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An Examination of College Flute Professors' Approaches to Improving Students' Intonation Skills

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AN EXAMINATION OF COLLEGE FLUTE PROFESSORS' APPROACHES TO
IMPROVING STUDENTS' INTONATION SKILLS

Kelly Theresa Cato



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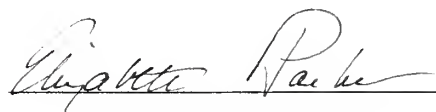
AN EXAMINATION OF COLLEGE FLUTE PROFESSORS' APPROACHES TO IMPROVING STUDENTS' INTONATION SKILLS

presented by Kelly Theresa Cato,
a candidate for the degree of Master of Music in Music Education
and hereby certify that, in their opinion, it is worthy of acceptance.



(Project Advisor)





Columbus State University

AN EXAMINATION OF COLLEGE FLUTE PROFESSORS' APPROACHES TO
IMPROVING STUDENTS' INTONATION SKILLS

By

Kelly Theresa Cato

A MASTERS THESIS

Submitted To The Faculty
of Columbus State University
in partial fulfillment of the requirements
for the degree of Master of Music in Music Education

Columbus, Georgia

2011

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ABSTRACT

The purpose of this study was to examine what methods college flute professors use to improve their students intonation skills and to highlight resources to aid future practices on the subject of intonation. The research questions guiding this study were (a) Do college flute professors teach students how to improve intonation skills? (b) What methods do college flute professors use to improve students' intonation skills? (c) What resources do college flute professors use in conjunction with teaching intonation? Research was conducted using a researcher-created online survey that was distributed to college flute professors throughout the United States. Findings suggested a limited amount of information within extant flute pedagogy literature. The research concluded that flute professors do teach intonation and address many variables when discussing the topic. These variables include ear training fundamentals, instrument tendencies, harmonic exercises, alternate fingerings, and specific techniques used to change intonation. Flute professors indicated many resources they used in conjunction with teaching intonation. Many of these resources were not intonation specific, rather encompassing a broader topic like tone. The limited amount information in flute pedagogy literature in combination with the abundant use of teacher-created exercises concludes that an intonation specific resource is necessary within the flute pedagogy literature. The goal of this study is to provide insight into the fundamental information that should be provided in such a resource.

TABLE OF CONTENTS

ABSTRACT	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES	vi
CHAPTER ONE: INTRODUCTION TO THE STUDY.....	1
Introduction.....	1
Purpose.....	1
Need For Study	2
Research Questions.....	2
Scope and Limitations.....	2
CHAPTER TWO: REVIEW OF THE LITERATURE.....	4
Introduction.....	4
Ear Training and Theory Fundamentals.....	4
Instrument Tendencies	7
Harmonic Exercises	9
Alternate Fingerings.....	10
Techniques Used to Change Intonation.....	11
Temperament.....	12
Summary	13
CHAPTER THREE: METHODOLOGY.....	17
Introduction.....	17
Methodology	17
CHAPTER FOUR: RESULTS.....	20
Results.....	20
Summary	35
CHAPTER FIVE: CONCLUSION AND DISCUSSION.....	38
Research Question One.....	38
Research Question Two.....	39
Research Question Three	45
Implications.....	46

Recommendations for Further Study	48
REFERENCES.....	50
APPENDICES.....	52
A. Web-based Survey	52
B. Human Research Proposal	55
C. Consent to be a Student Survey Participant	56
D. Online Survey Data.....	57
E. Intonation Exercise Resources	85
F. Harmonic Exercise Resources	86
G. Alternate Fingering Resources	87

LIST OF TABLES

Table	Page
1. Survey Question 1.....	20
2. Survey Question 2.....	20
3. “Other” Response Field to Survey Question 2.....	21
4. Survey Question 3.....	22
5. “Other” Response Field to Survey Question 3.....	23
6. Survey Question 4.....	24
7. “Other” Response Field to Survey Question 4.....	24
8. Survey Question 5.....	25
9. Survey Question 6.....	26
10. “Other” Response Field to Survey Question 6.....	26
11. Survey Question 7.....	27
12. Survey Question 8.....	28
13. Survey Question 9.....	29
14. Survey Question 10.....	29
15. Survey Question 11.....	30
16. Survey Question 12.....	31
17. Survey Question 13.....	32
18. Survey Question 14.....	32
19. Survey Question 15.....	33
20. Survey Question 16.....	34

CHAPTER ONE

Introduction to the Study

Introduction

Intonation is a crucial skill in music that must be mastered by all musicians. Robert Garofalo (1996) describes playing in tune as a, “skill that must be developed by every student instrumentalist” (p. 9). This is not an automatic skill but, rather, something that must be improved on through extensive work and practice. Many flute pedagogues including Nancy Toff (1985), Geoffrey Gilbert (Floyd 1990), and Thomas Nyfenger (1986) believe that intonation is an integral part of developing a beautiful tone on the flute. Trevor Wye (2006) describes intonation as a crucial skill needed to exhibit expression. Intonation is an essential part of a flutist’s study and is a much-discussed issue within flute pedagogy as well as band and orchestra settings. For these reasons it is important to examine how to learn and improve intonation through the course of musical study.

Purpose

The purpose of this study was to examine what methods college flute professors use to improve their students intonation skills and to highlight resources to aid future practices on the subject of intonation. Because many techniques exist to improve intonation in flute playing an examination of published literature on intonation will provide a foundation for these techniques. The survey will then examine these techniques further to establish a comprehensive sense of how current college flute professors approach the topic of intonation.

Need for the Study

Flute pedagogy resources offer large quantities of information on how to play the flute. Within these resources, standard topics such as breathing, articulation, and vibrato receive extensive discussion while the topic of intonation is not as rigorously discussed. A multitude of opinions exist on the subject of intonation and a consensus on how to teach intonation is lacking. Trevor Wye (2006) comments, “Occasionally I have heard intonation mentioned, but rarely have I heard a good solution offered to correct intonation problems” (p. 16). He also states that, “violinists are constantly aware, not only of the need for correct intonation, but the power of expressive intonation, that is adjusting a note according to the key or the note’s position in a chord” (p. 18). Flutists need clear ways to practice and improve intonation. This study will provide a brief look into the way college flute professors teach intonation which, in turn, will provide flutists with various techniques on how to improve intonation.

Research Questions

The following research questions will be examined throughout this research study:

1. Do college flute professors teach students how to improve intonation skills?
2. What methods do college flute professors use to improve students’ intonation skills?
3. What resources do college flute professors use in conjunction with teaching intonation?

Scope and Limitations

The focus of this study is to ascertain if and how college flute professors teach intonation. This research study was conducted using only college flute professors, limiting survey responses to teaching methods for college level students. Participants’ information was obtained through

the College Music Society database and web-based perusal. This study will provide information on the topic of intonation concerning the flute.

CHAPTER TWO

Review of the Literature

Introduction

There is limited information available on intonation within the flute pedagogy literature. Intonation is a crucial component of flute playing and it is important for flutists to have the necessary skills to improve intonation. In this chapter, I will examine the various resources on intonation that are available in flute pedagogy literature. The resources in this review include flute pedagogy books, wind band pedagogy books, and journal articles, and are organized into conceptual contexts of teaching intonation. The following concepts, within the study of intonation, will be addressed: ear training and theory fundamentals, instrument tendencies, harmonic exercises, techniques used to change intonation, alternate fingerings, and temperament. The review of these concepts will provide synthesized information on effectively teaching intonation.

Ear Training and Theory Fundamentals

Many of the resources examined indicate studying ear training and theory fundamentals as a key component to learning and improving intonation skills. The use of intervals is frequently cited as a method for practicing and improving intonation skills. Robert J. Garofalo (1996) in *Improving Intonation in Band and Orchestra Performance* highlighted the importance of having students play, sing, hear, write, and visually recognize all twelve intervals within the octave. Intervals are the foundation for chords and scales; interval training provides students with the foundation to develop good intonation. Garofalo provided a major scale exercise that students should play and sing daily. Ascending, the exercise covered four major and three perfect intervals

and descending, the exercise covered four minor intervals. He suggested classifying intervals (perfect, major, minor, other) to further help comprehension. The minor 2nd, major 2nd, and minor 3rd should be emphasized because all scales are constructed with these intervals. The use of interval training will continue to develop students' ears. Garofalo also explained that daily use of ear training, perhaps during warm-up time, is crucial to improving students tuning abilities.

Michel Debost (2002) in *The Simple Flute* also highlighted the importance of interval work for improving intonation. He provided interval exercises that can be used to train the ear which cover the most frequently heard intervals within an octave. Specific detail about the function of each interval in the Pythagorean scale is given:

The perfect fourth and fifth will be perfect (almost). The major third will be a little wide and the minor sixth a little narrow. The minor third will be a little narrow and the minor sixth a little wide. The major second will be very slightly narrow and the minor seventh very slightly wide. The major seventh (to the leading tone) will be narrow (p. 136).

This detail provided insight on the use of interval exercises to improve intonation. *The Simple Flute* provided interval exercises as the main practice method to improving intonation. Debost gave the function of intervals and suggested specific flute technique books to use when working with intervals, however, the clarity of information is presented as an encyclopedia rather than a detailed instructional guide.

In a *Flute Talk* article, "Intonation - Just and Tempered," Joanna White (2002) also discussed the importance of working with intervals to learn and improve intonation. To study intonation White suggested beginning with the octave. Students should be able to match octaves with a tuner, another flute, and other instruments. The next step included students learning

consonant intervals, beginning with the perfect fifth. Students should be able to identify the sound of the pure vertical interval and the visual component of how this interval looks notationally. Teachers should continue this work with all intervals. White suggested working with consonant intervals before moving to dissonant intervals. She (p. 11) stated, “Basic theory and ear training instruction is recommended so students can recognize where they are in the scale or chord and tune the intervals.” This fundamental knowledge makes adjusting and improving intonation easier.

Aurally identifying difference tones is another common concept used to practice and improve intonation. John Krell (1997) in *Kincaidiana* defined difference tones as a sound that is produced from the interference of two notes. This sound will produce a third note at a reduced volume when the interval is played correctly. He suggested to tune an interval correctly these difference tones must also be in tune. To determine what difference tone is speaking, subtract the lower note of the interval from the upper note. Krell provided an example, Trio for Three Flutes, which demonstrated these resulting difference tones and provided an opportunity for two flutes to practice identifying and tuning the resultant difference tones. Krell implied that aurally identifying and tuning difference tones will help students improve their intonation skills.

Trevor Wye (1980) in *Trevor Wye Practice Book for the Flute Volume 4 Intonation and Vibrato*, also discussed the use of difference tones. He defined difference tones as, “A note which sounds as a result of hearing two simultaneous clear tones; it is the mathematical *difference* between the two notes” (p. 126). Expanding or widening an interval played between two flutes affects the difference tone. For example, if the higher note is flattened and the lower note raised

the difference tone will in turn be flat. Similarly to Krell, Wye also provided three trios for two flutes to practice aurally identifying and adjusting difference tones.

In The Simple Flute, Debost (2002) provided similar information on what he calls “ghost tones,” referring to the sound as an imaginary flutist that is in the room. Intonation is amplified using these ghost tones. He suggested tuning the ghost tones as an exercise for the ear. Debost also cited an article in the *Flute Talk* publication by Frances Lapp Averitt (1986) which discussed the benefits of using difference tones to train the ear and improve intonation:

Learning to play intervals in tune by listening to the placement of the difference tone trains the ear to hear and adjust for very subtle pitch differences. This aural technique contrasts with the primarily visual aid of the tuner and is very beneficial to ensemble playing where one has to adjust quickly by ear to another player’s pitch (139-140).

Students should work together or with their teacher to identify and adjust tones. These difference tone exercises provide a positive approach to a complex subject and techniques to help students improve intonation.

Instrument Tendencies

Instrument tendencies are a component in flute playing that can be used to improve intonation. *Improving Intonation in Band and Orchestra Performance* by Robert Garofalo (1996) and *Seven Steps to Better Intonation* by Chris Potter (2000) discussed the importance of students learning specific tendencies for their instrument. Garofalo suggested learning the pitch tendencies of an instrument by using an intonation chart with the use of an electronic tuner. The ability to understand the physical and mechanical techniques needed to adjust the pitch will enable students to understand how to correct faulty pitches during a performance or rehearsal.

Chapter 2 of *Improving Intonation in Band and Orchestra Performance* (Garofalo) provided an intonation charting guide sheet. This exercise allowed students to use an electronic tuner in combination with an intonation chart to observe and notate tendencies on their instrument. The intonation chart used chromatic scales, major scales, minor scales, and small dynamic exercises to chart instrument tendencies.

Potter (2000) discussed using an intonation map to record instrument tendencies.

Students would work in pairs. One student would select pitches at random while the other students played the selected pitches. The pitches would then be recorded on an intonation map. Upon completion of the exercise students would have an accurate display of the tendencies on their instrument. This exercise completed in pairs allowed each student to be honest and accurate with their calculation of the pitch with the electric tuner. This is the first foundational step in Chris Potter's *Seven Steps to Better Intonation*.

Fenwick Smith (2006) in the article *Keeping Your Temper: A Flutists' Guide to Intonation* discussed the flute as one variable to improving intonation. Mechanical and acoustical compromises intrude on the flutes ability to play in tune. Smith provided an exercise to determine the tendencies on a players given instrument. He explained, "Our objective is to find out how the flute plays, not how we play" (p. 48). Students are instructed to make a record of the results for all notes and be aware of the tendencies when working on intonation. Smith described the benefits of knowing the tendencies of an instrument as, "the odds in your favor" (p. 49) when trying to improve intonation.

