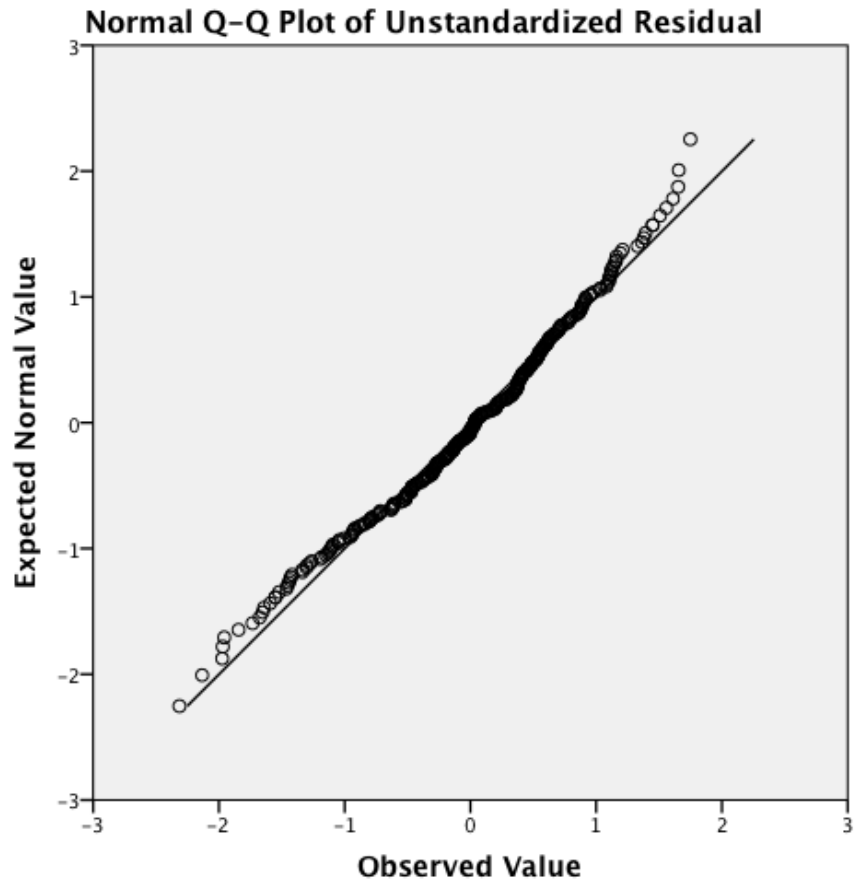


Figure G2. Q-Q Plot of Unstandardized Residuals for Research Question Two.

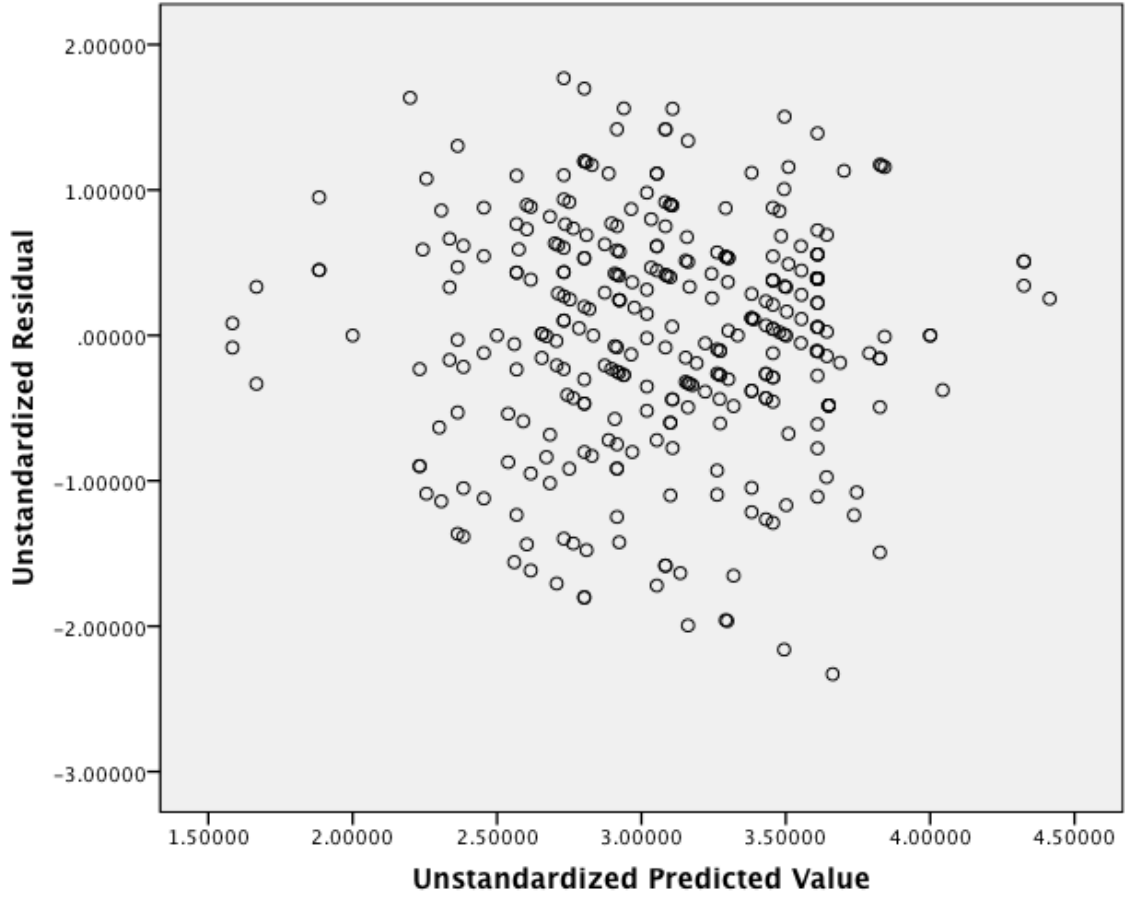


Figure G3. Plot of Unstandardized Residual versus Unstandardized Predicted Value to Assess Homoscedasticity Assumption for Research Question Two.

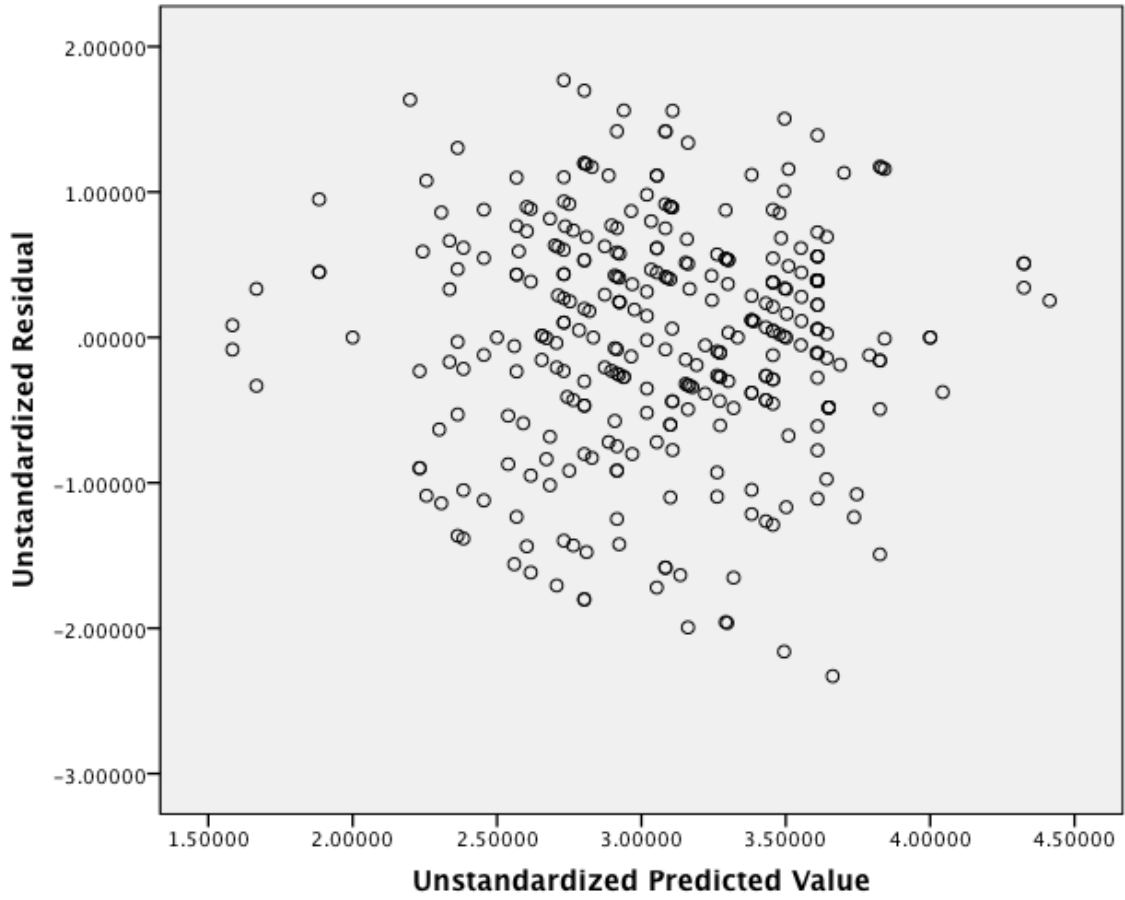


Figure G4. Plot of Unstandardized Residual by Case Number for Research Question

Two.

