THE APPLICATION OF JEAN-MARIE LONDEIX METHOD ON SAXOPHONE INTONATION TECHNIQUE FOR MAHIDOL UNIVERSITY COLLEGE OF MUSIC STUDENTS, THAILAND

XU ZHANG

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS (MUSIC)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2016

Thesis
entitled

THE APPLICATION OF JEAN-MARIE LONDEIX METHOD ON SAXOPHONE INTONATION TECHNIQUE FOR MAHIDOL UNIVERSITY COLLEGE OF MUSIC STUDENTS, THAILAND

Xu Zhang
.....
Miss Xu Zhang
Candidate

.....
Lect. Kyle R. Fyr,
Ph.D. (Music Theory)
Major advisor

.....
Asst. Prof. Anak Charanyananda,
Ph.D. (Music)
Co-advisor

.....
Prof. Patcharee Lertrit,
M.D., Ph.D. (Biochemistry)
Dean
Faculty of Graduate Studies
Mahidol University

.....
Lect. Kyle R. Fyr,
Ph.D. (Music Theory)
Acting Program Director
Master of Arts Program in Music
College of Music, Mahidol University

Thesis
entitled

THE APPLICATION OF JEAN-MARIE LONDEIX METHOD ON SAXOPHONE INTONATION TECHNIQUE FOR MAHIDOL UNIVERSITY COLLEGE OF MUSIC STUDENTS, THAILAND

was submitted to the Faculty of Graduate Studies, Mahidol University
for the Degree of Master of Arts (Music)
on
June 1, 2016

Xu Zhang
.....
Miss Xu Zhang
Candidate

Monsikarn Laovanich
.....
Asst. Prof. Monsikarn Laovanich,
Ph.D. (Music)
Chair

.....
Asst. Prof. Anak Charanyananda,
Ph.D. (Music)
Member

.....
Lect. Lect. Kyle R. Fyr,
Ph.D. (Music Theory)
Member

.....
Prof. Patcharee Lertrit,
M.D., Ph.D. (Biochemistry)
Dean
Faculty of Graduate Studies
Mahidol University

.....
Assoc. Prof. Sugree Charoensook,
D.A. (Woodwind Performance and
Pedagogy)
Dean
College of Music
Mahidol University

ACKNOWLEDGEMENTS

This thesis means a lot to me and it would not be possible without supports from several persons. I owe gratitude to those people and I would like to express my deepest appreciation to the following people:

To my major advisor, Dr. Kyle R. Fyr, for supporting, directions, and encouragement. Thank you for cultivating the independent researcher in me.

To my co-advisor Assoc. Prof. Dr. Anak Charanyananda for patience, valuable guidance, and supporting. You are my inspiration to foster me to continue my study.

I would like to sincerely thanks to Lect. Monsikarn Laovanich for being member of my committee and giving opinions, suggestion and ideas to improve my thesis.

My deep thank should go to Prof. Shyen Lee, who has been my mentor in music since I was 15. I went through the journey in music study under his instruction. Lots of the points and ideas in this thesis are from directly from him. He is a wonderful saxophonist, both performing and teaching saxophone, that inspires me profoundly.

Special thanks to the students who were the participants in this study. I would also like to acknowledge my faculty, friends, and colleagues. I would like to give the special thanks to Sevizono Tepa and Hanyi Zhang for editing my English language.

Finally, to my parents for supporting, thanks to them for giving me a chance to study abroad. I am a lucky person because of your support. Thank you for your love during the long years of my education.

Xu Zhang

THE APPLICATION OF JEAN-MARIE LONDEIX METHOD ON SAXOPHONE INTONATION TECHNIQUE FOR MAHIDOL UNIVERSITY COLLEGE OF MUSIC STUDENTS, THAILAND

XU ZHANG 5637308 MSMS/M

M.A. (MUSIC)

THESIS ADVISORY COMMITTEE: KYLE R. FYR, Ph.D.,
ANAK CHARANYANANDA, Ph.D.

ABSTRACT

The purposes of this study were: 1) to examine the learning of music by individual saxophone students, 2) To identity the effects of the Jean-Marie Londeix method on intonation technique in saxophone performance, 3) To find ways to improve the performance of selected saxophone students, 4) To assess the effectiveness of the Jean-Marie Londeix method on saxophone performance. The study employed qualitative research methodology and experimental methods to collect data, and data were analyzed and presented through descriptive statistics. After the data was collected, the researcher compiled the data from the log book and data was organized into text. Analysis results showed that the saxophone intonation technique falls into two categories: 1) a single practice, and 2) paying attention to practice. Saxophone practice intonation technique is divided into three categories: 1) opening the ears to learn to listen, 2) singing pitch, 3) self - control. These were the three most direct teaching factors that affected the participants' behavior, teaching methods, attitude and motivation. Through experimental teaching, students showed considerable development, validations of which were: 1) the students learned to control their sound themselves, 2) they opened their ears to listen during saxophone practice, and 3) the accuracy of their intonation was very high.

KEY WORDS: JEAN-MARIE LONDEIX / SAXOPHONE INTONATION TECHNIQUE/ MAHIDOL UNIVERSITY COLLEGE OF MUSIC STUDENTS

71 pages

CONTENTS

CONTENTS (cont.)

CONTENTS (cont.)

LIST OF TABLES

LIST OF FIGURES

CHAPTER I
INTRODUCTION

1.1 Background of the study

The saxophone was introduced to Thailand at the end of King Vajiravudh's (Rama VI) reign in the 1920s (Amatayakun and Duangjantip 2007). King Bhumibol Adulyadej (King Rama IX; 1946-present) played a very important role in popularizing the saxophone among Thai people. He was an accomplished alto saxophonist and took great interest in the welfare of music among the general public. Although saxophone was not common among the people of Thailand and does not have a long history, it has emerged, developed rapidly to a great extent. The first Thai-International Saxophone Composition Competition took place 2006. Mahidol University, College of Music had the honor to host the 15th World Saxophone Congress in 2009 and later organized the International Jean-Marie Londeix Saxophone Competition. Mahidol University continues to organize The International Jean-Marie Londeix Saxophone Competition every three years. The increased domestic and international reputation of Thai saxophonists has resulted in a greater variety and quality of educational establishments providing higher-level courses in the saxophone (Jaroensuk, 2005).

Jean - Marie Londeix's methods of teaching and the teaching methods of intonation are widely used for participants in Europe and the US but rarely applied for the students of Southeast Asia. Londeix believes that ear training is of the utmost importance in the pursuit of musical studies (Londeix 1997). In most saxophones, some notes have specific pitch tendencies that can be alleviated with the addition of alternation fingerings that shade the pitch in one direction or the other. Listening to oneself was an important skill Londeix emphasized and encouraged in his teaching. Londeix often reminded his students that the sounds they imagined coming from their instruments and the sounds that actually came out should be exactly the same (James 1999). Playing in tune relies on the ear, the embouchure and the instrument. The

education of the ear is the most important, and this is shown by the fact that one can play an instrument of poor quality in tune. In order to do this, one must “hear in tune” and know how to adjust the intonation, primarily through the use of a flexible embouchure. (Londeix 1997).

Teaching students to play in tune is of paramount importance in instrumental music education. Conductors of student ensembles devote a great deal of instructional time to tune the ensemble and present drills and exercises with the intent of improving intonation. Many educators make use of ensemble tuning procedures to require the active participation of student musicians. The students as well as the teacher must assess the intonation of tones from multiple instrument timbres as well as a variety of tone qualities within the same timbre. (Kohut, 1973, and Thomson,1995) .

According to this researcher’s experience of teaching, auditory training for saxophone, there is no fixed relationship between the interval and the absolute constant pitch, even if students play the same melodic parts. One important reason is that the saxophone has a vertebral body. This study provides an individual method of Jean-Marie Londeix as attaching module for teachers to teach intonation to college students. It is the combination of a) the researcher’s experiences in learning and teaching, b) constructivist saxophone technique method, and c) literature review. There is a teaching module used in teaching college students through intonation. It produces some additional benefits such as a) providing students with a method to improve their intonation, b) providing creative experiences to help with intonation, and c) enhancing the students’ enjoyment in playing Classical music and playing with ensembles.

Action research is the methodology chosen for this study because it is suitable for answering the research questions and researcher as a teacher, who aims to solve the student’s problems and take action to improve teaching and learning in the classroom situation. In the teaching module, students are taught for eight weeks, and teaching time is an hour per week. The concepts of teaching and learning in each lesson comprise musical foundations and the techniques of playing the saxophone.

1.2 Need for the study

This study has been conducted in order to find out what the fundamentals of saxophone tuning are. Does the intonation technique applied from the Jean-Marie Londeix teaching method improve intonation in saxophone performance among college students? If so, how does it do so?

The study to create and to qualitatively assess the teaching module for students' saxophone learning performance skills is based on the intonation technique applied from the Londeix teaching method. The saxophone has wonderful, rich and strange sounds in contemporary music, has been widely used in popular music, and has been a favorite of many music hobbyists. Intonation is a key factor in all types of saxophone music activities at all levels. Students always like to play very difficult and technical very hard music to show they can play well, but if the performance does not sound perfectly in tune, everything will not be perfect. The most fundamental and most basic skill is perfect sound and intonation, because if you don't have an accurate sound, even good timbre is useless. Therefore, these skills are needed in terms of how to improve saxophone intonation. What does playing in tune mean and what kind of concept is it? How can we improve intonation problems? Why are the ideas of the Londeix teaching method are useful? What kind of connections are there between the ear and intonation? With these questions in mind, the author reviewed relevant literature. In order to ascertain the origin of the facts and find the relevant counter--measures, the researcher decided on a method for classical student performance intonation research.

1.3 Purposes of the study

This study has two purposes as follows:

1) To examine the responses and music learning of individuals by studying the effects of the Jean-Marie Londeix method on intonation technique of saxophone performance skill for college students at the College of Music, Mahidol University

2) To find and assess effective ways to improve selected students' saxophone performance after being treated by experimental teaching.

1.4 Research Questions:

The research questions for this study include the following:

1) Does the intonation technique applied from the Jean-Marie Londeix teaching method improve intonation in saxophone performance among college students?

2) How effective is the intonation technique applied from Jean-Marie Londeix's teaching?

1.5 Scope of the study:

This research recognizes the following scope:

A qualitative case study was employed for this research. At first, among the twenty-two students from the study of classical saxophone performance, only five with unstable intonation will be chosen finally. Five students were chosen with the help of Ajarn Shyen Lee and Ajarn Wisuwat Pruksavanichfrom the College of Music, Mahidol University. The students ranged in age from 17 to 20 years old. The researcher focused on the five-student experimental teaching, using Londeix's methods of teaching and the researcher's personal auxiliary method to improve and strengthen the student's technical and intonation. The researcher used a log book and recorded the process of the experimental study on teaching method, and the process of data collection took five months.

1.6 Definition of terms:

The intonation technique: The lower or upper pitch of an interval may be sharp or flat, or both pitches of an interval may be out of tune. If the lower pitch is

sharp or the upper pitch is flat, the interval may be said to be flat given that as a whole it is too narrow; while if the lower pitch is flat or the upper pitch is sharp, the interval may be said to be sharp given that as a whole it is too wide. Intervals are conventionally measured from the bottom; as such in an interval that is too wide the upper pitch is thus sharp.

Jean-Marie Londeix teaching method: On almost every saxophone some notes have specific pitch tendencies that can be alleviated with the addition of alternation fingerings that shade the pitch in one direction or the other. The intonation belongs to the ear. It is a byproduct of the happy disposition of intervals at the heart of an ordered harmonic system, subject to the laws which regulate any vibrating sound no place in the formation of a player's ear. (Londeix 1997).

Saxophone intonation in original performing technique: As people know, music styles are very diverse, such as classical, jazz, pop, folk etc. When saxophone players play different styles of music, they have to idealize the sound by their ears and adjust the suitable technique in need. Saxophone has been designed to show a wide variety of sounds, how to produce the "ideal" sound is still a debated topic. However, among all the techniques, there is one basic issue: since each saxophone player's throat and embouchure are different, it really matters if one tries different things and memorizes the feeling of each interval jump.

1.7 Chapter Summary

This research consists of five chapters. The first chapter specifies aspects as follows: background of the study, requirements for the study, purposes of the study, research questions, scopes of the study, and definition of terms. The second chapter serves as the literature that relates to the intonation, and the meaning of Jean-Marie Londeix methods. In chapter three, the basis for selecting a qualitative study is presented. In chapter four, the result focuses on analytical Londeix's method on saxophone intonation technique, teaching methods affected by Jean-Marie Londeix's theory on saxophone intonation technique, student's attitude and motivation. Finally, the fifth chapter is dedicated to discussion and recommendations. This chapter starts

with the discussion of the study. The instructor discusses about results from the previous chapter-- chapter four, and focuses on the reaction of students.

CHAPTER II
REVIEW OF LITERATURE

This section serves as the review of literature relating to the research. First, I review the theories of intonation, namely the principles of the intonation and the basic classification, saxophone pitch and auditory training. Second, I survey the meaning of Jean-Marie Londeix's methods, Jean-Marie Londeix's life and background, and the Jean-Marie Londeix method as it relates to saxophone intonation technique.

2.1 Intonation

This section on intonation includes: 1) the principles of intonation and the basic classifications, 2) saxophone pitch, and 3) auditory training.

2.1.1 The principles of intonation and basic classifications

Beauty in any art is much easier to recognize than to describe, and this is undoubtedly true of a musical tone (Teal 1963). Saxophonists accurately tonguing while playing, which affects the pitch, volume, timbre accuracy, is the most important necessary requirement of professional training. Because of the complexity of the investigation of intonation, researchers have examined a number of factors believed to affect intonation directly such as: music sound and tone quality, directionality, accompaniment type, and intonation performance patterns. In addition researchers have looked at several training methodologies to help students improve their intonation skills. (Duke, 1985; Elliott, 1974; and Yarbrough, Green, Benson, and Bowers, 1991).