Many resources documented the importance of knowing the tendencies of an instruments. After working through these exercises, students would be able to have a clear idea of how to

identify an out of tune pitch and know how to change that pitch depending on the particular tendency. Intonation maps and charts are valuable tools suggested to assist students when tracking their tendencies. Research previously cited, stated that the work with electronic tuners will better enable students to improve their intonation in various environments.

Harmonic Exercises

Harmonic exercises are widely considered a beneficial component to studying intonation. *Practice Book for the Flute Volume 4 Intonation and Vibrato* (Wye, 1980) discussed the importance of the “Chord of Nature” more commonly referred to as the harmonic series. Wye provided a detailed exercise to identify the harmonic series and the benefits of its use in conjunction with improving intonation. Albert Tipton (2006) also discussed the “Chord of Nature” in the article *An Approach to ‘Just Intonation by Employment of Difference Tone*. He explained that the knowledge of the harmonic series enhances students abilities to improve their intonation.

Improving Intonation in Band and Orchestra (Garofalo, 1996, p. 54) discussed harmonics as, “a complex sound consisting of a fundamental frequency plus many higher, weaker frequencies called overtones.” Joanna White (2002) in “Intonation - Just and Tempered,” also explained the importance of understanding the harmonic series to help play intervals correctly. The ratio of the second partial 2:1 produces an octave and the third partial to the second partial 3:2 produces a fifth. She also explained that this pattern continued up the harmonic series and that working with the harmonic series in relation to a fundamental pitch will improve intonation.

It is also important to note that there are many resources which provided harmonic series exercises for flute players. These exercises did not deal directly with the improvement of

intonation but rather the exercise could be used to accomplish a multitude of beneficial practice techniques. Through the research previously cited, harmonic exercises are beneficial to improving techniques thus these resources are crucial for enhancing intonation. Robert Dick (1986) in *Tone Development Through Extended Technique* provided a chapter on harmonic exercises focusing on long tones and the use of harmonics in a scale. Patricia George and Phyllis Avidan Louke (2009) also provided similar harmonic exercises in the resource *The Flute Scale Book A Path to Artistry*. Within the flute pedagogy literature, the use of harmonic exercises has not been specifically regulated to improving intonation but they have been cited as valuable exercises.

Alternate Fingerings

Many flute pedagogy resources included the concept of alternate fingerings to help improve intonation. Nancy Toff (1985) in *The Flute Book* provided alternate fingerings as a solution to built-in intonation problems. For example, she suggested adding the first, second, and third keys of the right hand to lower *c#* in the second and third octaves. Toff referred to James Pellerite's (1972) *A Modern Guide to Fingerings for the Flute* as the main resource used for alternate fingerings. Debost (2002) also provided a guided resource for alternate fingerings that helped tuning, stability, and timbre.

In a recent *Flute Talk* article, "A Flutist's Guide to Better Intonation," Bradley Gardner (2011) provided a comprehensive list of alternate fingerings for the third octave. He once referred to the use of alternate fingerings as abhorrent considering, "flute fingerings were brought down from a mountain, inscribed on a stone tablet" (p. 3). Gardner stated he eventually realized a more rational approach was needed and that, "if that means closing or opening a vent

somewhere, so be it” (p. 4). Joanna White (2002) also discussed the use of alternate fingerings in a *Flute Talk* article, “Intonation - Just and Tempered.” White referred to alternate fingerings as offering a solution to improving intonation in combination with listening and adjusting.

Techniques Used to Change Intonation

Many techniques used to change intonation are discussed within the flute pedagogy literature. Wye (2006) in “Intonation: Time for Change,” examined the use of air speed in combination with air direction to create octaves. The combination of air speed and direction created changes in the embouchure and allowed for flexibility of pitches when working on intonation. He also discussed the importance of maintaining support when working on intonation which would allow the pitch not to sag or drop. Thomas Nyfenger (1986) discussed the use of air speed and angle of air as factors decisive in determining intonation. Examination of these variables will provide flutists with solutions for improving intonation.

Nancy Toff (1985) discussed a combination of three techniques, direction and pressure of the airstream, the amount of embouchure hole coverage, and the lip aperture size, to modify the pitch of a note. She referred to changing the air direction as the most common technique used to improving intonation. She provided specific instructions for lowering a pitch:

Drop the lower jaw and lower the head; roll the flute inward; pull the corners of the mouth back slightly; cover embouchure hole with the lower lip; and pull the upper lip down to direct the airstream lower into the flute. (p. 99)

Toff also provided specific instruction for raising a pitch, “raise the head, project the lower jaw outward, blow across the hole at a higher angle, increase breath pressure, and decrease lip aperture” (p. 99).

Angelita Floyd in *The Gilbert Legacy* discussed Geoffrey Gilbert's approach of techniques for improving intonation in a similar manner. Gilbert provided the following reasons flutists play sharp, "rolling the flute out too much, pushing the bottom lip and chin out too far, being too tight with the lips, and using too much breath pressure" (Floyd, 1994, p. 61). If the pitch is flat the angle of air stream is also wrong. He also provided the following reasons flutists play flat, "rolling the flute in cramps the sound, causing the harmonics to be out of tune, covering too much with the upper lip, and not using enough breath pressure" (p. 61). If the pitch is sharp, the angle of air stream is wrong. When working on intonation, flute instructors should be aware of these various problem enabling them to diagnose and equip students with solutions to improving their intonation.

Temperament

Students comprehension of tuning systems can also be used as a tool to help improve intonation. John Barcellona (2004) in a *Flute Talk* article, "Intonation and Tuning Systems," discussed three main types of tuning systems: Pythagorean tuning, just tuning, and equal temperament. He explained that the Pythagorean tuning system is most often used by string players who tune thirds and sevenths high and equal temperament is used by pianos where the octave is divided into twelve equal parts with an equidistance between each half step. Barcelona referred to just intonation as, "the consistent use of pure, intervals by performers, who play instruments capable of pitch flexibility" (p. 32). Flutists should be equipped to play in both just tuning and equal temperament tuning systems. Barcellona explained that when flutists are working with pianist is important to adjust to the inequalities in the overtone series that equal

temperament produces. Conversely he suggested when flutist are performing in an ensemble, just intonation should be used to create beat-free intonation.

Trevor Wye (1980) in *Practice Book Volume 4 for the Flute* also discussed the benefits of understanding various tuning system. He described the advantageous of equal temperament as the change to various keys sounding pleasing to the ear and all instruments matching each other in scale. Wye stated that the disadvantage of equal temperament is the “out of tuness” of some intervals. The importance of understanding this information is discussed in depth in *Practice Book Volume 4 for the Flute*. He emphasized that flutist must be flexible enough to play in both tuning systems and discern what adjustments should be made to play in either system. The comprehension of various tuning systems is another important tool to help students improve intonation.

Summary

In review of the literature many flute pedagogy books discussed various concepts to study intonation. Ear training and theory fundamentals were discussed to improve students intonation skills. The use of interval exercises suggested by Garofalo (1996), White (2002), and Debost (2002) provide a foundation for good intonation. Garofalo gave exercises the emphasized the major 2nd, minor 2nd, and minor 3rd because all scales are constructed with these intervals. White discussed interval training that began with the octave and the importance of having students match the octave with a tuner, another flute, and other instruments. Debost also stated the benefits of using interval exercises to train the ear. Aurally identifying difference tones was another ear training exercises stated within the literature. Krell (1997) discussed the importance of

having difference tones in tune to correctly tune intervals. Wye (1980) and Debost also suggested using difference tones to amplify intonation and provide a beneficial exercise for the ear.

Instrument tendencies were also cited as beneficial to the study of intonation. Garofalo (1996) and Potter (2000) indicated using intonation charts or maps in combination with an electronic tuner to help students identify their tendencies. Garofalo discussed the importance of having students understand the physical and mechanical techniques needed to adjust the pitch enabling them to correct faulty pitches during performance. Smith (2006) suggested having students keep a record of the results for all notes and be aware of the tendencies for each note. These resources provided detailed information about the benefits of having students learn instrument tendencies.

Many resources indicated the use of harmonic exercises to improve students intonation skills. Wye (1980) and Tipton (2006) discussed the benefits of knowing the harmonic series and the positive effect this knowledge has on students intonation skills. Garofalo (1996) and White (2002) also suggested that working with the harmonic series would improve intonation skills. Harmonic exercises that were located in many resources provided ways to improve a multitude of techniques including intonation.

Toff (1985) described alternate fingerings as a solution to built-in intonation problems. Gardner (2011) and White (2002) also discussed the use of alternate fingerings as a solution to improving intonation. Debost (2002) provided a guide to alternate fingerings that helped tuning. Through examination of the resources, alternate fingerings were considered a valuable tool to improving intonation.

Air speed and the angle of air stream were the most widely discussed techniques in the resources examined. Wye (2006) stated that a combination of air speed and direction allow for flexibility of pitches when working on intonation. Toff (1985) provided a combination of three techniques to improve intonation including direction and pressure of air stream, the amount of embouchure hole coverage, and lip aperture size. These techniques provided valuable ways for flutists to improve intonation.

The discussion of temperament was also indicated in the resources examined.

Comprehension of tuning systems is an important factor when working with intonation. Students should be equipped to play in both equal and just temperament systems. Barcellona (2004) explained that equal temperament should be employed when flutists are working with pianists while just tuning system should be used when flutists are performing in an ensemble setting. Wye (1980) explained that the flute must be flexible enough to play in both tuning systems and discern what adjustments should be made to play in either system.

This synthesized information suggested that there are many factors that contribute to improving intonation. The presences of multiple concepts within the literature provided a flute instructor with many ways to help improve intonation skills. Detailed examination of these resources gave multiple ways to teach intonation skills falling into six main categories: ear training and theory fundamentals, instrument tendencies, harmonic exercises, alternate fingerings, techniques used to change intonation and temperaments. The combination of these six categories gave a comprehensive approach to teaching intonation. Flute instructors should examine the techniques provided in each category to determine the most beneficial for each

student. The amount of information discussed enables instructors to have a wide variety of techniques to implement when helping students improve their intonation skills.

CHAPTER THREE

Methodology

Introduction

The purpose of this study was to examine what methods college flute professors use to improve their students intonation skills and to highlight resources to aid future practices on the subject of intonation. In this chapter, I will outline the methodology used to conduct this research. It is my goal through the synthesis of published information and the research, that this study will provide flute professors with a beneficial resource on teaching intonation.

Methodology

To examine the methods college flute professors use to teach intonation, a web-based, password-protected survey was designed using SurveyMonkey. The descriptive research paradigm of a survey was used to accurately evaluate a large number of flute instructors. An online survey method was selected as the most beneficial research paradigm because it could gain information from a large number of individuals quickly and efficiently. This study sought to find broad information about how flute instructors approach the topic of intonation. For these reasons the web-based survey was selected as the most preferred research method.

Participants selected for this study included college flute professors. College flute professors were selected to narrow the scope of research. They are all teaching at a standardized level and are considered credible in their field because of the teaching position they hold. The discrepancy among students is smaller when examining college flute players rather than flute players in general. Participants were selected from the College Music Society database and included college flute professors at music schools, departments, or conservatories. They were

instructed on the purpose and procedure for the survey and were ensured confidentially of survey results.

Data were conducted using a researcher-designed survey form. Survey questions encompassed a wide range of intonation teaching practices including: temperaments, instrument tendencies, theory and ear training fundamentals, harmonic exercises, techniques used to change intonation, alternate fingerings, and published intonation exercises. Questions were designed to examine if flute professors discussed these topics when teaching intonation and what resources, if any, they used in conjunction with these topics. Topics were established from review of extant flute literature on intonation and review with graduate project advisor. Answers for each question were based on information found within the literature and personal teaching and/or playing experience. Resources selected as answer choices were only included if they pertained specifically to the topic of intonation. Questions were composed in their simplest form, for example yes/no, multiple choice, and Likert scale, to ensure accuracy of results and a high rate of completion. This survey was designed with approximately 15 short questions enabling participants to complete the survey in a short amount of time. This was another design tool employed to ensure a higher rate of completion.

The flute studio at Columbus State University was used as a pilot test for the survey. All twelve members of the flute studio completed the survey and offered suggestions for slight modifications and clarifications. The survey was submitted to the Columbus State University Human Subjects Review Committee and subsequently approved. The initial email request for participation on December 2, 2010 was sent to 381 flute professors. A reminder email was sent to the same population on January 11, 2011 and data were collected until February 24, 2011. The

individual responses (n=138) were automatically recorded, providing a response rate of 36%.

Data were automatically collected through the web survey form and maintained on the password-protected web database.

CHAPTER FOUR

Results

The purpose of this research study is to collect information about how collegiate flute professors teach intonation. Analysis of results is based upon 138 responses received from an online survey administered to 381 college flute professors. Results examine participants responses based on the frequency and percentage of response rate for each question.

Table 1

Survey Question 1 - Do you assign intonation exercises?

	Frequency	Percentage
Yes	107	77.5%
No	31	22.5%

In response to question 1, participants were asked if they assign intonation exercises.

Table 1 displays the percentage of respondents that do and do not assign intonation exercises.

77.5% of respondents assign intonation exercises while 22.5% of respondents do not assign intonation exercises. The majority of participants teach intonation through various exercises when working with their students.

Table 2

Survey Question 2 - Please indicate the resources you use when assigning intonation exercises.