Appendix H. *Regression Assumption Tests for Research Question Three.*

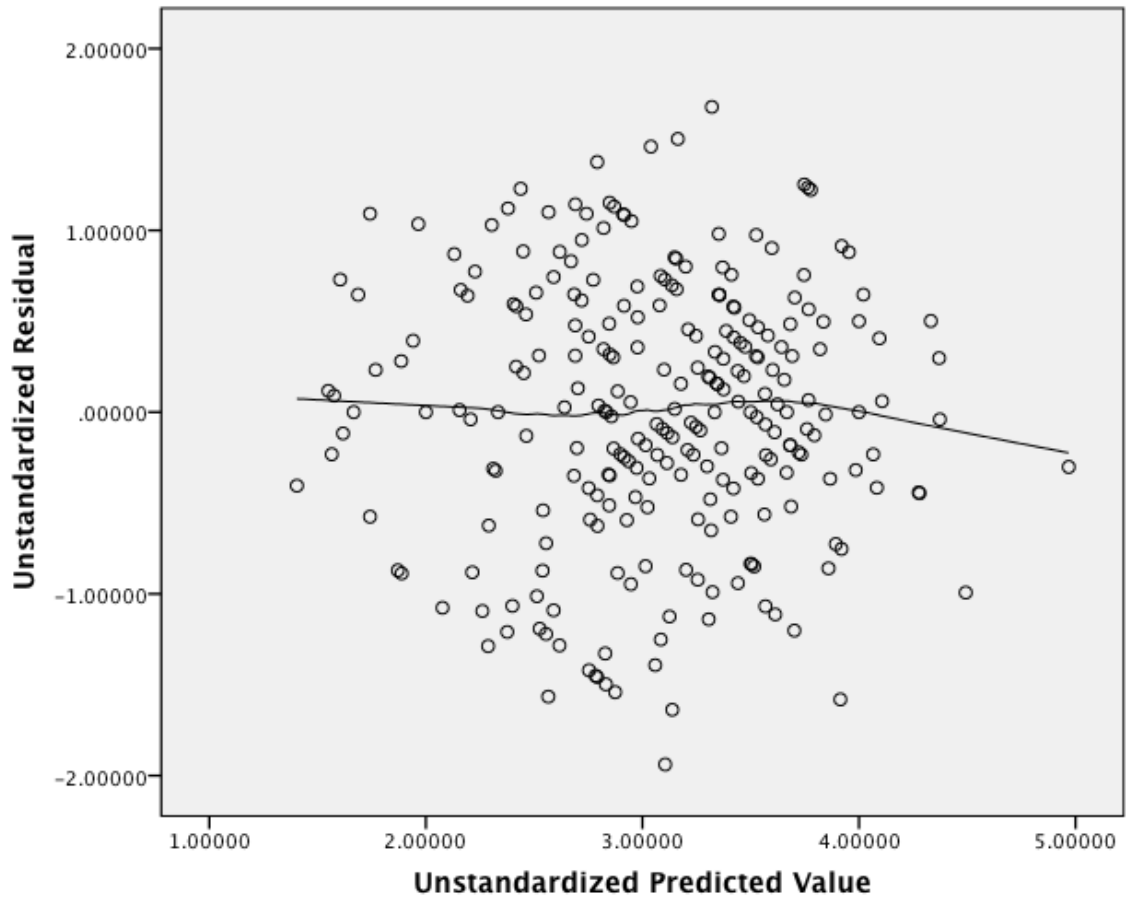


Figure H1. Linearity Assessment Plot with Loess Line for Research Question Three.

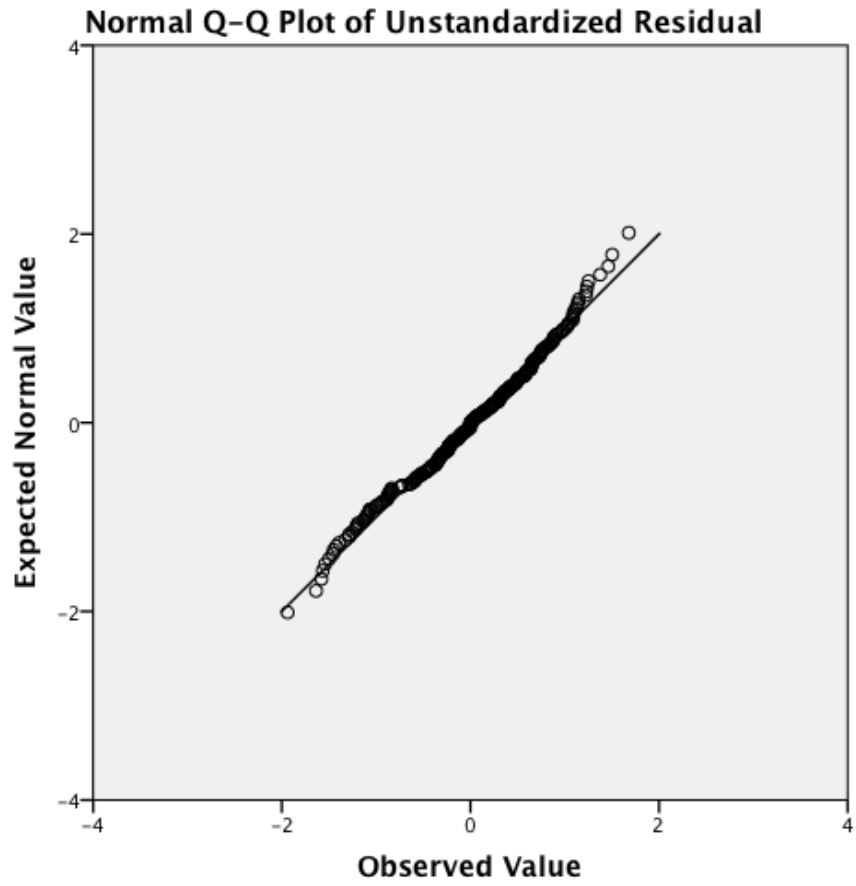


Figure H2. Q-Q Plot of Unstandardized Residuals to Assess Normality Assumption for Research Question Three.

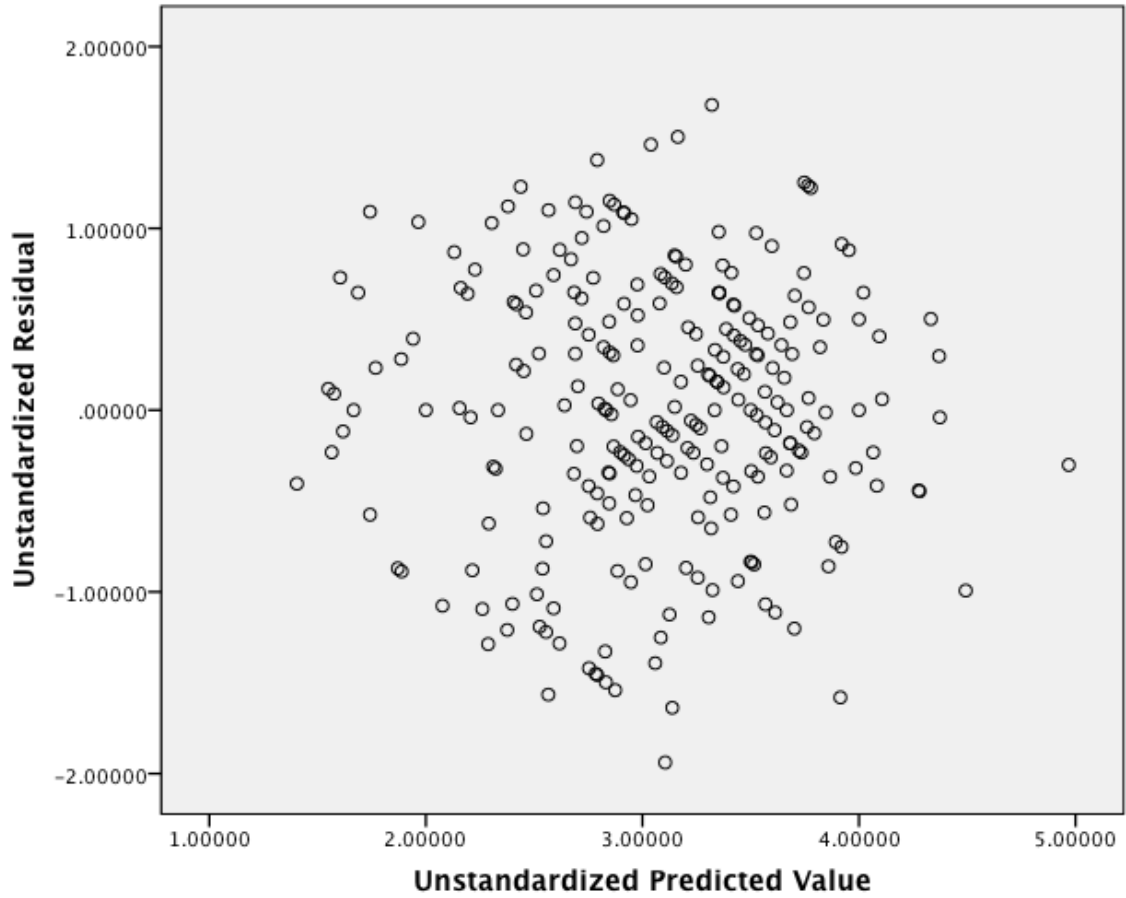


Figure H3. Plot of Unstandardized Residual versus Unstandardized Predicted Value to Assess Homoscedasticity Assumption for Research Question Three.