Success in instrumental music is a complex process that requires the musician to develop many skills. Initially the ability to read printed music and translate that information into specific fingering combinations on an instrument

provides the earliest signs of success (Heller, 1969; Yarbrough, Morrison, and Karrick, 1997). As time goes, with practice students gain more knowledge of music and their techniques and are equipped to play and be a part of the ensemble. But with increased knowledge of playing instruments, there arises complexities involved with performing on the instrument. A performer should be able to mix and blend with the rest of the ensemble. Thus, it requires a performer to be able to play his or her part precisely. A performer should be confident while he or she plays his instruments and must have the ability to play in tune. That is the most essential component in music. Playing in tune refers to the ability to recognize whether a given note (called a pitch) is played with the correct degree of highness or lowness and then adjust it appropriately so as to make it blend with the pitches being performed by the other members of the ensemble (Karrick, 1998; Worthy, 2000; Morrison, 2000). Tunes are adjusted during practices and while performing. So, a performer should be ready and equipped with making proper adjustments of tuning his or her instrument while performing.

Tone quality and pitch accuracy have been examined by a number of researchers (Geringer and Worthy, 1999; Singh and Hirsh, 1992; Wapnick and Freeman, 1980; Worthy, 1997). These studies were conducted to recognize the students' potential and capacity to identify the changes in pitch when the quality of the tone was changed. The results revealed that students acknowledged and identified different shades of tones with different pitches. Brighter tones that resonated high-pitched and cheerful sounds were identified as sharp pitch and darker tones with downbeat or somber like sound were identified as flat pitch. Cassidy 1989; and Ely 1992 found that students performed pitch-matching tasks better when matching complex tones (those with harmonic structure) versus pure tones (a pure sine wave without overtones). Several researches have been conducted to find out the precise pitch errors inside a melodic context. Researchers like Duke, 1982; Edmonson, 1972; Kantorski, 1986; Morrison, 2000; and Sogin, 1989 carried out research in this area. In these studies, students performed short melodic phrases with targeted pitches. These studies involved students performing short melodic phrases that included "targeted" pitches. These pitches were isolated and measured with various devices to determine the direction and amount of tuning inaccuracies. Results indicated that overall directionality (the direction the notes were played, i.e. ascending or descending) is not

a significant factor in pitch accuracy but that performers consistently play sharp. This finding is prevalent throughout the research.

Several researches have shown that a majority of instrumentalists tend to play sharp regardless of instrument, melody and tunings (Geringer, 1978; Geringer, and Witt, 1985; Kantorski, 1986; Salzberg, 1980; Sogin, 1989). The overall intonation tendency of instrumentalists has been examined in a variety of settings. Students' ability to perceive pitch discrepancies in an aural example and play their instrument in tune have also been examined (Ely, 1992; Geringe, 1978; Geringer and Witt, 1985). These studies were conducted to find out the relationship between a student's ability to recognize differences in pitches and playing the instrument in tune. The results conveyed that there was extremely low amount of relationship between a student's capability to discover blunders in intonation aurally and their potential to play their instrument in tune.

Intonation is best explained through demonstration. It could be merely indicated by playing in tune, either sharp or flat and have the student identify some of the characteristics of what a sharp and a flat exactly sound like. This is a significant way of getting the student experiment with the process instead of just reading it on handout. This process makes it easier for the student to perceive the concept. Another demonstration could be having the student play against a drone pitch and use the same features that they applied to the teachers playing and recognize whether they themselves are playing sharp or flat. The third demonstration could be by pulling the mouthpiece out and push in until the student identifies the tune. All these techniques are vital in order for the students to differentiate between different levels of pitches. It provides an easier process of identifying whether one pitch is lower or higher than the other. If the student is not in tune, he or she will need to find ways to be in tune by moving pitch. It is crucial in the next step to provide the students with techniques and procedures that they can use for changing pitch. (Hemke, 1977).

Saxophone tone quality and pitch accuracy have been examined by a number of researchers (Geringer and Worthy, 1999). These studies focused on students' ability to perceive pitch changes in pairs of tones when tone quality was altered. Students tended to identify "brighter" tones as being sharp and "darker" tones as being flat. Saxophone pitch – also called a note - refers to what the ear hears when a

musician plays an instrument. Pitch is a function of the frequency of the sound wave as it arrives at the ear. The faster the sound wave, the higher the pitch: the slower the sound wave, the lower the pitch. Pitch is measured in overtone or cycles per second (cps), which refers to the actual physical measurement of a periodic wave.

The indicators of professional saxophone playing skills are good pitch, volume, and timbre maximum accuracy rate. For analyzing the sound quality in general, there are two principles: (l) instrument design features and tuning, (2) music auditory perception and consciousness. The second rule should be the most fundamental principle, because only when hearing is well developed only can the correct position of each be found. Bowed string instruments are free tuning instruments, keyboard instruments are fixed pitch, and wind instruments may be called semi-automatic tuning instruments. The saxophone is also a kind of instrument which allows the player adjustment temperament within a certain range. (Harper-Scott, 2009).

2.1.2 Saxophone Pitch

In 1864 Adolph Sax, Belgian instrument manufacturer, clarinetist and flautist, developed the first saxophone. When he was in his father's musical instrument shop in Brussels, Sax started developing a musical instrument, with the power of the brass but the speed of the woodwind instrument. His goal was to create a musical instrument, the octave. In blowing technology used in the pipe, and through the influence of the air (e.g. fingering change or moving slides), a player could make the voice sounds jump an octave. (Figueroa, 2014). Saxophone is relatively limited in its ability to regulate tools. Saxophone pitch can only be adjusted by pulling or pushing the mouthpiece, which is a small "mechanical adjustment." Saxophone could not (unlike the cylindrical bore instrument like a flute or clarinet) alter it by adding extensions. The exact length of the tone hole has been placed depends on the relationship between the instrument and the change in the diameter of the cone. If a person only prolongs the instrument, the sound hole of the position is no longer correct, and the result is that some voices are incompatible. Most saxophones tune in to maintain a reasonable tone difference, which is small, +- 2HZ pitch higher or lower. Therefore, the design of the standard concert pitch of 440Hz saxophone still sounds reasonable, as for example, when concert pitch 442Hz or 438Hz are used. When you

put your A4 = 475Hz and a semitone (-100 cents) to reduce it, you will end up with A4 = 431.4Hz. It is very close to 432Hz. In other words, HP (high pitch) tools are very "in tune" with A4 = 432Hz, and can be completely in tune a little bit more than usual to push the nozzle. (Schneck and Berger, 2006).

While playing the instrument the foremost step of changing pitch is by moving the jaw, which should be done without using the hands. This technique is most commonly applied to drop the pitch in the middle and lower register around Bb3. The pitch is lowered by using the lips to make a tight shaped embouchure where the lips can flex even more, allowing the jaw to drop slightly. This “oo” shaped embouchure gives a low sound pitch. This exercise can be practiced and improved by applying saxophone middle D note with consistent practice. The goal of this exercise is to lower the D by about a half step just by moving the jaw. (Hemke, 1977).This technique requires a great amount of force on the student’s lip muscles and will be difficult for them to accomplish until they have built up embouchure strength. The pitch can also be raised by controlling the jaw. So, the quality and tone of the pitch also depends on how well an individual can control and manipulate their jaw and lip muscles. By smiling slightly, the lower jaw utilizes upward pressure to compensate for the lack of side pressure and the pitch will rise. In order to learn how to bend pitch using the jaw, one should understand some essential techniques and methods and put in place, such as the tongue must be in “i” position. If not, the pitch will tend to drop the octave and you might hear a honking sound. (Cassidy 1989; and Ely 1992). Another thing to remember is that the lips must be strong enough to undergo the pressure on the reed—otherwise you will end up getting toneless wind. Also, there must be adequate air stream.

Modern tone can be explained as not being perfect and usually based on an agreement. This scale is referred to as "reconciled" scale, and is divided into twelve equal parts in an octave. In order to simplify the pitch relationship when changing from one key to another, the development of this scale, advocated by Bach, was crucial and necessary to give a better understanding of the tone. (Cook, 2001). One must use the acoustics and scale correctly, based on the harmonic series, including the different pitch values in an octave, which build a musical instrument. The tuning of wind instrument must be done as close as possible, but due to the harmonic series

using production data, it is impossible to completely solve the gap between the two. However, this problem should not be an excuse for a player to stop playing saxophone. Performers have to bear the responsibility and learn to play the saxophone in tune. One of the advantages of the instrument is that it has great flexibility and that helps when pitch adjustment is necessary. The only problem arises when the players have difficulty in tuning the instruments. (Sethares, 2005).

2.1.3Auditory training

For the saxophone, there is no fixed interval relation and absolutely unchangeable pitch, even if you play the same melody segment, its pitch is not the same for each time. Learning aural skills, often involves tuner comparison exercises for minor second, major second, minor third, major third interval relations and others repeatedly on the piano. In the process, if the performer's lips tightness and breath flow changes, subtle changes in pitch will occur. Slightly changing the flow rate, such as C to D is a major second. If the lip is a little tight, and the breath forced somewhat, it becomes a high pitch; similarly, if the lip is a little loose saxophone pitch will be lower. (Geringer and Worthy, 1999). Therefore, to have a good understanding of "up" and "down", there must be a dialectical relationship between pitch a good relationship between the various intervals. In fact, a keen sense of hearing is a prerequisite; to truly achieve precision repeated practice is necessary on the saxophone because it is a wind instrument with a very important focus on the breath. (Londeix, 1997). Insisting on repeatedly practicing long tones, scales and arpeggios while also training exercises helps to improve students' tone, pitch and chord intonation. When playing etudes, their intonation and techniques are also based on the above scales and arpeggios, whether difficult or easy.

The effect of sound in different temperature: sound waves go faster at high temperatures, which lead to a higher pitch on the saxophone. As Larry Teal's mentioned in his study: "Saxophone which is built to be played in a room temperature of 72° Fahrenheit will have a pitch distortion at any other temperature, quite a frightening thought if taken literally. " (Teal 1963). The same situation also happened on other instruments, however not in an exact way. Teal also recorded this in his study that "in keyboard instruments, a rise in temperature expands the string to such an

extent that the instrument becomes flatter, while wind instruments sharpen in varying degrees."

2.2 The Meaning of Jean-Marie Londeix's methods

This section includes: 1) Jean-Marie Londeix's life, 2) Jean-Marie Londeix's methods, and 3) saxophone intonation technique.

2.2.1 Jean-Marie Londeix's life

Jean-Marie Londeix, born in the South-West of France in 1932, is an all-around musician who studied saxophone, piano harmony, chamber music, and music history. Among his teachers were Marcel Mule, Fernand Oubradous, and Norbert Dufourcq. He graduated from the Paris Conservatoire with a First Prize and a Prize of Honor. His concert career has been all over the world, and many composers wrote a saxophone special work for him. Jean-Marie Londeix is president and founder of the Association des saxophonists de France, and president of the International Committee of Saxophone. (Londeix 1981). According to Londeix, specific auditory perception leads to the development of the refined and intelligent choice of music. The choice should be to develop skills and integrated into the reaction in the performance of the work preparation time. (Umble, 2000).

Ear training from Londeix intonation research is extremely important. He has very versatile listening skills; and at the research institute of music in his youth, through his years of teaching experience in Dijon, solfeggio was stressed. So he always was highly sensitive to the rhythm of slight errors, and was sensitive to the smallest tone differences. (Umble, 2000). The listening to oneself was an important skill he emphasized and encouraged in his teaching. (Umble, 2000). Intonation, that is the tuning of an instrument, is very important in a saxophone. Poor intonation makes some notes sound too high or too low compared to other notes on the instrument.

Saxophone studying method presents a variety of research areas: a list of selected works various techniques and aesthetics of music, as well as types of musical expression. It attempts to be efficient, taking the young saxophonist toward the

understanding of why one does exercises, while acquiring solid musical habits “en route” to the essential gestures of apprenticeship in the acquisition of correct reflexes; mastering the techniques specific to the saxophone, whether it be the interpretation of music in the written tradition (generally called classical music) or to develop one’s own musical imagination and imagery. (Londeix, 1997).

Jean-Marie Londeix (born in Arveyres, September 20, 1932) is a French composer, music educator, saxophonist and arranger. He is one of the most important representatives of classical saxophone playing. Londeix was born into a musical family. He took piano and violin lessons. When he was eight years old, he began with a saxophone lessons. In 1946, when he was 14 years old he won first prize in the National Music Academy sax German central Bordeaux region, "Andre Malraux." From 1948, he studied with Marcel Mule (saxophone) and from 1951 to 1953; he studied at the Conservatory of Music, the National Higher Conservatory to Paris. He won many first prizes and the highest distinction; saxophone as a performer, he was the first man to win the Grand Prix medal at the Paris Conservatoire. (Umble, 2000).

As solfege teacher, he worked from 1953-1971 at the Conservatory àrayonnement area "Jean - Philippe Rameau." From 1954 he completed the concert and the premiere saxophone works at home and abroad. In 1966, he gave his first solo concert in the United States. On May 2, 1968, he played in New York's Carnegie Hall concert saxophone Paul Creston. (Teal 1963)He gave his second concert in Moscow and St. Petersburg. Since 1968, he has been a guest lecturer at the University of Michigan, Ann Arbor. In 1970, he founded the Association DES Saxophonists France (AsSaFra), he was the association’s chairman until 1991. (Umble, 2000).

