

STRING MUSIC EDUCATORS' USE OF ADAPTIVE STRATEGIES

STRING MUSIC EDUCATORS' USE OF ADAPTIVE TEACHING STRATEGIES
FOR STUDENTS WITH DISABILITIES

by

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String Music Educators' Use of Adaptive Teaching Strategies For Students With Disabilities

ABSTRACT

This descriptive research study was designed to collect strategies used by string music educators when they teach students with disabilities. The study was guided by four research questions. They were: (1) What type of training (if any) are string teachers given in preparation of working with students that have disabilities? (2) What strategies are effective for facilitating music learning to students with disabilities? (3a) What strategies are effective when teaching instrument posture/position, right-hand and left-hand skills to students with disabilities? (3b) Are these strategies newly developed, existing approaches, or adaptations of existing strategies? (4) How are instructional strategies modified when teaching students with disabilities? A questionnaire was distributed to 153 string music educators in a Midwest state, 45 questionnaires were returned giving the study a response rate of 29%. Descriptive statistics and informal analysis of free-responses were used to analyze the data. This study reinforced the use of the following four strategies: color coding, peer assistance, rote learning, and the use of a routine when working with students that have disabilities. Regarding string specific strategies, the use of tools (such as touch points or pinky houses), shifting earlier in the curriculum, and adjusting the weight of the bow and instrument were all noted as being helpful for the students with disabilities.

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Chapter 1: STATEMENT OF THE PROBLEM

Music educators have a professional responsibility to help every student create positive experiences and find success in the music class or ensemble of their choosing. According to music educator Keith Thompson (1990) “That some children should be excluded from music because they are disabled is an affront to the professional thinking of most music educators” (p. 33). Thompson continued by stating “. . . we must try to find ways to teach special students the same skills and concepts that we teach to other learners” (p. 33). The concept of “the right to learn and experience music” has been made apparent by the National Association for Music Education (NAfME). According to NAfME (2015), one of its missions is to “advance music education by promoting the understanding and making of music by all” (p. 1).

With the passage of the Education for All Handicapped Children Act (EAHCA or PL 94-124), passed by Congress in 1975, it was mandated that children with disabilities receive a free and appropriate public education. This act also affirmed that students with disabilities receive an education in the least restrictive environment and requires educators to include students with disabilities in their classroom (Jones, 2015). Regarding the concept of the “least restrictive environment”, students with disabilities should be placed in classes where they are able to succeed with the least amount of modifications and adaptations. Throughout various school districts and systems, schools are implementing an inclusive model when teaching students with disabilities by placing students in regular classrooms, and with supplementary aids or services, as needed. Hammel (2004) noted that this inclusion model is different from the earlier model of

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mainstreaming, where exceptional students began in self-contained classrooms and were then moved to the general classroom. Because students with disabilities are more frequently placed in regular classrooms, this has implications for music educators. As such, many music educators have found themselves teaching more exceptional students with greater and more complex needs (Hammel, 2004).

Generally, music educators acknowledge the benefits of music for all learners, and with the increasing levels of diversity in schools, they are required to teach every type of learner. Teaching exceptional students can be tremendously rewarding, for both the teacher and student. Though music teachers across all areas (elementary, choral, instrumental) may have students with disabilities in their classes or ensembles, they are not often provided with the proper pre-service training or administrative support to give their exceptional students a meaningful experience in music (Darrow, 2009, p. 1). Many music educators suggest that more pre-service training and in-service sessions are needed to better include students with disabilities in music (Darrow and Gfeller, 1991; Frisque, Niebur and Humphreys, 1994; Gfeller, Darrow and Hadden, 1990; Hahn, 2010; Haywood, 2005; Lapka, 2005; Shepard, 1993; Wong and Chik, 2016).

Knowledge of teaching strategies for students with disabilities is also a concern for teachers. Research-based journal articles present adaptive teaching strategies, but much of it is geared toward general music teachers. In addition, secondary instrumental teachers, especially those in string music education, find themselves without many research-based strategies to help them teach their students with disabilities. Gooding and Yinger (2014) conducted a review of literature regarding students with disabilities in the string classroom. They found that the majority of research studies available did not

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consist of any true experimental designs and state that “the review showed that investigations specifically targeting . . . teaching strategies are limited at best” (p. 5). This statement produces evidence of a need for research on effective teaching strategies for students with disabilities in the string classroom.

Problem Statement

Although much research has been done on inclusion and mainstreaming in music classes (Darrow and Gfeller, 1991; Frisque, Niebur and Humphreys, 1994; Hahn, 2010; Jellions, Brooks and Huck, 1984; Lapka, 2005; VanWeelden and Whipple, 2007; Wong and Chik, 2016), and adaptive teaching strategies in the general music, choral, and band classrooms (Cannella-Malone, Brooks and Tullis, 2013; Gerrity, Hourigan and Horton, 2015; Guthe, 2016; Hilier, Greher, Queenan, Marshall and Kopec, 2016; McCord, 2009; Nabb and Balceits, 2010; Perkins, 1996; Pinta, 2013; Poulcott, 1991; Salvador, 2015; Shelfo, 2007; Tooker, 1995; Wong, 2015; and Viniciguerra, 2016), there is little research about addressing inclusion and mainstreaming and adaptive teaching strategies in the string classroom (Chang, 2017; Van Camp, 1989).

Purpose Statement

The purpose of this study was to identify adaptive teaching strategies for students with disabilities that are currently used by string music educators.

Research Questions

1. What type of training (if any) are string teachers given in preparation of working with students that have disabilities?
2. What strategies are effective for facilitating music learning to students with disabilities?

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- a. Are these strategies newly developed, existing approaches, or adaptations of existing strategies?
3. What strategies are effective when teaching instrument posture/position, right-hand and left-hand skills to students with disabilities?
4. When strategies are altered, to what extent do they vary for differing disabilities?
5. How are instructional strategies modified when teaching students with disabilities?

Definitions

Adaptation: Adjusting or modifying the current curriculum to meet the needs of the student with disabilities. Adaptations include (a) accommodations and (b) modifications (Chang, 2017, p. 10).

Accommodation: "A change in curriculum or instruction that does not greatly alter learning objectives of the course or assessment" (Chang, 2017, p. 10).

Arco: To play a stringed instrument with the bow.

Heterogeneous Class: An instrumental class in which every instrument (in this case: violin, viola, cello, double bass) is studied (Van Camp, 1989, p. 12).

Homogeneous Class: An instrumental class in which only one instrument is studied (Van Camp, 1989, p. 12).

Individualized Education Plan (IEP): A written statement of a student's educational plan that is designed to meet the student's needs. An IEP usually includes the students: academic goals, modifications, and special education support services (Chang, 2017, p. 10).

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Least Restrictive Environment: The student's ability to be educated in an environment with as few restrictions as possible (Chang, 2017, p. 10).

Modification: "Changes in curriculum or instruction that does alter learning objectives of the course or assessment" (Chang, 2017, p. 10).

Rote Learning: Learning music by repetition without the understanding of musical notation (Van Camp, 1989, p. 12).

Pizzicato: Plucking a stringed instrument with the fingers to produce sound.

Universal Design for Learning: A framework that aims to help educators tailor instruction to students with disabilities. (Viniciguerra, 2016, p. 9).

Delimitations

This study only focused on string instruments. Strategies identified in this study may not be generalized to every student with a disability. The selection of this sample was limited to string music educators in the Midwest.

Chapter 2: REVIEW OF RELATED LITERATURE

This literature review features a variety of topics that are related to and justify the need for this study. It covers three areas that directly impact the success of exceptional students in the music classroom: a) attitudes of music teachers toward students with disabilities, b) inclusion and mainstreaming practices in music classes, and c) strategies for teaching exceptional students in music classes. Each of the three sections addresses general music, choral music, and instrumental music.

Teacher Attitudes Towards Inclusion

The attitude of music educators toward their exceptional students can have a profound impact on the success of those students. Teacher attitudes regarding inclusion in their classrooms was researched by Gfeller, Darrow and Hadden (1990). The purpose of their study was to look at the perceived effectiveness of mainstreaming in Iowa and Kansas. This study looked at six research questions. Questions were: (1) Are there differences among music educators who work predominately within different specialty areas (general music, choral, etc.) in the following subcategories: instructional support, musical objectives or perceived success of mainstreaming? (2) Are there differences among music educators with varied experiences working with mainstreamed students? (3) What extent of educational preparation for mainstreaming exists among music educators in Iowa and Kansas? (4) What is the extent of instructional support for music educators who have students with disabilities mainstreamed into music classes? (5) Does instructional support correlate positively with perceived success in mainstreaming? and

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(6) Do music educators perceive specific types of handicapping conditions as more difficult than others to integrate into the mainstream?

Gfeller et al. (1990) collected data for this quantitative study with a questionnaire. Items on the questionnaire were developed by reviewing previous research literature and examining items from other questionnaires. Using a random sample, 5% of elementary and secondary music educators (in both states) were given the questionnaire. The total number of participants was 350. Iowa had a return rate of 76% and Kansas had a 70% response rate. In the questionnaire returned from Iowa music educators, only 42% reported involving mainstreamed students into their classrooms. In Kansas, only 59% reported involving mainstreamed students into their classrooms.

Gfeller et al. (1990) reported their results for each research question. For the first question, “are there differences among music educators who work predominately within different specialty areas (general music, choral, etc.) in the following subcategories: instructional support, musical objectives or perceived success of mainstreaming?”, they found no significant differences. However, instrumental teachers reported having more instructional support than general or choral teachers got. Regarding the second question, “Are there differences among music educators with varied experiences working with mainstreamed students?”, there were no significant differences among educators who have worked with “few”, “some”, or “many” mainstreamed students. For the third question, “What extent of educational preparation for mainstreaming exists among music educators in Iowa and Kansas?” music educators in both states reported receiving little preparation that was related to working with mainstreamed students. Researchers found

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that the mean score for these questionnaire items was 10.78. A score of 5.00 would indicate no preparation, and a score of 25.00 would indicate maximal preparation. When discussing instructional support (question four), data revealed little participation by music educators in placement procedures, little support through in-service education, and lack of preparation time when creating programs for students with disabilities. For question five, "Does instructional support correlate positively with perceived success in mainstreaming", researchers found there was a significant positive correlation ($r = .40$) between instructional support and perceived success in mainstreaming. Regarding the last question, "Do music educators perceive specific types of handicapping conditions as more difficult than others to integrate into the mainstream?", researchers found that students with emotional or behavioral disorders and hearing impairments were the most difficult to mainstream, while students with speech/communication and other health impairments were the least difficult.

Attitudes toward inclusion were researched by Vanweelden and Whipple (2014). The purpose of their study was to investigate if a teacher's perceptions of inclusion, curriculum adaptation or student achievement was changed in comparison to prior research (Gfeller, Darrow and Hedden, 1990). For this quantitative study, researchers randomly selected band, chorus, orchestra, general music, guitar and other music classes (not specified by the researchers) from public school websites.

The research instrument used to collect data was a survey containing a demographic section, as well as questions regarding the music educator's effectiveness of inclusion, curriculum adaptations and exceptional student achievement. This survey was

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closely modeled after the instrument used by Gfeller et al. (1990). However, due to national, state, and local modifications to legislation, and educational philosophies during the last 20 years, a complete replication was not possible.

Participants were contacted via e-mail with a cover letter that described the study and a link to the survey on Survey Monkey™. Questionnaires were completed anonymously. Five thousand educators were contacted and 1,194 educators, representing all 50 states returned the survey. This resulted in a 24% response rate. Vanweelden and Whipple (2014) stated that this was consistent with literature describing response rates of web-based questionnaires. Most of the respondents ($n = 939$) taught either elementary general (58%), middle school/high school choral (41%) and/or middle/high school instrumental ensembles (50%).

Regarding perceptions of inclusion, 61% of teachers responded that students with special needs were successfully included in their classes, and 53% responded that their musical needs were being met. Demographic results indicated that perceptions were similar across teaching specialties; however, most teachers had not worked with students who were blind/visually impaired, deaf-blind, deaf/hearing impaired, or had a traumatic brain injury. Teachers reported that they were comfortable adapting (62%) or modifying (53%) their curriculum to meet the needs of students with special needs. Sixty three percent of teachers also reported that students with special needs participated in the same curriculum and 38% indicated that they graded students with special needs on the same standards of achievement as their non-disabled peers. No significant differences were found when comparing responses about inclusion, curriculum adaptations/modifications,

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or student achievement from different specialty areas. Generally, music educators reported that musical goals were more often addressed than nonmusical goals. However, responses also indicated that students with mental retardation or traumatic brain injury were more likely to work on nonmusical skills than students with other special needs. Vanweelden and Whipple (2014) found that, in comparison to the study by Gfeller et al. (1990), music educators answered similarly regarding the following categories: effective integration in music classes (2011, 62%; 1990, 61%), needs were being met (2011, 53%; 1990, 52%), and the same musical objectives for disabled and non-disabled students (2011, 63%; 1990, 62%). However, teachers had differing perceptions in the following categories: if the musical needs of special education students were better met in a self-contained class (2011, 33%; 1990, 50%), if the presence of special education students hindered the progress of their non-disabled peers (2011, 29%; 1990, 61%), and if the teacher's primary objective was the development of non-music goals (2011, 36%; 1990, 40%).

The attitudes of teachers in a mainstreamed classroom were also researched by Scott, Jellison, Chappell and Standridge (2007). The guiding research questions focused on (1) information, support, resources, and placement (2) parent contact and involvement, (3) outcomes of students with disabilities, typical students and teachers; and (4) teacher's advice. The sample consisted of 43 teachers: 16 elementary or general, 15 orchestra and 12 band. Teachers were purposefully chosen due to their experience in inclusive music classrooms. The average amount of experience was 13.2 years. Researchers note that they had difficulty finding secondary choral teachers with inclusive classrooms. Though they did conduct three interviews, they were not reported in the study. The instrument used

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consisted of structured and non-structured questions. In addition, Scott et al. developed a rating scale with six points to measure the emotion in the educator's responses. The points were: "highly positive", "positive", "neutral", "negative", "highly negative" or "positive and negative".

The results showed that teachers (elementary music = 87%; orchestra = 63%; band = 66%) had generally positive attitudes regarding inclusion and their access to support. However, only 38% of elementary music teachers participated in individualized education plan (IEP) meetings. This percentage was much lower than orchestra (87%) and band (58%). Regarding outcomes for students with and without disabilities, attitudes were also positive. Scott et al. (2007) also reported that, in terms of parental contact and involvement, instrumental teachers had more frequent and positive contact. One hundred percent of band and orchestra teachers reported having parental contact, and 76% of elementary teachers reported having parental contact. The researchers suggested that the differences in results between instrumental and elementary teachers could be attributed to the amount of parental contact and involvement. Scott et al. also note that teacher's perceptions of outcome for their students with disabilities were highly positive. Many educators reported being surprised with the achievement levels of their students with disabilities. Educators also responded positively when asked about the effects of inclusion on non-disabled students.