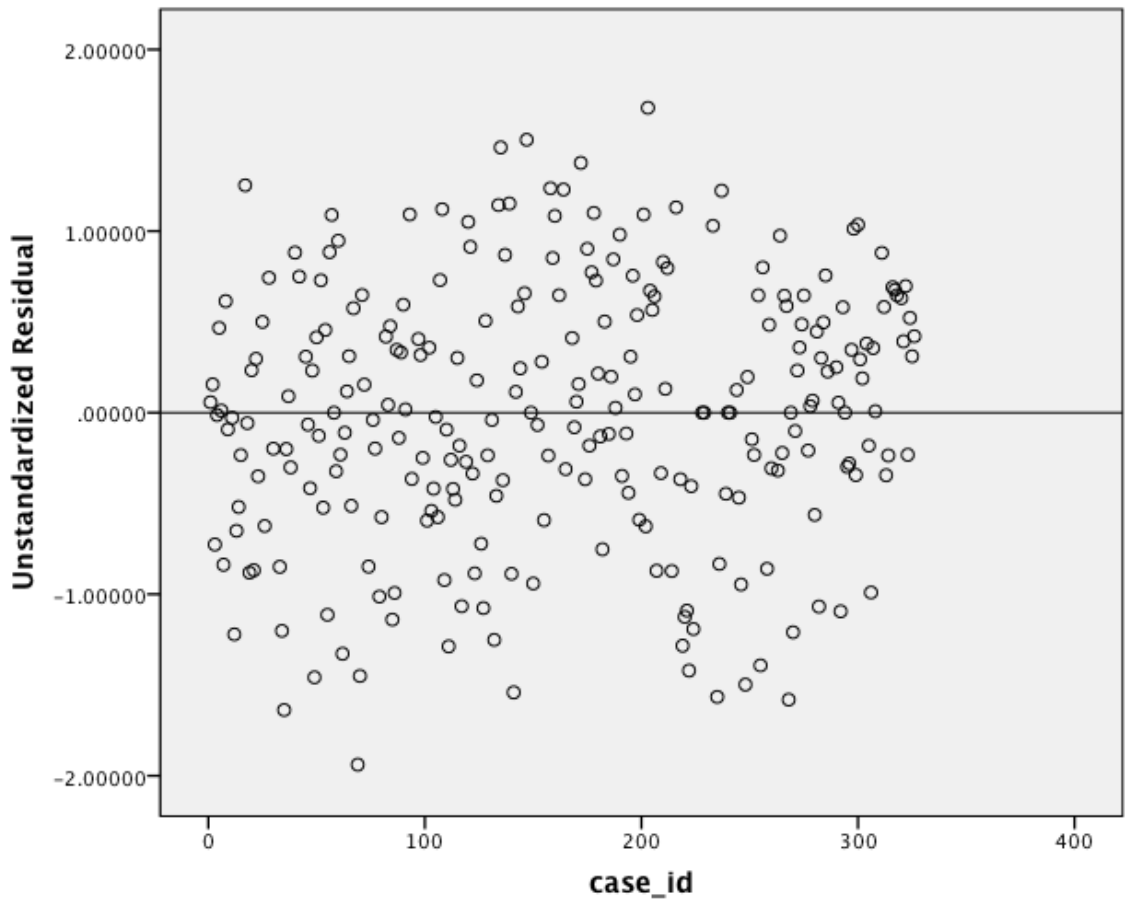


Figure H4. Plot of Unstandardized Residual by Case Number for Research Question Three.

Appendix I. *Number of Participants by State.*

Table I1. *Number of Participants by State*

State	Completed Responses (<i>N</i> = 326)	All Responses (<i>N</i> = 493)	Nonrespondents (<i>N</i> = 1,764)
Alaska	0	0	3
Alabama	1	1	7
Arkansas	7	10	25
Arizona	5	8	23
California	19	26	94
Colorado	4	7	44
Connecticut	3	3	17
District of Columbia	2	2	7
Delaware	2	4	4
Florida	8	11	63
Georgia	16	20	65
Hawaii	0	2	0
Iowa	9	14	29
Idaho	2	4	8
Illinois	17	29	84
Indiana	8	10	42
Kansas	5	6	17
Kentucky	6	9	28
Louisiana	1	2	19
Massachusetts	8	13	45
Maryland	9	13	11
Maine	5	5	12
Michigan	17	21	73
Minnesota	7	14	53
Missouri	5	7	43
Mississippi	1	2	8
Montana	2	2	13
North Carolina	7	11	51
North Dakota	1	1	7
Nebraska	6	7	22
New Hampshire	0	0	6
New Jersey	11	16	57
New Mexico	5	7	11
Nevada	2	3	10
New York	18	30	94
Ohio	7	15	78
Oklahoma	1	5	37

(Continued)

State	Completed Responses (<i>N</i> = 326)	All Responses (<i>N</i> = 493)	Nonrespondents (<i>N</i> = 1,764)
Oregon	7	8	26
Pennsylvania	8	15	79
Rhode Island	2	2	5
South Carolina	5	7	33
South Dakota	1	5	15
Tennessee	11	19	33
Texas	29	40	174
Utah	2	4	17
Virginia	7	11	55
Vermont	1	1	3
Washington	11	15	39
Wisconsin	10	17	56
West Virginia	2	6	13
Wyoming	3	3	5

Appendix J. *Chi-Square Analysis Results Tables for Chapter Four.*

Table J1

Chi-Square Analysis Results for Question One by Professional Development Format

Item	Professional Development Format Frequencies				χ^2	df	p
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
In-district workshop or institute	84	64	15	14	15.56	8	.049
Took courses for college credit	45	24	11	29	56.24	4	<.001*
Out-of-district workshops and institutes, focused on a specific topic	161	41	25	17	69.62	8	<.001*
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	125	67	14	18	6.53	8	.588
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	180	32	14	19	124.91	8	<.001*

(Continued)

Professional Development Format Frequencies							
Item	Out-of-district	In-district	College/University Workshop	Graduate Courses	χ^2	<i>df</i>	<i>p</i>
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	94	56	17	21	10.63	8	.224
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	49	31	9	10	6.88	8	.549
Served on a committee or task force that focused on curriculum, instruction, or student assessment	74	40	11	20	15.06	8	.058
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	52	37	8	14	10.80	8	.213

* $p < .05$.

Table J2

Chi-Square Analysis Results for Question One by Gender

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
In-district workshop or institute	109	40	7.52	4	.111
Took courses for college credit	54	26	1.58	2	.454
Out-of-district workshops and institutes, focused on a specific topic	137	60	3.08	4	.545
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	134	52	7.10	4	.131
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	135	63	9.30	4	.054
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	105	49	3.52	4	.475

(Continued)

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	55	23	1.46	4	.833
Served on a committee or task force that focused on curriculum, instruction, or student assessment	80	38	6.24	4	.182
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	67	25	4.53	4	.339

Table J3

Chi-Square Analysis Results for Question One by Education Level

Item	Education Variables			χ^2	<i>df</i>	<i>p</i>
	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>			
In-district workshop or institute	60	87	2	5.64	6	.465
Took courses for college credit	40	40	0	4.93	3	.177
Out-of-district workshops and institutes, focused on a specific topic	86	108	1	6.62	6	.357
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	77	103	3	4.14	6	.658
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	82	111	3	9.16	6	.165
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	76	77	1	11.72	6	.069

(Continued)

Education Variables						
Item	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	27	51	0	5.58	6	.472
Served on a committee or task force that focused on curriculum, instruction, or student assessment	37	75	2	9.83	6	.132
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	33	55	2	4.50	6	.610

Table J4

Chi-Square Analysis Results for Question One by NAfME Membership

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-Member <i>N</i>			
In-district workshop or institute	88	60	4.89	4	.299
Took courses for college credit	57	27	3.98	2	.136
Out-of-district workshops and institutes, focused on a specific topic	119	75	5.33	4	.255
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	107	75	3.90	4	.420
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	135	61	31.78	4	<.001*
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	94	61	4.80	4	.308

(Continued)

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-member <i>N</i>			
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	53	25	4.82	4	.306
Served on a committee or task force that focused on curriculum, instruction, or student assessment	82	33	18.50	4	.001*
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	55	37	4.12	4	.390

**p* < .05.

Table J5

Chi-Square Analysis Results for Question One by School Location

Item	School Location Variables			χ^2	<i>df</i>	<i>p</i>
	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>			
In-district workshop or institute	42	62	46	28.81	6	<.001*
Took courses for college credit	38	31	12	4.16	3	.244
Out-of-district workshops and institutes, focused on a specific topic	76	81	42	9.44	6	.150
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	75	75	36	5.75	6	.452
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	88	77	35	15.18	6	.019*
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	56	67	32	4.25	6	.643

(Continued)

School Location Variables						
Item	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	25	31	23	7.50	6	.277
Served on a committee or task force that focused on curriculum, instruction, or student assessment	43	53	22	10.96	6	.090
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	24	48	20	15.55	6	.016*

* $p < .05$.