In October 1971, he was appointed saxophone music professor at Bordeaux "Andre Malraux". Londeix is a motivating factor for a lot of the composers of many saxophone compositions, especially by Christian Lauba. Londeix has written several books and methods saxophone comprising five volumes. In addition to classical music, many modifications to saxophone ensemble, he wrote teaching and teaching work, for his instrument. He was also distinguished as officials of the Order of Arts and Literature. (Umble, 2000).

2.2.2 Jean-Marie Londeix's methods

Londeix is the first of Marcel Mule student in France, where he became the world of contemporary music and saxophone's technical leader: Jean - Marie · Londeix. Londeix in the early time teaching and performing at roughly the same aesthetic as Mule and others in the "French school" on the pitch and the traditional music of the concentration, rather than expanding technology . In North America, he performed various witness firsthand expansion technology (most notably altissimo register) a considerable number of teaching manuals, Etude books and Performance Guide, Londeix's book *Hello Mr. Sax* is among the most important for its discussion of extended techniques, including multiphonics research, slap tongue, altissimo, and is seasonally adjusted. (Londeix 1989). When he plays show tours he has many teaching methods and teaching and improves students' skills. He has written many scales, and etudes, based on concertos. He successfully held international saxophone world competitions in Thailand four times. He also has given master classes at College of Music, Mahidol University. In every year's master class, he would give Thai students about many useful skills and methods through his teaching, for Thai students in recent years, the technological level has seen significant progress.

Londeix wrote a lot of teaching methods, but this research is specifically interested in intonation problems, so I used a specialized Londeix intonation teaching method to test and verify the five students. Regarding how to improve the students' intonation problems he has three methods, which are as follows. First, ear training can only are improved by the conscientious listening to harmonic intervals. Second, corrective fingerings or the placement of lips can be found. We can find corrective fingerings or the placement of your lips which permit an immediate adjustment, enabling the necessary corrections for intonation. The third is broken octaves. This research used these three methods to carry on the experiment of helping to improve the intonation instability of the five students. (Londeix , 1997).

Practicing

Londeix encouraged his students to listen closely to their performance and learn from their daily practices and mistakes. He advised them on practicing shorter sections of music repeatedly until they honed their skills. Repetitions of smaller sections were encouraged as it helps in evaluating and clarifying the many complex

issues in phrasing, one at a time. Thus, high levels of discernment were encouraged. (Umble, 2000).

Until the performance is perfected and represented in the way the composer portrays it, one must not hesitate to continuously repeat a fragment, a motive, a phrase, or a gesture while practicing. As the saying goes, “practice makes a man perfect,” one should put in effort and endurance in order to achieve the representation of the composer’s idea. And practice should be done by experimentation, that is, by making comparisons between series of musical choices in order to explore and evaluate and make evaluative judgments for each of the musical pieces in one’s performances, including accuracy of notes, rhythm, tempo, intonation, tone, dynamics, and articulations as well as clarity of punctuation, diction, intelligibility, sensitivity, expressiveness, style, and character. (Londeix, 1997). A performer should learn to distinguish the strengths and the imperfections of playing while practicing, by always asking oneself what the composer really intended. This way the saxophone students will learn to improve and make the correct judgments on playing the musical pieces and become a better performer.

On learning

A performing musician has three levels of approach and appreciation in playing an instrument.

First level: Present the text

A performer must clearly present the notes, their duration, and their rhythms, dynamics, articulations, and tone quality. These presentations must be audible and intelligible enough to be understood distinctly from the written musical notation. This is the first level and an important one because this is the level that creates and builds the rest of the levels. (Londeix, 1997).This is the level, one might say, where the instrumentalist expresses manner.

Second Level: Understand why

It is important to perceive and understand the composer’s work’s genre and title, even though at times this information may not be significant or important. It is also necessary to be familiar with the specific aspects of how the work was written, and how the work came into existence. (Londeix, 1997). These observations and reviews lead to a deeper understanding of the work and serve to make one’s

interpretation more personalize. It helps to create an understanding of the person from his/her point of view, which creates more understanding between the composer's work and the performer. Thus, it depends a lot on the performer's initiative, understanding, taste, imagination, and especially his cultural training and education. His observations and considerations on the work can make a huge difference on how and why music is perceived in a certain way. (Londeix, 1997).

Third level: the interpretation

A performer has the will to do what he wants, not just what he can. One should sincerely and faithfully take into account the first two levels and present the musical score with his own interpretation. A performer must personalize the work, improvising it at the same time making it convincing by its simplicity. (Thomas, 2011). This involves adapting one's skills to the demands of the piece. Frequently, new performance techniques must be learned in order to sufficiently respond to the notated and implied elements in the work. Then, the performer can create his improvisation while still keeping true to its original form. (Londeix, 1997).

2.2.3 Saxophone intonation technique

Playing in tune relies on the ear, the embouchure and the instrument. The education of the ear is the most important, and this is shown by the fact that, with work, one can play an instrument of poor quality in tune. In order to do this, one must "hear in tune" and know how to adjust the intonation, primarily through the use of flexible embouchure. Two different operations are necessary in order to achieve this: 1) Train the ear to hear intonation correctly: ear training can only be improved by the conscientious listening to harmonic intervals (that is by listening to intervals composed of notes played simultaneously). 2) Find corrective fingerings or the placement of your lips which permit an immediate adjustment, enabling the necessary corrections for intonation. (Londeix1997). "Pitch" is the tuning level, perhaps A=440 cycles per second. "Tuning" is the adjustment one refers to the individual adjustments which should be made after the instrument has been made the proper length. (Thomas Liley 2011).

In addition to the deterioration of the accuracy of the pitch, large change of timbre and emissions change the temperature to make important changes. The

saxophonist should tune the instrument on several notes to selected three registers: low, middle, and high. Above all it must be strongly emphasized that, when tuning, one should not to play too loudly; in order that the model's voice clearly heard. One must also pay close attention to octave and fifth tuning to exclude or to warm up without modifying the normal embouchure.

Tuning is an important element and style when we play music. It is necessary and important in any music and style. Playing a note out of tune is like playing an incorrect pitch. It is important for the students to understand the value of tuning both when playing unaccompanied, with piano or other fixed pitch instruments, and with an ensemble. While playing saxophone, putting the fingers down in the right order does not guarantee that it will produce the right pitch. In order to master intonation, it is necessary for students to practice these techniques using scales, melodies and intervals. All of these must be thoroughly practiced against a drone pitch in order to learn the proper ways of tuning relative to another pitch.

The saxophone can create two, three, four, and sometimes more parts at the same time in a flawless manner. They can also play trills and tremolos in certain cases up to more than an octave exceptionally well. The saxophone, however, faces certain problems in the areas of tuning. Certain notes on the saxophone are usually out of tune due to the instrument’s design for acoustical reasons. There are however, solutions to solve this problem, that is, special fingerings can be applied to improve the intonation in these problems areas. But, these fingerings are only applied when an intonation problem is clearly audible. So, it is important for all saxophone players to check the intonation constantly. Intonation is an important factor for saxophone players as well as all musicians and must be taken seriously. (Wolfe 1986).

2.2.4 Pitch

According to Karpinski, pitch matching does not necessarily involve any memory, but rather requires a feedback loop that operates during concurrent stimulus and response. It basically entails the use of earlier actions like singing or playing in order to match a given pitch**.** (Karpinski, 2000).

The goal of every musician is a tone of the purest quality within the realm of his personal concept. Sometimes this is not achieved, due to incorrect production on the

part of the player (Kleinbammer, 1963). Every musician wants to show and perform the best quality of performance there they can. When a musician plays, the tone is exhibited and displayed in his performance. However, this is not always attained because of the player's imprecise or inaccurate study or production. Intonation is largely responsible in creating a precise and flawless performance. But one has to learn the appropriate way to achieve that goal.

2.2.5 Ear Training

Learning to listen builds our focus, which helps in developing and building ear training. Ear training is one of the prime features which every musician must acquire. It is something that requires doing and practicing regularly by all musicians. So the first thing is for a musician to reach a certain point of ability with the ear, and this can be attained through regular exercise. One should make it a practice and a routine to maintain the level of ear training, or else a good ear is something that can be lost if a musician is not cautious and diligent in his/her practice. Like one would care for his instrument, the same concern should be applied to ear training, as a good ear is the most valuable asset to any musician. (Schachnik, 2007). Therefore, it is necessary to keep in mind the importance and benefits one could achieve through ear training.

2.2.6 Intonation Methods for Wind Instruments

Trombone

In the orchestra, several instruments are required to be a part of the ensemble. But according to one study, the trombone is the only wind instrument to impart true intonation at all times, as the slide is considered to produce a perfect intonation, whereas other instruments of the orchestra are considered to have "bad tones" which require adjustments and yielding to, inspite of the latest and up-to-date creation of instruments. (Kruckenberg, 2002). The perfect examples can be taken from instruments like woodwinds and calve-manipulated brasses. The brasses, other than the slide-operated trombone, have devices such as ginger tings, slide triggers, and fourth valves which are built to make up for intonation irregularities that could be impossible to avoid in designing these instruments. One's ability to listen and play an instrument can always refine and improve. The ear can be developed with the support

and assistance of a stroboconn or strobotuner or by playing back tape recordings of your work. A musician carries a greater obligation towards his colleagues and audience while playing in an ensemble to bring out the best in him while delivering a quality performance. Thus, he needs to have a broad-minded attitude in regard to his own intonation.

One should note that each instrument produces somewhat different intonation and the pitch and tone will most likely differ even though they are same instruments with identical model of the same manufacturer. The nature and variation of the pitch is designed to please the ear. However, there are arguments and reasoning against the science and mathematics compared to variation of pitch in favor of the reasoning and logic of the musician's ear. Finally, the ear should dictate the slide arrangements of any pitch to the trombonist. However, there are several other features and qualities that should be taken under consideration. Aside from the intonation peculiarities of the individual instrument, there are the considerations of general ensemble intonation, chord construction, and temperature to which the player must adjust his tuning. (Kleinbammer, 1963). Any one of these qualities of intonation and other features are encountered and experienced by trombone players which is a necessary requisite to help and learn to move forward and become a better musician.

Listening is always an important tool in any area. One should be a good listener and that can be attained by learning to overcome interruptions and distractions, which can so easily capture our attention. Thus, a good musician must carefully listen to recordings of short pieces and make that a habit. (Johnson, 1981). Johnson explains that simply putting on a recording while cleaning or cooking and training oneself not to listen could be a dangerous habit and it will cause dangerous effects and results to us as musicians. He notes that when one listens, it should be done as carefully and intensely as is possible. Johnson points out not to attempt constructive listening with distractions as it could mess up one's mind to capture the core subject.

Clarinet

There are several rules and factors needed to remember while playing the clarinet. Clarinet can be tuned generally by adjusting the barrel in or out at the upper joint. Most clarinets are designed and manufactured to play a little sharp when the barrel and upper joint are flushed. This makes it easier for the clarinet to play the

lower pitch as that makes it flexible to pull the barrel out, especially after the clarinet warms up. A clarinet player should remember to pull out the barrel not more than one-sixteenth of an inch. If the cork of the upper joint tenon is exposed, the barrel is out too far. This will affect the intonation of the individual notes in the clarinet scales and registers. (Dietz and Kirkbride 1998).

If the clarinet is still sharp after the adjustment at the barrel, the mouth-piece can be pulled out the slightest amount, not more than one thirty-second of an inch. Once again, if the mouthpiece is pulled out too much, the intonation of the entire clarinet is affected. If the clarinet remains sharp, the upper and lower joints can be pulled apart, but not more than one thirty-second of an inch. Make sure the connecting bridge between the two joints still functions properly. If the clarinet is consistently sharp to A=440, the purchase of a longer barrel is necessary. (Dietz and Kirkbride 1998).

In order to solve the intonation problems on the clarinet, a musician must start adjusting the clarinet to the tuning note, which is more like the beginning stage to resolve the problem of intonation. (Dietz and Kirkbride 1998). Another adjustment to flatten an individual note would be to move the lower lip out and down in a fine and subtle movement until the desired pitch is reached. This is a simple and uncomplicated step as the embouchure is adaptable and flexible in this direction.

In order to play a sharpened individual note, the player must tighten the embouchure and stretch it out and back. This is a complicated adjustment because in order to attain that note, the embouchure should already be solid and firm. Therefore, it requires a lot of effort, balance and support. Each clarinet intonation problem could differ from clarinet to clarinet. It depends mostly on the way a musician plays his clarinet and how he/she adjusts the pitch and intonation.

Although each clarinet has its own individual intonation problems, some problems are often common from clarinet to clarinet; those students who have advanced enough to have a good sense of pitch and intonation and a firm but flexible embouchure can solve these problems. (Dietz and Kirkbride 1998). In order to attain a perfect quality of tune and good sense of pitch and intonation, it is necessary to work with a tuner, which will help a player to discover the pitch inclination of any individual clarinet and individual notes on that clarinet.

One of the differences between the tuning fork and the tuner is the tuning fork trains the ear, while the tuner, if not used to its fullest ability, simply trains the eye. (Dietz and Kirkbride 1998). Some of the important practices for a musician to remember are**:** when it is time to tune an orchestra or ensemble, it is advisable to get to rehearsal hall ahead of time to find his/her reed and your pitch center and prepare oneself before everybody else gets there. Once that is done, the player should check his sense of where the pitch A is and check to see if he can hear the A every time. Is it possible to hold a conversation and play a passage in another key and come back to A each time? (Dietz and Kirkbride 1998). If that is the case, then he should work toward holding that A in his mind and ear so he is able to tune the ensemble with or without the tuner. This helps in improving the use of tuner. Thus, the tuner turns out to be a reference tool and not the orchestra tuner. (Chen, Smith and Wolfe, 2008).