Attitudes and experiences of teachers were also researched by Nabb and Balcetis (2010). However, these researchers focused on secondary instrumental classes- specifically, band classrooms. Their main purpose was to measure band directors' concerns regarding the inclusion of students with physical disabilities into their

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classrooms. The researchers had three additional objectives: (a) to measure the perceptions and size of the population of students with disabilities, (b) to assess if band directors were aware of ways to involve students with disabilities, and (c) looking at the limitations and benefits as a result of integrated music classes.

Nabb and Balcetis (2010) surveyed band directors from high schools in Nebraska. A survey was sent to every high school on the music program list found in the Nebraska Schools Activities Association. Researchers sent 301 questionnaires to participating schools. The response rate was 74%; therefore, 221 questionnaires were returned.

The authors suggested that an integration of disabled and non-disabled students into band programs would present a multitude of benefits. Using a Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*), participants indicated their perceptions of whether students with disabilities benefitted from their experiences in instrumental music class, resulting in a mean of 6.3. However, students benefitting from their experiences was done with an increased awareness of adapted instruments, and knowledge of the availability of those instruments. Nabb and Balcetis (2010) note that band directors continually face obstacles when including students with physical disabilities into their band programs. The biggest concerns were a) availability of instruments to accommodate student's needs, b) awareness of options for how to include students with disabilities, and c) the cost of acquiring adaptive instruments. They suggest that music educators be better informed of existing programs and devices to assist students with disabilities and to lobby instrument manufacturers to create instruments that would support the students with disabilities.

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Sharrock (2007) researched the attitudes of choral music educators toward mainstreaming and inclusion and compared them with the attitudes of special education teachers. The purpose of his study was to look at the extent to which students with mental disabilities participated in secondary music classes in South Carolina. Sharrock sought to know a) the extent that students with mental disabilities were mainstreamed into chorus classes, b) the amount of participation by the music teachers in the placement of these students, c) chorus and special education teachers' perceptions of their and each other's roles in meeting the needs of students with disabilities, d) music teacher training with students with disabilities, and e) the relationship between teacher training and teacher attitudes. Research questions for this study were: a) to what extent are chorus teachers involved in the decision-making process for the placement of students with disabilities? b) what is the relationship between the perceptions of secondary special education teachers and chorus teachers as related to their respective roles? c) How do the perceptions of middle school chorus teachers compare with those of high school chorus teachers with regard to mainstreaming students? and d) how do the perceptions of chorus teachers who have received training in special needs education compare with the perceptions of chorus teachers who have not received training in special needs? This was a quantitative research study. To conduct the research, Sharrock (2007) created the *Survey of Teacher Attitudes toward Mainstreaming (STATM)*. A survey of 34 items was given to chorus teachers and special education teachers to examine the practices and attitude of mainstreaming in choral classes.

Using information from the South Carolina Department of Education, Sharrock (2007) distributed questionnaires to 110 high school and 131 middle schools.

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Questionnaires were sent to one chorus and one special education teacher in each school. With a response rate of 41%, 43 high school chorus teachers completed and returned the survey. High school special education teachers ($n = 35$) completed and returned the survey giving a response rate of 35%. Middle school chorus teachers ($n = 48$) and middle school special education teachers ($n = 41$) completed and returned the questionnaire giving a response rate of 39% and 34 %, respectively.

An almost even proportion of high school chorus (75%) and high school special education teachers (72%) reported that chorus teachers occasionally attend IEP meetings. At the middle school level, there was a discrepancy among response. Sixty-seven percent of middle school chorus teachers and 82% of middle school special educations reported that chorus teachers attend IEP meetings. Sharrock (2007) paired chorus and special education teacher's responses when they matched. The paired responses served as the basis for data analysis. Among high school teachers, nine pairs agreed students with disabilities were placed in chorus and four pairs agreed that they were not placed in chorus. At the middle school level, 11 pairs agreed that students with disabilities were placed in chorus. There were seven pairs of high school teachers that disagreed regarding the placement of students with disabilities. At the middle school level, 11 pairs disagreed on the placement. Sharrock noted that this could be due to the manner in which participants were chosen for the study. At schools where there were multiple teachers in one field, one teacher was randomly chosen to participate in the survey. Therefore, one teacher may not have placed a student in chorus when another teacher may have placed a student in chorus.

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When teachers provided their feedback about their perceptions, Sharrock (2007) used dependent (matched pairs) *t*-tests to compare the means of responses between chorus and special education teachers. Statistical significance occurred with $p < 0.05$. Sharrock notes that “these results are based on computations assuming equal variance between means and with two-tailed probability” (2007, p. 43). There were significant differences regarding the perceptions of changes in classroom procedures, $t(17) = 2.15$; $p = 0.046$. Statistical significance, $t(18) = -2.14$; $p = 0.046$, was also found concerning the frequency that a special education teacher (or aide) attended chorus class. Thirty-seven percent of chorus teachers indicated that a special education teacher (or aide) attended chorus, while 63% of special educators indicated that special education staff attended chorus. Sharrock noted that the potential of a disruptive effect by the presence of a special education teacher during instruction reached statistical significance, $t(18) = 0.89$; $p = 0.39$. The mean for chorus teachers ($M = 2.47$) was slightly higher than the mean for special education teachers ($M = 2.26$). The adequacy of training in special education for chorus teachers also presented statistical significance, $t(18) = -2.48$; $p = 0.02$. The mean for the special education teachers ($M = 3.16$) was significantly higher than the mean for chorus teachers ($M = 2.58$). High school teachers reported higher instances of attending IEP meetings than middle school teachers.

Teacher attitudes were also researched by Chang (2017). The purpose of her study was to look at string teachers' perceptions of inclusion of students with autism. The research questions were: (1) What are the current rates of inclusion for autistic students? (2) How successful do teachers feel when accommodating students with autism? (3)

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What sources are being used to get information on these accommodations? and (4) Do years of experience or education level have an effect on teacher perception of success?

Chang (2017) utilized a mixed-methods design that was conducted in two phases. The first phase involved a survey where teachers responded to statements on a 5-point Likert-type scale. The second phase involved e-mail interviews with a small group of participants. Participants were current string music teachers ($N = 51$) who had at least one student with autism in their classrooms. Contact information for the teachers was obtained through school websites and through the American String Teachers Association. Participants taught at the elementary, middle, or high school level.

For the first research question, “What are the current rates of inclusion for autistic students?”, Chang (2017) found that 64% of participants were teaching at least one student with autism. The survey indicated that 36 respondents were teaching between one and four students with autism. The second research question, “How successful do teachers feel when accommodating students with autism?”, found that the majority of participants felt successful, indicating *Agree* or *Strongly Agree*, when providing accommodations for their students. Respondents also reported being comfortable adapting the current curriculum ($M = 3.94$; $SD = 0.75$). They also reported being comfortable modifying their existing curriculum to accommodate students with autism ($M = 3.82$; $SD = 0.81$). Regarding the third question, “What sources are being used to get information on these accommodations?”, respondents tended to *Disagree* or *Strongly Disagree* when asked if they learned how to accommodate students by reading published literature, or by attending professional development sessions. Respondents tended to *Agree* or *Strongly Agree* when asked if they learned to accommodate students with the

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special education teacher at their school. To analyze the final research question, “Do years of experience or education level have an effect on teacher perception of success?”, Chang conducted two Kruskal-Wallis analyses. Results indicated no significant difference between level of education and perception of success. There were also no significant differences between years taught and perceived success of inclusion.

Chang (2017) conducted 11 interviews with participants in phase II of the study. The researcher and an external reviewer coded interviews to ensure reliability. All participants were asked to respond to the following questions: (1) Why do you think this student is being successfully integrated into your class? (2) What factors make you feel unsuccessful when including students with autism in your class? (3) What types of supports do you wish you had in order to feel more successful when including students with autism? (4) In what ways did your undergraduate program prepare you to teach students with special needs? (5) What do you think your undergraduate program could have done better to prepare you to teach students with special needs?

For the first question, “Why do you think this student is being successfully integrated into your class?”, participants indicated behavioral confirmation as a reason for the student’s success. The majority ($n = 6$) indicated feeling successful because their students with autism showed some degree of musical talent. Regarding the second question, “What factors make you feel unsuccessful when including students with autism in your class?”, four teachers felt their students with autism were doing well and did not have concerns at the time of the study. Six teachers reported feeling unsuccessful due to behavioral challenges, three teachers reported feeling unsuccessful because they were not able to give their students with autism individual attention during class. Regarding the

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third question, “What types of supports do you wish you had in order to feel more successful when including students with autism?”, the majority of respondents ($n = 7$) reported that more collaboration, parental involvement, and professional development would help foster feelings of success. For the fourth question, “In what ways did your undergraduate program prepare you to teach students with special needs?”, six teachers mentioned they had taken some type of methods course in their undergraduate classes. Regarding the last question, “What do you think your undergraduate program could have done better to prepare you to teach students with special needs?”, most respondents ($n = 7$) indicated that additional methods courses in special education would have been beneficial.

Shepard (1993) also researched music teacher attitudes toward students with disabilities in mainstreamed classrooms. This quantitative research was done using the Shepard Attitudes Toward Mainstreaming Scale (SATMS). The instrument consisted of 39 items that were separated into the following categories: a) demographic information, b) handicapping condition, c) general mainstreaming, and d) instructional support. Participants completed the survey using a five-point Likert-type scale. Possible answers ranged from “strongly agree” to “strongly disagree”. This study had seven independent variables: (a) chronological age, (b) ethnic background, (c) educational level, (d) years of teaching experiences, (e) amount of college level special education courses, (f) number of in-service workshops attended, and (g) grade level taught. The dependent variable was the attitude toward mainstreaming students with disabilities that was measured by the SATMS. Shepard also developed nine hypotheses that were analyzed for variance using the ANOVA procedure. The null hypotheses were: (1) Teacher’s chronological ages will

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not contribute significantly to teacher's attitudes, (2) Teachers ethnic backgrounds will not contribute significantly to teacher's attitudes, (3) Teacher educational levels will not contribute significantly to teacher's attitudes, (4) Teachers years of experience will not contribute significantly to teacher's attitudes, (5) The number of undergraduate special education courses will not contribute significantly to teacher's attitudes, (6) The number of graduate special education courses will not contribute significantly to teacher's attitudes, (7) The number of district in-service sessions will not contribute significantly to teacher's attitudes, (8) The number of professional in-service sessions will not contribute significantly to teacher's attitudes, and (9) The number of professional in-service sessions will not contribute significantly to teacher's attitudes.

Participants were public school music teachers from the following Georgia school districts: Fulton County, Cobb County, Clayton County, DeKalb County, Gwinnett County and Atlanta Public Schools. Initially, 350 questionnaires were sent to the teachers. Shepard (1993) had 188 returned, giving a response rate of 58%. The majority (29%) of the participants were 36 to 45 years old and the largest percentage (58%) of participants had 15 to 19 years of teaching experience. Thirty-two percent of participants had not taken any college course regarding special education and 61% of participants had not received any in-service training on mainstreaming.

For the first hypothesis, "Teacher's chronological ages will not contribute significantly to teacher's attitudes", the null hypothesis was accepted ($p = .5514$) and teacher's chronological ages did not present any significant differences. The null hypothesis was also accepted for the second, "Teacher's ethnic backgrounds will not contribute significantly to teacher's attitudes" ($p = .4179$), third, "Teacher educational

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levels will not contribute significantly to teacher's attitudes" ($p = .0669$), and fourth, "Teacher's years of experience will not contribute significantly to teacher's attitudes" ($p = .9037$) hypotheses. For the fifth hypothesis, "The number of undergraduate special education courses will not contribute significantly to teacher's attitudes", the null hypothesis was not accepted ($p = .0420$) because the number of undergraduate courses did contribute significant differences to the teacher's attitudes. The null hypothesis was accepted for the sixth, "The number of undergraduate special education courses will not contribute significantly to teacher's attitudes" ($p = .1200$), seventh, "The number of district in-service sessions will not contribute significantly to teacher's attitudes" ($p = .7525$), eighth, "The number of professional in-service sessions will not contribute significantly to teacher's attitudes" ($p = .1388$), and ninth, "The number of professional in-service sessions will not contribute significantly to teacher's attitudes" ($p = .8329$) hypotheses. Shepard also found that the other independent variables did not contribute any significant differences in teacher's attitudes toward mainstreaming. Following her research, Shepard made the following recommendations (a) help change music educators, perceptions of their ability to serve the needs of students with disabilities, (b) include music educators in the placement of students with disabilities, (c) create a unified position on the goal of music education for students with disabilities, and (d) complete studies to determine if students with disabilities are making progress developing their musical skills.

Summary.

Regarding the attitudes of teachers toward their students of disabilities, the literature presents many convergences between the various research studies. Much of the

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research indicated that teachers across different music areas have positive attitudes toward their students with disabilities (Chang, 2017; Scott et al., 2007). In addition, many teachers feel successful including these students (Chang, 2017; Vanweelden and Whipple, 2014). Teachers are also concerned with the adequacy of their training in special education (Chang, 2017; Sharrock, 2007), and the lack of in-service training (Chang, 2017; Gfeller et al., 1990). However, there are areas where the literature does not agree on the same topics. The first of these is the level of support. Gfeller et al. (1990) indicated that instrumental teachers receive more support than choral teachers, but instrumental string teachers in Chang's (2017) study indicated receiving very little support. The second is parental contact. Scott et al. (2007) indicated that instrumental teachers receive more parental contact, but participants in Chang's (2017) study contradicted this.

Inclusion and Mainstreaming Practices

General music.

With the passage of various legislative acts, such as the Education for All Handicapped Children Act (1975), education for students with disabilities in the least restrictive environment has become a priority for teachers across educational domains. Mainstreaming and inclusion have become topics of interest for many teachers, including those involved with music. Jellison, Brooks and Huck (1984) looked at structuring small groups and including positive reinforcement to help facilitate positive mainstreaming interactions. This study was done to examine attitudes and social interactions to the inclusive music classroom setting. They specifically looked at: a) the frequency and quality of social interactions between severely disabled and non-disabled students, b) the

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type of intervention (if needed) to facilitate these interactions, c) the acceptance of disabled students among their non-disabled peers, and d) the comparison of acceptance rates by non-disabled peers in a general education and music education setting. Jellison et al. also looked at the social interactions of students in three different contexts: large group, small group and small group with music contingency.

Jellison et al. (1984) conducted a quantitative study with 100 elementary school students. They ranged in ages from 9 to 12 years old. The students with disabilities ranged in ages from 8 to 15 and were from five different public-school classrooms. Regarding the students with severe disabilities, 21 were ambulatory, and five were in wheelchairs. In addition, 14 were able to use two (or more) words in response, six used single word response, one was echolalic (the student repeated words by others), four were nonverbal, and one used minimal sign language to communicate.

The independent variables were the teaching situations: small group and small group with music contingency. For the small group with music contingency, a music listening reward was given to the group that was the most cooperative. Dependent variables were: social interaction, general acceptance and acceptance within music. Heterogeneous social interaction was separated into two categories: helping and reciprocal. Jellison et al. (1984) measured the independent and dependent variables with behavioral observations.