Table J6

Chi-Square Analysis Results for Question One by Teaching Experience

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years	4-9	10-14 Years	15+ Years			
	<i>N</i>	Years <i>N</i>	<i>N</i>	<i>N</i>			
In-district workshop or institute	11	31	18	88	6.69	8	.571
Took courses for college credit	6	29	15	29	20.20	4	<.001*
Out-of-district workshops and institutes, focused on a specific topic	20	43	24	108	1.91	8	.984
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	22	40	24	94	4.67	8	.792
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	22	42	20	112	16.85	8	.032*
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	25	36	17	74	19.47	8	.013*

(Continued)

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years	4-9	10-14 Years	15+ Years			
	<i>N</i>	Years <i>N</i>	<i>N</i>	<i>N</i>			
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	8	18	8	45	7.65	8	.468
Served on a committee or task force that focused on curriculum, instruction, or student assessment	6	21	18	71	8.89	8	.360
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	9	15	9	58	7.85	8	.448

**p* < .05.

Table J7

Chi-Square Analysis Results for Question One by Teaching Assignment

Item	Teaching Responsibility Code*										χ^2	df	p
	1 N	2 N	3 N	4 N	5 N	6 N	7 N	8 N	9 N	10 N			
In-district workshop or institute	14	33	8	2	7	55	2	10	4	12	43.26	18	.001**
Took courses for college credit	9	7	4	2	11	28	2	4	0	14	18.28	9	.032**
Out-of-district workshops and institutes, focused on a specific topic	28	36	9	2	19	68	4	9	2	18	64.51	18	<.001**
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	17	36	7	5	17	61	3	11	1	26	24.27	18	.146
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	32	36	11	5	21	58	4	8	1	20	27.08	18	.078
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	19	30	7	2	11	46	4	4	4	23	17.65	18	.479

(Continued)

Item	Teaching Responsibility Code*										χ^2	df	p
	1 N	2 N	3 N	4 N	5 N	6 N	7 N	8 N	9 N	10 N			
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	10	14	2	0	6	28	1	5	1	9	12.70	18	.809
Served on a committee or task force that focused on curriculum, instruction, or student assessment	20	20	4	2	9	40	1	5	1	13	16.33	18	.570
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	14	15	4	1	8	35	0	4	2	7	18.36	18	.432

*See demographic codes in Appendix E.

** $p < .05$.

Table J8

Chi-Square Analysis Results for Question One by Grade Level

Item	Grade Level Variables			χ^2	<i>df</i>	<i>p</i>
	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>			
In-district workshop or institute	127	44	38	7.28	4	.122
Took courses for college credit	62	38	27	4.36	2	.113
Out-of-district workshops and institutes, focused on a specific topic	154	70	58	1.51	4	.825
Teacher collaboratives or networks, connecting teachers regionally, state-wide, nationally, or internationally	145	72	49	5.45	4	.244
Out-of-district conferences, provided by professional organizations, regional centers, the state department of education, etc.	145	78	50	7.54	4	.110
Received mentoring, coaching, observation in a one-on-one situation, usually in the classroom/ rehearsal setting	121	56	41	8.63	4	.071

(Continued)

Grade Level Variables						
Item	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Received professional development materials from a teacher resource center, which provided professional development materials, and was staffed by a lead or resource teacher	61	36	25	6.18	4	.186
Served on a committee or task force that focused on curriculum, instruction, or student assessment	82	38	41	12.54	4	.014*
Participated in a teacher study group that met regularly, in face-to-face meetings, to further knowledge in the discipline or pedagogical approaches	76	26	23	2.08	4	.722

* $p < .05$.

Table J9

Chi-Square Analysis Results for Question Two by Professional Development Format

Item	Professional Development Format Frequencies				χ^2	<i>df</i>	<i>p</i>
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Action research project, in which you examined your own teaching and your students' learning.	50	30	12	17	14.08	4	.007*
Individual learning, in which you read journal or other publications, browsed the Internet, etc.	195	106	27	37	5.59	4	.232

Table J10

Chi-Square Analysis Results for Question Two by Gender

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
Action research project, in which you examined your own teaching and your students' learning.	57	29	0.38	2	.827
Individual learning, in which you read journal or other publications, browsed the Internet, etc.	206	97	9.32	2	.009*

**p* < .05.

Table J11

Chi-Square Analysis Results for Question Two by Education Level

Item	Education Variables			χ^2	<i>df</i>	<i>p</i>
	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>			
Action research project, in which you examined your own teaching and your students' learning.	35	51	1	0.92	3	.821
Individual learning, in which you read journal or other publications, browsed the Internet, etc.	129	166	5	10.45	3	.015*

* $p < .05$.

Table J12

Chi-Square Analysis Results for Question Two by NafME Membership

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-member <i>N</i>			
Action research project, in which you examined your own teaching and your students' learning.	59	26	6.51	2	.039*
Individual learning, in which you read journal or other publications, browsed the Internet, etc.	183	118	17.43	2	<.001*

* $p < .05$.

Table J13

Chi-Square Analysis Results for Question Two by School Location

Item	School Location Variables			χ^2	<i>df</i>	<i>p</i>
	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>			
Action research project, in which you examined your own teaching and your students' learning.	38	36	13	2.26	3	.520
Individual learning, in which you read journal or other publications, browsed the Internet, etc.	126	118	61	11.76	3	.008*

* $p < .05$.

Table J14

Chi-Square Analysis Results for Question Two by Teaching Experience

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years	4-9	10-14 Years	15+ Years			
	<i>N</i>	Years <i>N</i>	<i>N</i>	<i>N</i>			
Action research project, in which you examined your own teaching and your students' learning.	6	21	18	41	8.04	4	.090
Individual learning, in which you read journal or other publications, browsed the Internet, etc.	27	64	39	164	1.55	4	.818

Table J15

Chi-Square Analysis Results for Question Two by Teaching Assignment

Item	Teaching Responsibility Code*										χ^2	df	p
	1 N	2 N	3 N	4 N	5 N	6 N	7 N	8 N	9 N	10 N			
Action research project, in which you examined your own teaching and your students' learning.	16	12	2	0	8	25	1	6	2	13	13.79	9	.130
Individual learning, in which you read journal or other publications, browsed the Internet, etc.	41	65	12	4	26	91	5	15	4	35	19.53	9	.021**

*See demographic codes in Appendix E.

** $p < .05$.

Table J16

Chi-Square Analysis Results for Question Two by Grade Level

Item	Grade Level Variables			χ^2	<i>df</i>	<i>p</i>
	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>			
Action research project, in which you examined your own teaching and your students' learning.	67	32	23	0.30	2	.861
Individual learning, in which you read journal or other publications, browsed the Internet, etc.	244	99	83	2.54	2	.281

Table J17

Chi-Square Analysis Results for Question Seven by Professional Development Format

Item	Professional Development Format Frequencies				χ^2	<i>df</i>	<i>p</i>
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Practiced under simulated conditions, with feedback	150	79	20	18	25.74	4	<.001*
Received mentoring or coaching in the classroom	160	92	26	28	5.23	4	.264
Met formally with other activity participants to discuss classroom implementation	140	66	22	23	14.66	4	.005*
My teaching was observed by the leader(s) and feedback was provided	7	12	2	6	10.88	4	.028*
My teaching was observed by other participants and feedback was provided	8	12	3	5	7.38	4	.117

(Continued)

Professional Development Format Frequencies							
Item	Out-of-district	In-district	College/University Workshop	Graduate Courses	χ^2	<i>df</i>	<i>p</i>
Communicated with leaders of the activity concerning classroom implementation	32	32	6	16	17.98	4	.001*
Students' work was reviewed by other participants or the activity leader	10	8	4	5	5.52	4	.238
Met informally with other participants to discuss classroom implementation	44	43	9	11	8.15	4	.086
Developed curricula or lesson plans which other participants or the activity leader reviewed	20	26	3	16	30.69	4	<.001*
None of these supports were provided	78	22	9	3	31.42	4	<.001*

**p* < .05.

Table J18

Chi-Square Analysis Results for Question Seven by Gender

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
Practiced under simulated conditions, with feedback	39	14	2.29	2	.318
Received mentoring or coaching in the classroom	11	4	0.25	2	.884
Met formally with other activity participants to discuss classroom implementation	48	22	0.55	2	.758
My teaching was observed by the leader(s) and feedback was provided	18	8	4.61	2	.100
My teaching was observed by other participants and feedback was provided	17	10	4.86	2	.088

(Continued)

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
Communicated with leaders of the activity concerning classroom implementation	54	31	2.08	2	.353
Students' work was reviewed by other participants or the activity leader	19	8	0.22	2	.898
Met informally with other participants to discuss classroom implementation	74	33	0.27	2	.875
Developed curricula or lesson plans which other participants or the activity leader reviewed	47	17	1.92	2	.382
None of these supports were provided	80	36	1.11	2	.573

Table J19

Chi-Square Analysis Results for Question Seven by Education Level

Item	Education Variables			χ^2	<i>df</i>	<i>p</i>
	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>			
Practiced under simulated conditions, with feedback	21	32	1	1.21	3	.752
Received mentoring or coaching in the classroom	6	8	1	2.97	3	.397
Met formally with other activity participants to discuss classroom implementation	28	28	2	2.10	3	.551
My teaching was observed by the leader(s) and feedback was provided	11	15	1	1.36	3	.716
My teaching was observed by other participants and feedback was provided	10	16	1	1.86	3	.602

(Continued)

Education Variables						
Item	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Communicated with leaders of the activity concerning classroom implementation	31	52	1	1.62	3	.655
Students' work was reviewed by other participants or the activity leader	8	19	0	2.87	3	.413
Met informally with other participants to discuss classroom implementation	43	62	2	0.58	2	.901
Developed curricula or lesson plans which other participants or the activity leader reviewed	26	38	1	1.34	3	.510
None of these supports were provided	44	69	2	1.29	3	.730

Table J20

Chi-Square Analysis Results for Question Seven by NAfME Membership

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-Member <i>N</i>			
Practiced under simulated conditions, with feedback	30	24	1.37	2	.505
Received mentoring or coaching in the classroom	9	6	0.25	2	.883
Met formally with other activity participants to discuss classroom implementation	40	30	1.55	2	.462
My teaching was observed by the leader(s) and feedback was provided	20	7	3.20	2	.202
My teaching was observed by other participants and feedback was provided	19	9	1.45	2	.486

(Continued)

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-Member <i>N</i>			
Communicated with leaders of the activity concerning classroom implementation	56	29	2.26	2	.324
Students' work was reviewed by other participants or the activity leader	17	10	0.64	2	.728
Met informally with other participants to discuss classroom implementation	74	34	8.43	2	.015*
Developed curricula or lesson plans which other participants or the activity leader reviewed	36	28	0.29	1	.867
None of these supports were provided	63	51	1.17	2	.557