	Frequency	Percentage
26 Studies for Intonation, Practice Book Volume 4 by Trevor Wye	27	27.0%

	Frequency	Percentage
Seven Steps to Better Intonation by Chris Potter	7	7.0%
Kincaidina by John Krell	19	19.0%
Other (please specify)	86	86.0%

In response to survey question 2, participants were asked to indicate all resources they use when assigning intonation exercises; they were permitted to indicate more than one resource. Respondents could also indicate an “other” response allowing them to provide specific resources they use when assigning intonation exercises. Table 2 displays the frequency and percentage of responses for each resource listed. Respondents that answered “no” (n=31) to survey question 1 were redirected to survey question 3.

Table 3

“Other” Response Field to Survey Question 2

	Frequency	Percentage
My own exercises	33	63.5%
A tuner	16	31%
De La Sonorité by Marcel Moyse	14	27%
TuningCD by Richard A. Schwartz	6	11.5%
Practice Book for the Flute, Tone by Trevor Wye	5	10%

The “other” selection for survey question 2 received the highest response rate of 86%.

Analysis of these specific responses provides five main response categories: teachers’ own

exercises, tuner, *De La Sonorité* by Marcel Moyse, *Tuning CD* by Richard A. Schwartz, and *Practice Book for the Flute, Tone* by Trevor Wye. The highest frequency response listed by participants was their own exercises followed by working with a tuner. Table 3 displays that 63.5% of respondents listed their own exercises as resources used to assign intonation exercises while 31% of respondents listed a tuner. *TuningCd* by Richard A. Schwartz and *Practice Book for Flute, Tone* by Trevor Wye were resources also cited, however, with a smaller frequency.

Table 4

Survey Question 3 - Please indicate the techniques used to change intonation discussed in your students' lessons.

	Frequency	Percentage
Angle of air stream	119	88.8%
Air Speed	112	83.6%
Aperture size	96	71.6%
Jaw position	89	66.4%
Body awareness/tension	88	65.7%
Embouchure shape	86	64.2%
Exposure of Embouchure hole	88	65.7%
Other (please specify)	52	38.8%

In response to survey question 3, participants were asked to indicate which techniques to change intonation were discussed in their students' lessons. Participants could select from seven techniques and were asked to indicate all techniques used; they were permitted to indicate more than one technique. Participants could also indicate an "other" response which allowed them to

list specific techniques that were not included within the seven choices given. Table 4 displays the frequency and percentage of response for each technique. Angle of air stream was the technique indicated most often with an 88.8% response rate followed by air speed with a 83.6% response rate. As Table 4 indicates, aperture size was also a technique that respondents considered beneficial to discuss with students. The remaining 4 selections received similar response rates falling between 64% - 66%.

Table 5

“Other” Response Field to Survey Question 3

	Frequency	Percentage
Vocalizing and/or singing	12	23%
Instrument alignment	8	15%
Listening	7	13.5%
Head position	5	10%
Alternate fingerings	4	7.7%

Selection “other” received the smallest response rate of 38.8%. Analysis of the specific responses provides the following main categories: vocalizing and/or singing, instrument alignment, listening, head position, and alternate fingerings. Vocalizing and/or singing received the highest response rate followed by instrument alignment and listening. Table 5 refers to the frequency and percentage of response for the five categories created through analysis of the “other” selection. Techniques also discussed but received less than 4 responses include: rolling in or out, correct breathing, venting tone holes, and harmonics.

Table 6

Survey Question 4 - Please indicate the temperaments discussed in your students' lessons.

	Frequency	Percentage
Equal Temperament	27	27.0%
Just Temperament	7	7.0%
Other (please specify)	19	19.0%

In response to survey question 4, participants were asked to indicate the temperaments discussed in their students lessons. Participants could select from equal temperament or just temperament and were asked to indicate all temperaments discussed; they were permitted to indicate more than one temperament. Participants could also indicate an “other” response allowing them to list specific temperaments not provided. Table 6 displays the frequency and percentage of response for each temperament. Equal temperament received the highest response rate of 27% and just temperament received the lowest response rate of 7%.

Table 7

“Other” Response Field to Survey Question 4

	Frequency	Percentage
Do not discuss	4	16%
Temperaments from the past	4	16%
Pythagorean	2	8%
Stretch tuning	2	8%
Temperament terminology not being used	2	8%

	Frequency	Percentage
Pitch relative to other sounding medium	2	8%

The “other” response field from survey question 4 received the second largest response rate of 19%. Analysis of specific responses indicate that the top two responses, not discussing temperament and discussing temperaments from the past, received a 16% response rate. Table 7 displays these results and includes four other responses that had a common response rate of 8% including: pythagorean, temperament terminology not being used, and pitch relative to other sounding medium.

Table 8

Survey Question 5 - How important is it for your students to know intonation tendencies on their instrument?

Unimportant (1) - Extremely Important (5)	1	2	3	4	5
	9.6%	1.8%	0.0%	5.3%	83.3%

In response to survey question 5, participants were asked to rate the importance of having their students know their instrument tendencies. This question was addressed using a 5 point Likert-type scale anchored by the terms “unimportant” and “extremely important.” A significant amount of respondents (83.3%) felt that it was extremely important for their students to know their instrument tendencies. Of the 114 respondents, 11 indicated that it was unimportant for their students to know their instrument tendencies. Table 8 displays the percentage results of responses ranging from unimportant to extremely important.

Table 9

Survey Question 6 - Please indicate the tools used most often to help students learn their tendencies.

	Frequency	Percentage
Intonation charts or maps	47	35.9%
Electronic tuners in lessons	109	83.2%
Playing duets in lessons	100	76.3%
Intonation assignments outside of lesson times	72	55.7%
Other (please specify)	54	41.2%

In response to survey question 6, participants were asked to indicate the tools used most often to help students learn their tendencies. Participants could select from 4 tools and were asked to indicate all tools used; they were permitted to indicate more than one tool. Participants could also indicate an “other” response which allowed them to list specific tools that were not included within the 4 given choices. Table 9 displays the frequency and percentage of response for each tool. Respondents indicated that electronic tuners are the tool used most frequently to help their students learn their tendencies. Respondents also highly regard playing duets in lesson to help their students. Intonation assignments outside of lesson time were also indicated as being frequently used to assist, receiving 55.7% response rate.

Table 10

“Other” Response Field to Survey Question 6

	Frequency	Percentage
Chamber music	9	16.6%

	Frequency	Percentage
Working with the piano	7	13%
Playing against a drone	6	11.1%
Listening	6	11.1%

Of the 131 respondents to survey question 6, 54 (41.2%) indicated “other” as a response choice. Analysis of these specific responses provides the following 4 main categories including: chamber music, working with the piano, playing against a drone, and listening. Table 10 displays respondents strong indication of using chamber music (16.6%) and working with the piano (13%) as a tool to help students learn their instrument tendencies. Playing against a drone and listening were also common responses indicated as an important tool to help students. Other tools were also discussed but at a smaller response rate including: playing with teacher, recording, tuners, SmartMusic, and paying attention.

Table 11

Survey Question 7 - Do you assign exercises to help your students better understand how dynamics affect intonation?

	Frequency	Percentage
Yes	104	80.0%
No	26	20.0%

In response to survey question 7, participants were asked if they assign exercises to help their students better understand how dynamics affect intonation. Table 7 displays the percentage of respondents that do and do not assign exercises to help students understand the affect of dynamics. 80% of respondents assign exercises while 20% of respondents do not assign

exercises. The results indicate that the majority of respondents do assign exercises to help their students to better understand how dynamics affect intonation.

Table 12

Survey Question 8 - Please list the exercise(s) assigned.

	Frequency	Percentage
Long tones with crescendo and diminuendo	36	38%
Various exercises created using resources by Marcel Moyse	30	32%

If respondents indicated “yes” to survey question 7 they were directed to survey question 8, where they were asked to list the exercise(s) assigned to help students better understand how dynamics affect intonation. This was an open response form question. Through analysis, specific responses were categorized into two main categories including: long tones with crescendo and diminuendo and various exercises created using resources by Marcel Moyse. Table 12 displays the frequency and percentage of response for these two main categories. Examination of Table 12 reveals that respondents felt that assigning long tone exercises with crescendo and diminuendo are the most valuable exercises. Of the 95 respondents, 8 suggested working with Trevor Wye resources, 4 suggested working with the Taffanel and Gaubert Daily Exercises, and 4 indicated that exercises are dependent on their students’ lessons. This open response question was skipped by 43 (31%) respondents.

Table 13

Survey Question 9 - Do you use ear training exercises to teach intonation?

	Frequency	Percentage
Yes	77	59.7%
No	52	40.3%

In response to survey question 9, participants were asked if they use ear training exercises to help teach intonation. Table 13 displays the percentage of respondents that do and do not use ear training exercises to teach intonation. Respondents were split on the use of ear training exercises with while 59.7% preferred to use these exercises when teaching intonation, 40.3% selected to not use these types of exercises. The results indicate that the majority of respondents use ear training exercises to teach intonation. Even though the majority of respondents use ear training, the amount of respondents that do not use ear training is closely related.

Table 14

Survey Question 10 - Please indicate the ear training exercises used in your students' lesson.

	Frequency	Percentage
Aural identification of difference tones	45	58.4%
Aural identification of intervals	51	66.2%
Singing intervals	59	76.6%
Playing intervals against a drone on a tuner	51	66.2%
Playing intervals against a tone on another instrument	58	75.3%

	Frequency	Percentage
Other (please specify)	12	15.6%

If respondents indicated “yes” to survey question 9 they were then directed to survey question 10 which asked them to indicate the ear training exercises used in their students’ lesson. Participants could select from five exercises and were asked to indicate all exercises used; they were permitted to indicate more than one exercise. Participants could also indicate an “other” response which allowed them to list specific exercises that were not included within the 5 given choices. Table 14 displays the frequency and percentage of response for each exercise.

Respondents highly regarded singing intervals and playing intervals against a tone on another instrument. As table 14 displays, a smaller amount of respondents used aural identification of difference tones as an ear training exercise with their students.

Table 15

Survey Question 11 - Do you use theory exercises to help teach intonation?

	Frequency	Percentage
Yes	57	44.9%
No	70	55.1%

In response to survey question 11, participants were asked if they use theory exercises to help teach intonation. Table 15 displays the percentage of respondents that do and do not use theory exercises to teach intonation. Respondents were split on the use of theory exercises while 55.1% preferred to use these exercises, 44.9% selected that they do not use these exercises. The results indicate that the majority of respondents do not use theory exercises to help teach

intonation. Even though the majority of respondents do not use theory exercises, the amount of respondents that use theory exercises is closely related.

Table 16

Survey Question 12 - Please indicate the theory exercises used in your students' lessons.

	Frequency	Percentage
Visual identification of intervals	47	79.7%
Writing intervals	11	18.6%
Identification and knowledge of placement of notes in a chord	56	94.9%
Identification and knowledge of placement of notes in a scale	55	93.2%
Other (please specify)	8	13.6%

If respondents indicated “yes” to survey question 11 they were then directed to survey question 12 which asked them to indicate the theory exercises used in their students' lessons. Participants could select from four exercises and were asked to indicate all exercises used; they were permitted to indicate more than one exercise. Participants could also indicate an “other” response which allowed them to list specific exercises that were not included within the four given choices. Table 15 displays the frequency and percentage of response for each exercise. Identification and knowledge of placement of notes in a chord and identification and knowledge of placement of notes in a scale are highly regarded as valuable theory exercises to use in students lessons. As table 14 displays, a smaller percentage (79.7%) of respondents used visual

identification of intervals. The least likely used theory exercise was writing out intervals in a students lesson, receiving only an 18.6% response rate.

Table 17

Survey Question 13 - Do you use harmonic exercises in conjunction with teaching intonation?

	Frequency	Percentage
Yes	92	73.0%
No	34	27.0%

In response to survey question 13, participants were asked if they use harmonic exercises in conjunction with teaching intonation. Table 17 displays the percentage of respondents that do and do not use harmonic exercises. Approximately 73% of respondents use harmonic exercises while 27.0% of respondents do not use harmonic exercises. The results indicate that the majority of respondents do use harmonic exercises in conjunction with teaching intonation.

Table 18

Survey Question 14 - Please indicate the resources used when assigning harmonic exercises

	Frequency	Percentage
Practice Book Volume 1 Tone by Trevor Wye	57	64.0%
Tone Development Through Extended Technique by Robert Dick	31	34.8%
Other (please specify)	40	44.9%

If respondents indicated “yes” to survey question 13 there were then directed to survey question 14 which asked them to indicate the resources used when assigning harmonic exercises.

Participants could select from two resources and were asked to indicate all resources used; they were permitted to indicate more than one resource. Participants could also indicate an “other” response which allowed them to list specific resources that were not included within the 2 given choices. Table 18 displays the frequency and percentage of response for each resource. *Practice Book Volume 1, Tone* by Trevor Wye was the top resources chosen with a 64% response rate. Many respondents (44.9%) indicated “other” which allowed them to list specific resources not included within the choices.

Within the “other” response field, the majority (75%) of respondents listed harmonic exercises they created as a resource used in their students lessons. Other resource such as *The Flute Scale Book* by Patricia George and Phyllis Avidan Louke, *Flute Fundamentals* by Mary Karen Clary and various Flute Talk articles were also indicated but with a significantly smaller frequency.

Table 19

Survey Question 15 - Do you use alternate fingerings in conjunction with teaching intonation?