To carry out this study, Jellison et al. (1984) integrated music classes a week after the initial orientation. For the small group and small group contingency, students began instruction in a large group and then divided into smaller groups for the activities. In every situation (large group, small group, small group with music contingency) students

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were informed that they could have free time after the class instruction. During the small group with contingency, the most cooperative group was announced before the free period began.

The results of the observational data were initially summarized by a tallied frequency of each behavior, and the frequency of that behavior was summarized within the four environments. Researchers deleted the observation intervals for the beginning and the end of class because they had a low frequency. During all conditions, the quality of all interactions throughout the study remained positive. It is also worth noting that the highest total mean of positive interactions was for heterogeneous, between disabled and non-disabled groups. The highest number of positive heterogeneous interactions happened in the small group music contingency setting. There was also a minimal amount of social interaction in the large group setting for all grade levels.

This study showed that simply integrating disabled students into a classroom will not ensure positive interactions. As shown by the data, teachers must structure antecedents and reinforcement of interactions to encourage a high frequency of positive interactions between disabled and non-disabled students. It was also shown, when comparing the small group setting to the small group with music contingency setting, that the contingency was very effective as a “socializing agent” (Jellison, Brooks and Huck, 1984, p. 258). Jellison et al. (1984) suggest that future research should explore the use of various contingences that offer music and nonmusical learning possibilities in an integrated classroom. This study is informative for future research because it lays out a baseline methodology to facilitate positive interactions between students with and without disabilities.

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Inclusion in the music classroom at the elementary level was also examined by Wong and Chik (2016). This was a case study that involved general music teachers in Hong Kong. The purpose of their study was to explore the experience of music teachers in Hong Kong when addressing inclusive education in their classrooms. The study focused on what primary level music teachers say about their curriculum planning, teaching and assessing their students with special educational needs (SEN) in their music classrooms. No research questions were specified.

Wong and Chik's (2016) study was a multiple-case study that involved ten teachers. The researchers used "purposeful sampling" (p.198) to collect qualitative data for the study. Therefore, researchers selected primary school music teachers who were currently teaching mainstreamed classrooms including students with SEN. In addition, the teachers had experience with students with special education needs. To collect data, researchers used semi-structured interviews. Using research literature, an interview guide was created with the following sections: SEN students in mainstream music classes, views on students with SEN, and their experiences of teaching students with SEN in the mainstreamed music classroom. The data collected were categorized and analyzed to report the music teacher's experiences. These categories were: personal profiles of the teacher, music curriculum planning, assessment practices, views on challenges of teaching students with SEN and pedagogical strategies for teaching students with SEN.

Respondents generally used a standard music curriculum (without modifications) for their students with SEN. Teachers have also reported that they face a variety of difficulties in assessing the abilities of students with SEN. This can be attributed to a lack of resources or training in this area. Generally, the teachers reported that their assessment

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included a solo or group performance, and a listening or written test. Wong and Chik (2016) note that the assessments were created based on the average abilities of non-students with disabilities instead of students with SEN.

Regarding challenges of teaching students with SEN, all respondents said that the problem was not hindering students with SEN but the effect that these students have on classroom management. The ideal inclusive classroom involves peer learning through peer acceptance; however, the practices that were reported indicated that with the unchanged curriculum and assessments, students with SEN were unable to access the potential music has to offer. The teachers used common strategies such as simplification, small-steps, slow pace and teacher proximity. Some teachers reported using peer assistants, activities to attract their attention, or having them sit closer to the teacher. Two teachers also reported that they did not have a strategy for working with students with SEN. Findings of Wong and Chik's (2016) study support the theory that teachers need to have more specific training to work with students that have SEN.

Darrow and Gfeller (1991) also looked at mainstreaming practices in the general music classroom, but their study focused on hearing-impaired students. Their purpose was to examine the status of music instruction for hearing-impaired students and to identify factors that lead to successful mainstreaming of hearing-impaired students. Darrow and Gfeller created seven research questions. (1) What is the extent of mainstreaming hearing-impaired students? (2) Are self-contained programs provided if students are not mainstreamed? (3) How prepared are music educators to work with these students? (4) What is the extent of educational support? (5) What factors obstruct effective music education? (6) Are objectives the same for hearing-impaired, and non-

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hearing-impaired students, and (7) What methodologies are helpful with hearing-impaired students? To carry out this quantitative study, a questionnaire was created.

Darrow and Gfeller (1991) sent 300 questionnaires to a random sample of music educators that were found in the national list of the American Annals of the Deaf. The majority of respondents (60%), were general music teachers, 25% were vocal music teachers, and 9% were instrumental music teachers. Most respondents taught grades K-6. The response rate was 32%.

Researchers found that the majority of hearing-impaired students in their study were mainstreamed into music classes. However, those that were not mainstreamed did not attend a self-contained music class, and therefore did not receive music education. In addition, educators reported that they did not receive the necessary preparation to teach hearing-impaired students and received little administrative support. Darrow and Gfeller (1991) identified multiple elements that hindered the success of hearing-impaired students in music class. These elements included lack of appropriate materials, lack of planning time, and little cooperation from other professionals. In terms of methodologies, teachers indicated that low-frequency instruments, sign singing, placement of the student and rhythm/movement activities were beneficial to hearing-impaired students.

Summary.

Much of the literature regarding inclusion in general music settings, indicates that small groups with some type of socializing agent are beneficial when trying to promote positive mainstreaming experiences for students with disabilities (Jellison et al., 1984). In addition, the use of group work also incorporates peer learning, which is also noted as a beneficial strategy for inclusion (Jellison et al., 1984; Wong and Chik, 2016). The

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literature also indicates that general music teachers need more effective training (pre-service and in-service) to properly create positive, inclusive environments for their students (Darrow and Gfeller, 1991; Wong and Chik, 2016).

Secondary instrumental music.

Specific mainstreaming practices were the subject of a study by Frisque, Niebur and Humphreys (1994). They examined mainstreaming practices of Arizona music educators. Researchers posed the following questions: What is the extent of mainstreaming in Arizona classrooms? What reasons do music educators cite for mainstreaming? What are the music educator's educational objectives? Which indicators are used to identify successful mainstreaming and What variables predict success in mainstreaming? This quantitative study was done with a questionnaire and was given to a sample of Arizona music educators.

Using systematic sampling, 227 educators were given the survey. Of those 227, 107 responded. Most respondents were secondary instrumental teachers, and many of the respondents had less than five years of experience. Demographic data revealed that 42% of respondents had special learners mainstreamed into their classes. In addition, 84% of respondents were responsible for teaching students who were special learners. Of the respondents, 41% had no training on special learners, 20% had a portion of an education course, 10% completed a collegiate course on special learners, 7% had multiple courses, and only 4% of respondents had combined college courses and in-service training.

Frisque, Niebur and Humphreys (1994) used a questionnaire from a previous study (Gfeller, Darrow and Hedden, 1990) to collect data. The questionnaire was mailed to music educators from a list provided by the Arizona Music Educators Association

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(AMEA). After removing duplicate names and names without K-12 experience, 1,362 names remained. Researchers chose every sixth name from the list ($n = 227$).

Based on the questionnaire, Frisque, Niebur and Humphreys (1994) found that 49% of music educators cited socialization as the primary reason for placement for exceptional students. Using Chi-square analysis of teaching area, researchers found that student interest and socialization are the primary reasons for inclusion across all teaching areas. In addition, researchers noted that 72% of respondents indicated “rarely” or “never” when asked if they were involved in the placement process for exceptional students. When responding to the statement “I feel successful in my teaching of special learners”, 62% of respondents “agreed” or “strongly agreed”. However, only 33% agreed or strongly agreed that special learners were effectively included in their classes. There was a moderately low correlation ($r = .39$) between music educators’ expressed views on their success in mainstreaming and their perception of how effectively special learners are being integrated.

Inclusion practices were also researched by Lapka (2005), to provide educators with the information needed to integrate students with disabilities into their classrooms. Lapka’s research was guided by the following questions: (1) How was the process begun? (2) How was it implemented? (3) How was the process sustained? and (4) To what degree have students formed relationships with their peers? This qualitative research was carried out using a case study design. Lapka used an Illinois high school band program for her observations. This band ($n = 29$) included eight students with disabilities. Five other students had Individual Education Plans (IEP), and out of those

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five students, three were categorized as having learning disabilities. The students with disabilities ranged in grade level from eight to twelve.

To collect data, Lapka (2005) conducted observations, interviews and focus group interviews with students in the program over the course of three months. The program's band director and the special education teacher were also involved in formal and informal interviews. For additional understanding, the researcher conducted interviews with the high school principal, middle school band director, resource teacher, academic assistant, and home economics teacher. The researcher used a video camera and digital audiotape to record words and actions. Coding was used to analyze rehearsal and interview transcripts. In order to lead the discussion, the researcher looked for trends in the transcripts.

Lapka (2005) found that music and special education teachers were embracing the inclusion of students with disabilities into non-disabled classrooms, and the implementation was gradual. In addition, efficient time management practices were used by teachers who used technology and informal means of teaching in their mainstreamed classrooms. In-service music teachers learning from mentors, music teachers that advocate for the program, parent/peer support and flexibility and creativity when solving problems were key components to the success of classroom inclusion. The curriculum also needed to be based on student abilities and the teachers also needed to understand how to adapt concepts for their students. Recruitment and education of peer tutors, staff collaboration, true collaboration (based on respect, communication and shared responsibilities), and social, personal and curricular goals were also noted as being important.

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Inclusion practices were also researched by Hahn (2010). The purpose of her study was to examine current preparation and practices of music educators when teaching students with disabilities. To carry out the quantitative research, Hahn used a survey to collect data. The survey included questions about: a) music educators' understanding of, and participation in, the special education process; b) the music educators' knowledge of available resources; and c) various accommodations utilized by music educators. Finally, participants provided information on their professional development experiences, and the barriers and support for inclusionary practices. Participants for the survey were sampled from the Pennsylvania Music Educators Association, and 363 questionnaires were completed. To analyze the data, Hahn (2010) used descriptive analyses for the first five research questions, and a two-way analysis of variance (ANOVA) was used for the sixth and seventh questions.

Hahn's (2010) first research question dealt with pre-service and in-service training preparation for working with students with disabilities. The researcher found that 59% of participants completed at least one undergraduate course that included some information about students with disabilities. Responses also indicated that 58% of participants did not have any graduate course regarding students with disabilities. In addition, 83% of participants have completed at least one in-service training (or professional development workshop) regarding students with disabilities. Question two dealt with music educator knowledge and skills related to working with students with disabilities. A large percent of respondents indicated a limited knowledge of the following aspects when teaching students with disabilities: The Individuals with Disabilities Education Act (56%), least restrictive environment (37%), specifically

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designed instruction (44%), collaboration (41%) and knowledge of IEPs (56%). The third question dealt with the presence of students with disabilities in music classes. The total number of students (disabled and non-disabled) ranged from 15 to 1,200 ($M = 316.8$). The total number of students who formally identified their disability ranged from 0 to 300 ($M = 36.0$). Research question four dealt with music educator's involvement in the implementation of special education services. More than half of respondents (61%) indicated that they were not consulted regarding placement decisions for their students with disabilities. In addition, less than half of participants (44%) indicated that they were never invited to their student's IEP hearing. Question five dealt with barriers and supports to mainstreaming. Participants indicated that the following were the most available resources: special education teachers (45%), support staff (7%), access to IEPs (6%), guidance counselors (6%) and student aides (6%). Question six looked at student participation rates by content area and level. Using a two-way ANOVA between grade level and content (independent variables) and the number of formally identified students (dependent variable), Hahn found that elementary music educators were responsible for a lower number of formally identified students in comparison to the middle and high school level. There was no significant effect for content. The final research question dealt with music educators' involvement in the placement process. Using a two-way ANOVA between grade level and content (independent variables), and the number of formally identified students (dependent variable), Hahn found that elementary music educators had a lower level of involvement than music educators at the middle or high school level.

Summary.

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One of the main convergences in the literature is that music teachers need to be more involved in the placement process of their students with disabilities (Frisque et al., 1994; Hahn, 2010). Participants of both studies reported that they were not consulted regarding the placement of students with disabilities in their instrumental ensembles. The literature findings also suggest that secondary instrumental teachers need more training to ensure more successful inclusion (Frisque et al., 1994; Hahn, 2010). Many participants in Hahn's study reported little knowledge of topics relating to special education. In addition to more pre-service and in-service training, Lapka's (2005) study indicates that mentorship between the music and special education teachers is a key component for successful inclusion.

Secondary Choral Music.

Implications for exceptional students in inclusive environments was researched by Haywood (2005). The purpose of her study was to expand on the research involving the inclusion of special needs students in music classes. Haywood had three research questions: (1) How does the process of including individuals with special needs create change in those individuals? (B) How does the process of including individuals with special needs create change within the ensemble, and (C) How does the process of including individuals with special needs create change in the ensemble director? Haywood (2005) states that her research is "intended to provide a multifaceted view of the inclusion of individuals with special needs. . ." (p. 34).

This qualitative study focused on inclusive environments in the choral classroom. Haywood (2005) presented three case studies. Haywood used meta-analysis when analyzing her data. The first case study focused on an individual with special needs in a

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choral ensemble. Research was conducted through semi-structured interviews with the participant and her parents. Haywood categorized the first case study as phenomenological. The second case study focused on a choir program that featured students with special needs and students without special needs. Research was conducted through observations, including field notes and video recordings, and semi-structured interviews with the choir's director. This case study was categorized as ethnographic, with the researcher fully immersing herself in the culture of an inclusive choral ensemble. The third case study focused on the director of the inclusive choir featured in the second case study. Research was conducted through semi-structured interviews. This case study was categorized as phenomenological. The case studies were compared to each other in order to find overarching patterns.

At the end of her study, Haywood (2005) indicated that six categories, regarding the inclusion of students with disabilities, emerged from the data. They were: a) pedagogy, b) barriers to inclusion, c) creating inclusive environments, d) music making, e) building relationships, and f) personal growth. Regarding pedagogy, Haywood found that movement can be helpful to encourage healthy singing, symbolic notation is useful for student with visual impairments, sign-language is helpful for hearing impaired students, and peer assistance is also beneficial. Haywood also found that the ensemble director should: continually reinforce confidence, use models to demonstrate healthy singing, and be flexible. Regarding barriers to inclusion and creating inclusive environments, Haywood found that access is still an issue for students with disabilities. These relate to physical and logistical challenges. Another indicated barrier was the internalized fear of those directly involved in the ensemble. Haywood described this as

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“the inner dialogue which tells one that including individuals with special needs... will harm the standards of learning or musicianship...” (p. 79). The theme of music making also emerged from the data. In the first case study, the participant indicated that the process of making music was the transforming element in their choral experience. Regarding building relationships, Haywood indicates that social interactions through the music and through being in the choir social setting were beneficial to the first case study's participant. To insure the creation of an inclusive musical environment, the ensemble director created a buddy system within the program. The last emergent category was personal growth. The act of participating in an inclusive choir generated personal growth for the students with and without disabilities. In addition, Haywood indicated that the participation in the director's buddy system helped to build their human and musical connections with each other.