**p* < .05.

Table J21

Chi-Square Analysis Results for Question Seven by School Location

Item	School Location Variables			χ^2	<i>df</i>	<i>p</i>
	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>			
Practiced under simulated conditions, with feedback	23	19	12	0.60	2	.740
Received mentoring or coaching in the classroom	5	6	4	0.49	2	.783
Met formally with other activity participants to discuss classroom implementation	31	27	12	0.90	2	.639
My teaching was observed by the leader(s) and feedback was provided	12	8	7	1.40	2	.497
My teaching was observed by other participants and feedback was provided	13	9	6	0.81	2	.667

(Continued)

School Location Variables						
Item	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Communicated with leaders of the activity concerning classroom implementation	30	36	20	1.37	2	.504
Students' work was reviewed by other participants or the activity leader	10	8	9	3.33	2	.190
Met informally with other participants to discuss classroom implementation	41	46	21	0.50	2	.780
Developed curricula or lesson plans which other participants or the activity leader reviewed	21	30	14	2.04	2	.361
None of these supports were provided	43	45	28	1.76	2	.415

Table J22

Chi-Square Analysis Results for Question Seven by Teaching Experience

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years <i>N</i>	4-9 Years <i>N</i>	10-14 Years <i>N</i>	15+ Years <i>N</i>			
Practiced under simulated conditions, with feedback	27	58	36	149	3.97	4	.411
Received mentoring or coaching in the classroom	28	69	43	170	48.61	4	<.001*
Met formally with other activity participants to discuss classroom implementation	25	56	37	135	1.27	4	.866
My teaching was observed by the leader(s) and feedback was provided	27	66	40	164	10.71	4	.030*
My teaching was observed by other participants and feedback was provided	27	67	41	160	3.13	4	.536

(Continued)

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years <i>N</i>	4-9 Years <i>N</i>	10-14 Years <i>N</i>	15+ Years <i>N</i>			
Communicated with leaders of the activity concerning classroom implementation	19	50	28	141	10.03	4	.040
Students' work was reviewed by other participants or the activity leader	28	64	39	165	3.29	4	.510
Met informally with other participants to discuss classroom implementation	16	42	32	126	8.13	4	.087
Developed curricula or lesson plans which other participants or the activity leader reviewed	26	59	34	139	1.10	4	.894
None of these supports were provided	24	47	27	108	5.49	4	.241

**p* < .05.

Table J23

Chi-Square Analysis Results for Question Seven by Teaching Assignment

Item	Teaching Responsibility Code*										χ^2	df	p
	1 N	2 N	3 N	4 N	5 N	6 N	7 N	8 N	9 N	10 N			
Practiced under simulated conditions, with feedback	7	4	3	14	15	0	4	4	0	1	9.63	10	.474
Received mentoring or coaching in the classroom	2	0	2	3	5	0	2	1	0	0	7.30	10	.696
Met formally with other activity participants to discuss classroom implementation	9	5	5	19	20	1	3	5	1	2	7.21	10	.706
My teaching was observed by the leader(s) and feedback was provided	2	2	2	8	8	0	3	2	0	0	7.38	10	.689
My teaching was observed by other participants and feedback was provided	2	2	3	8	8	0	1	2	0	2	18.05	10	.054

(Continued)

Item	Teaching Responsibility Code*										χ^2	df	p
	1 N	2 N	3 N	4 N	5 N	6 N	7 N	8 N	9 N	10 N			
Communicated with leaders of the activity concerning classroom implementation	13	9	8	22	22	0	5	3	1	2	12.70	10	.241
Students' work was reviewed by other participants or the activity leader	5	2	5	6	4	0	3	2	0	0	15.64	10	.110
Met informally with other participants to discuss classroom implementation	14	10	8	24	34	3	7	7	0	0	12.37	10	.261
Developed curricula or lesson plans which other participants or the activity leader reviewed	6	5	6	21	19	1	3	3	0	1	9.63	10	.474
None of these supports were provided	25	5	3	32	30	5	4	6	5	0	14.59	10	.148

Table J24

Chi-Square Analysis Results for Question Seven by Grade Level

Item	Grade Level Variables			χ^2	<i>df</i>	<i>p</i>
	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>			
Practiced under simulated conditions, with feedback	27	10	14	1.36	2	.508
Received mentoring or coaching in the classroom	6	6	2	4.06	2	.132
Met formally with other activity participants to discuss classroom implementation	45	13	11	2.43	2	.297
My teaching was observed by the leader(s) and feedback was provided	16	7	3	1.78	2	.411
My teaching was observed by other participants and feedback was provided	16	8	3	2.42	2	.298

(Continued)

Grade Level Variables						
Item	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Communicated with leaders of the activity concerning classroom implementation	48	20	14	1.46	2	.482
Students' work was reviewed by other participants or the activity leader	12	6	8	1.84	2	.399
Met informally with other participants to discuss classroom implementation	64	23	17	2.34	2	.310
Developed curricula or lesson plans which other participants or the activity leader reviewed	36	13	12	0.13	2	.934
None of these supports were provided	66	25	19	1.68	2	.433

Table J25

Chi-Square Analysis Results for Question Thirteen by Professional Development Format

Item	Professional Development Format Frequencies				χ^2	df	p
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Grant Writing	7	1	0	2	4.41	4	.353
Assessment	95	56	11	18	5.45	4	.244
Advocacy	68	11	5	6	33.31	4	<.001*
Conducting or Rehearsal Techniques	95	19	11	9	44.16	4	<.001*
Music Literature	102	20	14	11	47.01	4	<.001*
World Musics/ Multicultural Music Education	62	18	12	11	15.76	4	.003*
Teaching Improvisation	58	13	13	10	22.42	4	<.001*
Teaching Composition	7	13	37	15	11.54	4	.021*
Standards-Based Teaching	77	45	10	11	6.04	4	.196

(Continued)

Professional Development Format Frequencies							
Item	Out-of-district	In-district	College/University Workshop	Graduate Courses	χ^2	<i>df</i>	<i>p</i>
Pedagogies for Specific Instrument/ Voice Part	61	8	10	5	32.42	4	<.001*
Music Technology	87	30	5	10	24.68	4	<.001*
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	70	11	7	8	32.30	4	<.001*
Early Childhood Music Topics	14	48	8	6	10.31	4	.036*
Elementary or Secondary General Music Topics	88	38	16	12	8.34	4	.080
Research Applications to Teaching Practice	15	11	2	7	5.90	4	.207
Music for Special Learners	40	10	3	4	11.43	4	.022*
The Activity Did Not Focus on Content	2	27	1	7	48.80	4	<.001*

* $p < .05$

Table J26

Chi-Square Analysis Results for Question Thirteen by Gender

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
Grant Writing	218	96	1.78	2	.411
Assessment	124	56	0.03	2	.987
Advocacy	58	31	1.27	2	.530
Conducting or Rehearsal Techniques	80	53	7.98	2	.019*
Music Literature	85	51	4.17	2	.124
World Musics/ Multicultural Music Education	74	27	5.70	2	.058
Teaching Improvisation	69	24	2.19	2	.335
Teaching Composition	52	19	1.73	2	.421
Standards-Based Teaching	103	39	1.65	2	.438

(Continued)

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
Pedagogies for Specific Instrument/ Voice Part	53	30	1.90	2	.387
Music Technology	90	42	1.41	2	.493
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	55	40	7.88	2	.019*
Early Childhood Music Topics	56	19	2.34	2	.310
Elementary or Secondary General Music Topics	121	33	15.17	2	.001*
Research Applications to Teaching Practice	27	8	1.51	2	.469
Music for Special Learners	43	13	3.46	2	.178
The Activity Did Not Focus on Content	23	16	2.29	2	.318

**p* < .05

Table J27

Chi-Square Analysis Results for Question Thirteen by Education Level

Item	Education Variables			χ^2	<i>df</i>	<i>p</i>
	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>			
Grant Writing	127	179	5	1.73	3	.631
Assessment	75	101	3	0.58	3	.902
Advocacy	34	54	2	2.90	3	.407
Conducting or Rehearsal Techniques	57	76	1	4.59	3	.204
Music Literature	63	85	0	8.60	3	.035*
World Musics/ Multicultural Music Education	41	61	1	2.91	3	.405
Teaching Improvisation	51	42	1	11.17	3	.011*
Teaching Composition	43	29	0	15.09	3	.002*
Standards-Based Teaching	64	73	2	4.83	3	.184

(Continued)

Item	Education Variables			χ^2	<i>df</i>	<i>p</i>
	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>			
Pedagogies for Specific Instrument/ Voice Part	43	41	0	7.55	3	.056
Music Technology	49	80	3	5.72	3	.126
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	43	51	2	3.11	3	.214
Early Childhood Music Topics	36	39	1	3.01	3	.390
Elementary or Secondary General Music Topics	66	85	3	0.73	3	.866
Research Applications to Teaching Practice	14	20	0	1.06	3	.786
Music for Special Learners	28	29	0	3.63	3	.304
The Activity Did Not Focus on Content	15	22	0	4.47	3	.215

**p* < .05.

Table J28

Chi-Square Analysis Results for Question Thirteen by NAfME Membership

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-Member <i>N</i>			
Grant Writing	5	4	4.94	2	.084
Assessment	113	65	3.09	2	.213
Advocacy	60	28	4.43	2	.109
Conducting or Rehearsal Techniques	87	44	5.52	2	.063
Music Literature	97	48	6.93	2	.031*
World Musics/ Multicultural Music Education	61	40	0.26	2	.881
Teaching Improvisation	56	37	0.25	2	.882
Teaching Composition	45	26	0.68	2	.713
Standards-Based Teaching	87	51	7.98	2	.019*

(Continued)