	Frequency	Number of Responses
Yes	113	88.3%
No	15	11.7%

In response to survey question 15, participants were asked if they use alternate fingerings in conjunction with teaching intonation. Table 19 displays the percentage of respondents that do and do not use alternate fingerings. 88.3% of respondents use alternate fingerings while 11.7% of respondents do not use alternate fingerings. The results indicate that the majority of respondents use alternate fingerings in conjunction with teaching intonation.

Table 20

Survey Question 16 - Please list any alternate fingering resource(s) used.

	Frequency	Percentage
Modern Fingerings for the Flute by Pellerite	29	35.3%
My own knowledge and experience	28	34%
Alternate Fingerings for the Flute by Nestor Herszbaum	10	12%
The Other Flute by Robert Dick	8	9.8%
None used	7	8.5%

If respondents indicated “yes” to survey question 15 they were directed to survey question 16, where they were asked to list any alternate fingering resource(s) used. This was an open response form question. Through analysis, specific responses were categorized into 5 main categories. Table 20 displays the frequency and percentage of response for these 5 response categories. Examination of Table 20 reveals that respondents use *The Modern Fingerings for the Flute* by James Pellerite and their own knowledge gained through experiences as alternate fingering resources. Other resources such as *Alternate Fingerings for the Flute* by Nestor Herszbaum and *The Other Flute* by Robert Dick are also indicated by respondents. A small percentage (7%) of respondents indicated that they did not use any resources when teaching alternate fingerings.

Summary

The results from this research provided extensive information on how flute instructors teach intonation. This summary will provide a brief overview of the results from each individual survey question.

A large majority of instructors indicated that they assign intonation exercises, implying that intonation is a necessary component of flutists' study. When asked to indicate what resources are used when assigning intonation exercises, instructors referred most often to individualized instructor created exercises. Other resources indicated included, an electronic tuner, *26 Studies for Intonation, Practice Book Volume 4* by Trevor Wye, and *De La Sonorité* by Marcel Moyse. Many resources to use when assigning intonation exercises were provided by flute instructors however, the majority of respondents indicated the use of their self-created exercises.

This research also examined the physical techniques flute instructors' discussed when teaching intonation. Respondents were given seven options for techniques discussed in lessons including aperture size, air speed, angle of air stream, jaw position, body awareness/tension, embouchure shape, and exposure of embouchure hole. The majority of flute instructors considered the angle of air stream and air speed techniques the most to help improve students intonation. Respondents also indicated jaw position, body awareness/tension, embouchure shape, and exposure of embouchure hole with a relatively same frequency however, these techniques did not receive as significantly high frequency results as the previous two techniques mentioned. Other techniques used to improve students' intonation provided by respondents but not given as a choice within the survey included vocalizing, instrument alignment, listening, and head position. Various techniques were indicated as useful for helping students improve intonation. Flute

instructors most commonly referred to the angle of air stream and air speed when working with students in lessons.

To further examine how instructors teach intonation participants were asked to indicate various temperaments used in their students' lessons. The majority of participants most often discussed equal temperament in a lesson while fewer participants indicated not discussing temperaments at all or discussing Pythagorean or just temperaments.

The majority of respondents indicated that it is extremely important for their students to know intonation tendencies on their instrument. The results also indicated that 10% of respondents believed that this was an unimportant tool for improving intonation. Of the respondents that indicated knowing tendencies was extremely important, a large majority indicated the use of a tuner in lessons and playing duets in lessons as the most common tools to help students further learn their tendencies.

The majority of respondents believed that is important to ensure students understand how dynamics affect intonation. This majority (80%) indicated assigning specific exercises to increase students' knowledge of this concepts. The most common exercises indicated were the use of long tones with a *crescendo* and *diminuendo* while a smaller percentage of respondents indicated using various exercises created from Marcel Moyse resources.

Ear training exercises were another variable examined to further determine how flute instructors teach intonation. Respondents are split on the use of ear training exercises with 60% preferring to use these exercises when teaching intonation, and 40% selecting not to use these types of exercises. Of the respondents that do use ear training the most common ear training exercises used in lessons included singing intervals, playing intervals against a tone on another

instrument, playing intervals against a drone on a tuner, and aural identification of intervals. Flute instructors were also asked to indicate if they use theory exercises to teach intonation. Approximately, 45% of respondents indicated that they use theory exercises, while the larger percentage, 55%, indicated that they do not use theory exercises to improve intonation. Of the respondents that indicated they do use theory exercises, the most commonly used exercises included identification and knowledge of placement of notes in a scale, identification and knowledge of placement of notes in a chord, and visual identification of intervals. The results indicated that respondents more commonly used ear training to help students improve their intonation and less commonly discussed the use of theory in relation to intonation.

The use of harmonic exercises was also examined in this research. A large majority indicated that they do use harmonic exercises in conjunction with teaching intonation. The most commonly used harmonic exercise resources included *Practice Book Volume 1 Tone* by Trevor Wye and self-created exercises from instructors. Flute instructors also indicated the use of alternate fingering in conjunction with teaching intonation. Similarly to harmonic exercises, alternate fingers were strongly indicated as being used when teaching intonation. Respondents listed resources such as *Modern Fingerings for the Flute* by Pellerite and their own knowledge of widely used alternate fingering resources.

The results from this research covered a wide gamut of information that should be considered when teaching intonation. Through the examination of these results a clear indication of the information flute instructors discuss and do not discuss regarding intonation is provided. These research results coupled with the review of extant literature will provided a basis of fundamental information on how to teach intonation to flutists.

CHAPTER FIVE

Conclusion and Discussion

The motivation for this study was a direct result of having limited learning experiences about intonation and limited resources on the concept of intonation. As mentioned in Chapter 1, intonation skills are continually discussed throughout a flutists career, however many flutist students are uncertain about how to practice and improve intonation. This learning process also contributes to flutists' uncertainty about teaching intonation. For these reasons it is important to further examine how flutists can improve the teaching of intonation.

To continually strengthen the quality of flute pedagogy curriculum, flute instructors must examine ways to better improve their understanding of a topic and methods for teaching this topic. The goal of this study was to provide flute instructors with a resource that presents clear and practical ways to teach the topic of intonation. This study was also intended to highlight the limited amount of information on intonation within flute pedagogy literature, while also highlighting the multiple ways flute instructors teach the concept of intonation.

Research Question One

Do college flute professors teach students how to improve intonation skills?

To examine this research question participants were asked if they assign intonation exercises. With most relevant topics in flute pedagogy literature, such as technique, tone, and articulation, exercises are assigned to help students practice concepts and further demonstrate competency. Rather than ask the specific question, "*Do you teach intonation?*" the question "*Do you assign intonation exercises?*" was employed, to provide conclusive results for a broad spectrum question. Flute instructors could have simply said "yes" to the question "*Do you teach*

intonation?” even if they only briefly discuss this topic in lessons. If flute instructors are assigning intonation exercises in a similar fashion as other topics then they are exhibiting the teaching of intonation.

Analyzed data from survey question 1 revealed that the majority of college flute professors teach the topic of intonation and illustrates that the topic of intonation is included in most flute pedagogues’ curriculum. The results also indicated that 22.5% of participants indicated that they do not assign intonation exercises. Instructors could address the topic of intonation through others methods such as specific repertoire or verbal instruction. It is unclear if the amount of participants that responded “no” to assigning exercises are not teaching intonation or using other methods to teach intonation. However, the amount of respondents answering “no,” almost one-fourth of the survey participants, is alarming and further demonstrates the lack of comprehensive understanding of this topic. If intonation is considered a crucial topic, which a review of flute pedagogy literature has shown, then why is the consensus on how to teach this topic not aligned? The limited amount of information on the topic could be a contributing factor. Examples set by previous generations of teaching could also contribute to these results. If flute instructors were not taught clear ways to practice and improve intonation then it is likely they will not feel comfortable teaching their students this concept. These results are further motivation for this study, providing flute instructors a sense of how to approach this topic from every angle.

Research Question Two

What methods do college flute professors use to improve students’ intonation skills?

This research question was approached from methods found in the review of flute pedagogy literature on intonation. Survey questions were created based on methods that were

discussed in this literature such as, ear training and theory fundamentals, instrument tendencies, harmonic exercises, techniques used to change intonation, alternate fingerings, and temperament. Participants were guided in their discussion of how they teach intonation but were also given the opportunity to further elaborate on a method or give an idea that was not provided. For this reason, I will discuss research question two in correlation with the methods outlined in the review of the literature and survey questions two through sixteen.

Ear Training

As chapter 4 revealed, ear training was a method that flute instructors used to help their students learn and improve intonation. In response to survey question 10, participants indicated ear training exercises such as singing intervals or playing against a tone on another instrument as beneficial to the study of intonation. This supports the information Debost (2002) provided on the importance of using interval training to help improve intonation. All other ear training methods indicated in survey question 10 were selected with a large frequency establishing that each of these ear training methods are used to teach intonation. There was no clear indication that one method was used more than another. These results establish ear training methods such as singing intervals, playing against a tone on another instrument, playing against a drone on a tuner, aural identification of intervals, and aural identification of difference tones as common methods for teaching intonation. This research provides flute instructors with the various types of ear training exercises that can be used in conjunction with the topic of intonation.

It is also important to discuss that 40% of respondents do not use ear training exercises in conjunction with teaching intonation. In Chapter 2 many resources established that ear training exercises are crucial for the improvement of intonation skills. Why are such a large number of

instructors not using this method? The definitive lack of a standard teaching method for intonation contributes to the number of respondents indicating they do not use ear training exercises. Flute instructors are well versed on how to teach topics such as technique and articulation. There are many resources, currently available, devoted to these specific topics. The topic of intonation, however, does not have the same type of standard resources. This reason is, perhaps, the largest reason why some teachers use ear training exercises while others do not.

Theory Fundamentals

Chapter 4 also discussed the use of theory fundamentals as a method to help improve intonation. In response to survey question 11, the majority of participants indicated that they do not use theory fundamentals in conjunction with teaching intonation. Theoretical study in a classroom setting is standard in the college music curriculum. The response to this question indicates that the majority of flute professors are not including classroom theory topics when teaching intonation. The benefit of using theory fundamentals to help improve intonation has been previously stated in Chapter 2. The results indicate that flute instructors could provide more application of theory fundamentals in conjunction with teaching intonation. Students can be given clear examples of theory topics that can be applied to improving intonation. The application of theory fundamentals will not only benefit the students understanding of intonation but will also help to further solidify these fundamentals.

Of the respondents that indicated using theory fundamentals in conjunction with intonation the most commonly used techniques were identification and knowledge of placement of notes in a chord, identification and knowledge of placement of notes in a scale, and visual identification of intervals. These techniques provide beneficial examples of how theory

fundamentals can be incorporated into teaching intonation. Because the frequency of response for all three techniques is high, a correlation can be made between the benefit of using them during instruction.

Instrument Tendencies

In response to survey question 5, a large majority of flute instructors indicated that it is extremely important for students to know their instrument tendencies and is considered a vital component to teaching intonation. These results support the information previously present on instrument tendencies in Chapter 2. Electronic tuners in lessons and playing duets in lessons were the techniques selected as the most common to help students identify their tendencies. The use of a tuner provides a visual technique to help improve intonation. Students can visually see the tuner while also listening to make adjustment. The ability to play duets in a lesson allows students to rely specifically on their aural abilities to make adjusts while learning their tendencies. The combination of these two techniques would provide a strong foundation for students to learn their tendencies.

Intonation charts or maps were included as a selection to survey question 6. Through the review of the literature much emphasis was found on having students create intonation charts or maps of their instrument. Potter (2000) and Garofalo (1996) both provided charts and maps in their resources. This is not the most commonly used device used to help students find their tendencies but is something that is being used in the flute pedagogy community. Flute instructors should consider implementing the use of intonation charts and maps to help students learn their tendencies. These charts and maps provide written documentation of tendencies and can also show a student's progress and further competency of their tendencies from year-to-year. The

ideal situation for teaching instrument tendencies would include the use of all three techniques listed: visual identification using a tuner, aural identification by playing duets, and written documentation by creating charts or maps.

Harmonic Exercises

Results from survey question 13 indicated that the majority of flute instructors use harmonic exercises in conjunction with teaching intonation. The validity of harmonic exercises is not established in this research, however, a correlation between the amount of respondents that use harmonic exercises and their benefit can be made. The use of harmonic exercises is another method that should be implemented when working on intonation with students.

Techniques Used to Change Intonation

Many techniques can be employed to change intonation. This study examined the use of these various techniques in students lessons. As the results chapter indicated, seven main techniques were indicated in the survey. Flute instructors also provided a wide variety of techniques within the open field response "other." The two techniques selected with the most frequency included angle of air stream and air speed. It should be considered that these two techniques are most often addressed by flute instructors. The other five techniques received similar frequency of responses indicating that flute instructors address each of these techniques in students lessons. Because respondents were allowed to indicate more than one technique and one technique did not receive a significantly lower frequency of response, it can be concluded that instructors find all seven techniques beneficial when teaching intonation.

Flute instructors also provided other techniques such as vocalizing and/or singing, correct instrument alignment and active listening as beneficial when teaching intonation. It is important

to examine these techniques and consider their implementation as well. Every student is different. Their body, their embouchure, and their physical make-up make each student unique. Instructors must be equipped with many techniques to help students change intonation. Body awareness could benefit a specific student while jaw position might be more beneficial for another student. For these reasons, it is important for flute instructors to explore many techniques used to change intonation. The results from this survey indicated that all seven techniques are being used in conjunction with teaching intonation. Results also provided other techniques that might not have been uncovered unless specifically given by respondents. This study provides a resource for all of these various techniques and further equips instructors to teach intonation.