Strategies for Teaching Students with Disabilities in Music

General music.

To effectively mainstream students with disabilities into a music classroom, a teacher must adapt instruction to meet the needs of those students. The adaptation of instruction in a general music setting was investigated by Salvador (2015) to isolate curriculum modification practices of the music teacher that would directly benefit the students with disabilities in the classroom. This case study details the practices of an elementary general music teacher in her mainstreamed music class and when the students with disabilities were in their self-contained music class.

Salvador (2015) conducted a qualitative case study that examined how the teacher provided individualized instruction to her exceptional students. Salvador especially

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focused on the teacher's use of assessment in her practices. The teacher had eight years of experience teaching general music. Salvador also chose this teacher because she had expertise working with special needs students. The study included one fourth grade general music class, and one general music class for upper-elementary students with moderate to severe cognitive impairments. The fourth-grade class included students with and without disabilities, and the upper-elementary class was self-contained. Salvador did not specify the ages or number of students in each class. Two students with Down's Syndrome attended both classes.

To collect data, Salvador (2015) conducted multiple observations from April 19 to May 26, 2010. Observations were done in both the fourth grade and the upper level class. Classes were 40 minutes, twice a week for the fourth-grade class, and 25 minutes, twice a week for the upper level class. The researcher tried to avoid influencing the class; however, her presence may have altered the classroom climate. Observations were video recorded, and excerpts of the video were taken out for the teacher to watch and provide a verbal protocol analysis. In addition, she was also interviewed before and after the data collection and provided journal entries about the classes being observed. Salvador used three methods to ensure credibility for the data. They were: triangulation, member checks and peer review. The researcher also returned interview transcriptions to the teacher to ensure an accurate portrayal of her thoughts.

Salvador (2015) found results in three different areas: readiness to teach exceptional children, inclusive practices in fourth-grade music, and instruction in a self-contained setting. Regarding readiness to teach exceptional children, Salvador suggested

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that collaboration with special education teachers could help resolve the lack of preparation suggestions for instruction. The participation of music teachers in Individualized Education Plan (IEP) meetings were also helpful. In the second category, inclusive practices, Salvador found that various modifications to activities, such as color coding music, were helpful for the students with exceptionalities. In addition, peer assistance helped to keep the students with exceptionalities on task during various activities. Third, regarding instruction in the self-contained setting, the teacher used an instructional model that was based on an early childhood approach. This early childhood approach was called Music Play by Edwin Gordon. This style of informal teaching allowed for students in this class to voluntarily participate which also maximized the participation. The added success in the self-contained classroom was also due to the use of paraprofessionals. They helped to facilitate social behavior by modeling for the students.

From this case study, Salvador (2015) found that music in a mainstreamed and self-contained setting was beneficial to students with exceptionalities. In addition, using a music play instructional model was well received by students with moderate to severe exceptionalities. This was because the music play model provided the needed scaffolding for the students with disabilities to feel successful in their inclusive classes.

The facilitation of learning in students with exceptionalities was also researched by Gerrity, Hourigan, and Horton (2013). The purpose of their study was to investigate specific methods that would aid in the music learning process for students with exceptionalities when included in a general music class. This study utilized mixed

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methods for its research; therefore, a different research question was provided for each method. The research questions were: What is the musical ability of students with special needs? (quantitative); what are the conditions that facilitate music learning? (qualitative); and do the conditions that facilitate music learning have an effect on the musical ability of students with special needs (mixed)?

This study began with the collection and analysis of quantitative data. During the second phase, qualitative data were collected through interviews with the participants and were used to further explain the quantitative data. Research took place at a Midwestern university. The ages of the participants ranged from seven to fourteen years of age. Out of the sixteen children, eleven had autism, two had Down's syndrome, one had cerebral palsy, one had cognitive delay, and one also had cognitive delay with chronic health issues. In the music sessions, the curriculum consisted of musical concepts such as steady beat, pitch matching and tonal memory. Children met on Saturday afternoons for ten weeks. Participants were given music instruction from university faculty, special education teachers, a music therapist and university students.

To complete the quantitative component, researchers utilized a pretest and posttest design. Children with special needs were assessed individually at the beginning and end of the 10-week session. The instrument used for this process was an inventory of 20 items that related to the student's skills and knowledge of pitch and rhythm. During each assessment, students were asked to keep a steady beat, recognize high and low notes, recognize long and short note durations, perform and improvise expressively, vocally, and using percussive instruments. Gerrity et al. (2013) used an evaluator not

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associated with this study to ensure reliable results. Regarding the qualitative aspect of this study, participants were given semi-structured interviews. However, only 13 out of the 16 students were interviewed because three of the students were nonverbal.

Interviews were conducted with students, parent or guardians and the mentoring university students. All interviews were audio recorded and transcribed for analysis.

After collecting the data, researchers coded that data based on the personal experience of each participant. To measure validity, the researchers used triangulation, since data were gathered from multiple sources.

In the quantitative section of the study, the researchers described the musical ability, at the beginning of the study, as poor for all participants. The overall mean pre-test score was 43.0 out of 100 ($SD = 18.9$). At the end of the study, the mean post-test score was 49.7 ($SD = 23.4$). A paired-samples t -test showed that there was a significant mean difference of 6.7 between the pre and post-test scores, $t(15) = -3.0, p = .009, d = .87$. Gerrity et al. (2013) also isolated specific inventory items and created summated scores that were reflective of the participants ability level in that area. The first area was rhythm/duration. The mean pretest score was 23.7 ($SD = 11.2$), and the mean posttest score was 26.3 ($SD = 12.9$). The second area was pitch. The mean pretest score was 19.3 ($SD = 9.4$), and the posttest score was 23.4 ($SD = 11.2$). The final category was tonal memory, where the mean pretest score was 12.0 ($SD = 5.7$) and the mean posttest score was 13.6 ($SD = 7.2$). Paired t -test scores showed significant increases after the experimental period. The results of those tests were: a) rhythm/duration; $t(15) = -2.4, p = .029, d = .66$, b) pitch; $t(15) = -2.6, p = .019, d = .68$, and c) tonal memory; $t(15) = -2.3, p = .036, d = .70$.

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Regarding the qualitative data, researchers found common themes from interviews with participants and their parents. The emergent themes were: revelation of knowledge and skills, effective teaching strategies and essential conditions for learning. Regarding the revelation of knowledge and skills, many of the student's parents noted that because of their music classes, they have seen the emergence of musical skills in their students that were not apparent before. In terms of effective teaching strategies, repetition, student choice, and increased response time were all identified as strategies that led to increased engagement and music learning. Gerrity et al. (2013) note, regarding repetition, that "it also allowed the student to better understand the sequence of instruction" (pp. 153-154). Student choice gave the participants the freedom to explore the instruments at their own pace. Increased response time was noted by the university student mentors. When participants were given a longer opportunity to respond, they were more likely to demonstrate their understanding of a skill. To facilitate learning, participants indicated that clear directions, behavior plans and a positive environment (free from distractions) all helped to create a good learning environment. Clear directions, with as little language as possible helped students feel more successful when given a task. Behavior plans, especially those that rewarded students, helped to keep students on task.

Teaching strategies were also researched by Perkins (1996) in her dissertation. She specifically looked at adaptive strategies that could be used in the elementary music classroom. She sought to determine: a) strategies used for all students and adaptive strategies, b) descriptions the adaptive strategies, c) aspects of the learning process that are considered when adapting strategies, d) the extent of variation of these strategies based on the student's disability, e) the ways that students with disabilities are influenced

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when adaptations relating to socialization, classroom management, physical environment, musical understanding or required cognitive skills are implemented, and f) the extent that training, teaching experience, number of students, number of music classes, classifications of integrated students, and the amount of support influence the use of adaptive teaching strategies. Perkins developed four research questions. They were: a) What strategies, if any, do teachers use to facilitate music learning for students with disabilities integrated into the elementary general music classroom? b) When strategies are altered and/or adapted, to what extent do the adaptations vary of students with differing disabilities? c) In what ways are students with disabilities integrated into elementary music classes influenced when: socialization strategies are adapted, classroom management strategies are adapted, and when strategies relating to physical environment, materials, musical understanding and/or cognitive skills are adapted? and d) To what extent do the variables (training/preparation, teaching experiences, number of students with disabilities, number of integrated music classes, classification of students, amount of support) relate to the implementation of adaptive teaching strategies?

In Perkins' (1996) quantitative research study, a questionnaire was distributed to a sample of elementary music teachers in 18 Midwestern school districts. Of the 366 questionnaires, 171 questionnaires were returned. Of those 171 questionnaires, 166 had usable data. In addition, four teachers also selected for observations and interviews. The six most common disabilities reported were: behavior disorder, communication disorder, hearing impaired, learning disabled, mild mental retardation, and attention deficit disorder.

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Analysis of the data was done with descriptive statistics, analysis of variance (ANOVA), correlation coefficients and content analysis. The second phase of data collection consisted of observations and interviews. The interview questions were designed to build upon the respondent's questionnaire responses and the teaching practices observed.

From the questionnaire, Perkins (1996) found that several of the teaching strategies fell into two categories: teaching behavior strategies and pupil reinforcement strategies. In the category of teaching behavior, some of the most common strategies were verbal cues (96%), modeling (96%), and verbal directions (95%). Regarding pupil reinforcement, the most common strategies were positive reinforcement (96%), feedback (95%) and encouragement (95%). When discussing the degrees of adaptation, Perkins noted that there were varying degrees of adaptations among respondents. One teacher noted that she constantly adapts instruction for the varying levels in her class. Another noted that when adapting flexibility is important. Conversely, other respondents found it difficult to adapt strategies (and thus rarely did it) due to the minimal amount of music instruction. When teaching a song, the following strategies were identified as being helpful to students with disabilities: hand motions to show pitch, repetition, sign language, performance with added movement or instruments, visual of words, hearing instrumental parts only, solo/ small group performances, playing or clapping the rhythms and singing on a neutral syllable. Regarding note reading, Perkins suggested that rote learning is a strategy that is especially beneficial to students with reading difficulties and autism. Perkins also concluded that when strategies were adapted, the integrated students were more willing to participate and enjoy interaction with their non-disabled peers.

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Analysis of variance tests were conducted to determine if there were significant differences among various groups use and adaptation of teaching strategies related to training/preparation, teaching experiences, number of students integrated into music class, number of integrated music classes, and amount of assistance. Significant differences ($p = .05$) were found among the various groups' years of teaching experience as related to their use of adaptive teaching strategies in the following categories: teaching behaviors used with all students, teaching behaviors adapted for students with disabilities, reinforcement adapted strategies for students with disabilities, demonstration of knowledge used with all students, and demonstration of knowledge for students with disabilities. Significant differences were found between first-year teachers and those with 16 to 20 years of experiences in the implementation of strategies for all students and those adapted for students with disabilities.

Harris (1991) developed a general music curriculum with instructional strategies for students with disabilities. Harris looked at specific procedures, activities and methods that would be beneficial to a disabled student in an instrumental music class. For her qualitative research, Harris looked at the areas of singing, playing instruments and movement in the music classroom. To carry out this study Harris taught music to seven multiply-disabled students. These students ranged in age from five to eleven. Conditions included: autism, cerebral palsy, visual impairment, auditory disorders and varying degrees of mental disability. Harris, focused on singing, playing instruments, and movement, and compiled activities in each category to establish a foundation for the study. Data collection was done through observations and video recordings of the music classes. Harris also developed a Weekly Musical Responses evaluation sheet to evaluate

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student responses. Harris (1991) conducted music instruction once a week during 30-minute classes. Lesson plans were carried out for approximately one month, before a new cycle of lesson plans were introduced. The monthly focus of the lessons provided frequent repetition for the students.

When creating her curriculum Harris (1991) found that educators must focus on the individualization of the curriculum for each student. The curriculum must be geared to the student's maturity level and individual capabilities. In addition, educators must be constantly aware of the various learning styles that children need. Harris also stated that curriculum development must always be geared towards the student's developmental level. From there, the educator can make a plan that would most benefit the student. Harris also noted that students with disabilities can be taught the same curriculum as students without disabilities, however the instructional strategies and modifications implemented needed to be effective. When implementing a curriculum for students with disabilities, Harris states that the following strategies are beneficial for those students: a) repetition of the same concept in many ways, b) a structured, systematic approach, and c) classroom management plans that begin with a positive attitude.

For curricula involving singing, Harris (1991) found that the objective should be providing a meaningful learning experience while the student is having fun. Harris stressed that the goal should not be to achieve perfect pitch or to create a proficient singing performance. Harris suggested that nonsense syllables, repetitive words/phrases, and short/simple melodies would provide students with disabilities with the most success. In addition, these songs should feature a steady rhythm. Regarding curricula involving playing instruments, Harris specified that rhythm instruments have been designed for

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students with disabilities. In addition, since some instruments may not be suitable for the student with disabilities, some adaptation will be needed. Harris noted that curricula involving movement are especially useful for the disabled student because movement activities help the student improve coordination between various body parts and practice with proper breathing. Movement also helps to teach concepts such as up, down, over, under, between and through which Harris noted may be confusing to the multiply-disabled student.

Summary.

General music teachers have a variety of strategies that are beneficial to students with disabilities. Hands on activities and movement were both indicated by Perkins (1996) and Harris (1991) as useful strategies. Gerrity et al. (2015) and Perkins (1996) both agreed that giving students more choice and ability to explore at their own pace were helpful to students with disabilities. When teaching melodies, Harris (1991) suggested keeping the songs short and simple and using nonsense syllables rather than teaching lyrics. In addition, Perkins (1996) suggested that using hand motions to represent pitch is also beneficial when teaching a new song.

Secondary instrumental music.

The following studies examined teaching strategies in secondary level instrumental classes. Viniciguerra (2016) focused on the experiences of music teachers with their students that have disabilities. The purpose was to look at the lived experiences of four secondary instrumental music teachers who teach students with disabilities in their classes. Qualitative data were collected with journals, interviews, artifacts and observations of the teacher. Viniciguerra had the following research questions: (1) What

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do secondary instrumental teachers do to accommodate students? (2) Why do secondary instrumental teachers make accommodations for their students with disabilities? and (3) How do the teaching practices of secondary instrumental teachers align with the aspects of the Universal Design for Learning?

Participants were four secondary instrumental music educators that had varying levels of teaching experience. Purposeful sampling was used to locate participants. Teacher A had 15 years of experience, taught sixth through 12th grade, and had no college level coursework or in-service training with mainstreaming. Teacher B had four years of experience, taught K-5 general music, and had taken one college level class regarding students with disabilities. Teacher C had 21 years of experience, taught K-5 general music and sixth through eighth grade chorus, band, drama, piano and guitar classes. Teacher C had taken one college level class regarding students with disabilities. Teacher D had four years of experience, taught middle and high school band, and had also taken a college level class regarding students with disabilities. The study was conducted over 20 weeks, and reflective journal prompts were given to participants during the first week and continued biweekly throughout the study. Viniciguerra (2016) used a phenomenological approach to this study because it “focused on developing better instructional practices as well as a deeper understanding ... in teaching secondary instrumental music to students with disabilities” (p. 60).