It is necessary to keep track and develop your ear time and again because especially when practicing scales and arpeggios, it could lead to distractions and weariness. So it is always best to never lose the ear training method and practice with the use of scales. While building the scale, it is crucial to make each succeeding note sound like the preceding note. (Chen, Smith and Wolfe, 2008). For example, in D major the E should sound as if it came from the D in its quality, texture, timbre, and volume.

While practicing scales, if the notes sound partially different, one should aim to find their right position with the best use of your air and embouchure. If this practice works properly, it will be necessary to ascertain whether the problem is one’s approach. If the notes work well while going up as compared to the sound while coming down, the problem may only be your approach to the notes when descending. (Dietz and Kirkbride 1998). In order to solve the problem, one should try to approach each note from a different note above to learn the tendency and proper placement of each note. The goal here is to build a scale that sounds as smooth as solid as a proper foundation of your home. If there are uncertain notes in the scale, your foundation will definitely fail you when the scales are more involved. Thus, the arpeggios will start to travel farther, and intervals may become bigger. (Dietz and Kirkbride 1998). Therefore, one must build his scale one step at a time using his ears, eyes, a tuner, and a tape recorder.

Saxophone

Pitch accuracy is an important element to be remembered for saxophonists while playing with other wind instruments, a saxophone section or keyboard instrument. The saxophone can be played with different techniques as it has interesting characteristics. One of the beneficial features of the saxophone is that it has substantial flexibility to play distinct pitches within a half-step span. (Teal, 1963). Flexibility requires challenges to hear and place notes in tune, which is another challenge. In order to attain and overcome these problems and challenges, a musician's early training must involve work on intonation and pitch adjustment. (Flesch, 1939; Havas, 1961; Menuhin, 1972; Rolland & Mutschler, 2000). This will build and develop a player's intonation, and thus will not have to face the later challenges in the future as a musician.

A saxophonist must go by three basic rules to pitch flexibility:

1) Pitch is more easily lowered than raised.
2) Notes with longer tube lengths or closed keys have less flexibility.
3) The high register is more flexible than the low register.

Thus, if the overall pitch centre is lowered by pulling out the mouthpiece, it will generally help the high register, which will leave the low register almost untouched and unaffected. (Teal, 1963). A saxophonist should keep this mind when it comes to working with a sharp high register and flat low register, which is a common and unpleasant situation that every saxophonist faces and deals with. (Londeix, 1997).

Pitch awareness could be developed and taught to a saxophonist by using a tuner or recently tuned piano as a tool. But it shouldn't be just any kind of tuner. It should be the type that can make different pitches with a visual measuring device. (Teal, 1963). If a tuner is used in a proper way, it will develop the ear rather than the eye.

Below are some of the tuning exercises to help saxophonists develop good intonation:

1) HEARING FIFTHS

This exercise requires a tuner that automatically meters the pitch played. Begin by playing a low C, close your eye, and slur to a perfect fifth above the C. When you think the G is in tune, open your eyes and check the tuner meter. If it is in

tune, play the G and slur up to a D. Keep on going until you reach your top note. Repeat any intervals that are not in tune until the ear guides the throat to voice it correctly. (Crochet & Green, 2012, p. 51). Transpose the exercise to begin on other notes.

2) HEARING "BEATLESS" INTONATION

This exercise requires either a tuner than can sound a pitch, an in-tune piano, or another saxophonist with good pitch. Play a major arpeggio while a sustained reference pitch is sounded, often the root of the arpeggio. (Karr, 1987, p. 17). Play slowly enough to allow time to eliminate any beats that are heard between the moving and reference pitches.

3) MATCHING THE PIANO

Prepare a tape, using a tuner or piano, of any musical passages where you are having pitch problems. The reference tape may contain the melody pitches that you should match or a complete harmonic accompaniment. Either way, it is best if the tape is made under tempo so you have time to hear and make adjustments. (Dietz and Kirkbride 1998).

The following methods of adjustment can be used, either one at a time or in combination:

1) Lip adjustment involves squeezing the muscles around the lips to form a "pucker" or relaxing the muscles for a looser seal. The slight pressure created by the pucker closes the reed and raised the pitch, whereas a relaxed embouchure lowers the pitch. Be careful to listen to the tone while using lip pressure or relaxation, and avoid using the jaw to correct pitch.

2) Changing the shape of the oral cavity will affect pitch in a more subtle fashion than the lip and will not affect the saxophone tone nearly as much as lip adjustment. An open throat position is created by imagining "ahh" and will lower the pitch. A closed throat and raised pitch will occur with the sound "ee." (Dietz and Kirkbride 1998). This technique is known as *voicing*.

3) Airspeed affects the pitch the least of the three methods. Faster air will raise the pitch slightly, and slower air will lower it. (Teal, 1963). Be careful to listen for any undesired tone color changes when using airspeed to affect pitch.

4) When lip, throat, or airspeed is not successful at correcting a pitch, the advanced saxophonist may use fingering adjustments. These vary from instrument to instrument, and the number of options is too numerous for presentation here. For more detailed information on fingering adjustment, refer to *The Art of Saxophone Playing* by Larry Teal. (Teal, 1963).

CHAPTER III
RESEARCH METHODOLOGY

In this chapter, information about the research of methodology is presented. This includes the procedure to do data analysis and collecting data. There are two questions addressed in the study: 1) Does the intonation techniques applied from the Jean-Marie Londeix teaching method improves intonation in saxophone' performance among college students? If so, how does it do so? ; 2) How effective are the intonation techniques applied from Jean-Marie Londeix's teaching? To research the answers to these questions, the methodology of case study was used to acquire in-depth information from five participants.

3.1 Case study

Case study is a kind of qualitative research method. It involves one or more cases in a limited system. (Silverman, 2000). A case study mainly involves the "why" and "how" questions.

A case study goal is to expand and promote a theory. Contrast experiment and study, will focus on demographics and generalizes (Yin, 2009). Researchers have realized the extensive and in-depth information that can come from informative cases (Barton, 2002). This means that the researchers choose those who can provide effective information about important aspects of the problem.

3.1.1 Qualitative research

Qualitative research is suitable for the quality of learning and describes the phenomena that occurred in the natural environment. (Custodero, 2009). The researchers that are interested in music teachers' and students' cognitive phenomena related to teaching and learning in music often do qualitative research. Qualitative research is descriptive. It is not intended to predict or to build. Qualitative research

methods include the following: ethnography, phenomenology, heuristic query, symbolic interaction, hermeneutics, the narrative analysis of grounded theory, feminist inquiry and critical theory. Similarly, each approach tries to answer questions on a slightly different. Type of design for each mentioned above that qualitative research method might lead to different research strategies or design. Some qualitative research follows a case study design. (Merriam 1998 & 1995).

3.2 Research Design

The research questions are based on the cause-effect relationship. The experimental method is the most suitable method to be used because it is designed to assess the effectiveness of the "treatment" which in this study is the effectiveness of "researcher's teaching module." This includes the procedures of teaching and evaluation. To investigate the answers, the methodology of case study is used to acquire in-depth information from the five participants.

3.3 Participants for this qualitative study

The participants of this research were five selected students at the Mahidol College of Music who met the following qualifications:

1) The students have been studying saxophone for more than three years.

2) The students' intonation is not yet stable.

The five participants were selected from a total of twenty-two students from classical saxophone performance studies, and then only five with unstable intonation were chosen finally. The five students were chosen with the help of Ajarn Shyen Lee and Ajarn Wisuwat Pruksavanich from the College of Music, Mahidol University. The student's ages ranged from 17 to 20 years old. Finally, the process of data collection took five months. Therefore, it is necessary to inform the conditions of the participants. General information about the participants is provided as follows. The names of all the five participants are pseudonyms.

Participant 1 (Heng): Heng has been played classical saxophone for three years. He likes pop and jazz music. He likes kinds of music that are more relaxing, but he thinks now since he should learn classical music in order to know more about classical ideas. Now he concentrates on classical music and listens a lot of classical--style saxophone music. When he plays the saxophone he cannot control his techniques and saxophone intonation well when playing together with others.

Participant 2 (Ae): Ae has played classical saxophone for four years, He likes classical and jazz music. When he practices the saxophone he always focuses on saxophone technique, and listens a little.

Participant 3 (Sun): Sun has learned saxophone for about two and a half years, and he likes classical music. He loves to listen to Japanese classical master Sugawa's pieces. He values the technology music. He always cares about technique more than the intonation that comes out.

Participant 4 (Golf): Golf has learned saxophone for four years. He likes both classical music and jazz music. He doesn't seem to care about sound and intonation. When he plays his mouth is not stable, it changes all the time. He can't control the mouth posture in both jazz style and classical style. He doesn't seem to cares that much about sound and intonation, and always just plays the things as he likes. He seems to care about technique more than intonation.

Participant 5 (Pao): Pao has learned saxophone for eight years. He has a passion for classical music. He listens to classical music every day. He has good musicality in playing music. He cares about both the sound and technique.

3.4 Research Instrument:

In this research the instrument used in teaching experiment was the prepared teaching module. The eight-week's lesson plan was drafted and arranged in sequence of prospective learning skill. A logbook was used to record was used to record students' learning skill and behavior.

Teaching plan

Week 1: (**the basic understanding of pitch**)

Practice pitches at different octaves, to enhance the awareness of intonation and mouth control.

Exercise: play saxophone mouthpiece and memorize the mouth position when getting a right note.

Week 2: (play the mouthpiece to find the pitch position)

Check the practice that was taught at the previous class

Practice Londeix's practice-piece, on page 8, Major third.

Exercise: Listen to a simple melody, then use the mouthpiece to play out the corresponding sound.

Week 3: (long tone breath control)

Practice long note, each lasts eight beats and be careful to maintain the intonation.

Exercise: Practice a simple melody, which includes long note.

Week 4: (Altissimo high position)

Practice octaves for training ears. Two students cooperate with each other. One plays a pitch, and the other plays an octave higher of the pitch.

Exercise: Ear training by playing notes at different octaves.

Week 5: (saxophone duet)

Practice duet to deepen and improve the students' ability to control the intonation

Week6 :(saxophone reed comparison)

Through comparing the old and new reed, students would have an impression that the sound wouldn't change much. At the same time, whether the

player performs indoor or outdoor, the intonation also wouldn't be affected that much. The key point is to adjust the sound by ears.

Week 7: (piano accompaniment) Through six weeks of practicing, the researcher arranged students to perform with piano accompaniment.

Week 8: (end) Play in a studio class. And present what they've learned. Show participants video and praise them since they've made much progress.

Londeix's methods focus on listening, hand position, posture of mouth, and octave exercises. However, the researcher adds different ways, which are aimed to help different participants especially on ear tuning and also duet playing, since duet playing is based on the knowledge of intonation. Duet is a combination of exercise, two players play simultaneously; they can clearly distinguish the exact location of the pitch and tone degrees. Learning intonation is a serious and time-consuming process. But practicing duetscan both improve intonation and have fun through interaction. The researcher wants to show that practicing a duet is another effective way to learn intonation aside from Londeix's method.

These are associated with the daily practice. At the beginning, when the instructor chose a piece of music to practice, students felt puzzled since it was a simple classical piece called *Aria*. But the reason for choosing the song is that it includes all necessary elements such as long tone, high pitch parts and rotary parts for students to practice. Students who have learned saxophone for years or icebreakers are all suitable to practice *Aria* to adjust the intonation. This piece, *Aria* is for beginners to practice classical saxophone, but usually players pay more attention on skillful pieces even ignore the details on basic practice. This piece *Aria* is a lyrical adagio one. We may ignore the fact that only when performing adagio, we can notice the exact intonation with piano accompaniment. Although this is a simple primary piece, it's a suitable one to practice intonation. It includes long tone, clear articulation, middle pitches and high pitches and also harmonious parts with piano. It has a lot of harmonious parts with piano, so if the intonation is not perfect, listeners can tell easily. So this piece can be used both for practicing intonation and ear tuning.

3.5 Data collection

I spent five months for collecting data at College of Music Mahidol University in Thailand. The data were collected from August to December 2015. I collected data once a week and each time took an hour. To correspond with the research questions, the data collection was qualitative to acquire the in-depth information of case study. Primary data sources used in this research were the observations of participants, video recordings, logbook, interview, and participants' assignments.

The researcher taught participants individually and each participant received eight intonation lessons once a week (one hour for each lesson; 30 minutes for reviewing and 30 minutes for new musical skill) over a period of five months. During each lesson, the development of students' intonation was recorded in the logbook. The data collected from the observations and interview of participants was brought to have a data treatment in the method of the most prominent of intonation problems and classification of data items. Interpretation of the performing skill and behavior was also made.

3.6 Data analysis

This case study used qualitative research and descriptive and content analysis as a means of data analysis. After the data was collected, I compiled the data from the logbook into organized text data. Then, I used content analysis of qualitative data, which is a way to analyze the data by reading through the data, marking, and dividing the data into parts by hand (Creswell, 2008). This is a process to categorize the data into categories or segments during the data analysis.

For the data in the first section, the initial research question was addressed. This section mainly comprises two parts – analyzing the Jean-Marie Londeix saxophone method and principles of intonation and the basic classifications. Intonation technique is introduced as well to support the case study.

Second, the instructor focused on teaching as student-centered, by encouraging students to discover knowledge through a variety of ways. Student

learning effects guided the instruction in learning activities. Teaching methods influence the participants of the saxophone intonation technique in four ways: reaction, demonstration, deduction, and discussion.

Third, although this study was focused on the cognition, attitude is one of the factors that influenced the effects of study. In this research, I used emotional goals by Krathwohl et al. 1964 as a framework to analyze the participants' attitude. I explain how the participants reacted in the following three sections: reaction at the very beginning, responding, and the moment that turned to valuing.