Alternate Fingerings

The use of alternate fingerings has been highly debated within the flute pedagogy community. Many instructors believe in the use of alternate fingers while some instructors are more “purist” and find the use of alternate fingerings as cheating. Results from survey question 15 indicated that the majority of flute instructors fall into the first category of flutists that use alternate fingerings in conjunction with teaching intonation. As Gardner (2011) stated in his research, alternative fingers should be implored when necessary if they benefit the performers ability to improve intonation. The use of alternate fingers is another method that should be implemented when working on intonation with students.

Temperament

Temperament remains an unclear subject in conjunction with the topic of intonation. Should instrumentalist consider playing in a certain temperament? Should they understand their tendencies based on a certain temperament? How much should the role of temperament play in

the study of intonation? These questions address many issues within the topic of temperament and lead to the ambiguity of its teaching. Survey question 4 further establishes this ambiguity. Eighty-five of the 138 respondents skipped this question. These results indicate that flute instructors did not discuss temperament when teaching intonation. Furthermore, of the respondents that selected the open response choice "other," the majority of "other" responses indicated that they do not discuss temperaments in lesson. As indicated in Chapter 2, understanding temperaments has benefited students' improvement of intonation. Then why are teachers not discussing this concept in their students lessons? Will a clearer understanding of temperaments help improve students' intonation? More research in the future needs to be completed to further examine this topic. A research study could be conducted to examine the discussion of various temperaments in lessons and their benefits.

Research Question Three

What resources do college flute professors use in conjunction with teaching intonation?

The results from this study provide an abundant amount of resources to use in correlation with teaching intonation. Refer to figures 1-3. In response to survey question 2, participants could selected from the following resources, *Kincaidina* by John Krell, *Seven Steps to Better Intonation* by Chris Potter, and *26 Studies for Intonation, Practice Book Volume 4* by Trevor Wye. Resources were only selected for this list if they specifically addressed the topic of intonation. Many of respondents selected the open filed response "other" providing a multitude of resources they use when assigning intonation exercises. These resources were not originally included in the survey because they were considered tone specific books rather than intonation specific resources. This result leads to the assumption that flute instructors believe intonation and

tone are interconnected and therefore can be taught using either tone specific or intonation specific resources. Further research should be conducted to examine this interconnected relationship of tone and intonation and the effect this has on how flute instructors teach the concept of intonation.

Of the resources indicated, instructors most often referred to self-created exercises as a main resource. This result further solidifies that there is a limited amount of information available on intonation in the flute pedagogy. Flute instructors indicated they created their own exercises based on individual students needs. They also indicated creating exercises based on information that they learned from previous teachers. Refer to Appendix E for a list of resources used to assign intonation exercises, Appendix F for a list of resources used to assign harmonic exercises, and Appendix G for a list of resources used for alternate fingerings.

Implications

Teaching students how to improve their intonation skills requires knowledge of all instructional categories (temperament, instrument tendencies, harmonic exercises, alternate fingerings, ear training and theory fundamentals, and techniques used to change intonation) and establishes a well balanced curriculum. Intonation pedagogy should no longer be considered vague or ineffective; results from this study provide an abundance of information on the topic. Flute instructors may examine this information and to ensure students are taught a wide variety of ways to improve intonation skills. The most successful student will be equipped with multiple tools to improve their skills and if students are provided intonation instruction from all categories discussed in this study their ability to improve will be greater.

Results from this study indicated that flute instructors are not teaching all aspects of how to improve intonation skills. Some instructors used certain methods while others did not. The comprehension of intonation within flute pedagogy would be more extensive if professors examined all the various aspects presented in this study rather than using limited techniques to teach this topic. If students are provided this information in a private lesson, when confronted with an intonation problem in ensemble or solo playing they will have many techniques to diagnosis and improve their intonation problems. Whether they have trained their ears to hear problems more clearly, or they understand the particular temperament they are playing in, or they comprehend how to change a particular pitch, students will succeed when all aspects of their skill are enhanced. When all of these aspects are incorporated into instruction, flutists could develop a better sense of how to improve intonation, in turn, creating less friction and more beautiful “in tune” flute expression.

Ensemble conductors may also examine the use of various instructional categories when discussing intonation with flutists. The results of this study indicated a variety of methods being used to teach intonation. College flute professors are providing their students with information on how to improve intonation; ensemble conductors should be prepared to give similar information. For example, if students are trained to understand what type of chord they are playing and how to properly tune that chord, ensemble directors may further enforce this learning process by holding flutist accountable for these techniques in ensemble playing. If college flute instructors are administering comprehensive instruction on intonation then ensemble conductors must hold flutists accountable for using these techniques. An examination of this study for an ensemble conductor equips them with the knowledge of how the topic of

intonation is being addressed within flute pedagogy. This enables them to effectively address this topic with flutists in their ensembles.

Results from this study provide flutists with multiple ways to learn intonation skills. The research conducted substantiates this information by demonstrating that college flute professors are currently employing various methods for teaching intonation. Flutists should consider all instructional categories when working on this topic. All flutists can benefit from the information found in this study. Whether or not they are studying with a college flute professor, this information can provide flutists with ways to improve their intonation skills. Results from this study have a direct impact on how flutists should approach the topic of intonation in their future study. Flutists incorporating the various methods discussed throughout this research will be most successful at improving their intonation skills, in turn, further enhancing their overall abilities.

Recommendations for Further Study

Recommendations for further study have been highlighted throughout this chapter.

Further recommendations include:

1. A collaboration of instructor-created exercises resource

The creation of a resource that contains all instructor-created exercises would be extremely valuable for flute pedagogy literature. This combination of knowledge has the potential to become a pinnacle resource on intonation in flute pedagogy.

2. Examine the validity of methods selected

The results from this study concluded that many of the methods are beneficial because of the frequency of response that was received from respondents. This frequency however does not

establish validity. Further research could examine the validity of these methods. For example, does the use of harmonic exercises in conjunction with intonation improve students intonation?

3. A similar research study with various wind instruments

The information found in this study was very beneficial for flute pedagogy. Other wind instruments might also benefit from a similar study. This information could then be compiled into a wind instrument resource available for use by band directors.

4. The effect of vibrato on intonation

Further research could examine the role of vibrato when teaching intonation.

5. Examination of the use of intonation software within the curriculum

Some instructors indicated using intonation software such as the *TuningCD* or *Tune Up*. More research could be done to examine the benefits of this software within flute pedagogy.

6. Similar research on other concepts in flute pedagogy such as technique or articulation

A similar study could be conducted on other flute pedagogy concepts. Information could be gathered to determine if flute instructors are generally using the same methods and resources to teach concepts.

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APPENDIX A

Web-based Survey

Hello,

I would like to take this opportunity to introduce myself, Kelly Cato, and ask for a brief moment of your time. I am currently a graduate student at Columbus State University pursuing a Masters in Music Education with an emphasis in Flute Pedagogy. My thesis, entitled “**A flute instructors guidebook to intonation: understanding, teaching, and executing**” will include the results of the following survey on how college flute professors approach teaching intonation.

Your participation in this survey would be greatly appreciated. The survey consists of 16 questions and should take no more than 5 minutes to complete. Participation and all answers will remain anonymous. Please click the link below and follow the guided directions to complete the survey.

link

Thank you in advance for you support,
Kelly Cato

1. Do you assign intonation exercises?

- yes
- no

2. If yes, please indicate the resources you use when assigning intonation exercises.

- *26 Studies for Intonation, Practice Book Volume 4* by Trevor Wye
- *Seven Steps to Better Intonation* by Chris Potter
- *Kincaidina* by John Krell
- Other _____

3. Please indicate the techniques used to change intonation discussed in your students' lessons?

- Angle of air stream
- Air speed
- Aperture size
- Jaw position
- Body awareness/tension
- Embouchure shape
- Exposure of embouchure hole
- Other _____

4. Please indicate the temperaments discussed in your students' lessons.

- Equal temperament
- Just temperament
- Other _____

5. How important is it for your students to know intonation tendencies of their instrument?

1 2 3 4 5

Unimportant ----- Very Important

6. Please indicate the tools used most often to help students learn their tendencies.

- Intonation charts or maps
- Electronic tuners in lessons
- Playing duets in lessons
- Intonation assignments outside of lesson times
- Other _____

7. Do you assign exercises to help your students better understand how dynamics affect intonation?

- yes
- no

8. If yes, please list the exercise(s) assigned.

9. Do you use ear training exercises to teach intonation?

- yes
- no

10. If yes, please indicate the ear training exercises used in your students' lessons.

- Aural identification of difference tones
- Aural identification of intervals
- Singing intervals
- Playing intervals against a drone on a tuner
- Playing intervals against a tone on another instrument
- Other _____

11. Do you use theory exercises to help teach intonation?

- yes

-no

12. If yes, please indicate the theory exercises used in your students' lessons.

- Visual identification of intervals
- Writing intervals
- Identification and knowledge of placement of notes in a chord
- Identification and knowledge of placement of notes in a scale
- Other _____

13. Do you use harmonic exercises in conjunction with teaching intonation?

- yes
- no

14. If yes, please indicate the resources you use when assigning harmonic exercises.

- *Practice Book Volume 1 Tone* by Trevor Wye
- *Tone Development Through Extended Technique* by Robert Dick
- Other _____

15. Do you use alternate fingerings in conjunction with teaching intonation?

- yes
- no

16. If yes, please list any alternate fingering resource(s) used.

APPENDIX B

COLUMBUS STATE UNIVERSITY

Human Research Proposal

to the

Human Subjects Review Committee

Instructions-- Please submit this form electronically to the Committee Chair (schwimmer.david@colstate.edu), with all supplementary materials attached. Be sure to include informed consent documents, questionnaires, and supplemental materials for the Committee's examination.

Name: Kelly Cato

Date: 12/1/10

**Class and /Instructor
(if student):**

Graduate Music Project MUSE-6485-02 - Dr. Andrée Martin

Project Title:

“A Flute Instructors' Guidebook to Intonation: Understanding, Teaching, and Executing”

Problem/Purpose/Nature of the Project:

The intended purpose of this thesis is to create a current and beneficial resource on teaching intonation for flute teachers. The information will include a brief overview of intonation, exercises on how to teach and improve intonation from current resources, and exercises and information on intonation gathered from professors in the field. To gather information from professors in the field an online survey will be used. This thesis is intended to provide flute teachers with a guidebook for teaching intonation.

Subject(s) (Include recruitment procedures):

Subjects include college flute professors. Email addresses have been obtained through the College Music Society database.

Methodology/Procedures:

An online survey will be created using SurveyMonkey. College flute professors compiled from the College Music Society database will be sent an email asking to participate in the online survey. They will be instructed to click on the link and follow the guided instructions to complete the survey. All information and data for the survey will be store on the SurveyMonkey website. The data compiled from the online survey in combination with extensive research of other resources will comprise the research for this thesis.

Additional Considerations:

Action

Approved Denied Instructor Comments:

Approved Denied Dept. Chair Comments

*Approval must also be secured from other agencies and/or institutions, when such subjects are to be used.

APPENDIX C

Consent to be a Student Survey Participant

Introduction

This survey is being conducted as part of a study by Kelly Cato a graduate student at the Schwob School of Music, Columbus State University. The study aims to determine the various approaches college flute professors use to instruct intonation. Data obtained from this survey will be used in Kelly Cato's thesis, "A Flute Instructors' Guidebook to Intonation: Understanding, Teaching, and Executing".

Procedures

You will be asked to complete a questionnaire. The online questionnaire consists of 16 questions. Guided instructions are given to fully complete the online questionnaire.

Confidentiality

All information provided will remain confidential and will only be reported as group data with no identifying information. All data, including questionnaires will be kept in a secure location and only those directly involved with the study will have access to them.

Participation

Participation in this survey is voluntary. You have the right to withdraw at any time or refuse to participate.

Questions about the Research

If you have questions regarding this study, you may contact Kelly Cato at kelly.cato@gmail.com.

The return of this survey is your consent to participate in the research.

APPENDIX D**Online Survey Data**

Total of Participants Started Survey = 138

Total of Participants Completed Survey = 128

Survey Question 1

Do you assign intonation exercises?