Viniciguerra (2016) found that teachers were knowledgeable of the various learning disabilities and the needs of students. However, problems occurred when teachers were not notified of student diagnoses. They received little guidance from Individual Education Programs (IEP). Successful accommodations were dependent on the

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experience and training of the teacher, severity of the disability, and how much the students had learned to cope with their disability. Viniciguerra found that the following strategies were helpful when making accommodations for students. They were: (a) representation through visual aid and multiple formats, (b) interaction between students, teachers, faculty, and administrators to create an accessible environment for students with disabilities, and (c) collaboration and individual work that rewards and motivates students.

From interviews with participants, Viniciguerra (2016) found strategies that were beneficial to students with disabilities. The first is structure; however, from a student response, Viniciguerra indicates that the teacher should maintain the structure of the class but change lessons or ideas to make them different for each session. Modeling was also noted as a beneficial strategy. Utilizing student leaders and incorporating cooperative learning are both beneficial strategies too. When assisting students with note reading, Viniciguerra indicated that color coding music is also helpful for the student.

Tooker (1995) conducted a research study on special learners in a high school band program. His qualitative research was carried out with a case-study of a self-contained band class. The class was at the beginning level and contained eight students with learning disabilities and three emotionally disturbed students. Tooker used video observation, transcription and coding for 15 weeks of instruction and student learning.

Tooker (1995) employed four methodological strategies to collect and analyze data. The first was video recorded class instruction. Tooker randomly chose to focus on an individual student, cluster of two to four students, or the full ensemble on a daily basis. The second data collection strategy was a review of the IEPs for each student with

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disabilities. Third were observations and assessments conducted by professional music educators and professional special educators. These observations provided a pedagogic view of the special education beginning band class. The final method for data collection was informal interviews that were conducted with school, district, and central board of education administrators. These interviews were audio recorded and transcribed.

Tooker (1995) found that high expectations aided in the level of performance of the special learners in comparison to their non-disabled peers. The expectations, for the methods, materials, and instruments, were identical to those in a beginning band class of students without disabilities. In addition, an individualized curriculum and pace of instruction was also beneficial to students with disabilities. A slow introduction of performance skills that were repeated and reviewed daily helped students to successfully retain material. Tooker added that modification to written music may also be necessary, especially if the student has academic disabilities (e.g. dyslexia). Examples of these modifications are: a) large print music, b) alphabetizing notation, and c) indicating the fingerings above pitches. Modeling and a consistent daily routine were also noted as beneficial strategies for the students in this class. Tooker also notes that modifying negative behaviors allowed for higher levels of musical achievement and maintained the on-task behavior of the students. At the conclusion of the study, two students were able to be mainstreamed into band classes with non-disabled peers and five students reached the first year, beginning performance level.

Pinta (2013) also looked at teaching strategies in the secondary level guitar classes. The purpose of her study was to look at adaptations that were designed for three students enrolled in high school guitar classes. Student A was autistic, Student B was

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diagnosed with Asperger's disorder and also had behavioral issues, and Student C had a specific disability in the areas of auditory processing and expression. Each student was in a different guitar class. Pinta was the guitar teacher for these classes, and the case study researcher. This study took place at a Los Angeles area high school. The guitar classes were 90 minutes long and taught daily. Students in the guitar class also received weekly private lessons. Throughout the curriculum, Pinta (2013) used best practice teaching strategies. They were: modeling, guided practice, free practice, manual assistance, pair/share, and cooperative learning. Pinta implemented an 18 week guitar curriculum for each of her classes.

From the study, Pinta (2013) found that each student was able to complete the curriculum with various modifications. Strategies such as cooperative learning, and pair/share allowed the students with disabilities to receive assistance (without being singled out) and helped them to work on their social skills. In addition, the differentiated instruction was not a hinderance to the non-disabled students. It provided a chance to continually review past material, while the students with disabilities were learning at their pace. Pinta also allowed the students to choose their own literature and to complete quizzes at their own pace. This allowed the students with disabilities to demonstrate competency when they were ready.

After the research study Pinta (2013) made the following recommendations. They are: a) students with special needs should be placed in classes where music teachers are willing to work with them at their level and tailor instruction, b) the most important goal is to provide students with special needs an emotional and social outlet through music, c) if the teaching strategies are successful with a variety of students, then it may be the

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techniques and not the class that appeals to students with disabilities, and d) guitar classes provide an alternative to standard secondary music classes (i.e. band/chorus/orchestra).

From her research, Pinta found that a slower pace, rewards for good behavior, modeling, manual assistance, cooperative learning, and student choice were all beneficial teaching strategies in the high school guitar class.

Teaching strategies for the string classroom were researched by Van Camp (1989). The purpose of her study was to design and implement a string curriculum for students with mild mental disabilities. The researcher posed the following questions: (1) Was the curriculum content pedagogically accurate and appropriate for students with mild mental disabilities? (2) Did student skill levels and attitudes toward string classes indicate the feasibility of string classes for the mentally disabled? (3) Which class setting was more appropriate for students with mild mental disabilities, homogeneous (only violin) or heterogeneous?

Participants in this study were 24 middle school students, although the study ended with 22 participants due to the expulsion of two students. Van Camp (1989) chose middle school students because "it was assumed that the older students would be better equipped developmentally to participate in string instrumental music" (p. 56). Participants were divided into four classes, each with six students and each class was randomly assigned a homogeneous or heterogeneous structure. Each class received 24 lessons over the course of 12 weeks. Rote teaching was used to introduce all songs and technical skills. Charts of finger numbers were also utilized to help the retention of finger patterns, and colored tapes were used to mark finger placements. Lessons were videotaped and audio-recorded to evaluate student progress and the teacher delivery. Van

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Camp notes that the pedagogical sequence was like the one used for students without disabilities. However, the sequence moved at a slower pace and involved more exact and varied repetition. Following instruction, student performances were evaluated by a panel of string music educators. The panel of educators also responded to a questionnaire about the feasibility of string classes for mildly mentally disabled students. Finally, a survey was distributed to participants to determine their attitude toward string class.

The curriculum for the study was developed by Van Camp (1989) and was based on established string pedagogy by Culver (1981), Gillespie (1984), and Rolland (1974). In addition, the curriculum was based upon information regarding the characteristics of mildly mentally disabled students. A curriculum evaluation form was developed by Van Camp to evaluate the content of the curriculum. The curriculum was also evaluated by a panel of string music educators to establish the content validity of the curriculum. Van Camp also developed *The String Music Attitude Inventory for Special Students*, which was used to determine student attitudes toward string class. The inventory had five objectives: (1) to determine if students liked the twelve weeks of string class, (2) to determine if students liked playing stringed instruments, (3) to determine if the students would continue playing a stringed instrument, if given the opportunity, (4) to determine if students thought that other students with disabilities would like playing a stringed instrument, and (5) to determine whether or not the students thought that other students with disabilities should have the opportunity to take string classes. To evaluate students, following the twelve weeks of instruction, Van Camp designed *The Performance Evaluation Form for MMH Middle School String Students*. The form was divided into three sections: technique, music and ear training.

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Regarding her first research question, Van Camp (1989) found that her curriculum was developmentally appropriate for the students with mild mental disabilities. However, recommendations were made to break down skills into smaller steps, omit the use of F and A major scales for lower instruments, avoid having students use the entire bow prematurely, and beginning shifting motions earlier in the curriculum. The second question dealt with the improvement of student skill levels and attitudes toward string classes. Van Camp found that students improved their string skills and appeared to enjoy string class. The participants' scores were compared to the scores in the acceptable range of the Performance Evaluation Form to give perspective of the achievement level as perceived by the string experts. Following instruction, the mean ear training score was 23, which was two percent below the acceptable range. The mean technique score was 25 or 55% of the possible score. An acceptable technique score would be 27, or 60% of the total possible score. Regarding the student's music score, the mean was 65%. This was 10% below the acceptable range score of 75%. Student attitudes were measured by daily observation and *The String Music Attitude Inventory for Special Students*. There were three possible responses (1- agree; 2- not sure; 3- disagree), with the total possible score being 24. A score of 19 was considered to be an acceptable positive attitude score. Each class had the following, average score: a) Class A- 22.3; b) Class B- 19.2; c) Class C- 20; and d) Class D- 20. Student behavior and attitudes seem to indicate the feasibility of string classes for mildly mentally disabled students. The third question dealt with the appropriate class setting. Van Camp used the Wilcoxon Two-Sample Test to compare homogeneous and heterogeneous classes on the following variables: a) I.Q., b) social quotient, c) attitude, and d) string skills. There were no significant differences between

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the heterogeneous and homogeneous classes regarding technique, music, ear training, and the total string score. Van Camp concluded that students with mild mental disabilities will achieve similar levels of success in both settings. However, two of the three string music experts stated that the homogeneous setting was most the most appropriate, and one judge stated that the heterogeneous setting was best, and a homogeneous setting was not a suitable climate for student progress.

Summary

Regarding teacher attitude, much of the literature found that music educators have positive attitudes toward their exceptional students (Chang, 2017; Gfeller, Darrow and Hadden, 1990; Nabb and Balcetis, 2010; Scott, Jellison, Chappell and Standridge, 2007; Sharrock, 2007; VanWeelden and Whipple, 2014). In addition, the research also agrees that teachers need more pre-service (undergraduate and graduate courses) and in-service sessions to properly facilitate positive experiences in an inclusive setting (Darrow and Gfeller, 1991; Frisque et al., 1994; Gfeller, Darrow and Hadden, 1990; Hahn, 2010; Haywood, 2005; Lapka, 2005; Shepard, 1993; Wong and Chik, 2016).

Education for all students in the least restrictive environment is a priority for many teachers. In context of a music education class, whether it is at the general or secondary level, teachers are looking for effective ways of including students with exceptionalities in their classrooms. Much of the literature presented indicates that the following help to facilitate positive instances of inclusion: a) peer mentorship, among students with and without disabilities (Lapka, 2015; Jellison et al. 1984; and Wong and Chik, 2016), b) small groups for cooperative work (Jellison, Brooks and Huck, 1984; Wong and Chik, 2016), and c) having a reward or contingency in place (Jellison et al.,

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1984). Though not a specific strategy, the research also suggests that secondary instrumental teachers should be involved in the placement process for their students with disabilities (Frisque et al., 1994; Hahn, 2010; Lapka, 2015).

Finally, teachers must be able to adapt current curriculum to meet the needs of their exceptional students. Much of the research indicates that the following teaching strategies are beneficial for students with disabilities: a) peer assistance/cooperative learning (Pinta, 2013; Perkins, 1996; Salvador, 2015; Viniciguerra, 2016), b) repetition (Gerrity et al., 2015; Harris, 1991; Van Camp, 1989; Viniciguerra, 2016), c) modeling (Perkins, 1996; Pinta, 2013; Viniciguerra, 2016) d) color coding music (Salvador, 2015; Viniciguerra, 2016), e) student choice (Gerrity et al., 2015; Perkins, 1996; Pinta, 2013), f) routine/structure (Harris, 1991; Perkins, 1996; Tooker, 1995; Viniciguerra, 2016) g) movement to reinforce musical concepts (Harris, 1991; Perkins, 1996), h) slower lesson pace (Tooker, 1995; Van Camp, 1989), and i) rote learning (Perkins, 1996). The strategies (Van Camp, 1989) specific to string music education are: a) omitting the use of the F and A major scales for lower instruments, b) limiting bow usage to the upper (violin/viola) 2/3 or lower (cello/bass) 2/3 of the bow, and c) beginning shifting motions early in the string curriculum.

Chapter 3: METHODOLOGY

The purpose of this descriptive study was to identify adaptive teaching strategies for students with disabilities in a string class. The following research questions were addressed:

1. What type of training (if any) are string teachers given in preparation for working with students that have disabilities?
2. What strategies are effective for facilitating music learning for students with disabilities?
 - a. Are these strategies newly developed, existing approaches, or adaptations of existing strategies?
3. What strategies are effective when teaching instrument posture/position, right-hand and left-hand skills to students with disabilities?
4. When strategies are altered, to what extent do they vary for differing disabilities?
5. How are instructional strategies modified when teaching students with disabilities?

Participants

Purposeful sampling was used to choose participants for this study. Participants of this study were current string music teachers in a Midwest state who have a least one student with a disability in any of their classes. Email addresses for public school string teachers were collected from a Directory of Music Teachers for this state. To collect the email addresses for private school string teachers, I used the directory of private schools from the state's Department of Education. Elementary, middle, and high school string

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teachers were contacted to be potential participants in the study. There were no further stipulations for participation in this study.

Measure

The measure for this study was *The Adaptive Teaching Strategies of String Music Educators* questionnaire (See Appendix A). This measure was designed by Perkins (1996) and was adapted for the purposes of this study. For this study, a questionnaire was determined to be the most appropriate tool for collecting data, as it allowed a large sample of teachers to participate in this study. In addition, an online survey was decided to be the most practical and effective method of distributing the questionnaire. Therefore, this questionnaire was designed and distributed through the survey website Survey Monkey™. The questionnaire was divided into three parts. Part One of the questionnaire collected demographic information about the participants. Questions in this section asked the participant to identify: the number of total years teaching, number of years teaching self-contained string classes, number of years teaching integrated string classes, amount and type of training to teach students with disabilities, the types of disabilities among their students, and the number of students with disabilities.

Part Two of the questionnaire focused on specific teaching strategies that were utilized by string music educators, how these strategies were utilized and parts of the teaching process that were considered when adapting strategies. In addition, this section of the questionnaire also featured open ended questions that dealt with the types of strategies utilized when teaching instrument posture, right-hand technique (i.e. bowhold, various bowstrokes, etc.) and left-hand technique (i.e. left-hand shape, finger placement, shifting, etc.). Part Two of the questionnaire featured questions regarding teaching

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behaviors and strategy preparation for teaching students with disabilities. Part Three of the questionnaire allowed participants to elaborate on any adaptive teaching strategy indicated in Part Two. These open-ended questions also focused on any new strategies participants have developed and how the same strategies are adapted for differing disabilities.

Development of the Measure

The measure for this study was adapted from previous research by Perkins (1996). When developing the original survey, Perkins consulted the “Steps in In Conducting a Questionnaire Survey” from *Educational Research: An Introduction* by Gall, Gall and Borg (2003). This resource was also used when altering the original questionnaire for the purposes of this study. Gall et al. (2003) recommended placing non-threatening items at the beginning of the questionnaire and the more difficult questions towards the end. Therefore, in keeping closely to the original design, demographic questions about participants and their students were placed at the beginning of the survey, and the open-ended questions regarding teaching strategies were placed at the end.

Four items on the questionnaire were changed from the original questionnaire. Item seven in Part One of the questionnaire, “Is your student with a disability in a homogeneous or heterogenous class?” was added due to previous research by Van Camp (1989). Part Two of the questionnaire was focused on teaching strategies and teaching behaviors used and how they were adapted for students with disabilities. When altering this section of the questionnaire, I changed items 13, 14, and 15 to focus on instrument position, right-hand skills and left-hand skills, respectively. The original questionnaire

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items primarily dealt with general music, so these items were added to better address the purposes of this study.