Finally, the results were discussed and related to how each student's studying motivation is different. It depends on their ability and experience. Motivation is usually divided into two kinds: extrinsic and intrinsic motivation. Summary of data analysis is depicted as follows:

Table 3.1 Data analysis

Stages	Description
Stage 1	**Analyzing Teaching Factors** Analyzing the Jean-Marie Londeix saxophone method and principles of intonation Principles of intonation and the basic classifications
Stage 2	**Teaching methods affected by Jean-Marie Londeix's theory on Saxophone Intonation Technique** Instruction methods: Instructor focuses on teaching as student-centered. Encourage students to discover knowledge through a variety of ways.
Stage 3	**Attitudes** Although this study was focused on the cognition, attitude is one of the factors that influence the effects of study.
Stage 4	**Motivation** Extrinsic & Intrinsic

CHAPTER IV
RESULTS

This research aims to a) develop saxophone intonation teaching module which is designed to enhance the musicianship of the students whose ages range from17 to20, b) examine the effectiveness of the teaching methods in relation to intonation skills, and c) analyze the teaching process and discuss the effects. Five participants were taught by the researcher, as a private class that the instructor taught students separately in a music practice room at the College of Music, Mahidol University. Each student took eight classes, once per week. Every lesson lasted approximately one hour allocated to teach a) Hearing Intonation Convey - This is to improve students' intonation hearing skill, b) Tone Quality—which is to help students show more high quality sound when playing saxophone, c) Embouchure Controlling. All lessons covered the following concepts: a) Practice the Mouthpiece, b) Let students catch the piano pitches easily, c) Provide effective ear-training lesson.

In this chapter, the findings through the research will be presented. The data comes from the observations of participants, video recordings, field notes, interviews, and participants' assignments. And my research questions are as follows: 1) Does the intonation technique from the Jean-Marie Londeix teaching method improve the intonation of saxophone players? 2) If the first research question is yes, how does the Jean-Marie Londeix teaching method improve the intonation in saxophone performances among college music students? According to the research questions, this chapter is organized into two sections.

The first section responds to the initial research question. This section is mainly comprised of two parts – analysis of the Jean-Marie Londeix saxophone method and principles of intonation and basic classification. Intonation technique will also be introduced as well to support the case study. Participants were required to present their current saxophone intonation technique before starting the research. This was to ensure the accuracy of the research. The following section is aimed to answer

the last question—about how the Jean-Marie Londeix teaching method improves intonation in saxophone performance among college students.

4.1 Jean-Marie Londeix Method on Saxophone Intonation Technique

4.1.1 Analysis of the Londeix Method on Saxophone Intonation Technique

The study of ear training intonation is extremely important to Londeix. When he was young, he did versatile studies in listening skills training. Through years of studying, his teaching experience helped students in Dijon solfege undoubtedly enhance. And he, himself, was always extremely sensitive to the slightest errors of rhythm, and also sensitive to the smallest differences in intonation. (James C. Umble 2000)

Londeix felt the following priorities should be considered:

1) Gentle nobility of the sounds (including embouchure controlling).

2) The perfection of the intonated tone and pitch-interval relationships, improving (such as skills of ear training, tone memory, embouchure flexibility and awareness of using correct fingering) (James C. Umble 2000)

Before starting to play, performers have to warm the instrument by blowing their warm breath into it; this is for tuning the instrument. A cold saxophone and a warm saxophone have different sound when performing. If the instrument was hot, pitches would be higher than the original. When it was cold it would become sharp and lower. When blowing the mouthpiece, player has to control by mouth carefully. If a player bites it too close or too loose; the effect of the sound is opposite. Don’t give too much pressure to the mouth; it could make the pitch sharp, while using less pressure would lead to the opposite effect. No matter how precious the instrument is, without exact control, it would be out of tune. However, if the player had an ear training seriously and carefully, he or she wouldn’t have any difficulty in tuning.

Players should carefully avoid cheek bulging when performing. It was not standard in a classical way. And this could damage the quality of the sound. Therefore, the embouchure should be pulled down when performing. This would be a wise

position to adjust the intonation. It is advisable to stand in front of the mirror to practice in order to correct the wrong position. Therefore, the player can change the mouth position through face curves. (Paul de Ville 1908)

4.2 Teaching methods affecting Jean-Marie Londeix's theory on Saxophone Intonation Technique

Intonation plays an important role in saxophone performance. Since most of the students haven't realized the vital role of intonation, the researcher decided to experiment and test to prove it. In the study, the researcher combined her own research methods and Londeix's teaching intonation methods. Besides teaching methods, participants' attitude and motivation are also analyzed below.

4.2.1 Instruction methods

The instructor focused on teaching as student-centered, (*Student-centered teaching methods* move the attention of teaching activity from the instructor to the learners, these include active learning, in which students try to solve problems, search the answers, ask questions of their own, discuss, debate, express or brainstorm during class; cooperative learning, in which students learn in groups about problem solving and projects, building conditions which can ensure both positive interdependence and group cooperation; and inductive teaching and learning, in which students are first exposed to face challenges and learn through the course material how to overcome them. (Weimer, 2002). Student-centered methods have been shown many times to be preferable to the original teacher-centered method. To conclude, student-centered teaching methods can help students improve the understanding of course contents, acquisition of critical thinking or creative problem-solving skills, and also build strong confidence in the future). Encouraging students to discover knowledge through a variety of ways. Student learning effects guides the instruction in learning activities. Teaching methods influence the participants of the saxophone intonation technique: Reaction and demonstration, deduction, discussion.

Reaction

The primary method for studying is the reaction. This approach fosters the intonation ability. It promotes students to summarize the principle or concept from various examples (Khemmani, 2009). Learning requires accumulating, organizing, and manipulating knowledge to search ideas or solve the problem (Joyce, Calhoun and Hopkins, 1997). In the research, the instructor encouraged students to find their own learning problem, helped them to review the knowledge they have, and applied several methods to practice Londeix's skill. As a result, the method was used to emphasize the saxophone intonation. All participants were encouraged to play musical pieces to perceive the concepts of intonation.

All participants were actively cooperating with the researcher after several weeks of studying, although at the beginning, they didn't notice the importance of intonation. Gradually, students started to recognize the importance of intonation, and applied the intonation skill in their performance.

After learning and research, the students have improved significantly by using the method of Londeix and the instructor's method. Before they used these methods, they didn't listen to themselves, which leads to incorrect tuning. But now when they practice or do some rehearsal, they involved their ears willingly and habitually, seize every pitch's position. When the teaching research came to an end, the students always told me, "it changes a lot; their sounds are getting better and better; it's easy to play the instrument than before, and easy to catch every pitch".

Ae, Heng and Sun are learning at the undergraduate level at the College of Music, Mahidol University. They improved obviously. Now, as long as they perform saxophone in a concert or practice daily, all of them pay attention to the intonation, their ears have become very sensitive, when the tune is wrong, they can know very fast, they can correct quickly. Golf and Pao are learning at high school at the College of Music, Mahidol University. They are young but have very solid foundation, because when they started to learn, they followed a very professional instructor. Now they are senior students at high school, so their saxophone technique, including intonation, was already very good when they began the research lesson. However, they still improved a lot as well. On the last week, the instructor showed the class video

from week1 to week7 to each students, and let them know how different they are and how many changes and improvements they made after taking the research lesson.

Demonstration

The demonstration method is applied to practice. Based on Bandura (1986), humans have to learn from observing models. My purpose is not to expect all participants to copy everything. Participants have to select and analyze their own learning pieces or to imitate some models, which they can sense the difference and cultivate their own skill.(Kowatrakul 2013 and Suttachit, 1998).

Several important teaching methods are: 1) playing the mouthpieces to find music pitch, 2) practicing octave intonation, 3) singing pitch, 4) listening to the music part and playing out on the saxophone, 5) playing duet, 6) letting students realize it’s not about what instrument they use or what environment they are in, the only issue that can decide their intonation is themselves. The key point to playing perfect pitch is that they themselves know how high the pitches are. After each class, the instructor tried to ask the students which method they like. Ae mentioned he liked to sing pitch, he said it was very helpful. At the practice room, when he saw some students play wrong notes, he also suggested them to sing the pitch first and find the tone. Sun, Golf and Pao liked to play duet, because they felt playing duet can not only help intonation, but also can help more. Performing duet can help partners cooperate harmoniously, think and listen more about music. Heng liked to play the octave exercise, and he felt after learning the intonation method he got a lot of ideas about music. And the high tones he plays are more stable than before.

Before participants started a new lesson, the instructor helped them review last week's content, impressed the importance of intonation in their mind, and offered consultant service about their own saxophone learning problem. In order to prove to students how they were making progress, the researcher took video in every saxophone class, to record their learning process, and provide an effective data when having a discussion about learning.

In the teaching process the instructor applied several types of teaching methods: first, let them play the music part by part, and do the corresponding practice when meeting the difficult part. Through the eight weeks of practicing and teaching,

every student had different problems and also different improvements. Ae, Sun and Heng, have basic skills and level. They were almost the same skill level. The level of Golf and Pao can be slightly better, so the instructor gave them a lot of new knowledge constantly through the process of the eight weeks, helping them to change their shortages, and set up faith before playing, introducing how to have more sensitive ears, how to use breath, how to think about the position of the pitch.

Ae, Sun and Heng have changed obviously by the eight weeks of training. Ae, in the first two weeks, played sight-reading of music. When he played the long note each time, his saxophone sound of pitch was always higher than the original pitch, because his saxophone skill was a little bit weak. So at the beginning, I had to play show him everything as a model and explain to him every part of the music. The reason that I let him play the mouthpiece was because I wanted him to use the idea to recognize and identify the location of the pitch by ear. At first he could not catch the pitch, and when the fourth week came, he played the music, and there was a pitch in a high position that he always played unstably. So I let him take out the mouthpiece and play the C scale on it again and try to find the pitch of music in tone. This time his accuracy rate was 100% without any impurity. He could play the C major scale clearly and correctly with mouthpiece, this is a good change.

Heng's biggest problem was that when he played the high pitches part, his sounds were always broken. This problem lasted several weeks, especially at week 2 and 3 it was very obvious. Then I made him play the octaves exercise; this exercise can help him to get an idea about the position of the pitch. He needed to play the lower pitch first and then to play an octave higher. Since saxophone is a conical instrument, the higher pitches are hard to control. Especially the mouth shouldn’t bite tightly, otherwise the tone and intonation of saxophone would higher and sharp than the original. So I let Heng play the lower part first, after he has an impression of the note and then, play the higher octave of the note. Through several weeks of practice, by the fourth week, I asked Heng to play high notes. His high part of the saxophone sound already didn’t have sharp sound, and he could completely take control of his own. Golf’s and Pao’s saxophone techniques are very strong. In the first class, when they tried to show the teaching pieces, there were only a few incorrect places. After I reminded them in every week of lessons, Pao started to pay attention in the third week,

and he played quite well. Golf is a little bit careless, his skill is very good, but he doesn't like thinking a lot when he plays. He doesn't care that much, just likes to follow himself. So I decided to remind him every time before he starts to play. And at the beginning of the third week, he started to notice by himself and show each practice quite accurate.

When the sixth week came, I decided to offer a test of intonation that I taught before. I wanted to help them do a little summary for a few weeks of saxophone intonation study. I prepared several questions they didn't know before, and let them give me the explanation and demonstration. For example: 1) When you play the long note, how you can control the unstable sound? 2) How can you play the high note without breaking the sound? 3) When you play duet what things do you have to care about? When I asked these questions students were silent for a while before they answered them.

The results indicated that the five students in different extents, all had great progress and cognition. Through short-term learning, Ae got the knowledge that he didn't know. Before he did not notice intonation, but now he realizes the importance of using ears when performing. No matter how perfect the skill he has, without ear conformation, it's meaningless to play any pieces. Sun got the experience that he should take care of using ear and breath. When playing the long notes, he should listen to his sound carefully, to ensure that the sound is in tune. So he needs to offer enough breath.

Heng's experience is at the time of playing the high pitches; he needs to know the location of the pitches in mind and also care about the sound of the music, and then express the music accurately and emotionally. Golf and Pao's experience is to play duet. Duet is a performance, which needs high cooperation and understanding of two performers. They need to communicate by ear while performing, not only show their own saxophone technique, but also show the music harmoniously.

Deduction

The following teaching method is deduction. When participants could not perceive music elements or concepts including the limitation of timing, the deduction method was employed. It helps participants learn principles or concepts and use them

(Clark, 1990).This method was used to explain the concept of the intonation and high pitch controlling.

At first when they played the difficult parts, they could not find out the problem or didn't know how to solve the problem. But I gave practice methods, for example, do ear-training, practice the mouthpiece, practice the high-pitches and sing them out. These exercises can help them make progress and feel more confident in saxophone performing.

According to the data, my teaching method has enhanced their confidence and ability to get hold of the skills gradually. During the sixth and seventh week of teaching, they could tell the instructor exactly how much they understand about the class and what their problem is when practicing. Ae, Sun and Heng gave me a lot of feedback, such as: through practice high-pitches or practice the mouthpiece, their intonation and ear sensation has increased, every time when the sound is not accurate, they know how to adjust the mouthpiece to find the right pitch. Golf and Pao loved to discuss after using some methods to practice the music--like the piece *Aria*, the difference they showed it before and after taking classes.