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-Member <i>N</i>			
Pedagogies for Specific Instrument/ Voice Part	52	31	0.65	2	.725
Music Technology	81	50	1.53	2	.466
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	65	30	4.99	2	.082
Early Childhood Music Topics	47	29	1.84	2	.399
Elementary or Secondary General Music Topics	91	63	0.13	2	.939
Research Applications to Teaching Practice	24	11	2.06	2	.357
Music for Special Learners	34	22	0.09	2	.957
The Activity Did Not Focus on Content	20	18	1.07	2	.585

**p* < .05.

Table J29

Chi-Square Analysis Results for Question Thirteen by School Location

Item	School Location Variables			χ^2	<i>df</i>	<i>p</i>
	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>			
Grant Writing	2	6	2	2.07	2	.355
Assessment	76	68	37	1.01	2	.605
Advocacy	39	39	12	3.68	2	.159
Conducting or Rehearsal Techniques	53	49	32	2.12	2	.347
Music Literature	62	58	28	0.54	2	.762
World Musics/ Multicultural Music Education	39	46	18	1.59	2	.452
Teaching Improvisation	29	42	23	4.63	2	.099
Teaching Composition	28	31	13	0.48	2	.788
Standards-Based Teaching	56	57	20	0.10	2	.951

(Continued)

School Location Variables						
Item	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Pedagogies for Specific Instrument/ Voice Part	33	36	15	0.58	2	.748
Music Technology	51	56	25	0.63	2	.729
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	38	38	20	0.02	2	.986
Early Childhood Music Topics	28	33	15	0.55	2	.758
Elementary or Secondary General Music Topics	53	67	26	4.51	2	.105
Research Applications to Teaching Practice	16	12	7	0.64	2	.725
Music for Special Learners	21	23	13	0.39	2	.824
The Activity Did Not Focus on Content	21	11	7	3.80	2	.150

Table J30

Chi-Square Analysis Results for Question Thirteen by Teaching Experience

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years <i>N</i>	4-9 Years <i>N</i>	10-14 Years <i>N</i>	15+ Years <i>N</i>			
Grant Writing	3	0	2	5	7.28	4	.122
Assessment	16	42	28	93	2.31	4	.680
Advocacy	10	20	45	15	3.16	4	.531
Conducting or Rehearsal Techniques	19	33	18	62	8.71	4	.069
Music Literature	18	36	15	78	5.84	4	.212
World Musics/ Multicultural Music Education	12	24	17	46	7.72	4	.102
Teaching Improvisation	16	31	11	34	24.40	4	<.001*
Teaching Composition	15	24	9	24	26.63	4	<.001*
Standards-Based Teaching	26	17	23	76	4.90	4	.297

(Continued)

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years	4-9 Years	10-14 Years	15+ Years			
	<i>N</i>	<i>N</i>	<i>N</i>	<i>N</i>			
Pedagogies for Specific Instrument/ Voice Part	12	22	10	39	5.14	4	.273
Music Technology	14	32	14	71	2.67	4	.614
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	13	23	15	44	4.79	4	.309
Early Childhood Music Topics	15	19	11	31	15.86	4	.003*
Elementary or Secondary General Music Topics	21	40	18	76	10.19	4	.037*
Research Applications to Teaching Practice	6	5	7	17	5.34	4	.254
Music for Special Learners	10	11	8	28	6.05	4	.195
The Activity Did Not Focus on Content	2	6	9	21	5.38	4	.250

* $p < .05$.

Table J31

Chi-Square Analysis Results for Question Thirteen by Teaching Assignment

Item	Teaching Responsibility Code*										χ^2	df	p
	1 N	2 N	3 N	4 N	5 N	6 N	7 N	8 N	9 N	10 N			
Grant Writing	1	5	0	1	3	0	0	0	0	0	30.63	10	.001**
Assessment	31	17	8	50	46	5	7	9	5	1	7.07	10	.719
Advocacy	20	13	3	18	21	0	4	6	4	0	22.68	10	.012**
Conducting or Rehearsal Techniques	29	16	10	27	24	5	7	10	3	1	25.85	10	.004**
Music Literature	23	14	12	39	35	3	6	9	3	2	7.89	10	.640
World Musics/ Multicultural Music Education	8	12	3	31	33	2	7	4	1	2	24.10	10	.007**
Teaching Improvisation	9	8	2	32	32	1	4	1	3	1	19.37	10	.036**
Teaching Composition	5	9	3	24	19	1	3	4	1	1	14.68	10	.144
Standards-Based Teaching	22	17	5	30	42	4	6	9	3	3	17.89	10	.057

(Continued)

Item	Teaching Responsibility Code*										χ^2	df	p
	1 N	2 N	3 N	4 N	5 N	6 N	7 N	8 N	9 N	10 N			
Pedagogies for Specific Instrument/ Voice Part	19	11	3	19	16	2	4	4	4	0	17.74	10	.059
Music Technology	20	13	11	34	30	4	6	8	4	1	7.99	10	.630
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	21	12	9	22	13	3	2	7	3	1	27.80	10	.002**
Early Childhood Music Topics	4	9	1	24	26	2	6	2	1	0	23.13	10	.010**
Elementary or Secondary General Music Topics	8	14	3	50	62	2	8	3	3	1	64.03	10	<.001**
Research Applications to Teaching Practice	4	7	1	6	8	1	0	5	1	1	21.60	10	.017**
Music for Special Learners	3	6	3	15	23	2	3	1	1	0	14.30	10	.160
The Activity Did Not Focus on Content	8	2	2	13	10	1	2	1	0	0	4.55	10	.919

*See demographic codes in Appendix E.

** $p < .05$.

Table J32

Chi-Square Analysis Results for Question Thirteen by Grade Level

Item	Grade Level Variables			χ^2	<i>df</i>	<i>p</i>
	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>			
Grant Writing	8	2	0	3.14	2	.208
Assessment	108	34	35	2.29	2	.318
Advocacy	48	27	15	6.08	2	.048*
Conducting or Rehearsal Techniques	54	41	35	23.71	2	<.001*
Music Literature	79	39	27	5.21	2	.074
World Musics/ Multicultural Music Education	66	17	17	4.51	2	.105
Teaching Improvisation	65	12	14	10.56	2	.005*
Teaching Composition	46	11	12	3.20	2	.202
Standards-Based Teaching	86	29	23	3.60	2	.165

(Continued)

Item	Grade Level Variables			χ^2	<i>df</i>	<i>p</i>
	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>			
Pedagogies for Specific Instrument/ Voice Part	40	21	21	3.31	2	.191
Music Technology	76	31	24	1.55	2	.461
Topics for a Specific Ensemble (Choral, Band, Jazz, Strings, etc.)	33	33	28	27.96	2	<.001*
Early Childhood Music Topics	58	10	7	16.50	2	<.001*
Elementary or Secondary General Music Topics	118	18	17	47.85	2	<.001*
Research Applications to Teaching Practice	19	10	5	1.97	2	.374
Music for Special Learners	45	3	8	16.05	2	<.001*
The Activity Did Not Focus on Content	18	10	8	1.19	2	.553

**p* < .05.

Table J33

Chi-Square Analysis Results for Question Fourteen by Professional Development Format

Item	Professional Development Format				χ^2	<i>df</i>	<i>p</i>
	Frequencies						
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Specific rehearsal techniques or strategies	102	23	14	13	37.78	4	<.001*
Student-guided composition projects	25	16	4	9	3.73	4	.444
Tasks that develop music composition skills	32	16	7	8	3.43	4	.489
Arts Integration	50	27	5	11	4.44	4	.349
Implementing world music into the classroom/rehearsal setting	47	18	9	7	6.41	4	.170
Teaching techniques for a specific instrument/voice	76	21	13	12	18.60	4	.001*
Technology in music instruction	85	33	5	13	19.32	4	.001*

**p* < .05.

Table J34

Chi-Square Analysis Results for Question Fifteen by Professional Development Format

Item	Professional Development Format				χ^2	df	p
	Frequencies						
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Objective tests (e.g., multiple choice, true/false, short answer)	23	27	2	7	12.19	4	.016*
Essay tests	2	9	1	3	10.93	4	.027*
Performance tasks or events	93	47	18	18	6.45	4	.168
Systematic observation of students	59	34	8	15	5.47	4	.242
Music Reports (e.g., research paper on a composer/ genre)	13	4	2	4	3.56	4	.468
Music projects (e.g., compositions)	35	20	4	11	5.78	4	.216
Analysis of student work for the purposes of charting student progress	39	31	5	15	9.76	4	.045*
Portfolios	16	8	0	9	16.27	4	.003*
The activity did focus on student assessment	39	14	7	2	7.85	4	.097

* $p < .05$.

Table J35

Chi-Square Analysis Results for Question Sixteen by Professional Development Format

Item	Professional Development Format				χ^2	df	p
	Frequencies						
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Use of computers for composition purposes	36	18	1	5	6.50	4	.165
Recording/mixing/sequencing/producing music	30	9	2	5	6.35	4	.174
Creating a podcast	11	1	0	3	7.93	4	.094
Web site design	23	5	0	5	7.19	4	.126
Use of music notation software (Finale or Sibelius)	43	13	3	6	9.50	4	.050
Use of assessment software (Auralia, Musition, Alfred's Essentials, etc.)	12	5	0	3	3.37	4	.498
Digital Media (presentations, digital video or audio)	43	13	0	9	13.98	4	.007*
Computers for drill and practice on skill acquisition (PracticaMusica, etc.)	23	6	3	3	4.75	4	.314
Use of electronic instruments or MIDI	19	2	2	3	8.26	4	.082

(Continued)

Item	Professional Development Format				χ^2	<i>df</i>	<i>p</i>
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Music education apps for Android or iOS	50	9	2	4	23.59	4	<.001*
The activity did not focus on technology	51	43	17	13	12.68	4	.013*

* $p < .05$.