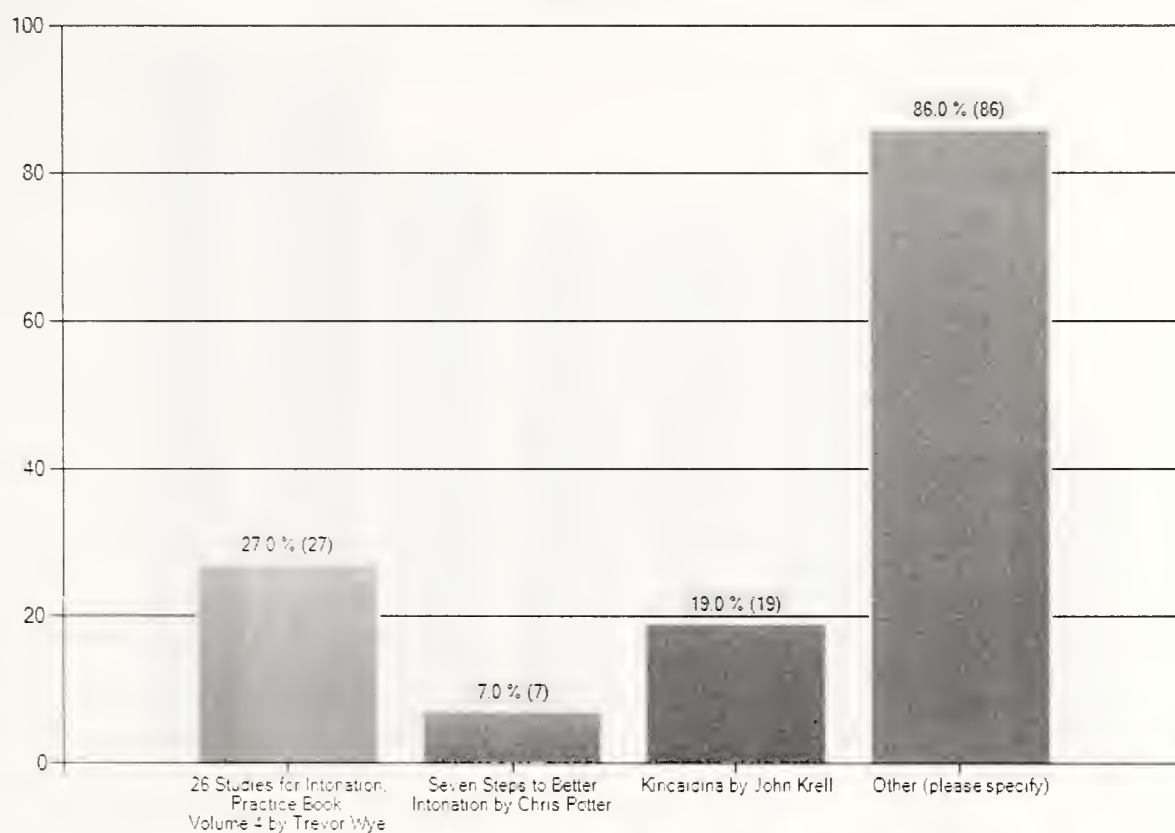


Participants Answered Question = 138

Participants Skipped Question = 0

Survey Question 2

Please indicate the resources you use when assigning intonation exercises.



Participants Answered Question = 100

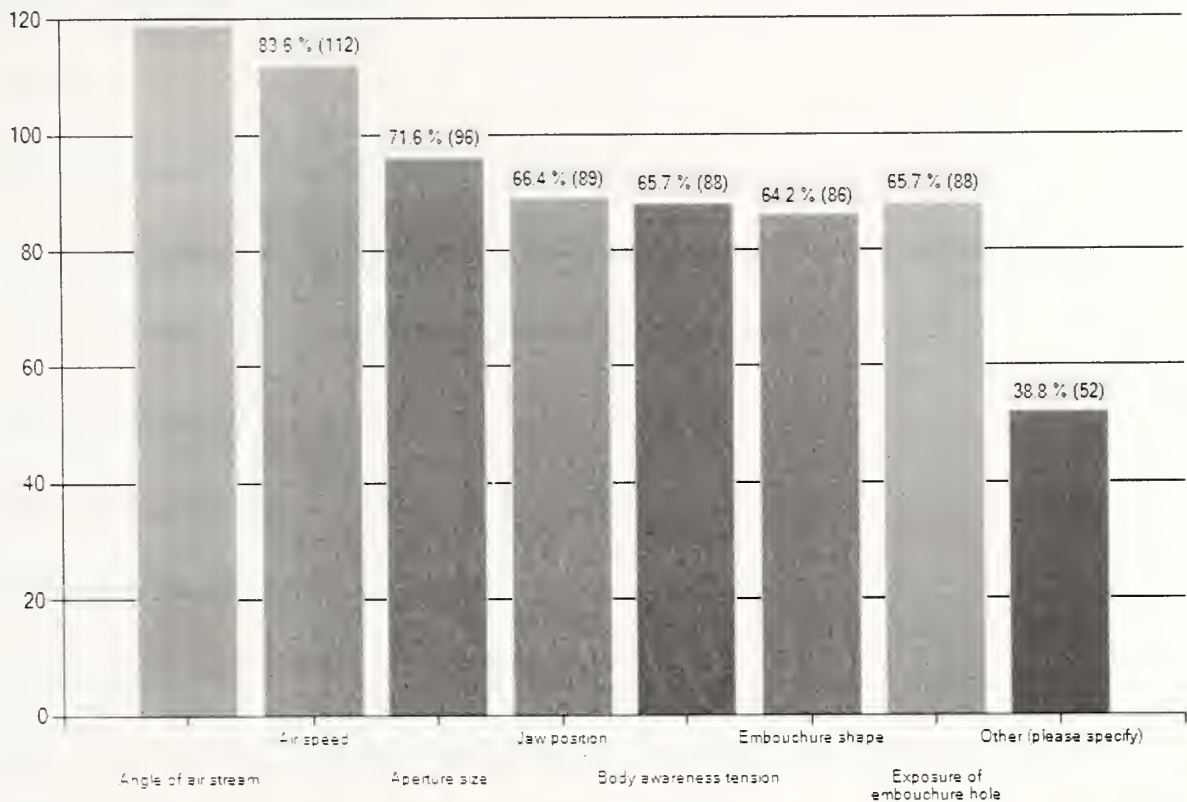
Participants Skipped Question = 38

“Other” Field Responses

Data for the “Other” field responses can be located in Appendix G

Survey Question 3

Please indicate the techniques used to change intonation discussed in your students' lessons.



Participants Answered Question = 134

Participants Skipped Question = 4

“Other” Field Responses

- Listening/tone-a good tone is usually in tune
- Cover or uncover tone hole
- Vowels (Ahh for lowering; Eee for raising)
- Inner mouth space (combination of raising the soft palate and dropping the jaw)
- Pulling out or pushing in the head joint, rolling out and rolling in the head joint

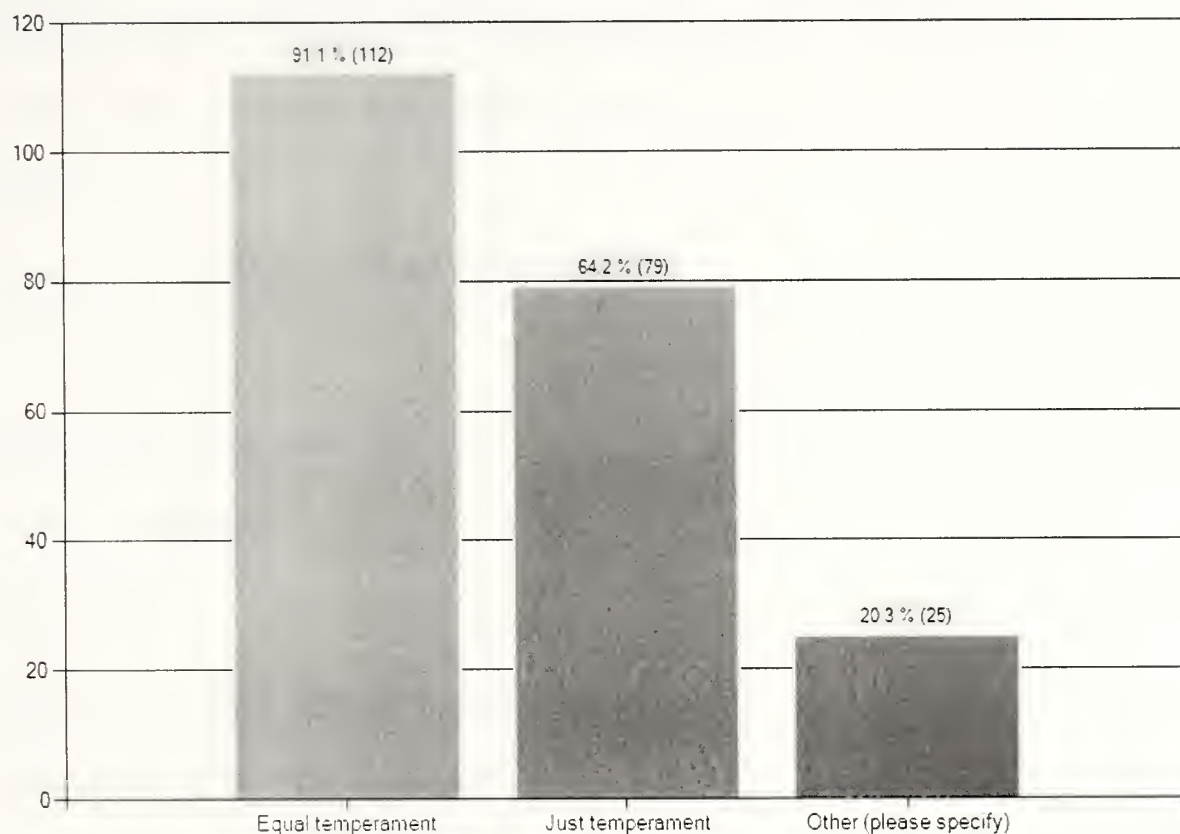
- Air support
- Alternate fingerings
- Alternate fingerings occasionally
- Listening
- Instrument setup, hand position
- Awareness of effects of temperature, playing equally tempered fixed pitch instruments (mallet percussion, etc.) as compared with piano or strings
- Throat position/open
- Tongue position must be low in mouth at all times
- Maintain resonance/overtones
- Note Bending (see Trevor Wye, Tone Book)
- Characteristics of your particular instrument, and whether you are playing in orchestra with strings or in band; how to play in the woodwind section alone
- Learning to listen
- Rotate instrument
- Space between lips and teeth, head position, hand position/posture, space between top/bottom teeth
- Head position- chin down or up to lower or raise pitch
- Dropped jaw position
- Vowel shape in mouth
- Amount of air (same as air speed)

- Patience
- Lower body muscle usage and alignment
- Whistle tones, harmonics
- Position of lips - in and out
- Voicing/ ear training
- Left arm pressure; moving flute away from body with right arm
- Flute position
- Raising chin
- Venting of tone holes
- I refer to "teeth open" rather than the jaw; tuning=listening!
- Listening for a balance of highs and lows in the sound and making sure the head joint is in a position where the scale of the flute is best in tune with itself.
- Listening to difference tones, intervallic tuning
- Minimize up and down head motion
- Alternate fingering
- Most important is to hear a pitch before playing and then match it. The flute is only a tool to play pitches and thus music.
- Imagining note different from the one playing; harmonics
- Alternate fingerings
- Rolling in or out - all interconnected
- Voice position

- Shape & size of oral cavity, placement of tongue inside mouth, throat tuning
- Correct breathing and support
- Size of "cave" inside the mouth -- "ooo" or "oh" vowel rather than "ee" or "ih"
- Rolling in and out for extreme situations
- Singing (with and without the flute), development and knowledge of one's air supply, overtone exercises, multi-phonics, and "bamboo tones."
- Alignment of head joint, hand position, raising lowering head
- Sliding off an open hole (ie. F)
- Vocalize, singing pitches first - throat tuning
- Actually knowing what a fifth/octave, etc. should sound like, knowing where your crown should be in your head joint
- Head angle, eye direction (body awareness)

Survey Question 4

Please indicate the temperaments discussed in your students' lessons.



Participants Answered Question = 123

Participants Skipped Question = 15

“Other” Field Responses

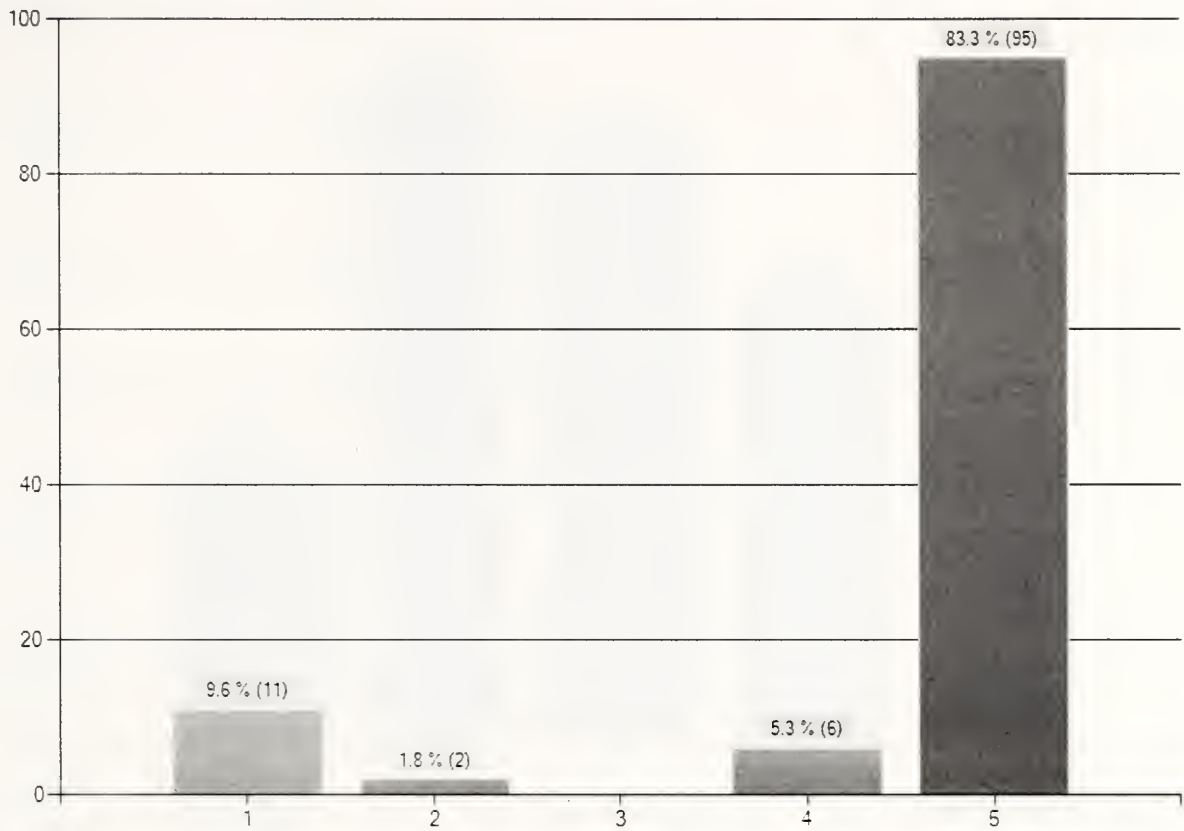
- I don't really discuss any
- Depends on student, and piece
- Stretch tuning (pianos) and Pythagorean tuning (some string playing)
- History of Intonation dating back to Ancient Greece
- Various baroque tunings

- Pythagorean, strings
- Discuss some of the concepts re: temperament, but not by name
- While I don't use the above terminology, I do discuss with them that in instrumental ensemble playing, they will need to listen to intervals such as M3 and P5 and make adjustments.
- "Expressive" intonation- as is used in string playing
- Piano stretch tuning
- Glancing look at other temperaments
- It makes no difference
- Baroque Pitch
- Learning to use timbre in combination with pitch
- Ambient pitch in ensemble rehearsals
- Mean & well-tempered
- Others from the past
- Vellotti, Werkmeister, Kirnberger
- None
- And the differences between each.
- We also discuss pitch tendencies of other instruments and unison playing
- Don't really discuss temperaments - rather "you have to play in tune with the piano"
- Various temperaments based on level of student
- Pitch relative to other sounding medium(s)

- Microtonal, pentatonic, whole tone, septatonic- we talk about how each culture has a scale and the relationships between the notes in those scales have to be just right and that the pull of re-do is different than the tug of ti-do, etc.