Discussion

The method of discussion is also used through music teaching. The contents of the discussion are based on the theme in the music class. In this study, two types of discussion are involved: class discussion and students' discussion. Class discussion is one on one discussion separately with the teacher, talking about the new knowledge and the hard points. Students' discussion happened between the participants and the rest of saxophone students who didn't took the training classes. Through the discussion and observation, they can see if the rest of the saxophone students have the same problem. And they can share the knowledge they've got and discovery they found from the training courses. In addition, students' discussion can exchange different ideas.

Based on the data, when it required the participants to do some cooperation and discuss, the five students were very active. In the class when the instructor gave a new teaching concept, they always discussed and gave a good feedback. Sun mentioned he got used to practicing saxophone skills only. Although

his technique had been very good, he hadn't paid much attention to intonation. This affects him showing the ideal saxophone sound. So when he came to the class, the instructor helped him to solve the sound problem. He got a new experience since he knew using ears to confirm the tune. He now feels his instrument sounds smoothly. Ae and Heng also said it's easier to breathe than before during saxophone performing. And when playing quartet or saxophone ensemble they can catch the sound very fast. Golf and Pao are good friends. They communicated a lot with each other. They are in the same quartet. So they felt that after training, they are faster to catch the accurate pitch when playing together.

Table 4.1 Summary of instruction methods

Instruction Methods	Advantages	Disadvantages
1. Reaction	Discovering music through A variety of ways. Summarize the concepts of music by themselves	Time consuming
2. Demonstration	Illustrate the way of practice quickly Understand the content of the music	Without a repeat
3. Deduction	Application rules of music elements And assignments	Difficult for
4. Discussion	Exchanging musical knowledge with friends students And teacher.	Who had no idea.

4.3Attitudes

Although this study was focused on the cognition, attitude is one of the factors that influence the effects of study. In this research, I used emotional goals by (Krathwohl et al.1964) as a framework to analyze the participants' attitude. I will

explain how the participants reacted in the following three ways: reaction at the very beginning, responding, and the moment that turned to valuing.

Reaction at the very beginning

The five participants had different responses on the acceptable level. Heng, at the beginning, was a little reluctant to accept the training and not willing to learn. As the time went by, he started to discuss how he thinks and ask me questions when a new concept is given. Once he understands, he is willing to obey my rules to practice for him. It's a process from passive to active. Sun and Ae could adapt to my teaching module quickly. Whenever they played something wrong, they came to me for solving problems. They know how my teaching methods are connected, and how it's useful to solve a series of problems. Golf and Pao were very active with my teaching plan. They also supported each other and had suggestions to each other during the courses.

Responding

The five participants gave a lot of feedback to my teaching methods. Sun said that he could feel the difference every time he played saxophone. He used my methods to overcome some hard pieces. These five students made progress every time to the training class. Through the intonation practice, their ears are getting more and more sensitive.

The moment that turned to valuing

From a passive reaction to an active one, participants needed some time. When they saw the changes that happened, they were more willing to accept the new teaching method. In the beginning, most of the participants only cared about practicing skills rather than paying attention to exploring saxophone sounds with their ears, except Pao. He did the best in both intonation and technique. He told me he liked classical music, he listened to classical saxophone music, he had studied saxophone for eight years, and he started to listen to classical saxophone music at a very early age too. His saxophone skill was also the most excellent of the five participants. So I used the example of Pao to encourage the rest of the four, telling them to use ears when playing music. Tone and intonation are very important for saxophone players. After a

few weeks of teaching, they all have a rich experience and change. Their intonation problems also have corrected slowly.

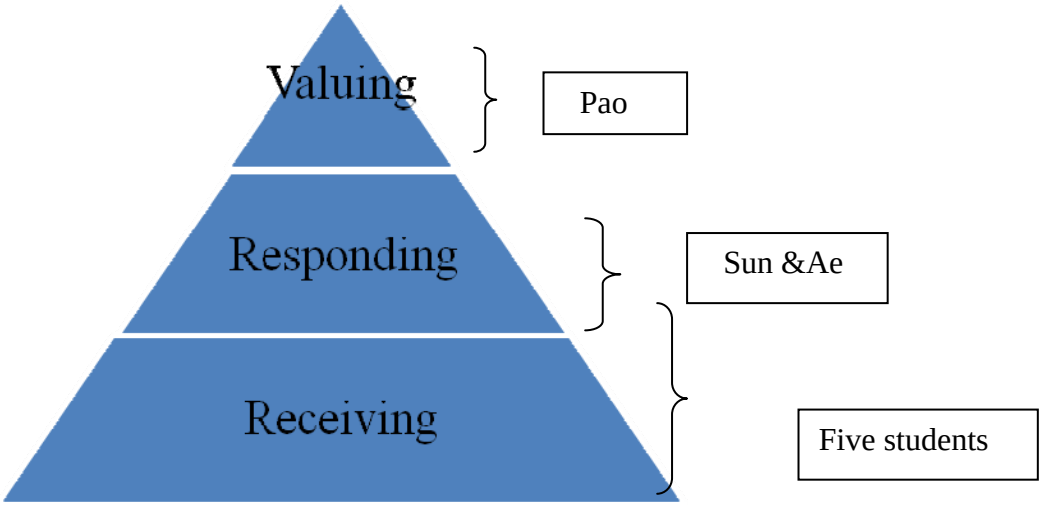


Figure 4.1 Levels of participants' attitudes

4.4 Motivations

Each student's studying motivation is different. It depends on their ability and experience. Motivation is usually divided into two kinds: extrinsic and intrinsic motivation.

Extrinsic Motivation

There are three kinds of extrinsic motivations in this research: instructor's expectation, rewards and recognition.

Instructor's Expectations

The instructor's expectation influences the thoughts and behaviors of the participants. According to Brophy (2004), the instructor should inform their goals ahead of time, to give a blueprint, such as students learning activities in details, and the final evaluation. In addition, giving feedback is very important. Instructors should have a clear standard for each student's level. And they also need to clarify the students' advantages and defects. So in this research, I did the video recording for

each student. My ultimate goal was that they could express the complete piece by themselves perfectly, even though they're totally unfamiliar with it at the beginning. I arranged a recital concert for every participant to summarize what he or she learned during the research. After the concert, I showed them the recording video and let them see the changes through the eight weeks of learning.

Rewards

According to the operant theory (Skinner, 1953), rewards reinforce all behaviors and can highly affect the unmotivated students. Significantly, if they are excessively used, it is valueless.

I applied this in my teaching research to promote my students learning desire and give them enough confidence. In the fifth week, the topic of the course was to find if there is any difference between new reeds and old reeds. And will this change the saxophone intonation? The five students gave me different feedback. Some said it was changed, and some said no. Before the test, I told them, if anyone answered correctly, I would give a new saxophone reed as a reward. When they knew that they could get a new reed, the five students became very positive to practice and the results that they gave is whether new or old reed, intonation has no change at all. To give some rewards appropriately seems necessary.

Recognition

Based on Maslow's hierarchy of needs (Maslow, 1987), humans have security requirements. I offered appropriate praise as the participants reached the target. I praised my students if they shared the useful experience with classmates. And when I praised them, I explained the reason at the same time.

Appropriate recognition is very helpful; students can set up more confidence through it. One of the impression issues that happened during the research is about participant Heng. In the eighth week it was a studio class. All participants had to play the music piece *Aria* with the piano accompaniment. All five students were very nervous. Heng was feeling the worst. He was in anxiety. On the stage he sweated a lot. When the piano accompaniment started, he counted the beat wrong twice. This made him have to start all over again. He even jumped the score from line 2 to line 4. I supposed that it was because there was a lot audience in the studio and also other participants, and I was recording. So I turned off the recording machine, and let him

calm down. I asked him to have a seat to listen to other students' perform first. I told him that he was the one who made the largest progress of the five participants. He had overcome the hardest parts, his tone, and intonations were very accurate. Just make the audience witness your growth, and no need to be afraid, be bold. When he felt better, I let him go to the stage, and he did it comfortably and perfectly. He was happy and I was proud of him.

Five participants responded to extrinsic motivation stimulation. In this study, the extrinsic motivation was divided into three kinds, namely the expectations of instructors, rewards and recognition. The instructor's expectation would influence the outcome of the participants. The benefits of learning are clarified since there are requirements in detail. Rewards could activate all of the participants to behave and think carefully during the study. Praise supported the participant's behavior and helped them to ensure they got the knowledge. while offering a reason when giving praise is also very important.

Intrinsic motivation

Intrinsic motivation involves self-determination and curiosity (Kowatrakul, 2013; Ryan and Deci, 2000). Participants who engaged in intrinsic motivation were Sun and Ae.

Although Sun and Ae were stimulated by extrinsic motivation, they displayed a great interest in music analysis. I found that they like to look for music that suits their style to discuss with me. Sun likes to do all kinds of comparison; he likes to find new scores or old ones to play, in order to prove that he really had improved his intonation. Every time he came to class, he would like to show me the music type that he found, and discuss how to deal with the difficult parts appeared on the score. He also told me which teaching method is the most effective to him. Ae likes innovation; he would like to make a summary after every class about the new skill he got. Every time he came he would use the method he learned and combine his own consideration to perform the new piece. This is a good change. They started to catch the good ideas that occurred in their mind occasionally. To sum up, inner motivation is an important factor to stimulate students' intonation in saxophone learning.

<table>
<tr><td rowspan="3">Motivations</td><td>All Participants</td><td>Extrinsic Motivation

Items Application

1. Instructor expectations Notify the evaluate and benefits of learning, be objective to give feedback
2. Rewards Stimulate participants to improve intonation in saxophone performance; analyzing the techniques
3. Praising Participants who finish the target participants who tried to share musical knowledge</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Sun & Ae</td><td>Intrinsic Motivation

Items Application
1. Free- choice Arranging musical experiences by self-determination
2. Curiosity Seeking music content to improve competence</td></tr>
</table>

Figure 4.2 Summary of motivations

CHAPTER V
DISCUSSION AND RECOMMENDATIONS

This chapter presents both the discussion and recommendations. Chapter five summarizes the results of this study according to the research questions. This chapter includes a discussion of the findings that will enhance the understanding of the research data, which correspond with the research questions. The data collection was qualitative to acquire the in-depth information of case study. The data was analyzed and organized to answer the two research questions: 1) Does the intonation technique applied from the Jean-Marie Londeix teaching method improves intonation in saxophone' performance among college students? If so, how does it do so? ; 2) How effective is the intonation technique applied from Jean-Marie Londeix teaching? In this chapter, the researcher presents a summary and discussion. The discussion in this chapter was drawn from the viewpoints shared by the participants and the findings regarding the literature review as follows:

5.1 Discussion

5.1.1 Teaching factors affecting Jean-Marie Londeix Method on Saxophone Intonation Technique

According to the results in chapter four, there are three factors affecting the teaching saxophone intonation technique. First, the four teaching methods used in this study, namely reaction, deduction, demonstration and discussion. Second, the participants' attitudes were divided into three groups, reaction at the very beginning, responding, and the moment that turned to valuing. Finally, motivation involved extrinsic and intrinsic motivation. Extrinsic motivation involves the instructor's expectation, rewards and precognition. For intrinsic motivation, it consists of the freedom to choose music activities and curiosity.

Although I separate reports these teaching factors, all of them were interrelated; it is useless if lacking one of them. To apply the instruction teaching method, I mainly used the namely reaction and demonstration, which induced promoting saxophone intonation technique (Khemmani, 2009).

Students' understanding of intonation through this research can give students a very different cognition and understanding; studying saxophone intonation is of vital importance. In this study, the researchers used her own research methods and Londeix teaching intonation methods too. These can be summarized into three categories: teaching methods, attitude, and motivation. All of them were interrelated and inseparable when providing music instruction.

The primary method for studying is the reaction. This approach fosters the intonation ability. It promotes students to summarize the principle or concept from various examples (Khemmani, 2009). Learning requires accumulating, organizing, and manipulating knowledge to search ideas or solve the problem (Joyce, Calhoun and Hopkins, 1997). In the research, the instructor encouraged students to find their own learning problem, helped them to review the knowledge they gained, and applied several methods to practice Londeix's skill. As a result, the method was used to emphasize the saxophone intonation. All participants were encouraged to play musical pieces to perceive the concepts of intonation.

After learning and research, the students have improved significantly by using the method of Londeix and the instructor's method. Before they took the methods, they didn't listen to themselves, which leads to incorrect tuning. But now when they practice or do some rehearsal, they involve their ears willingly and habitually, seize every pitch's position. When the teaching research came to an end, the students always told me, "it changes a lot; their sounds are getting better and better; it's easy to play the instrument than before, and easy to catch every pitch".

Demonstration method is applied to practice in the saxophone teaching.Based on Bandura (1986), humans have to learn from observed learning or modeling. My purpose is not expecting all participants to imitate everything. Participants must have to select and analyze by their own learning or to imitate some models, which they can sense (Kowatrakul 2013 and Suttachit, 1998).

These studies have shown that education researchers need to consider the many ways to help the students improve. Extrinsic motivation stimulation, for example, teacher expectation to student's, giving encouragement and praise can deeply affect the psychology of the students. Internal stimulus and motivation is to focus on students to help students find ways and interest in music.

Several important teaching methods are: 1) Playing the mouthpieces to find music pitch, 2) Practicing octave intonation, 3) Singing pitch, 4) Listening to the music part and play out on the saxophone, 5) Playing duet, 6) Letting students realize it’s not about what instrument they use or what environment they are in, the only issue that can decide their intonation is themselves.

In teaching process the instructor applied several types of teaching methods: first, let them play the music part by part, and do the corresponding practice when meeting the difficult part. Through the eight weeks of practicing and teaching, every student had different problems and also different improvements. The instructor gave them a lot of new knowledge constantly through the process of the eight weeks, helped them to correct their deficiencies, and set up faith before playing, introduced how to have more sensitive ears, how to use breath, how to think the position of the pitch.