Table J36

*Chi-Square Analysis Results for Question Seventeen by Professional Development**Format*

Item	Professional Development Format				χ^2	df	p
	Frequencies						
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Music teacher from your school	5	17	0	3	20.41	4	<.001*
Other music teacher	83	33	12	8	12.44	4	.014*
District staff	4	39	0	1	81.84	4	<.001*
State staff	26	0	1	0	25.31	4	<.001*
Professional development expert or consultant	86	27	18	8	26.95	4	<.001
Don't know	4	2	0	2	2.95	4	.566

* $p < .05$.

Table J37

Chi-Square Analysis Results for Question Eighteen by Professional Development Format

Item	Professional Development Format				χ^2	<i>df</i>	<i>p</i>
	Frequencies						
	Out- of- district	In- district	College/ University Workshop	Graduate Courses			
Teachers as individuals	137	73	27	27	12.90	4	.012*
Teachers as representatives of their department, grade level, or school	52	36	6	3	9.24	4	.055

* $p < .05$.

Table J38

Chi-Square Analysis Results for Question Nineteen by Professional Development Format

Item	Professional Development Format				χ^2	df	p
	Frequencies						
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Listened to a lecture	120	51	12	19	17.93	4	.001*
Observed a demonstration of a lesson or unit	103	41	19	16	16.62	4	.002*
Participated in whole-group discussion	69	63	19	20	19.45	4	.001*
Participated in small-group discussion	56	61	10	20	25.51	4	<.001*
Gave a lecture or presentation	9	13	0	8	18.01	4	.001*
Demonstrated a lesson, unit, or skill	23	20	6	16	24.41	4	<.001*
Led a whole-group discussion	7	11	0	5	10.75	4	.030*
Led a small-group discussion	5	7	1	7	18.03	4	.001*
Engaged in extended rehearsal or problem solving	21	9	6	8	7.51	4	.111

(Continued)

Item	Professional Development Format				χ^2	<i>df</i>	<i>p</i>
	Frequencies						
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Wrote a paper, report, or plan	5	9	4	23	122.52	4	<.001*
Practiced using student materials	59	28	14	12	6.09	4	.193
Developed or reviewed music curriculum materials	30	34	4	10	11.10	4	.025*
Reviewed student work	11	11	1	7	9.64	4	.047*
Scored assessments	11	14	0	6	10.59	4	.032*
Collaborated as a colleague with musicians	65	40	15	10	4.33	4	.363
Used technology (computers, multimedia or the internet)	48	32	3	16	13.81	4	.008*
Performed as a musician on your major instrument or voice part	31	10	10	7	11.31	4	.023*

**p* < .05.

Table J39

*Chi-Square Analysis Results for Question Twenty-Two by Professional Development**Format*

Item	Professional Development Format				χ^2	df	p
	Frequencies						
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Participants completed a survey	81	37	10	15	5.63	4	.228
Participants were interviewed to provide feedback	11	6	4	5	5.82	4	.213
The session was observed by an evaluator	10	6	5	5	8.61	4	.072
My classroom was observed	14	10	1	6	5.30	4	.258
Student outcomes in my classroom were evaluated	15	14	1	5	4.57	4	.335
No discernible evaluation took place	65	39	10	4	9.57	4	.048*

* $p < .05$.

Table J40

Chi-Square Analysis Results for Question Twenty-Three by Professional Development Format

Item	Professional Development Format Frequencies				χ^2	df	p
	Out-of-district	In-district	College/University Workshop	Graduate Courses			
Curriculum (e.g., units, texts, standards)	161	99	27	31	33.69	16	.006*
Instructional methods	163	98	36	31	49.13	16	<.001*
Approaches to assessment	158	98	27	31	24.53	16	.079
Use of technology in music instruction	160	99	26	31	27.46	16	.037*
Strategies for teaching diverse student populations	161	98	27	31	38.40	16	.001*
Deepening knowledge of music	163	99	27	31	66.59	16	<.001
Leadership development	161	98	27	31	34.10	16	.005*
Adapting teaching to meet national, state, or district assessment requirements	162	99	27	31	17.23	16	.371

(Continued)

Professional Development Format Frequencies							
Item	Out-of-district	In-district	College/University Workshop	Graduate Courses	χ^2	<i>df</i>	<i>p</i>
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	161	98	27	31	19.70	16	.234
Learning about national, state, or district assessments in professional development	161	99	27	31	25.21	16	.066
Learning about national, state, or district standards in curriculum frameworks in professional development	160	98	27	30	21.55	16	.158

* $p < .05$.

Table J41

Chi-Square Analysis Results for Question Twenty-Three by Gender

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
Curriculum (e.g., units, texts, standards)	221	99	7.07	8	.529
Instructional methods	221	99	4.74	8	.785
Approaches to assessment	218	98	15.11	8	.057
Use of technology in music instruction	219	99	5.45	8	.709
Strategies for teaching diverse student populations	220	99	23.92	8	.002*
Deepening knowledge of music	221	101	7.81	8	.453
Leadership development	220	99	9.61	8	.293
Adapting teaching to meet national, state, or district assessment requirements	221	100	13.00	8	.112

(Continued)

Item	Gender Variables		χ^2	<i>df</i>	<i>p</i>
	Female <i>N</i>	Male <i>N</i>			
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	220	99	9.17	8	.328
Learning about national, state, or district assessments in professional development	221	99	10.37	8	.240
Learning about national, state, or district standards in curriculum frameworks in professional development	217	100	14.35	8	.073

**p* < .05.

Table J42

Chi-Square Analysis Results for Question Twenty-Three by Education Level

Item	Education Variables			χ^2	<i>df</i>	<i>p</i>
	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>			
Curriculum (e.g., units, texts, standards)	131	181	5	10.31	12	.589
Instructional methods	131	181	5	16.40	12	.178
Approaches to assessment	130	178	5	13.85	12	.310
Use of technology in music instruction	131	179	5	7.52	12	.822
Strategies for teaching diverse student populations	132	179	5	9.66	12	.646
Deepening knowledge of music	132	182	5	26.22	12	.010*
Leadership development	131	180	5	10.32	12	.588
Adapting teaching to meet national, state, or district assessment requirements	132	181	5	9.51	12	.659

(Continued)

Item	Education Variables			χ^2	<i>df</i>	<i>p</i>
	Bachelor's <i>N</i>	Master's <i>N</i>	Doctorate <i>N</i>			
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	131	180	5	8.50	12	.745
Learning about national, state, or district assessments in professional development	131	181	5	13.49	12	.335
Learning about national, state, or district standards in curriculum frameworks in professional development	132	177	5	11.04	12	.526

**p* < .05.

Table J43

Chi-Square Analysis Results for Question Twenty-Three by NAfME Membership

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-Member <i>N</i>			
Curriculum (e.g., units, texts, standards)	188	129	5.04	8	.753
Instructional methods	187	130	11.13	8	.194
Approaches to assessment	184	129	14.92	8	.061
Use of technology in music instruction	186	129	9.23	8	.323
Strategies for teaching diverse student populations	187	129	7.95	8	.439
Deepening knowledge of music	190	130	8.01	8	.432
Leadership development	187	129	7.62	8	.471
Adapting teaching to meet national, state, or district assessment requirements	188	130	13.25	8	.104

(Continued)

Item	NAfME Membership		χ^2	<i>df</i>	<i>p</i>
	Member <i>N</i>	Non-Member <i>N</i>			
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	187	129	7.43	8	.491
Learning about national, state, or district assessments in professional development	187	130	10.25	8	.248
Learning about national, state, or district standards in curriculum frameworks in professional development	186	128	14.81	8	.063

Table J44

Chi-Square Analysis Results for Question Twenty-Three by School Location

Item	School Location Variables			χ^2	<i>df</i>	<i>p</i>
	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>			
Curriculum (e.g., units, texts, standards)	127	130	65	10.10	8	.258
Instructional methods	128	130	64	5.78	8	.672
Approaches to assessment	127	129	62	6.71	8	.568
Use of technology in music instruction	127	130	63	4.92	8	.766
Strategies for teaching diverse student populations	127	130	64	5.46	8	.708
Deepening knowledge of music	129	130	65	8.16	8	.418
Leadership development	128	129	64	5.34	8	.721
Adapting teaching to meet national, state, or district assessment requirements	129	130	64	9.28	8	.319

(Continued)

School Location Variables						
Item	Rural <i>N</i>	Suburban <i>N</i>	Urban <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	127	130	64	2.49	8	.962
Learning about national, state, or district assessments in professional development	129	129	64	6.69	8	.570
Learning about national, state, or district standards in curriculum frameworks in professional development	126	130	63	6.09	8	.637

Table J45

Chi-Square Analysis Results for Question Twenty-Three by Teaching Experience

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years <i>N</i>	4-9 Years <i>N</i>	10-14 Years <i>N</i>	15+ Years <i>N</i>			
Curriculum (e.g., units, texts, standards)	31	70	44	173	7.44	16	.964
Instructional methods	31	70	44	173	21.62	16	.156
Approaches to assessment	29	70	44	171	18.73	16	.283
Use of technology in music instruction	31	70	43	173	18.06	16	.320
Strategies for teaching diverse student populations	31	69	44	173	16.46	16	.421
Deepening knowledge of music	31	70	43	176	22.00	16	.143
Leadership development	31	69	44	173	9.95	16	.869
Adapting teaching to meet national, state, or district assessment requirements	31	70	44	174	10.35	16	.848

(Continued)