Approval of the Study

Before emailing the introductory letter and questionnaire link to participants, this study was sent to the Institutional Review Board (IRB) for approval. As this study was done through an anonymous survey, it qualified as exempt status from the full IRB review. Approval for this study was granted on October 30, 2018.

Procedures

The study took place over the course of four weeks during the Spring of 2019. After obtaining permission from Indiana University's Institutional Review Board (IRB), participants were chosen and sent an introductory email (see Appendix B) with the questionnaire link. Using the directory of teachers from a Midwestern state, potential participant's email addresses were collected to use in the study. In addition, a full list of private schools was used from the Department of Education's website to allow for the inclusion of string teachers from private schools. From the date that the questionnaires were emailed out, participants had four weeks to complete and return the questionnaire. Following the first one-week period, a follow-up notification (see Appendix C) was sent to non-respondents indicating that three weeks remained for the completion and return of their questionnaires. Following another one-week period, a second follow-up notification was sent to non-respondents indicating that two weeks remained for the completion and return of their questionnaires. A third notification was sent when there was one week remaining for the completion and return of their questionnaires. Once the period for

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completing and returning questionnaires ended, the questionnaire results were analyzed, and the data was interpreted and reported.

Analysis

Data from this survey were analyzed for descriptive statistics and an informal analysis of free-response items was conducted. Descriptive statistical calculations were done automatically through Survey Monkey's analysis software. For questions 1, 2, 3, 4, 5, 6, and 7, percentages were used to determine the frequency of the responses. These percentages helped in answering the first research question. When analyzing questions 12 through 15 in Part Two, and questions 27, 27, and 29, in Part Three, an informal analysis of free responses was done. Data gathered from this section were grouped based on the strategies participants described, and they were used to answer the second, third, fourth and fifth research questions. Analysis of the survey began once the data collection period ended.

Chapter 4: RESULTS

This chapter presents the results of a questionnaire distributed to public and private school string teachers in a Midwest state. The sample size consisted of 177 string teachers in a Midwest state from public and private schools. However, during the data collection period, some teachers requested not to participate in the survey. Therefore, the number of questionnaires distributed went down to 153. Out of the 153 potential participants, 45 participants completed and returned their questionnaire. This gave the study a response rate of 29%. The data will be presented in accordance to its respective research question. In addition, the *n* for the Tables 4 and 6 through 18 will be greater than the number of participants because participants were able to choose multiple answer choices.

Research Question 1: What type of training (if any) are string teachers given in preparation of working with students that have disabilities?

The first seven questionnaire items addressed this research question. The first was: “What academic preparation have you had for working with students with disabilities?” Participants were able to choose from five options: undergraduate training (i.e., courses in the special education department, elective course from music education/music therapy department, featured topic in an undergraduate course), graduate training (i.e., courses in the special education department, elective course from music education/music therapy department, featured topic in a graduate course), special sessions (i.e., district in-service training, workshops, or conference sessions), no formal training, and other. When choosing “other” participants were asked to detail the type of training they had received. Participants were allowed to check multiple answer choices.

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For this question, most participants (57%) reported that they received undergraduate training, followed by special sessions (50%), graduate training (11%), no formal training (23%) and other (5%). The participants that selected “other” noted that trial and error experiences, collaboration with other teachers, personal research, spending a semester in school working with students that have disabilities, and observations of music therapist aided in their training.

The next questionnaire item was: “Number of years of teaching experience.”

Table 1 summarizes these results. The largest category was more than 25 years of experience (29%).

Table 1

Frequency and Percentage of Number of Years of Teaching Experience (N = 45)

Years Teaching	Frequency	Percentages
1-5	7	16%
6-10	8	18%
11-15	5	11%
16-20	8	18%
21-25	4	9%
More than 25	13	29%

Questionnaire item three also related to research question one: “Number of years of teaching experience with students with disabilities integrated into string classes”.

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Table 2 below summarizes these results. The largest category was one to five years (40%).

Table 2

Frequency and Percentages of Years Teaching in Integrated String Classes (N = 46)

Years Teaching	Frequency	Percentage
0	2	4%
1-5	18	40%
6-10	9	20%
11-15	2	4%
16-20	6	13%
21-25	1	2%
More than 25	8	18%

The fourth questionnaire item to address this research question was: “Number of music classes that include students with disabilities.” It should be noted that one respondent skipped this question. For this item, the mean number of students was 3.43, and the range number of students was 0 to 9. Item five was: “The average number of students with disabilities that are currently integrated into your string classes.” The table below (Table 3) summarizes these results. The most common category was two to four students (45%).

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Table 3

Frequency and Percentage of Number of Students with Disabilities in String Classes (N = 44)

Number Students	Frequency	Percentage
1	8	18%
2-4	20	45%
5-7	5	11%
8 or more	11	25%

The sixth item on the questionnaire addressed the types of disabilities found in the string classroom. Participants were able to choose more than one classification if they had multiple students of differing disabilities in their classes. However, every different disability was only counted once. Table 4 summarizes these results. The largest two categories were communication disordered students (20%) and emotional/behavioral disordered students (20%). The least common categories were students that had a traumatic brain injury (2%) and students that were considered to be severely mentally disabled (1%). In Table 4, the “other” category included: autism spectrum disorder, Asperger’s disorder, dyslexia, deformity of the left hand, and learning disabled.

The seventh questionnaire item addressed the type of class string students with disabilities were in. It should be noted that one respondent skipped this question. Teachers indicated that the heterogeneous setting was the most common (93%) in comparison to the homogeneous setting (7%).

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Table 4

Frequency and Percentage of Students Indicated to Have a Certain Disability (N = 170)

Label	Frequency	Percentage
Communication disordered	34	20%
Emotional/behavioral disordered	34	20%
Hearing impaired	16	9%
Mildly mentally disabled	25	15%
Moderately mentally disabled	6	4%
Severely mentally disabled	2	1%
Physically impaired	16	9%
Visually impaired	15	9%
Traumatic brain injury	3	2%
Other	7	4%
Unsure of diagnosis	12	7%

The final questionnaire item addressed the use of special education assistants in string classes. The results are summarized below in Table 5. The majority of respondents (73%) reported never having an assistant in their string classes.

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Table 5

Frequency and Percentage of Use of Assistants for Students with Disabilities (N = 45)

	Frequency	Percentage
Always	1	2%
Usually	0	0%
Sometimes	3	7%
Rarely	8	18%
Never	33	73%

Research Question 2: What strategies are effective for facilitating music learning to students with disabilities? Are these strategies newly developed, existing approaches, or adaptations of existing strategies?

Items 9 through 12 in the questionnaire were used to answer research question two. Item nine asked: “Strategies implemented in your integrated string classes might be described as: existing instructional strategies, adaptations of existing strategies, or new strategies?” For this question, 21 teachers (66%) noted that they adapt pre-existing instructional strategies. This was followed by seven teachers (22%) who noted they use pre-existing strategies without adaptations, and four teachers (13%) who noted they create new instructional strategies.

The next item on the questionnaire was: “What aspect(s) of the teaching-learning process do you consider when adapting teaching strategies?” Thirteen respondents

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skipped this question. Teachers ($N = 32$) were able to choose multiple options from the following categories: socialization, classroom management/discipline, physical environment/materials/activities, musical understandings, or cognitive skills. Results of this question are summarized below in Table 6. The physical environment and musical understanding were the most common considerations when adapting strategies. The average number of aspects considered by respondents was 3.6, with the range being 1 to 5.

Table 6

Frequency and Percentage of Considerations by String Teachers ($N = 113$)

Consideration	Frequency	Percentage
Socialization	18	16%
Classroom management	21	19%
Physical environment/materials/activities	26	23%
Musical Understandings	25	22%
Cognitive skills	23	20%

The next two questionnaire items (items 11 and 12) addressed types of activities commonly used in integrated string classes, and adaptations (if any) to those activities. Item 11 was: “What types of activities are commonly incorporated into your teaching.” Respondents ($N = 31$) were able to choose multiple categories. The most commonly chosen category was speech (30%). The “other” category consisted of physio-kinetic

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activities and reflective activities. Table 7 summarizes the results. Item 12 was “What adaptations of the above activities, if any, do you make for your students with disabilities?” This item was an open response question. Fourteen respondents skipped this question. When analyzing item 12, five broad categories were identified from the given answers.

Table 7

Frequency and Percentage of Considerations by String Teachers (N = 82)

Activity	Frequency	Percentage of Responses
Singing	24	29.6%
Speech	30	36.6%
Guided Listening	22	26.8%
Other	6	7.3%

The first category was called “social.” Teachers identified many social activities they noted as being helpful for their students with disabilities. Two teachers specifically noted that small group instruction and one-to-one teaching were a good alternative to large group class settings. When small groups were not an option, other teachers noted that having student with disabilities in the front row helped in keeping their focus on the lesson and would also move closer to the student to help keep their attention. Mentoring seats was also an alternative mentioned by one of the teachers: students with disabilities would be stand partners with a student who does not have a disability. The student

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without a disability would provide encouragement and help (when needed) to their stand partner.

The second category was called “materials”, these strategies related to adapting materials used in the string classroom. Many teachers noted that altering sheet music was the most common method of adaptation. Teachers mentioned that they would enlarge text, compose simpler parts (i.e., having the student only play open strings in a piece), write finger and string names in the music and color code the music. Teachers noted that they would color code the music by matching it to the finger tapes on the student’s instrument. For example, all third fingers in a violinist’s music (A, D, G, and C) would be colored green to match the green third finger tape. For students with issues focusing, one teacher noted that he/she would color the music to help the student’s eyes focus. To help visually organize material, three teachers noted that the use of graphic organizers were helpful to their students with disabilities.

The third category was called “singing/speech.” This category had the smallest number of responses. Repetition of ideas and concepts was most commonly mentioned in this category. The fourth category was “assessment”: these strategies were more related to how students turn in assignments and are assessed on their work. Electronic submission was mentioned by one teacher, and the use of technology was brought up many times and will be discussed further in relation to research question four. Teachers also noted that having less strict grading policies were helpful for their students with disabilities. Longer response time was also noted as a beneficial strategy.

The final category was called “physical,” and adaptations in this category dealt with adapted or non-adapted physio-kinetic activities. Physical adaptations to the

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instrument and bow will be discussed further in relation to research question three. Many of these activities were not adapted, however they were used more frequently with the students that have disabilities in comparison to the students without disabilities. The first activity mentioned by teachers was shadow bowing. Shadow bowing is an activity that has students hold their bows in the air over the instrument and practice the bow directions without making any extra sounds. Sometimes, students will also silently finger the note while they are shadow bowing. Another activity mentioned was full body movement to the beat. Utilizing clapping rhythms while stomping the steady beat would be beneficial for helping students with disabilities internalize their pulse and rhythm.

Research Question 3: What strategies are effective when teaching instrument posture/position, right-hand and left-hand skills to students with disabilities?

Items 13, 14, and 15 on the questionnaire corresponded to this research question. Each of these items were open-response items. Item 13 addressed instrument position. For respondents, creating a level of comfort with the instrument was a top priority when working with their students with disabilities. For violin and viola students, the use of a sponge was a strategy provided by one respondent. In comparison to a shoulder rest, the sponge allowed for more comfort and mobility on the student's part. The use of different instrument positions was another strategy discussed by one respondent. In this situation, the teacher allowed the violin student to play in "guitar" position, rather than having them play with the instrument on their shoulder, which is the traditional positioning of the instrument. In this situation, instead of using the bow, the student would pluck the strings. Another situation described dealt with a cellist with muscular dystrophy. To get the proper instrument position for this student, the teacher allowed the student to use a

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smaller sized cello, since the smaller size was more manageable for the student to handle. In addition, the cello was more at an upright position rather than angled outward, which is the traditional cello position. When it came to establishing comfort with the instrument, the weight of the instrument was a factor that was strongly considered by respondents. Another strategy regarding instrument posture and position was giving the student tactile reminders on where the instrument should sit on the student. One respondent noted that he/she used stickers and tapes to show where the instrument should touch. A similar strategy was used to teach bowhold, which will be discussed later. Other strategies that were given by respondents were allowing violin and viola students to stand rather than sit and reversing the setup of the instrument. For the latter strategy, the respondent used it with a student that was unable to rotate his/her left arm. Therefore, the strings on the violin were backwards, with the E string on left side of the instrument and G string on the right side.

The next item that corresponded to this research question addressed adaptations to right-hand skills. In this section respondents mainly focused on how they taught the bowhold to their students with disabilities. One common strategy was the use of bow grip helpers. These were small materials that helped students to form and maintain their bowhold. Pinky houses, "bow hold buddies" and rubber bands were all useful materials when helping students begin to set their bowholds. Touch points was also a strategy that some respondents noted as useful. For example, one teacher used stickers to indicate where each finger should rest on the bow. Other teachers commented on altering the grip for each student. For more control over the bow, two respondents discussed allowing their students with disabilities to place their thumbs under the frog. Another case where

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the bowhold was altered for a student was described by the teacher of the student with muscular dystrophy. Instead of using a French bowhold, the traditional bow grip for the violin, viola and cello where the hand rests over the frog of the bow, this student (who was a cellist) used a German bowhold, an under handed grip primarily used by double bass players, because that grip was more suited to the mobility in his/her hand. The topic of the bow's size was notable for another teacher. He/she discussed using a smaller bow, based on the length of the student's forearm, since the smaller bow would be less weight than the normal sized bow. For other teachers, there was not as much adaptation. These teachers used the same methods for teaching bowhold; however, progress was delayed based on the student's individual needs.

The final questionnaire item that dealt with this research question addressed adaptations to left-hand skills. Teachers often noted that using colored finger tapes to match notes in the music was helpful for their students. Other teachers would change the finger patterns or begin shifting early for students with missing digits. This way they would be able to reach the same notes as their peers. For example, one teacher detailed how they alter a cellist's finger pattern. Instead of doing 1 – 2 – 4 on the D string to play E, F natural and G, the teacher would change the finger pattern to be 1 – 2 – 2. Therefore, the student places their first finger for E, second finger for F natural, then shifts so their first finger is on F natural and their second finger is on G. Visual aids, such as finger charts, also provided assistance when teaching finger placement.

For posture, right-hand skills and left-hand skills a common theme among respondents was having lower expectations for their students. For many of these teachers

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their focus was to facilitate a positive music making experience for their students with disabilities, rather than focusing on perfecting a student's vibrato or bowhold.

Research Question 4: When strategies are altered, to what extent do they vary for differing disabilities?

This research question corresponded to item 29 on the questionnaire. Many of these answers were "it varies based on the student". However, a few respondents, instead, offered their own thoughts regarding what they consider when they adapt or modify a strategy. One teacher noted that when thinking of an adaptation, he/she first considers how the student learns rather than the disability they have. This way they are tailoring the adaptation or modification to the student's learning style. Another teacher noted that he/she first consider the challenges based on the instrument. Each stringed instrument presents a different set of issues, therefore this respondent thought it would be best to first consider the instrument when considering an adaptation. When modifying parts for a student, another respondent noted to keep the level of disability in mind. For more severe disabilities, parts could be simplified to only open strings, and for less severe disabilities the parts could consist of some open strings with a few fingered notes.