Survey Question 5

How important is it for your students to know intonation tendencies of their instrument?

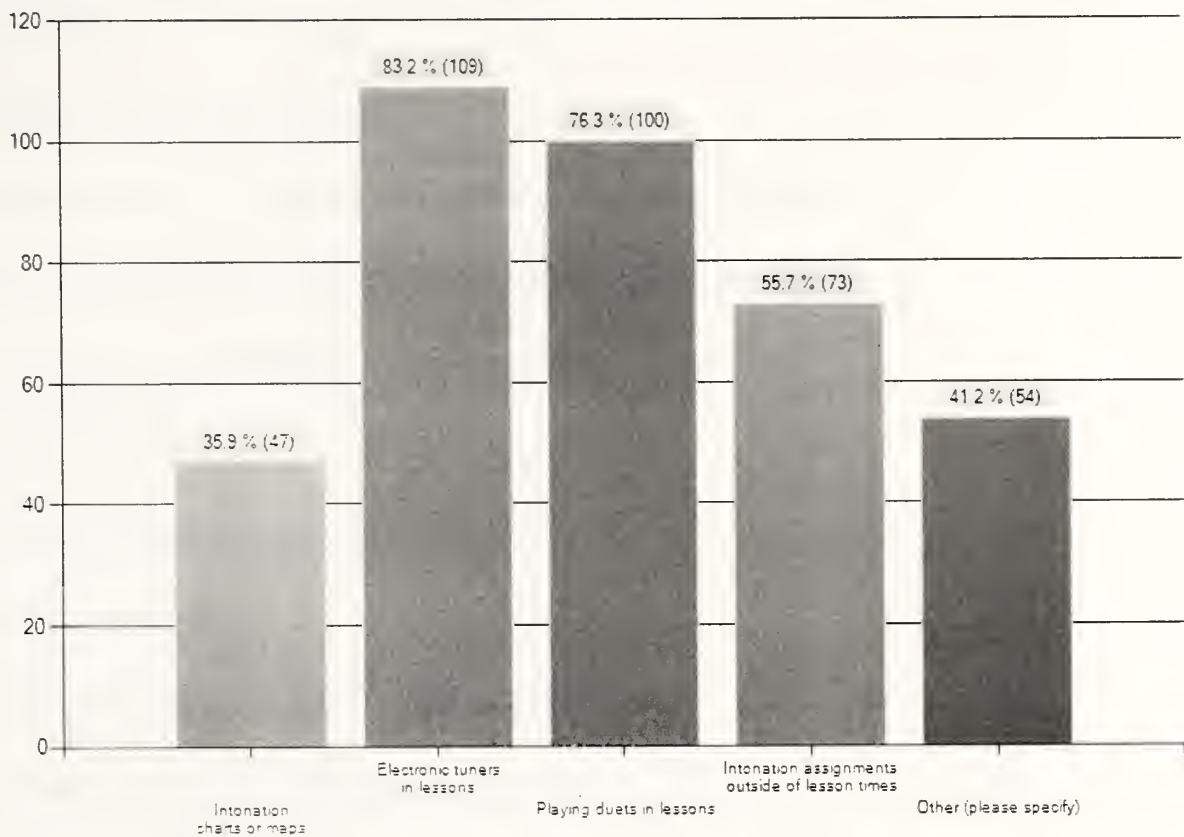


Participants Answered Question = 114

Participants Skipped Question = 24

Survey Question 6

Please indicate the tools used most often to help students learn their tendencies.



Participants Answered Question = 131

Participants Skipped Question = 7

“Other” Field Responses

- Singing (choir and their music)
- Demonstration of exercises in the lesson
- Other small ensembles, difference tone tuning
- Playing unisons, octaves and fifths in lessons
- Chamber music

- Having a student hold notes while hearing related chords on piano
- Singing!
- Tuning CD
- Listening! playing with others
- Teaching them how to listen and internalize pitch: singing pitches
- Play intervals with me or tuner sounding the tonic, record and listen
- Playing tunes with held notes (The Tuning CD)
- These are all fives.
- Learning to listen and actually hear
- Listen to each note
- Playing piano along with their accompanied pieces
- Ensemble playing such as flute choir or chamber groups
- Chamber music (small group and with pianist)
- Tuning intervals and chords in flute choir
- Playing octave with the teacher in lessons- verbal pitch correction in lessons
- Tuners in practice: playing against drone
- Tuners at practice, only to check. EARS!
- Personal psychoacoustic exercises and audio equipment
- Electric tuners outside of lessons, pitch matching, playing to a drone
- Playing with a drone
- In everything they play we are constantly paying attention to intonation

- Recording self and listening in and out of lesson, playing to a good recording
- Requesting student to practice with a tuner.
- Listening to intervals at the piano
- Tuning passages in ensemble music
- Keyboard reference in lessons
- Ear training
- Solfege (movable do)
- Recording themselves, playing with SmartMusic
- Constant reminders
- Practicing with a drone
- Chamber music
- Thinking about it on a regular basis. It is not an extra but essential to tone production and phrasing
- Piano comparison, intervals played with teacher (not duets as music)
- Dsmall ensembles--not like instruments
- Practicing with a drone intervals above that drone
- Listening when playing with piano, being aware of harmony to understand how they fit in, using the tuner during practice, understanding what key a melody they're playing is in to better hear how scale steps influence tuning- for instance if they're playing a leading tone to the tonic, the tuning might be different than if they're playing a third to the fourth. In this way, I try to emphasize how intonation isn't separate from other

elements of musicianship but very intertwined. I have them sing parts that are out of tune- they usually sing more in tune than they play, then we have them try to play with the same tuning and relationships between notes

- Playing with the student in all music so they can learn to listen and match pitch.
- Difference tone exercises.
- Playing with other instruments- chamber music
- Work with piano and other instruments; listening to and singing intervals
- Smartmusic tuner and Melodyne software
- Tuning with others
- Recording selves
- Pitch matching with me, their teacher. Playing with recordings of other flutists.

Survey Question 7

Do you assign exercises to help your students better understand how dynamics affect intonation?



Participants Answered Question = 130

Participants Skipped Question = 8

Survey Question 8

Participants Answered Question = 95

Participants Skipped Question = 43

Please indicate the resources used - Open field responses

- Trevor wye practice bk. vol.1 p35, the page with the 16th note pattern changing dynamics from one beat to the next. I believe it starts with an A major triad, forte then piano
- Swells: metronome = 60, from ppp --> fff in 6 beats then fff --> ppp in 6 beats, in one breath
- Long Tones Moyse studies (the old standby)
- Moyse, De La Sonorite
- Moyse Tone studies Original exercises
- Arpeggios Octave slurs Interval slurs m2/M2/m3/M3/P4/P5/m6/M6/m7/M7/Octave play slowly with tuner/gradually speed up to encompass the interval of 2 octaves
- Long tones and crescendos and diminuendos.
- Long tones with crescendo/diminuendo
- Crescendo and decrescendo with tuner with and without vibrato.
- Harmonic series exercises. use tuner, play with piano
- Various exercises included in Trevor Wye "Tone".
- The exercises vary - are primarily geared towards where the student is at the time
- Taffanel and Gaubert: A. Maquarre; Moyse

- Mostly use phrases within their repertoire played at various dynamic levels, comparing tendencies, discussing changes that need to be made and putting them into practice.
Slow practice with tuner so they get used to making the physical changes need to correct the pitch. They need to get used to listening and changing, the tuner is not the end, only the beginning.
- Moyse - Tone Development Through Interpretation Moyse - De la Sonorite
- Hairpin crescendo & decrescendo with tuner - handout I created for my students
- Crescendo-diminuendo on long tones, listening and checking w/tuner
- M. Moyse exercise that consists of crescendi-diminuendi
- Warmups such as Marcel Moyse "De la sonorité" No. 1 with various dynamics, such as each, cresc/dim, etc.
- Holding a pitch, watch a tuner and crescendo/decrecendo (à la Kincaid)
- Finding "p" from above, crescendo/dim w/ drone, subito f/p with needle and Drone, melodic studies with drone
- Diminuendo/crescendo exercises with drone pitches, tuning triads and seventh Chords to just and equal tempered scales/intervals.
- Moyse De La Sonorite
- Daily studies -- Taff & Gaubert Robert Dick -- Tone Devel through Extended Tech
- De la contrite with cres/dim through each pair
- Tabuteau; Moyse de la Sonorite
- Moyes 24 Petite etudes, Wye practice book 1 intonation section

- Musical Gestures by Peter Simpson
- Long tones cres--dim
- Diminuendo on a long note. Diminuendo on a note resolving half a step higher or lower.
- Diminuendos and crescendos on long tones with tuner
- It depends on the student's incorrect habit. C#s in the middle register are a common problem so ex. in keys with that note are used.
- Long-tones with crese and decrease
- Made up at the lesson
- Listen to intervals
- Moyse De la Sonrité initial exercises with tapers and with different dynamics. Play scales/intervals/chords with drone in various dynamics. Sometimes leave tuner on stand and glance at certain "trouble" notes as they occur and at ends of phrases.
- Long tones with a tuner
- Tone Development Through Interpretation and other similar exercises
- Sonorite
- Long tones; melodies in Moyse's Tone Development through Interpretation
- Matching pitches
- Students choose a single note and play it across a range of dynamic levels (repeatedly) to discover where their own personal level of each dynamic is and how they can create it

- Moyses made-up exercises T. Wye
- Selected etudes, duets, and orchestral works
- Taffènel Gaubert 17 daily studies #4
- Flexibility exercises (Trevor Wye) Tone bending decrescendos on whole notes up a scale
- Exercises from Jill Felber
- Trevor Wye Practice Book Vol. I Tone
- Crescendo/diminuendo exercises with tuners
- Playing a short, slow piece in contrasting dynamics and tone colors all the while watching the tuner. Playing scales with cresc. and decresc. and listening for the 5ths and the octaves.

Survey Question 9

Do you use ear training exercises to teach intonation?