Item	Experience Variables				χ^2	<i>df</i>	<i>p</i>
	< 4 Years	4-9 Years	10-14 Years	15+ Years			
	<i>N</i>	<i>N</i>	<i>N</i>	<i>N</i>			
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	31	70	44	172	17.17	16	.375
Learning about national, state, or district assessments in professional development	31	70	44	173	17.93	16	.328
Learning about national, state, or district standards in curriculum frameworks in professional development	31	70	44	170	17.04	16	.383

Table J46

Chi-Square Analysis Results for Question Twenty-Three by Teaching Assignment

Item	Teaching Responsibility Code*										χ^2	<i>df</i>	<i>p</i>
	1 <i>N</i>	2 <i>N</i>	3 <i>N</i>	4 <i>N</i>	5 <i>N</i>	6 <i>N</i>	7 <i>N</i>	8 <i>N</i>	9 <i>N</i>	10 <i>N</i>			
Curriculum (e.g., units, texts, standards)	52	23	19	82	90	9	14	18	8	3	43.86	40	.311
Instructional methods	52	23	19	83	90	9	14	18	7	3	51.65	40	.103
Approaches to assessment	51	22	19	83	89	9	14	18	7	3	38.69	40	.529
Use of technology in music instruction	41	23	19	82	90	9	13	18	8	3	45.94	40	.239
Strategies for teaching diverse student populations	52	23	19	82	90	8	14	18	8	3	43.54	40	.323
Deepening knowledge of music	53	23	19	84	89	9	14	18	8	3	37.60	40	.579
Leadership development	42	23	18	83	89	9	14	18	8	3	37.82	40	.569
Adapting teaching to meet national, state, or district assessment requirements	52	23	19	83	90	9	14	18	8	3	48.24	40	.174

(Continued)

Item	Teaching Responsibility Code*										χ^2	<i>df</i>	<i>p</i>
	1 <i>N</i>	2 <i>N</i>	3 <i>N</i>	4 <i>N</i>	5 <i>N</i>	6 <i>N</i>	7 <i>N</i>	8 <i>N</i>	9 <i>N</i>	10 <i>N</i>			
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	51	23	19	82	90	9	14	18	8	3	43.56	40	.322
Learning about national, state, or district assessments in professional development	52	23	19	83	90	8	14	18	8	3	53.21	40	.079
Learning about national, state, or district standards in curriculum frameworks in professional development	51	23	19	82	88	9	14	18	8	3	66.22	40	<.006**

*See demographic codes in Appendix E.

** $p < .05$.

Table J47

Chi-Square Analysis Results for Question Twenty-Three by Grade Level

Item	Grade Level Variables			χ^2	<i>df</i>	<i>p</i>
	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>			
Curriculum (e.g., units, texts, standards)	178	67	65	5.97	8	.650
Instructional methods	178	67	65	6.94	8	.544
Approaches to assessment	177	65	64	9.96	8	.268
Use of technology in music instruction	179	66	63	5.14	8	.742
Strategies for teaching diverse student populations	179	66	64	5.24	8	.731
Deepening knowledge of music	179	67	66	11.26	8	.188
Leadership development	178	66	65	3.41	8	.906
Adapting teaching to meet national, state, or district assessment requirements	179	67	65	13.02	8	.111

(Continued)

Grade Level Variables						
Item	Elementary <i>N</i>	Secondary <i>N</i>	Combined <i>N</i>	χ^2	<i>df</i>	<i>p</i>
Adapting teaching to meet national, state, or district standards or curriculum framework requirements	178	67	64	19.52	8	.012*
Learning about national, state, or district assessments in professional development	179	66	65	5.52	8	.701
Learning about national, state, or district standards in curriculum frameworks in professional development	177	67	63	13.76	8	.088

* $p < .05$.

Appendix K. *“Other” Responses for Music Teacher Professional Development*

Survey.

Table K1

Frequency of “Other” Professional Development Listed by Participants for Question

One (N = 66)

Response	<i>N</i>
Informal Collaborative Structures	10
State music education conference	9
Music workshops	6
National, regional, or local Orff Workshops	5
National Association for Music Education	3
Kodaly	2
Applied Study	2
Judges Training	2
Reading Sessions	2
Online classes	1
Webinars	1
Field Trips	1
American String Teachers Association	1
Midwest Band and Orchestra Conference	1
Degree completion	1

(Continued)

Response	<i>N</i>
Teaching as an adjunct	1
Teaching during the summer	1
Dalcroze	1
Professional Children's Concerts	1
Regional Clinics or conferences	1
Teach for America Training	1

Table K2

“Other” Responses for Question Two by Frequency (N = 49)

Response	N
Performing	5
Collaboration with Colleagues	4
Observation of Other Teachers	4
Webinars	3
Applied Lessons	2
Taking Classes at a University	2
Teacher Evaluation Processes (Student Growth, NY APPR)	2
Coordinating/ assisting with solo/ ensemble festival	1
Composing Music	1
Creating Teaching Tools	1
Vertical Team Meetings	1
Social Media Networking	1
Professional Learning Communities	1
Reading Sessions	1
Orff Level I	1
Reading Blogs	1
Understanding the New District Text	1

Table K3

“Other” Responses for Question 7 (N = 18)

Response	<i>N</i>
No Supports	3
Action Research Project	1
Support for Implementation	2
Implementation in Classroom	4
Joined online forum with participants and presenter	1
Attended workshops on classroom management, methods, etc.	1
Called other educators for feedback	1
Considering questioning	1
It was a conference	1
Not applicable	1
Student orchestra performances	1
Research paper that led to implementation	1

Table K4

“Other” Responses to Question 12 (N = 22)

Response	<i>N</i>
Advocacy	2
Teacher evaluation	2
Curriculum/ Assessment	1
Engaging Students	1
Ensemble rehearsal skills	1
Teaching to the test	1
No follow-up activity	1
Improvisation	1
Instrumental Pedagogy and Rehearsal Techniques	1
Making connections from school to workforce	1
New music	1
New instructional trends	1
Focus on student learning	1
Addressed all listed areas	1
Student Learning Objectives	1

Table K5

“Other” Responses for Question 13 (N = 7)

Response	N
Almost all of these are optional to attend at TMEA	1
Music and Choreography for Jazz/ Show Choirs	1
Playing on instruments	1
Specific instruments in classroom music	1
I do not remember	1
Common Core State Standards	1
International Baccalaureate Curriculum	1

Table K6

“Other” Responses for Question 15 (N = 13)

Response	<i>N</i>
None	2
Student Growth Objectives/ Student Learning Objectives	2
Exposing students to multicultural music and dance	1
General Re-Do-Re learning approaches	1
Individual formal assessments through singing and playing instruments	1
Listed common music assessments	1
General (non-music) session on assessment	1
SmartMusic Applications	1

Table K7

“Other” Responses for Question 16 (N = 23)

Response	<i>N</i>
How to use the SmartBoard/ Promethean Board in the music classroom	4
iPad apps	2
None	2
Internet-based Content	2
a-b-e through my own investigation and research	1
Charms	1
Distance Learning	1
iPad for recording large group performances	1
QR codes, SmartMusic	1
iMovies, PowerPoint	1
Using technology to help students with special needs	1
Web-based instruction	1

Table K8

“Other” Responses to Question 17 (N = 64)

Response	N
College Teacher	11
Myself	7
Music Teachers from other districts	5
Clinicians that applied to present	3
Composer	2
Company representatives	2
ACDA-MN	1
Conductor, Arranger	1
County Law Enforcement	1
Curriculum Director, Publisher	1
Director of Cleveland Orchestra Chorus	1
Professional Development Expert	1
Kodaly Association of Southern California	1
Local Music Teachers’ Association	1
Midwest Clinic	1

(Continued)

Response	<i>N</i>
NAfME	1
Other School District Supervisor	1
Orff Certified Teachers	1
Teachers as part of Loyola University Kodaly Music Institute	1
Vendors	1
Author of the curriculum	1

Table K9

“Other” Responses to Question 18 (N = 8)

Response	<i>N</i>
Students	4
Aspiring students	1
Colleagues in art but not through education	1
School Administrators	1
Teachers as representatives of the Kodaly Method	1

Table K10

“Other” Responses to Question 19 (N = 7)

Response	<i>N</i>
Participate in activities as students	3
Experienced multicultural dance as it related to music	1
Multiple music activities (singing, playing instruments, creation, improvisation)	1
Performed on various percussion instruments	1
Active Learning	1

Table K11

“Other” Responses to Question 22 (N = 19)

Response	<i>N</i>
Final project/ paper to conclude course	3
Graded by instructors and degree conferred	3
Performance	2
Test	2
Administration invited to my classroom to observe implementation	1
Combined concert with students from each school	1
Completing responses to blogs and submitting a sample curriculum for review	1
Participants filled out evaluations	1
Projects and lessons were turned in for all to use	1
Sign-in sheet	1
Survey	1

Appendix L. Professional Development Topics as Reported in Question 24.

Topic	<i>N</i>
Teaching techniques for specific instrument or voice part	30
Curriculum	25
Technology	25
Assessment	17
Standards	15
Orff	12
Teaching Strategies	12
Music and the Common Core State Standards	11
Observing other music teachers	9
SLO/ Teacher Evaluation	8
Content – specific	8
Something for everyone	7
Urban/ poverty/ diverse populations	5
Special Education Topics in Music	4
Classroom management	4
Kodaly	4
New teachers	4
Composition	4
Movement	3

(Continued)

Topic	<i>N</i>
Question and Answer	2
Skill Development	2
Music and literacy connections	2
National Board Certification Requirements	2
Comprehensive Musicianship through Performance	2
Brainstorming	1
Rigor of instruction	1
Teaching music through composition or performance	1
Teaching materials	1
Engaging students	1
Dalcroze	1
Lesson plan sharing	1

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