After taking intonation class, the five students show much difference. Through several techniques they showed different changes. 1) Long tone. in the first two weeks, while sight-reading music, when students played the long note each time, the saxophone sound of pitch was always higher than the original pitch, because they saxophone skill was a little bit weak. So at the beginning, I had to play to show them everything as a model and explain them every part of the music. When the fourth week came, they played the music, and when there was a pitch in a high position they always played unstably. So I let them take out the mouthpiece and play the C scale on it again and try to find the pitch of music in tone. This time the accuracy rate was 100% without any impurity. They can play the C major scale clearly and correctly with mouthpiece, this is a good change. 2) Practicing octave intonation, they need to play the lower pitch first and then to play an octave higher. Since the saxophone is a conical instrument, the higher pitches are hard to control. Especially the mouth shouldn’t bite tightly, otherwise the tone and intonation of saxophone would be higher

and sharper than the original. So after use my method to teach them to play high notes, the high part of the saxophone sound already don't have sharp sound, they can completely take control of themselves.

The results indicated that the five students, in different extents, have all great progress and cognition. Through short-term learning, the five students gained knowledge that they didn't know. Before they did not notice intonation, but now they realize the importance of using ears when performing. No matter how perfect the skill they have, without ear confirmation, it's meaningless to play any pieces.They also know that playing duet is a performance, which needs high cooperation and understanding of two performers. They need to communicate by ear while performing, not only show their own saxophone technique, but also show the music harmoniously.

5.1.2 Jean-Marie Londeix Method on Saxophone Intonation Technique

Through teaching the students, the research proved that the utility of Londeix teaching method is very high. His technique method is very useful in not only in Europe, but this research proved that, using his technique method in Asia is also very practical, the students in a short time (just eight weeks) made very big changes. Londeix's method is very good, because he not only develops technique, but more importantly emphasized how you understand. About playing a saxophone instrument-how much music player knows, about the saxophone body, player body, thinking, ideas, and technique.

Londeix wrote a lot of teaching methods, but the researcher was only interested in intonation problems, so the researcher used specialized Londeix intonation teaching methods to test and verify the five students, regarding how to improve the students' intonation problems which are, respectively:

Practicing

Londeix encouraged his students to listen closely to their performance and learn from their daily practices and mistakes. He advised them on practicing shorter sections of music repeatedly until they honed their skills. Repetitions of smaller sections were encouraged as it helps in evaluating and clarifying the many complex issues in phrasing, one at a time. Thus, high levels of discernment were encouraged. (Umble, 2000).

A performer should learn to distinguish the strengths and the imperfections of playing while practicing, by always asking oneself what the composer really intended. This way the saxophone students will learn to improve and make the correct judgments on playing the musical pieces and become a better performer.

On learning

A performing musician has three levels of approach and appreciation in playing an instrument.

First level: Present the text

A performer must clearly present the notes, their duration, and their rhythms, dynamics, articulations, and tone quality. These presentations must be audible and intelligible enough to be understood distinctly from the written musical notation. This is the first level and an important one because this is the level that creates and builds the rest of the levels. (Londeix, 1997).This is the level, one might say, where the instrumentalist expresses manner.

Second Level: Understand why

It is important to perceive and understand the composer's work's genre and title, even though at times this information may not be significant or important. It is also necessary to be familiar with the specific aspects of how the work was written, and how the work came into existence. (Londeix, 1997). These observations and reviews lead to a deeper understanding of the work and serve to make one's interpretation more personalize. It helps to create an understanding of the person from his/her point of view, which creates more understanding between the composer's work and the performer. Thus, it depends a lot on the performer's initiative, understanding, taste, imagination, and especially his cultural training and education. His observations and considerations on the work can make a huge difference on how and why music is perceived in a certain way.

Third level: the interpretation

A performer has the will to do what he wants, not just what he can. One should sincerely and faithfully take into account the first two levels and present the musical score with his own interpretation. A performer must personalize the work, improvising it at the same time making it convincing by its simplicity. (Thomas, 2011). This involves adapting one's skills to the demands of the piece. Frequently, new

performance techniques must be learned in order to sufficiently respond to the notated and implied elements in the work. Then, the performer can create his improvisation while still keeping true to its original form. (Londeix, 1997).

In my opinion, if intonation or at high or low the sound is not accurate, the problem comes from students themselves, because when I do the teaching research, has a section specifically is to do my research for this course and testing, using the new or old reed to test the students themselves. Also, letting students play inside the practice room and outside the practice room, the intonation is not changed. If there are any changes, they are also because cold and hot climates make the saxophone neck tube temperature rise and fall, but the intonation problem did not have too many big changes. The premise is already mastered intonation control on the basis of the saxophone.

5.1.3 Attitudes

Obviously, this research mainly emphasized students' saxophone intonation technique. In the field of education, this includes students, teachers, content, and context (Steiner, 1988). In this section, the teacher and the content used in this study are discussed.

Teacher

As a teacher and researcher as well as a saxophone player, I think for those who want to play saxophone well, the most important thing is to play accurate saxophone sound. From my research intonation project, the intonations can directly student’s integrity and listening skills. It is worth noting for players, intonation is an important part that every student should take note of. Even for some good students, they always ignore the characteristics and properties of intonation. They think that their playing is good as long as the technique is really good but, actually the transmission of sound is crucial.

Content

There are four elements of the research on the saxophone intonation: play mouthpiece, playing high octave, playing a duet and improving listening practice.

Through the teaching, in the short time without teaching the students can feel that the five participants have made big changes. At the beginning intonation

technique was ignored by almost everybody, but after teaching them the third week's practice in high notes finding intonation, the students have in turn slowly made progress. Through demonstration and explanation, participants clearly understand the standard of intonation practice and a good way to improve.

This progress is not very simple, however. The researcher focused on the understanding of the students, for their support, recognition and appreciation, to give students confidence unceasingly; after that students changed and progressed. Although there are a lot of difficulties in learning for the students, they can accept, but also use is very good, in the usual practice, met other friends have the same problem they will give them what they have learned new ways to help them.

5.1.4 Overview

The purposes of this study are 1) to examine the responses and music learning of individuals with study effects of the Jean-Marie Londeix method on intonation technique of saxophone performance skill in college students at the College of Music, Mahidol University, and 2) to find and assess effective ways to improve selected students' saxophone performance after being treated with experimental teaching. The research employed a case study qualitative research using descriptive and content analysis as a means of data analysis. After the data was collected, the researcher compiled the data from the log book to organized text data. Analysis results show that the saxophone intonation technique falls into two categories: 1) a single practice, 2) paying attention to practice. Saxophone practice intonation technique is divided into three categories: 1) learning to listen. 2) sing pitch, 3) self control. These three are the most direct teaching factors that affect participants' behavior, teaching methods, attitude and motivation. Participants, through experimental teaching, made very significant changes, validations of which are: 1) the students learned self control, 2) opened their ears to listen during saxophone practice, 3) the accuracy of the sound is very high.

I spent five months for collecting data at the College of Music Mahidol University in Thailand. The data were collected from August to December 2015. I collected data once a week and each time took an hour. To correspond with the research questions, the data collection was qualitative to acquire the in-depth

information of case study. Primary data sources used in this research were the observations of participants, video recordings, logbook, interview, and participants' assignments.

The researcher taught participants individually for this research. Each participant received eight intonation lessons once a week (one hour for each lesson; 30 minutes for reviewing and 30 minutes for new musical skill) over a period of two months. During each lesson, the development of students' intonation was recorded by the logbook. The data collected from the observations and interview of participants was brought to have a data treatment in the method of the most prominent of intonation problems and classification of data items. Interpretation of the performing skill and behavior was made.

The data collected from the observations of participants, video recordings, field notes, interviews, and participants' assignments were analyzed according to the research questions: 1) Does the intonation technique applied from the Jean-Marie Londeix teaching method improves intonation in saxophone' performance among college students? How? 2) How do techniques applied from the Jean-Marie Londeix teaching method improve intonation in saxophone' performance among college students? The results are organized into two sections. In the first section, the initial research question is responded. This section comprises two parts, namely analytical Jean-Marie Londeix saxophone method and principles of the intonation and the basic classification. The main themes of each intonation technique are reported with supporting case studies. Participants' description is provided prior to presenting their saxophone intonation technique. The following section is devoted to answering the last question: how can applying the Jean-Marie Londeix teaching method improve intonation in saxophone' performance among college students.

Before I started doing this research, I had already been a saxophone player for 15 years. I have also participated in many performing activities and competitions. Even though I had good technique, every time I performed in a band or quartet ensemble, intonation was always a big problem that gave me a headache. It takes a long time to tune the intonation perfectly. When I realized the problem I tried to consult with other players. To my surprise, they all responded that they also faced the same problem.

Therefore, I started to collect methods to improve intonation. And I then had the chance to study saxophone performance at Mahidol University. There, I had a master class with Londeix, and felt it was very beneficial, since he is a world-renowned saxophone player. Later I started to learn his saxophone studying method, and also collected his teaching books, practicing pieces for scales, intonation, etc. Through self-teaching and practicing, I found that my ears became open which lead to a perfect intonation. I benefited greatly by combining Londeix's method and my own practicing my methods.

Therefore, I hope more saxophone players could know the importance of intonation and the right way to improve it. So I did this research to confirm if this method also works well for other people. In order to make my research more reputable, I recorded the whole process.

The five participants who participated in my study all had no realization about the importance of intonation. Step by step, I taught them to realize and improve intonation, using activities like playing with the mouthpiece, singing pitch, dictating melody and practicing duets. Through several weeks of practicing, they improved a lot and gave many good feedbacks both tome and on Londeix's teaching methods.

Ae never realized the importance of intonation before, but now he keeps an eye on it all the time; Sun and Heng only paid attention to skills and techniques, but they liked to sing pitches every time before practicing to make sure the intonation and perform pieces more musically; recently, Golf and Pao joined a competition, they told me that the intonation helped them a lot on quartet ensemble. They learned to listen to each other and won the golden award.

It's such a pleasure that I could confirm the Londeix's teaching method can help to improve the intonation of the five participants. And during the research I also developed my own teaching methods. Meanwhile, I hope saxophone players can realize the importance of intonation if they want to become professional. A good saxophone player should not only be good at technique and skills, but should also have perfect intonation.

5.2 Recommendations for further study

This research adopts qualitative research methods, through the saxophone intonation experimental teaching conclusion and research methods. This method is not the only one, however, so if other researchers are interested in the study, they can try to use other methods of teaching to further verify the saxophone technique of intonation. Second, this study is based on the method of the saxophone intonation practice of teaching. The main purposes of Londeix's and my teaching methods of are to parse the saxophone intonation to correct problems and recognize the importance of the saxophone intonation. Future researchers might choose to mainly concentrate on the practice teaching, or try to use a variety of methods such as reference for teaching, video teaching, in order to display the saxophone intonation. Thirdly, this study is a small study: the five participants were selected from at twenty-two students from the study of classical saxophone performance are chosen to study saxophone and then only five with unstable intonation will be chosen finally. Five students are chosen by the help of Ajarn ShyenLee and Ajarn Wisuwat Pruksavanichfrom the College of Music, Mahidol University. The students' ages range from17 to 20 years old.

In addition, the content and scope of research can continue to refine and deepen. Finally this study mainly aimed at the classical saxophone students. The results of this study not only show that through the students love of saxophone and the technique study of saxophone, the students' potential are very rich. Through the study of teaching the five students know the importance of intonation, playing saxophone exercise is good, but the method that is the most important should use the correct practice methods. This study focuses on student's saxophone intonation technology development. I hope in the future to modify these conclusions and to provide some references for the standard measure of a target and enlightenment.

REFERENCES

Abeles, Harold F., and Lori A. Custodero. *Critical Issues in Music Education: Contemporary Theory and Practice*. Oxford: Oxford UP, 2010.

Amatayakun, P., and Duangjantip, S. (2007). Thai Jazz Bands before World War II [in Thai]. *Music Journal, 12*(9), 25-35. Nakhon Pathom: Mahidol University.

Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, N.J.: Prentice-Hall.

Brittin, R.V. (1993). Effects of Upper and Lower-Register Accompaniment on Intonation. *Journal of Band Research, 29*, 43-50.

Chen, J.M., Smith,. J. and Wolfe, J. (2008) "Experienced saxophonists learn to tune their vocal tracts", Science, 319, 726.

Clarke, J.H. (1990). *Patterns of Thinking: Integrating Learning Skills in Content Teaching*. Boston: Allyn and Bacon.

Conway, C. M., & Jaffers, T. (2004). The Teacher as Researcher in Beginning Instrumental music. *Update: Applications of Research in Music Education,* 22(2), 35-45.

Creswell, J.W. (2008). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (3rd ed.), Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Crochet, L. S., & Green, S. K. (2012). Examining progress across time with practical assessments in ensemble settings. Music Educators Journal, 98(3), 49-54.

Daniel J. Schneck，and Dorita S. Berger *(2006). The Music Effect: Music Physiology and Clinical Applications*. London : Jessica Kingsley .

Figueroa, K. (2014). Online History and Development of the Saxophone of the Saxophone .Retrieved 2014 October 21, from Prezi. https://prezi.com/eardwnpnfdjb/history-and-development-of-the-saxophone/

Flesch, C. (1939). *The art of violin playing (2nd rev. ed.)*. Boston: C. Fischer.

Frederick, H. (1997). Teacher’s guide to the saxophone. Selmer; Revised edition.

J. P. E. Harper –Scott . (2009). An Introduction to Music Studies. Cambridge University Press

Geringer, J.M., and Worthy, M.D. (1999).Effects of Tone-Quality Changes on Intonation and Tone-Quality Ratings of High School and College Instrumentalists. *Journal of Research in Music Education, 47,* 135-149.