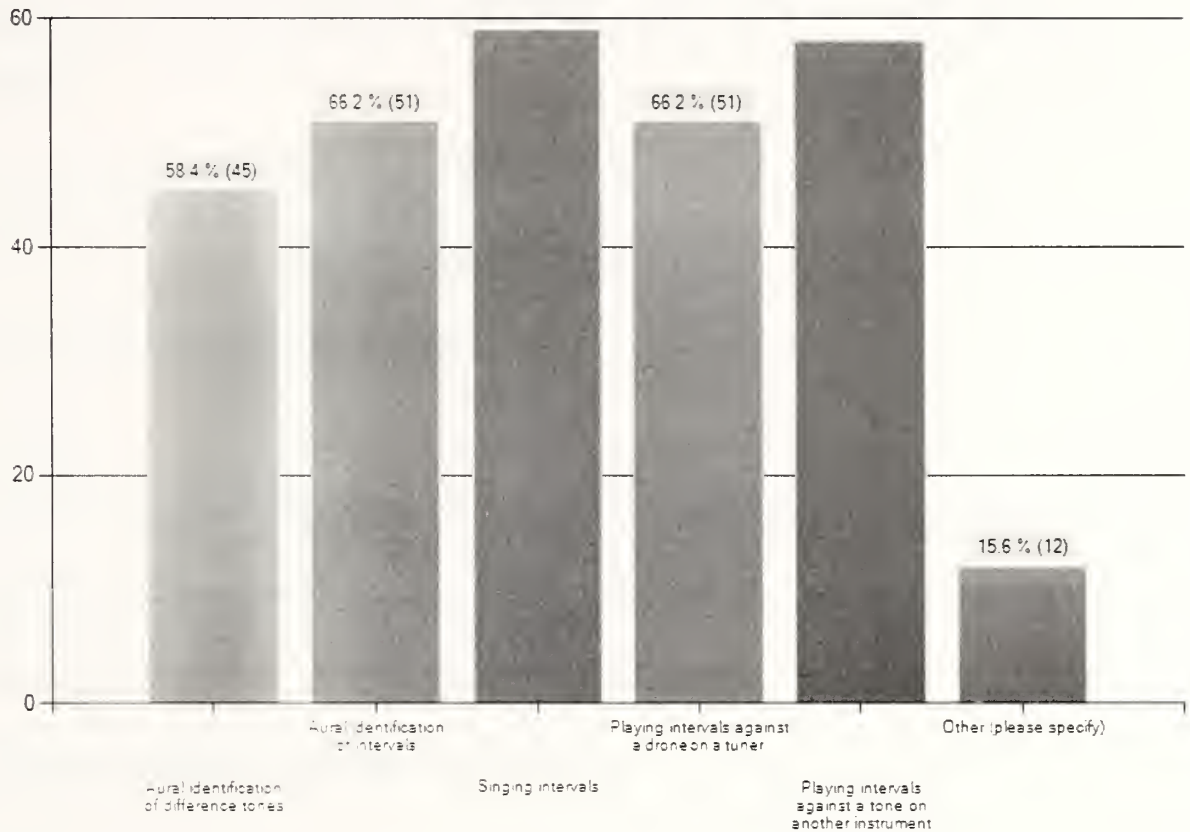


Participants Answered Question = 129

Participants Skipped Question = 9

Survey Question 10

Please indicate the ear training exercises used in your students' lessons.



Participants Answered Question = 77

Participants Skipped Question = 61

“Other” Field Responses

- Learning what sharp or flat is by having a tuner on another stand while doing #4
- Playing scales slowly, playing scale degrees
- Singing their music
- Readjusting your ear to the harmonic feel of upper register notes when played accurately in tune with the lower note. We become accustomed to hearing the upper

register sharp, and some of them can seem flat to us when we learn to play them in tune with a tuner. Also, it is better to play a little sharp rather than a little flat. You have to learn how to feel the pitch "alive", in relationship with the line of music you are playing.

- Audio equipment is utilized
- Playing one long note against many different chords
- Singing patterns in Solfege (arpeggios)
- Solfege.
- Difference tone math to show function of chord and variations on the same pitch.
Exercises with common tones and chord changes to also show variations of pitches.
- Playing different kinds of chords, three-note and seventh.
- Singing and playing, singing phrase then playing
- Smart Music

Survey Question 11

Do you use theory exercises to help teach intonation?

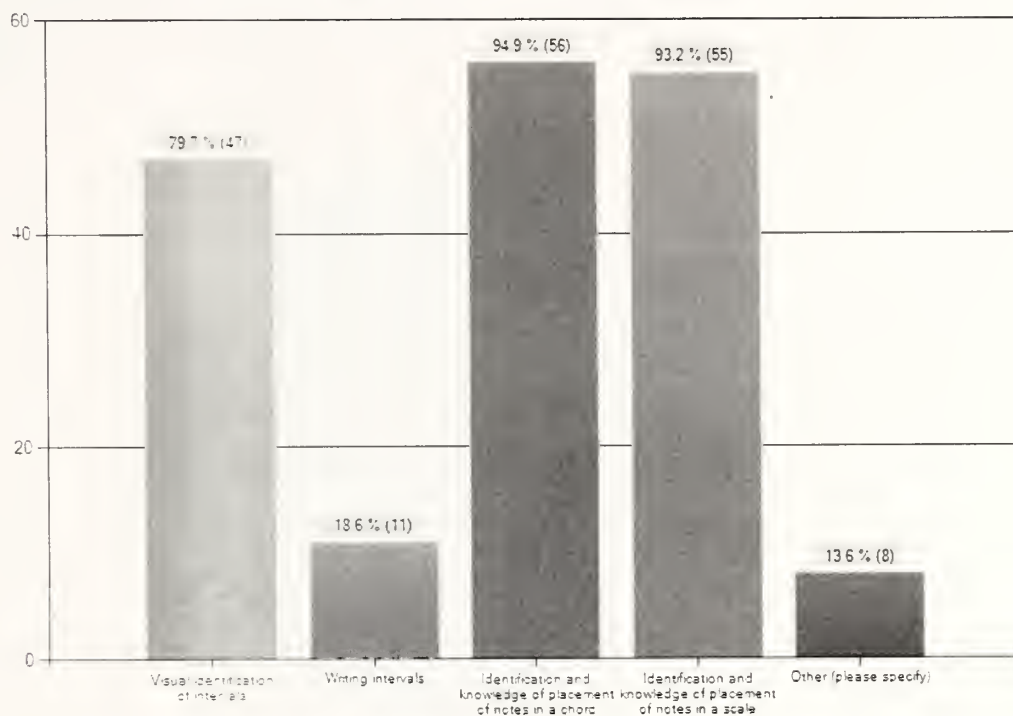


Participants Answered Question = 127

Participants Skipped Question = 11

Survey Question 12

Please indicate the theory exercises used in your students' lessons.



Participants Answered Question = 59

Participants Skipped Question = 79

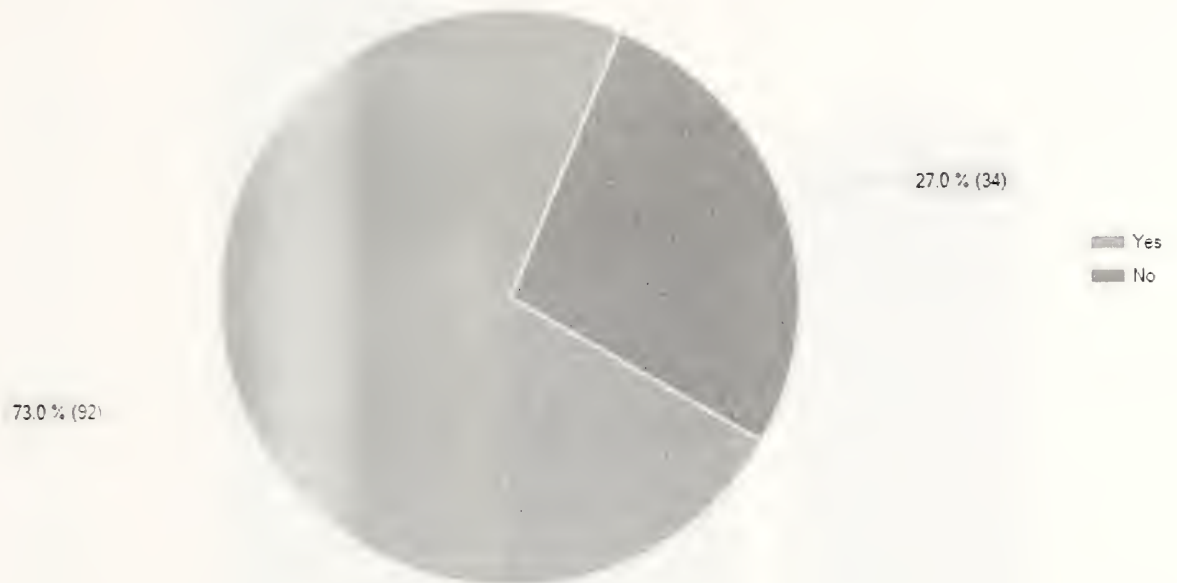
“Other” Field Responses

- Harmonics
- Playing 8, 16 and 32 chord progressions in one key per week, identification of intervals and chords in melodies
- Hearing note resolutions
- Just tempering of pitches within vertical sonorities
- Key of section of piece being played, if orchestral excerpt what instrument they are playing w/

- Identifying the above in music
- Keyboard visualization exercises along with singing
- Analysis

Survey Question 13

Do you use harmonic exercises in conjunction with teaching intonation?

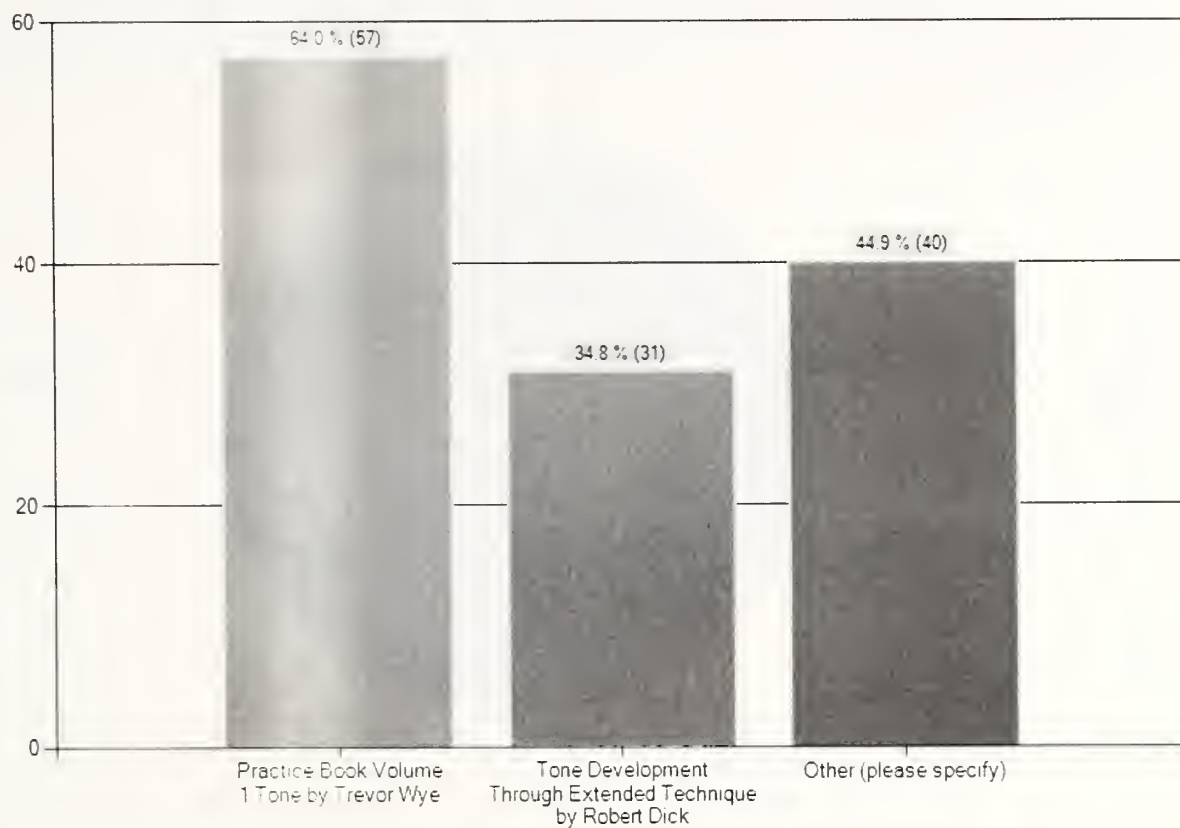


Participants Answered Question = 121

Participants Skipped Question = 12

Survey Question 14

Please indicate the resources used when assigning harmonic exercises.



Participants Answered Question = 89

Participants Skipped Question = 49

“Other” Field Responses

Data for the “Other” field responses can be located in Appendix F

Survey Question 15

Do you use alternate fingerings in conjunction with teaching intonation?



Participants Answered Question = 128

Participants Skipped Question = 10

Survey Question 16

Data for this question can be located in Appendix G

Participants Answered Question = 82

Participants Skipped Question = 56

APPENDIX E

Intonation Exercise Resources

Author (Last Name, First Name)	Book
Clark & O'Loughlin	Melodious Etudes for Flute Selected for the Vocalises of Marco Bordogni
Colley, Stephen	Tune-Up System
Dick, Robert	The Other Flute
Dick, Robert	Tone Development through Extended Technique
Krell, John	Kincaidina
Kujala, Walfrid	Vade Mecum
Moyses, Marcel	24 Short Melodic Etudes with Variations
Moyses, Marcel	De La Sonrite
Moyses, Marcel	Tone Development through Interpretation
Potter, Chris	Seven Steps to Better Intonation
Reichert, Mathieu	Seven Daily Exercises, Op. 5
Schwartz, Richard	The Tuning CD
Takahashi, Toshio	Suzuki Flute School, Tonalizations
Wye, Trevor	24 Studies for Intonation, Practice Book Volume 4: Intonation & Vibrato
Wye, Trevor	Practice Book Volume 1: Tone

APPENDIX F**Harmonic Exercise Resources**

Author (Last Name, First Name)	Book
Clardy, Mary Karen	Flute Fundamentals
Dick, Robert	Tone Development through Extended Technique
George, Patricia & Louke, Phyllis Avidan	The Flute Scale Book: A Path to Artistry

APPENDIX G

Alternate Fingering Resources

Author (Last Name, First Name)	Book
Artaud, Pierre-Yves	Flûtes au présent
Debost, Michel	The Simple Flute
Dick, Robert	The Other Flute
Gippo, Jan	The Complete Piccolo
Herszbaum, Nestor	Alternative Fingerings for the Flute
Kujala, Walfrid	The Flutist's Vade Mecum
Moratz, Karen Evan	Flute for Dummies
Pellerite, James	Modern Guide to Fingerings for the Flute
Tanzer, Stephen	A Basic Guide to Fingerings for the Piccolo
Wye, Trevor	Practice Book for the Flute Volume 6: Advance Practice