Research Question 5: How are instructional strategies modified when teaching students with disabilities?

This research question corresponded to items 16 through 28 on the questionnaire. For items 16 through 26, respondents were asked to choose instructional strategies that they incorporate with their students with disabilities. Respondents were allowed to choose multiple answer choices. The question was as follows: "For the following categories, mark which of the following instructional strategies you currently

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incorporate/adapt or have previously incorporated/adapted into your teaching. Check all that apply.” For this section, respondents were able to choose multiple strategies that dealt with instruction and planning in each category. The results of these categories are summarized in Tables 8 through 18 below. Following each table, an explanation of any additional strategies from respondents is provided.

Table 8

Percentage and Frequency of Teaching Behaviors (N = 195)

Teaching Behavior	Percentage	Frequency
Verbal Cues	15%	30
Reviewing	14.9%	29
Questioning	13%	25
Reminding	14.9%	29
Modeling	14.9%	29
Nonverbal directions	13%	25
Repetition	14%	28

Other: Enlisted parental help to monitor progress outside of class

As indicated by the data, each of these teaching behaviors were used almost equally among participants. Teachers noted that using any combination of these teaching behaviors can be effective when teaching students with disabilities.

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Table 9

Percentage and Frequency of Teaching Approaches (N = 106)

Teaching Approaches	Percentage	Frequency
Peer tutors	22%	23
Cooperative Learning	19%	20
Project Work	7%	7
Cooperative Teaching	12%	13
Rote Learning	27%	29
Guided Discussion	13%	14

The use of rote learning was noted as the most effective strategy in this group. In addition, the use of peer tutors was also noted as being effective. Cooperative learning also yielded a high percentage of responses. The data indicates that having students with disabilities work with other students without disabilities in groups as an effective teaching strategy.

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Table 10

Percentage and Frequency of Materials (N = 85)

Material	Percentage	Frequency
Adapt pre-existing materials	28%	24
Study guides	11%	9
Development of original materials	19%	16
Home use materials	17%	14
Alternative materials	28%	22

Other: Utilization of practice charts and technology (iPads)

The use of adapted pre-existing materials and alternative materials (28% of responses, respectively) were indicated as the most common materials used. In addition, technology was listed frequently as an alternate material that provided more accessibility for the student with disabilities.

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Table 11

Percentage and Frequency of Expectations (N = 118)

Expectation	Percentage	Frequency
Partial Participation	12%	14
Modification of tasks	22%	26
Modification of evaluation procedures	23%	27
Modification of classroom management procedures	6%	7
Routines	21%	25
Modification of instructional pace	16%	19

Modification of evaluation procedures was noted as the most common adaptation for expectations. In these situations, teachers noted that they would allow the student with disabilities to record their playing test in a separate room to avoid taking the playing test in front of the class. Regarding the modification of tasks, teachers would allow students to do simpler assignments or simplify their concert music, so they are only playing open strings. The use of routines was also noted as a beneficial strategy. Establishing a routine allowed the student with disabilities to have a clear understanding of what was going to happen in each class.

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Table 12

Percentage and Frequency of Physical Environment Responses (N = 42)

Environment	Percentage	Frequency
Preferential seating	67%	28
Adjusting arrangement of the room	33%	14

For teachers, preferential seating involved students being placed at the front of the room (especially those that are visually impaired), being seated next to a peer mentor or students being given their own stand.

Table 13

Percentage and Frequency of Choices of Demonstration of Knowledge (N = 56)

Demonstration of Knowledge	Percentage	Frequency
Playing Tests	51.8%	29
Oral Tests	19.6%	11
Written Tests	28.6%	16

Since string classes are predominantly focused on performance, playing tests were the most common ways students were asked to demonstrate knowledge. However, teachers modified their evaluation procedures to fit the needs of the student (see Table 13).

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Table 14

Percentage and Frequency of Choices of Visual Aids (N = 77)

Visual Aid	Percentage	Frequency
Chalkboard	14%	11
Whiteboard	26%	22
SmartBoard	7%	5
Color coding	16%	12
Teacher made visual materials	25%	19
Commercially made visual materials	11%	8

Other: iPads

The use of whiteboards was the most common visual aid choice. In addition, teacher made visual materials were almost as common as the use of whiteboards. In comparison to commercially made visual materials, teacher made visuals can be easily tailored to the students needs.

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Table 15

Percentage and Frequency of Sensory Adaptations (N = 55)

Sensory Adaptations	Percentage	Frequency
Sign language	4%	2
Microphone	11%	6
Enlarged visuals	24%	13
Adaptation of instruments	17%	9
Computer technology	45%	25

Computer technology was the most frequently chosen answer choice. The use of technology allowed for more accessibility for the student with disabilities. Enlarged visuals was also a popular response. Giving students larger sheet music, or worksheets was noted as a beneficial music learning strategy in regard to research question two.

Table 16

Percentage and Frequency of Planning Choices (N = 38)

Planning	Percentage	Frequency
Adaptation of long- range plans	28.9%	11
Adaptation of daily plans	71%	27

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Table 17

Percentage and Frequency of Curriculum Choices (N = 52)

Curriculum	Percentage	Frequency
Simplify/alter curriculum	53.8%	28
Supplement curriculum	30.7%	16
Implement curriculum "as is"	15.4%	8

Regarding simplifying the curriculum, teachers noted that this most commonly occurred with concert music. Rather than having students playing the indicated notes, teachers would simplify the parts so the student with disabilities was only playing open strings. Supplementing the curriculum with worksheets, teacher made materials or technology was also noted as a common strategy.

Table 18

Percentage and Frequency of Communication Choices (N = 64)

Communication	Percentage	Frequency
With special education teachers	40.6%	26
With Parents	45.3%	29
Participation in IEP development	14.1%	9

Regarding communication, the majority of responses indicated that teachers have some kind of communication with the parents of the student with the disability. This can

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be helpful because parents can reinforce the concepts learned in class at home. In addition, teachers also noted that they have some communication with the special education teachers. This can be helpful when designed adaptations to teaching or assessment practices.

Based on the number of responses, the most commonly used instructional strategies were verbal cues (15% of responses, see Table 8), rote teaching (27% of responses, see Table 9), adapting pre-existing materials or using alternative materials (28% of response, see Table 10), modification of evaluation procedures (23% of responses, see Table 11), preferential seating (67% of responses, see Table 12), using playing tests for assessments (52% of responses, see Table 13), the use of whiteboard (26% of responses, see Table 14) and the addition of some kind of supplementary technology (45% of responses, see Table 15). Regarding the use of supplemental technology, many respondents indicated that iPads were often used instead of physical copies of assignments. In addition, the use of technology helped to modify evaluation procedures for many respondents. For example, allowing students to record themselves in a private room, rather than taking a playing test in front of the class helped to reduce anxiety a student with disabilities could feel during a playing test. Regarding strategy planning, the most common strategies were altering daily plans (71%), simplifying the curriculum (54%), and communicating often with the parents (45%)

The last items on the questionnaire were open-response items. It is worth noting that the final three questions received the least number of responses. The first item was: "Please describe your adaptations to two or more of the strategies you marked in items 16 through 26. Describe the strategies you have found to be most effective." Explanations

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given by respondents fell in the four categories of strategies: curriculum, sensory, and environment. When altering the curriculum, respondents noted that simplifying music was the most effective strategy. For example, they had students play open strings when possible, to avoid needing to put down fingers. This allowed the students with disabilities to still feel a level of inclusion with their peers. Regarding teaching a piece, one respondent suggested keeping a tempo consistent while studying a piece. So, instead of beginning slowly and gradually speeding up, keep the tempo the same while the student learns the piece. They noted that this is especially effective for students with cognitive processing problems, as it keeps a level of consistency for the students. Repetition in the curriculum was also noted as a good strategy by multiple respondents.

The next category is sensory. Three strategies given by respondents fell into this category. The first was tapping on the shoulder, for helping students internalize and maintain the steady beat. The next strategy was not exactly an adaptation, but it involved letting students use pinky house, tapes, bow guides or other physical additions to the instrument for longer periods of time. The last strategy was color coding. Matching colored notes to finger tape colors, or coloring words in music was noted by many respondents as effective. The next category was environment. Giving one-on-one time to students with disabilities was a common adaptation to the environment; however, many respondents noted that seating the student with disabilities next to a peer mentor was much more beneficial. The peer mentor helped the student with disabilities with any problems in their music, and also provided friendship and mentorship.

Chapter 5: SUMMARY, CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS

Summary

This study was done to identify adaptive teaching strategies that have been used or are currently used by string music educators. The research questions were: (1) What type of training (if any) are string teachers given in preparation of working with students that have disabilities? (2) What strategies are effective for facilitating music learning to students with disabilities? (3a) What strategies are effective when teaching instrument posture/position, right hand and left- hand skills to students with disabilities? (3b) Are these strategies newly developed, existing approaches, or adaptations of existing strategies? (4) When strategies are altered, to what extent to they vary for differing disabilities? (5) How are instructional strategies modified when teaching students with disabilities?

A descriptive research design was used for collecting information from a large sample of teachers involved in the study. The questionnaire used for this study was based on a previous study done by Perkins (1996). However, items on the questionnaire were altered to fit the purposes of this study. The questionnaire was divided into three sections. The first, background information, asked respondents to identify their level of training, number of years of teaching experience, number of years of teaching experience with student that have disabilities into integrated string classes, number of string classes that include students with disabilities, average number of students with disabilities the string classes, primary classifications of the integrated students, the primary string class setting (homogeneous or heterogeneous), and if anyone assists the integrated string classes or the

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student with a disability on a regular basis. Part Two of the questionnaire focused on adaptive strategies, instructional strategies and planning strategies that have been or are currently used by respondents. Part Three of the questionnaire allowed respondents to detail some of their responses in free-response items.

The sample for this questionnaire were string teachers from a Midwest state. Emails of potential participants were gathered from a teaching directory and the state's Department of Education. Originally, 177 questionnaires were sent to potential participants. However, the number of questionnaires distributed went down to 153, due to teachers choosing to opt out of the study. Out of the 153 potential participants, 45 participants completed and returned their questionnaires, giving the questionnaire a response rate of 29%. Descriptive statistics and informal analysis of free-responses were used to analyze the data.

Regarding the first research question "What type of training (if any) are string teachers given in preparation of working with students that have disabilities?", many responses (57%) indicated that teachers received undergraduate training. Following undergraduate training, 50% of responses indicated that teachers attended special sessions (i.e. in-service training, or conference sessions), and 23% of responses indicated that some teachers did not receive any training. The second research question was "What strategies are effective for facilitating music learning to students with disabilities?" Data indicated that 66% of strategies were adaptations to pre-existing music teaching strategies. Responses given by teachers fell into four categories: social, materials, singing/speech and physical. Strategies in the social category dealt with the use of small-group instruction and peer mentors. Materials used by teachers were color-coded music

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and enlarged sheet music. The only strategy listed in the singing/speech category was the repetition of concepts. Strategies in the physical category were clapping and stomping to rhythms and integrating shadow bowing activities.

The third research question dealt with adaptations made for instrument posture, right-hand and left-hand skills. Regarding instrument position, the use of a sponge for violin and viola students, utilizing unconventional positioning for the instrument, use of smaller instruments and the use of touch points on the instrument were all noted as helpful strategies. Strategies for teaching right-hand skills included, the use of bow grip helpers, touch points on the bow, changing the position of the thumb, and the use of smaller bows. Strategies for teaching left-hand skills included color coding finger tapes to match color coded music, beginning shifting earlier, and the use of finger charts. The fourth research question was “When strategies are altered, to what extent do they vary for different disabilities?” The majority of responses were “it varies based on the student.” Teachers did not provide further discussion for this research question.

The last research question dealt with adaptations made to instructional strategies. Teachers noted that these strategies did not need much adaptation. Based on the number of responses the most popular strategies were verbal cues (15%), rote teaching (27%), using alternative materials (28%), modification of evaluation tasks (23%), preferential seating (67%) and the use of supplementary technology (45%).

Conclusions

Based on previous literature, many of the findings from this study were expected. For example, previous literature (Salvador, 2015; Viniciguerra, 2016), agreed that color coding music was beneficial to students with disabilities, especially those with dyslexia,

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or cognitive processing disabilities. This study supports the previous literature because 16% of responses indicated that this strategy was used in their classrooms. For string musicians, this is particularly effective because teachers can match the color-coded music to their finger tapes. In addition to helping with note reading and maintaining student's attention, it also reinforces the relationship between the notes in the music and the fingering.

The use of peer assistance was also a strategy indicated in this study that is supported by previous literature (Pinta, 2013; Perkins, 1996; Salvador, 2015; Viniciguerra, 2016). In this study, teachers indicated that having a mentor as stand partner of the student with disabilities helped to increase engagement and musical understanding for the student with disabilities. The use of peer mentors also relates to a common theme discussed by respondents, which was the importance of inclusion. By having peer mentors as stand partners, (according to respondents) the students with disabilities felt more included in the classroom environment, rather than being defined by their disability and excluded from the classroom environment. Respondents often noted that the inclusion of the student with the disability was the most important factor when designing adapted strategies. Most teachers wanted their students to feel like they were able to be a part of the larger ensemble, therefore when adapting strategies teachers would focus on getting the students involved in the orchestra.

String specific considerations mainly dealt with placement of the right-hand thumb, weight of the instrument, and finger placement. Teachers often noted that they allowed students to have their right-hand thumb (bow hold thumb) in a different spot to allow for comfort when playing and control over the bow. Since the thumb is an integral

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part of maintaining a good bowhold and playing certain bowstrokes, teachers often focused on adjusting the placement of the thumb when adapting the bowhold. The weight of the instrument is also a consideration for string teachers. It was noted that students used smaller instruments or bows because they were easier to support. This conclusion was supported in the previous literature by Van Camp (1989). Another conclusion dealt with finger placement. It was noted, from the respondent's commentary, that the best way to make adaptations to finger placement was to create alternate fingerings. One teacher also suggested that students could begin shifting earlier if they have missing digits. This strategy was also found in previous literature by Van Camp (1989), who noted that beginning shifting earlier in the curriculum would be beneficial to string students with disabilities.

Regarding instructional strategies, 28% percent of responses noted that rote learning was a beneficial teaching approach for their students. Rote learning allowed respondents (and their students) to focus more on the posture and position of their instrument and bow, without worrying about reading music, which often added an extra layer of difficulty. This conclusion was supported by previous literature (Perkins, 1996). Another strategy noted was modifying evaluation procedures for students with disabilities. Teachers (23% of responses) noted that this was a common strategy in their classes. Rather than doing live playing tests, respondents would often use technology (iPads or Chromebooks) to allow students to pre-record their playing tests. This was especially helpful for students with emotional disorders or anxiety disorders. The use of computer technology was also the most common (45% of responses) sensory adaptation noted by teachers. This strategy was not as widely found in previous literature. However,

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this could be due to the fact most of the previous literature was written before technology in the classroom was widely used. It was also noted, by 21% of respondents, that routines were also a helpful strategy. This was supported by previous literature (Harris, 1991; Perkins, 1996; Tooker, 1995; Viniciguerra, 2016). Though not as common as the use of routines, modifying instructional pace was also indicated by 16% of responses. This was also supported by previous literature (Tooker, 1995; Van Camp, 1989).

One conclusion that did not align with the previous literature was that more music education pre-service teachers are receiving training in order to work with students that have disabilities. Previous literature (Darrow and Gfeller, 1991; Frisque et al., 1994; Gfeller, Darrow and Hadden, 1990; Hahn, 2010; Haywood, 2005; Lapka, 2005; Shepard, 1993; Wong and Chik, 2016), noted that pre-service music education teachers are in need of more training. However, respondents for this study noted that they did have some type of undergraduate training (57%), graduate training (11.36%), or attended special sessions on working with students with disabilities (50%). This conclusion may reflect the growing level of importance that inclusive music classrooms have in the field of music education. As more string classrooms become inclusive, more pre-service teachers are beginning to receive the training they need to effectively teach these students. When considering the undergraduate or graduate curriculum in any education field, courses dealing with special education would be beneficial for all pre-service teachers. Effective training goes beyond a classroom discussion on special education. Perkins (1996) notes “methods courses should be designed to allow students to have contact with these students through their degree, during observations, practicums, early field experience and

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student teaching” (pp. 195-196). While being given the information is important, giving pre-teachers the chance to apply the information is just as important.

Implications

Based on the data presented, this study presented a multitude of implications for a string teacher. The first is to consider the weight of the instrument and bow. Many respondents noted that they had to use smaller instruments or bows because the student with the disability had trouble supporting the weight of a full size or three-quarter size instrument. Therefore, if needed, going down an instrument size or bow size would better accommodate students having trouble supporting the instrument. In addition, when teaching different bow strokes, respondents noted that a smaller bow helped students better control the bow to achieve any bowstrokes that were indicated by the music.

The use of tools is another practical implication for string teachers to consider. Respondents noted that the use of tools such as pinky houses, rubber bands to set the fingers on the bow, or bow guides all helped to set and maintain the students bowhold. In addition, the use of touch points, specifically on the bow could help to set and maintain a student's bowhold. These touch points, or tools, are useful for helping remind students where to place their fingers on the bow, especially when they are practicing at home and are unable to consult the teacher. String teachers should be aware that the use of these tools and touch points will be much longer for the student with disabilities in comparison to their peers without disabilities.

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Color coding music was a common and effective strategy noted by teachers. This is commonly used with students that have difficulty focusing, dyslexia, or have difficulty following the music. String teachers can take this strategy a step further by matching the student's color-coded music to their finger tapes. For example, on a violin, a student can have the following finger tapes in these colors, first finger (red) second finger (green) third finger (blue). The teacher can then color the music so that first fingers in a song are red, second fingers are green, and third fingers are blue. In addition to helping students follow and focus on the music, this helps students to understand the relation of what their left-hand is doing to the music in their books.

Regarding the adaptation of strategies, one teacher mentioned the use of Universal Design for Learning (UDL) principles into their classroom. These principles would help with the adaptation of most strategies in the classroom. UDL began as a way to help eliminate physical barriers in the classroom that eventually grew into a method to help teachers modify curriculum and their assessment strategies (Viniciguerra, 2016, p. 9). These principles were particularly useful in creating inclusive environments for students with various disabilities. According to Valle and Conner (2010) though "...universal design was originally intended to incorporate people with disabilities, the flexibility it provides benefits everyone" (p. 77). Therefore, the use of the Universal Design principles may aid in creating adapted or modified strategies for students with disabilities in addition to students without disabilities. UDL principles seek to give students multiple means of representation, expression and engagement. Representation refers to how teachers uses various methods to help students interact with the curriculum. This can include usage of diagrams, enlarged visuals with color, or other means of representation

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that are not fixed. The second aspect is multiple means of expression. This allows students various ways to show their understanding of the material. The last aspect is multiple means of engagement. Therefore, teachers are providing students with a variety of ways to challenge their interests in the subject and motivate them. Viniciguerra (2016) notes that UDL principles “provide a basis for understanding the problems and successes of instrumental musical educators as they learn to teach students with learning disabilities” (p. 11).

Recommendations for Further Research

Little research on this topic has been done in the field of string music education. Therefore, this survey was designed to provide insight and strategies that are utilized or have been utilized by current string teachers. The survey instrument gathered the information it was designed for. In addition to the strategies listed in the survey, respondents offered their own adaptations of commonly used strategies and points to consider when making the adaptations.

Though the questionnaire was able to gather the intended information, there were limitations in this study. One was the low response rate. An explanation for the low response rate could be the applicability of the topic. String teachers without students with disabilities in their classes may not have felt the need to participate in the study. In addition, some teachers requested to be removed from the questionnaire contact list because they have not taught a student with disabilities in a long time. Another explanation for the low response rate could be the lack of experience respondents have with students that have disabilities. Due to their potential lack of knowledge on the

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subject, some teachers may have been hesitant to complete and return the questionnaire. Another explanation could be the length of the questionnaire. When altering the questionnaire, I was able to keep the length of time needed to complete it to ten minutes. However, there were a few free-response items which may have discouraged potential respondents from completing the survey. Due to the time restraints for the completion of this study, the questionnaire could not be piloted. If the questionnaire was piloted before being distributed to respondents, some of the issues with the length may have been solved before the questionnaire was distributed. The low response rate could also have been due to the geographic area in which the survey was conducted. The Midwest state that research took place in has a low number of string teachers, in comparison to the amount of band and choral teachers; therefore, there might not have been enough participants in the chosen geographic area.

The following recommendations could help provide more information on a growing topic in music education. The first recommendation is a replication of this study featuring string teachers from multiple geographic areas. This study was limited, in terms of respondents, due to the geographic area. However, researchers looking to replicate this study may consider choosing an area with a larger number of string teachers and also choosing multiple areas to include in the study. This way, a large variety of strategies may be collected for future use.

In this study, there was not much information collected regarding how strategies are used for varying disabilities. Therefore, another recommendation for future research would involve experimental research that could look at which strategies work best for a certain type of disability. This potential research may need to take place in a

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homogeneous string class, because with the differences among the four string instruments, a heterogeneous string class may present too many extra variables that could add (or detract) from the success of the study. This type of study may also allow the researcher to look at the types of strategies that work best for each instrument. In this study, respondents tended to provide more general strategies rather than strategies that work for an instrument. This recommended study could also look at how strategies, when implemented with a class, compare for each instrument.

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Appendix A: Adaptive Teaching Strategies of String Music Educators (adapted from Perkins, 1996)

Please answer each question as completely as possible. Your responses will remain confidential. Thank you for taking the time to complete this questionnaire.

Part I

Background Information

1. What academic preparation have you had for working with students with disabilities? Check all listings within categories that apply.

Undergraduate Training
 course(s) from special education department
 elective course(s) from music education/therapy department
 topic in a required music education course

Graduate Training
 course(s) from special education department
 elective course(s) from music education/therapy department
 topic in a required music education course

Special Sessions
 school district in-service training
 workshops
 conference sessions

No formal training

Other (please specify) _____

2. Number of years of teaching experience.

1-5 6-10 11-15 16-20
 21-25 more than 25

3. Number of years of teaching experience with students with disabilities integrated into string classes.

0 1-5 6-10 11-15
 16-20 21-25 more than 25

STRING MUSIC EDUCATORS' USE OF ADAPTIVE STRATEGIES

4. Primary classifications of students with disabilities that are included in your integrated string classes. Please write the total number of students you teach from each classification in the corresponding blanks. Each student should be counted only once.

_____ communication disordered (speech and language disorders)
_____ emotional or behavioral disordered
_____ hearing impaired
_____ learning impaired
_____ mildly mentally disabled
_____ moderately mentally disabled
_____ severely or profoundly mentally disabled
_____ physically impaired
_____ visually impaired
_____ traumatic brain injury
_____ multiply impaired
_____ other (please specify) _____
_____ unsure of diagnosis

5. Number of music classes that include students with disabilities.

_____ out of _____

6. Average number of students with disabilities in integrated string classes.

_____ 1 _____ 2-4 _____ 5-7 _____ 8 or more

7. Is your student with a disability in a homogeneous or heterogenous class?

_____ homogenous _____ heterogenous

8. Do you have (an) assistant(s) or does the student with disabilities have an assistant that attends and/or assists integrated string classes when needed?

_____ always _____ sometimes _____ rarely _____ never

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Part II

A. Strategies

The remainder of this questionnaire focuses on the strategies you implement in integrated string classes. Please feel free to continue your responses on the back of this questionnaire or on another piece of paper.

9. Strategies implemented in your integrated string classes might be described as:

- existing instructional strategies (ones you have always used)
- adaptations of existing instructional strategies
- new strategies (ones you have developed)

10. What aspect of the teaching-learning process do you consider when adapting teaching strategies? (check all that apply)

- socialization
- classroom management, discipline
- physical environment, materials, and/or activities
- expectations of musical understandings
- required cognitive skills (i.e., attend, recall, synthesize, apply)

11. What types of activities are commonly incorporated into your teaching? (check all that apply)

- singing
- speech
- guided listening
- other (please specify) _____

12. What adaptations of the above activities, if any, do you make for students with disabilities?

STRING MUSIC EDUCATORS' USE OF ADAPTIVE STRATEGIES

Please detail your comments for the following questions in the space below.

13. What adaptations, if any, do you make for students with disabilities when teaching instrument posture and position? Please indicate the instrument that you make adaptations for in your comments.

14. What adaptations, if any, do you make for students with disabilities when teaching right hand skills (i.e., bowhold, various bowstrokes etc.)? Please indicate the instrument that you make adaptations for and the specific right-hand skill in your comments.

STRING MUSIC EDUCATORS' USE OF ADAPTIVE STRATEGIES

15. What adaptations, if any, do you make for students with disabilities when teaching left hand skills (i.e., finger placement, vibrato etc.)? Please indicate the instrument that you make adaptations for and the specific left-hand skill in your comments.

STRING MUSIC EDUCATORS' USE OF ADAPTIVE STRATEGIES

For the following categories, mark which of the following instructional strategies you currently incorporate/adapt or have previously incorporated/adapted into your teaching. Check all that apply. Do not mark strategies that you do not use or adapt

16. Teaching behaviors:

- verbal cues
- reviewing
- questioning
- reminding
- modeling
- nonverbal direction and cues
- other (please specify) _____

17. Teaching approaches:

- peer tutors
- cooperative learning
- project work
- cooperative teaching
- rote learning
- guided discussion
- other (please specify) _____

18. Materials:

- adapt materials
- use of study guides
- development of original materials
- prepare materials for home use by students
- provide alternative materials
- other (please specify) _____

19. Expectations:

- partial participation
- modification of tasks
- modification of evaluation procedures
- modification of classroom management procedures
- establishment of routines
- establishment of expectations appropriate for individual students
- other (please specify) _____

STRING MUSIC EDUCATORS' USE OF ADAPTIVE STRATEGIES

20. Physical environment:

- preferential seating
- adjust physical arrangement of the room
- other (please specify) _____

21. Demonstration of knowledge:

- playing tests
- oral testing
- written tests
- other (please specify) _____

22. Visual aids:

- use of chalkboard
- use of white board
- use of SmartBoard
- color coding
- use of teacher made visual materials
- use of commercially made materials
- other (please specify) _____

23. Sensory adaptations:

- sign language
- use of microphone
- enlarged visuals/worksheets/music
- adaptations of musical instruments
- use of variety of instructional styles and media
- use of computer technology
- other (please specify) _____

STRING MUSIC EDUCATORS' USE OF ADAPTIVE STRATEGIES

Strategy Preparation

Please continue to mark your responses as you did in section A.

24. Planning:

- _____ adaptation of long-range plans
- _____ adaptation of daily plans
- _____ other (please specify) _____

25. Curriculum:

- _____ simplify curriculum
- _____ alter curriculum
- _____ supplement curriculum
- _____ implement curriculum "as is"
- _____ other (please specify) _____

26. Communication:

- _____ establishment of personal relation with student(s)
- _____ communication with special education teachers
- _____ communication with parents
- _____ participation in development of IEPs
- _____ other (please specify) _____

Part III

Commentary

27. Please describe your adaptations to two or more of the strategies you marked in Part II. Describe the strategies you have found to be most effective.

STRING MUSIC EDUCATORS' USE OF ADAPTIVE STRATEGIES

28. If you have developed new strategies for addressing the needs of students with disabilities, please describe them and explain how you use them.

29. When a strategy is adapted in multiple ways for students with disabilities, how do the adaptations vary for students with differing disabilities? Please described the adaptive strategy, the differing disabilities you use it with, and how the strategy is modified according to each different disability.

**Appendix B: Initial Questionnaire Email (adapted from
Perkins, 1996)**

Dear Music Educator,

I am asking you to participate in a research study involving string music and students with disabilities by completing a survey using the link provide below. I am a master's level student at Indiana University- Bloomington; this thesis research is under the supervision of Dr. Brenda Brenner.

During the last twenty years music educators across all areas have been integrating more students with disabilities into their classrooms. Consequently, there is need for research that identifies practical and adaptive teaching strategies that will help meet the needs of these integrated students. As a cellist and string educator, I have found this area to be lacking in much string research. Therefore, this questionnaire addresses teaching strategies used by string music educators to facilitate learning for students with disabilities. The results from this questionnaire will provide information on a variety of strategies and adaptations that are successful in meeting the needs of students with disabilities.

Please complete the questionnaire within two weeks. Your responses will remain confidential. Completion of the questionnaire should require approximately 12 minutes and I appreciate your taking the time. In addition, there is an attached form, further detailing this research.

Please feel free to contact me by telephone or email at the following addresses if you have any questions or concerns:

Bianca Walker
(803) 445-8029
biwalker@iu.edu

Sincerely,
Bianca Walker
Master of Music Education Student
Indiana University- Bloomington

Appendix C: Follow-Up Email to Non-respondents

Dear Music Educator:

Several weeks ago, you were sent a questionnaire that addressed adaptive teaching strategies in the string music education classroom. I realize how busy you are, but I hope you can take the time to fill out and return the survey. The questionnaire takes approximately 15 to 20 minutes to complete.

As a string music educator, I feel that it is important to obtain information from other educators on successfully integrating and teaching string music to students with disabilities. This is an area that is underrepresented in the research literature, and future music educators (and the students with disabilities in their classes) would greatly benefit from your response.

Below is another link to the questionnaire. I would greatly appreciate a prompt response. If you have any questions or concerns, please feel free to contact me at the following email address, or telephone number.

Bianca Walker
biwalker@iu.edu
(803) 445-8029

Sincerely,

Bianca Walker
Master of Music Education Student
Indiana University- Bloomington