Geringer, J.M. (1978). Intonational Performance and Perception of Ascending Scales. *Journal of Research in Music Education, 26*, 32-40.

Geringer, J.M., and Witt, A.C. (1985). An Investigation of Tuning Performance and Perception of String Instrumentalists. *Bulletin of the Council for Research in Music Education, 85*, 90-101.

George, W. (1986). *Preparatory Method for Saxophone Volume One: Classical Technique*. Cherry Hill, N.J.: Roncorp

Havas, K. (1961). *A new approach to violin playing*. London: Bosworth

Heller, J.J. (1969). Electronic Graphs of Musical Performance: A Pilot Study in Perception and Learning. *Journal of Research in Music Education, 17*, 202-216.

Jaroensuk, S. (2005).The new face of music in Thailand [in Thai].*Music Journal, 11*(5), 25-30.

Joyce, B., Calhoun, E., and Hopkins,D. (1997). *Models of Learning Tools for Teaching*. Buckingham: Open University Press.

Johnson, K. (1981). *The art of trumpet playing*, Iowa State University Press.

Kantorski, V.J. (1986). String Instrument Intonation in Upper and Lower Registers: The Effects of Accompaniment. *Journal of Research in Music Education, 34*, 200-210.

Karr, G. (1987). *The Gary Karr double bass book*. Pacific, MO: Amati Productions.

Karrick, B. (1998). An Examination of the Intonation Tendencies of Wind Instrumentalists Based on Their Performance of Selected Harmonic Musical Intervals. *Journal of Research in Music Education, 46*, 112-127.

Karpinski, G, S. (2000). *Aural Skills Acquisition: The Development of Listening, Reading and Performing Skills in College-level Musicians*. Oxford: Oxford University Press.

Khemmani, T. (2009). *14 Teaching Approaches for Professional Teacher*. Bangkok: Chulalongkorn University Press.

Kleinbammer, E. (1963). *The Art of Trombone Playing*. Secaucus, NJ: Summy-Birchard.

Kohut, D. (1973). *Instrumental Music Pedagogy*. Englewood Cliffs, NJ: Prentice-Hall.

Kowatrakul, S. (2013). *Educational Psychology* (11thed.). Bangkok: Chulalongkorn University, Press.

Kruckenberg ,S. (2002). *Symphony Orchestra and Its Instruments*. Gramercy: Chartwell book.

Londeix, J.M. (1997). *Saxophone Studying Method*. Editions Henry Lemoine, Paris.

Londeix, J.M.(1981). *Jean-Marie Londeix on the Exactness of Intonation for all Saxophone*. Editions Musicales Alphonse Leduc, Paris.

Londeix, J, M. (1989). *Hello! Mr. Sax*. Paris: Editions Musicales Alphonse Leduc.

Menuhin, Y. (1972). Violin; six lessons. New York: Viking Press.

Merriam, S. (1998). Qualitative Research and Case Study Applications in Education. San Francisco: Jossey-Bass.

Morrison, S.J. (2000). Effect of Melodic Context, Tuning Behaviors, and Experience on the Intonation Accuracy of Wind Players. *Journal of Research in Music Education, 48*, 39-51.

Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods* (3rd ed.). Thousand Oaks, CA: Sage

Perry R. Cook. (2001). *Music, Cognition, and Computerized Sound: An Introduction to Psychoacoustics*. The MIT Press.

Robbins, J., Burbank, M K., and Dunkle, H. (2007). Teacher Research: Tales from the Field. *Journal of Music Teacher Education*, 17(1), 42-55.

Rolland, P., & Mutschler, M. (2000). The teaching of action in string playing: developmental & remedial techniques, violin and viola (2nd ed.). Urbana, IL: Illinois String Research Associates.

Salzberg, R.S. (1980). The Effects of Visual Stimulus and Instruction on Intonation Accuracy of String Instrumentalists. *Psychology of Music, 8,* 42-49

Schachnik, G. (2007). *Beginning Ear Training (Ear Training: Exercises).* Berklee Press.

Sliverman, D. (2000). *Doing Qualitative Research: A Practical Handbook*. London: Sage.

Sogin, D.W. (1989). An Analysis of String Instrumentalists' Performed Intonational Adjustments within an Ascending and Descending Pitch Set. *Journal of Research in Music Education, 37*, 104-111.

Stake, R. (1995). *The Art of Case Study Research*. Thousand Oaks, CA: Sage.

Stehares. W, A. (2005). *Tuning, Timbre, Spectrum, Scale*. London: Springer-Verlag.

Suttachitt, N. (1998). *Psychology of Music Teaching*. Bangkok: Chulalongkorn University Press.

Teal, L. (1963). *The Art of Saxophone Playing*. Secaucus, NJ: Summy-Birchard

Thomas, L. (2011). *Eugene Rousseau: With Casual Brilliance.* Naperville, IL: North American Saxophone Alliance.

Thomson, J. (1995). Teaching with Goals, not Answers: An Interview with John Whitwell. The Instrumentalist, 50 (5), 10-15.

Umble, J, C.(2000). *Jean-Marie Londeix, Master of the Modern Saxophone*. Cherry Hill, NJ: Roncorp Publications

Ville, Paul (1908). *The World's Edition Universal Method for the Saxophone* Carl Fischer, Inc: Cooper Square, New York.

Wapnick, J., and Freeman, P. (1980). Effects of Dark-Bright Timbral Variation on the Perception of Flatness and Sharpness. *Journal of Research in Music Education, 28*, 176-184.

William Dietz, Jerry Kirkbride (1998) *Teaching Woodwinds: A Method and Resource Handbook for Music Educators*. Thomson Learning Shirmer , United States.

Worthy, M.D. (2000). Effects of Tone-Quality Conditions on Perception and Performance of Pitch among Selected Wind Instrumentalists. *Journal of Research in Music Education, 48*, 222-236.

Yarbrough, C., Morrison, S.J., and Karrick, B. (1997). The Effect of Experience, Private Instruction, and Knowledge of Directional Mistuning on the Tuning Performance and Perception of High School Wind Players. *Bulletin of the Council for Research in Music Education, 134*, 31-42.

Yin, R. K. (2009). *Case Study Research: Design and Methods* (4th ed.). Los Angeles, CA: Sage.

APPENDICES

APPENDIX A
QUESTIONS FOR INTERVIEWS

Date: …… Time: ……

Interviewee's Name …….

Questions for participants

Questions used before teaching

1. How long have you been learning saxophone?
2. What kind of music do you like?
3. Please explain the meaning of out of tune and in tune?
4. When you play, have you ever thought about the location of the sound? What is the meaning of intonation in your understanding?
5. When you play the saxophone, do you pay attention on listening to its sound?
6. When you play with piano, why does the sound always have fluctuation?

Questions used after teaching

1. How do you feel after using the method of Londeix?
2. How can you find the way make faster in tuning the instrument?
3. After eight weeks, are you paying more attention with your saxophone?
4. What do you feel is more important about saxophone, ears or air?
5. How have you changed the way you play with piano?
6. About the intonation techniques, which one is hard for you, why?
7. Now do you feel your intonation is better, and if so, how?

Thank you for your participation

APPENDIX B
LOG BOOK PROFILE

Date.....

Name.....Surname.....nickname.....Age.....years old

Curriculum.....Class..... Time schedule.....

Record.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Thank you for your participation

APPENDIX C
HUMAN SUBJECTS APPROVAL DOCUMENT

Certificate of MU-SSIRB Approval

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Certificate of Approval No.:	2015/369.0112
MU-SSIRB No.:	2015/435 (B1)
Title of Project:	THE APPLICATION OF JEAN-MARIE LONDEIX METHOD ON SAXOPHONE INTONATION TECHNIQUE FOR MAHIDOL UNIVERSITY COLLEGE OF MUSIC STUDENTS, THAILAND
Principal Investigator:	Miss Xu Zhang
Name of Institution:	College of Music, Mahidol University
Approval includes:	1) MU-SSIRB Submission form version received date 14 October 2015 2) Participant Information sheet version date 14 October 2015 3) Informed consent form version 14 October 2015 4) In-depth Interview Guideline version received date 14 October 2015

The Committee for Research Ethics (Social Sciences) is in full compliance with International Guidelines of Human Research Protection such as Declaration of Helsinki, The Belmont Report, CIOMS Guidelines and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP)

Date of Approval: December 1, 2015

Date of Expiration: November 30, 2016

Chairman

(Emeritus Professor Dr.Santhat Sermsri)

Head of the Institute

(Assoc.Prof.Dr.Wariya Chinwanno)
Dean of Faculty of Social Sciences and Humanities

Office of The Committee for Research Ethics (Social Sciences), Faculty of Social Sciences and Humanities, Mahidol University
Phuttamonthon 4 Rd., Salaya, Phuttamonthon District, Nakhon Pathom 73170. Tel.(662) 441 9180 Fax.(662) 441 9181
Website: www.mu-ssirb.com ; e-mail: mussirb310@gmail.com

โครงการวิจัยนี้ได้รับการรับรองจริยธรรมการวิจัยในคนจากคณะกรรมการจริยธรรมการวิจัยในคน สาขาสังคมศาสตร์ มหาวิทยาลัยมหิดล แล้ว

ระเบียบในการดำเนินการวิจัย ดังนี้

1) ขอให้ผู้วิจัยนำเอกสารชี้แจงผู้เข้าร่วมการวิจัย และหนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัยโดยได้รับการบอกกล่าวและเต็มใจที่มีตราประทับรับรองจากคณะกรรมการจริยธรรมการวิจัยในคน สาขาสังคมศาสตร์ ไปสำเนาใช้กับผู้เข้าร่วมการวิจัยของโครงการวิจัยนี้เท่านั้น

2) หากผู้วิจัยต้องการปรับเปลี่ยนรายละเอียดบางส่วนของโครงการวิจัย ขอให้ผู้วิจัยแจ้งมายังสำนักงานคณะกรรมการจริยธรรมฯ โดยกรอกแบบฟอร์ม "แบบขอปรับเปลี่ยนโครงร่างวิจัย (Protocol Amendment)" เพื่อขอรับการพิจารณารับรองก่อนเริ่มดำเนินการวิจัย เมื่อคณะกรรมการจริยธรรมฯ พิจารณารับรองแล้ว จะมีหนังสือตอบรับ (Acceptance Letter) แจ้งไปยังผู้วิจัย โดยระบุวันที่พิจารณารับรอง ผู้วิจัยจึงสามารถเริ่มดำเนินการวิจัยต่อไปได้

3) หากเกิดเหตุการณ์ไม่พึงประสงค์อย่างร้ายแรง รวมทั้งเหตุการณ์ที่ไม่อาจคาดเดาได้ล่วงหน้ามาก่อนเกิดขึ้นกับผู้เข้าร่วมการวิจัย ขอให้ผู้วิจัยรายงานมายังสำนักงานคณะกรรมการจริยธรรมฯ โดยกรอกแบบฟอร์ม "รายงานเหตุการณ์ไม่พึงประสงค์" หรือส่งสำเนาการรายงานที่ส่งไปยังผู้ให้ทุนวิจัยมาให้สำนักงานคณะกรรมการจริยธรรมฯ ด้วย เมื่อคณะกรรมการจริยธรรมฯ พิจารณารายงานเหตุการณ์ไม่พึงประสงค์แล้ว จะมีหนังสือแจ้งไปยังผู้วิจัย โดยระบุวันที่พิจารณา

4) หากผู้วิจัยดำเนินการวิจัยเสร็จสิ้นภายใน 1 ปี ขอให้ผู้วิจัยดำเนินการส่งรายงานความก้าวหน้าของโครงการวิจัยตามแบบฟอร์ม "แบบติดตามผลการดำเนินการวิจัยประจำปี" มายังสำนักงานคณะกรรมการจริยธรรมฯ หลังจากสำนักงานคณะกรรมการจริยธรรมฯ ได้รับรายงานแล้ว จะมีหนังสือตอบรับการรายงานโครงการวิจัยและแจ้งปิดโครงการมายังผู้วิจัย

5) ในกรณีที่โครงการวิจัยของผู้วิจัย มีระยะเวลานานกว่า 1 ปี ผู้วิจัยจะต้องส่งรายงานความก้าวหน้าของโครงการวิจัยตามแบบฟอร์ม "แบบติดตามผลการดำเนินการวิจัยประจำปี" เพื่อขออายุโครงการวิจัย มายังสำนักงานคณะกรรมการจริยธรรมฯ หลังจากสำนักงานคณะกรรมการจริยธรรมฯ ได้รับรายงานแล้ว จะมีหนังสือตอบรับการรายงานโครงการวิจัยและต่ออายุโครงการมายังผู้วิจัย (**ทั้งนี้ตามประกาศคณะสังคมศาสตร์และมนุษยศาสตร์ มหาวิทยาลัยมหิดลเรื่อง หลักเกณฑ์และอัตราการเก็บค่าธรรมเนียมการพิจารณาโครงการวิจัยเสนอขอรับการรับรองจริยธรรมการวิจัยในคน ของคณะกรรมการจริยธรรมการวิจัยในคน สาขาสังคมศาสตร์ มหาวิทยาลัยมหิดล (MU-SSIRB) พ.ศ. 2557 ลงวันที่ 17 พฤศจิกายน 2557 ข้อ 1.2 (1) การต่ออายุการรับรองโครงการวิจัย เก็บค่าธรรมเนียมการพิจารณาฯ จำนวน 1,000 บาท**)

This research project had been certified by MU-SSIRB.

Research methodology was as follows:

1) The researcher had to use the copies of Participant Information Sheet and Informed Consent Form with the seal of MU-SSIRB for research project participants only.

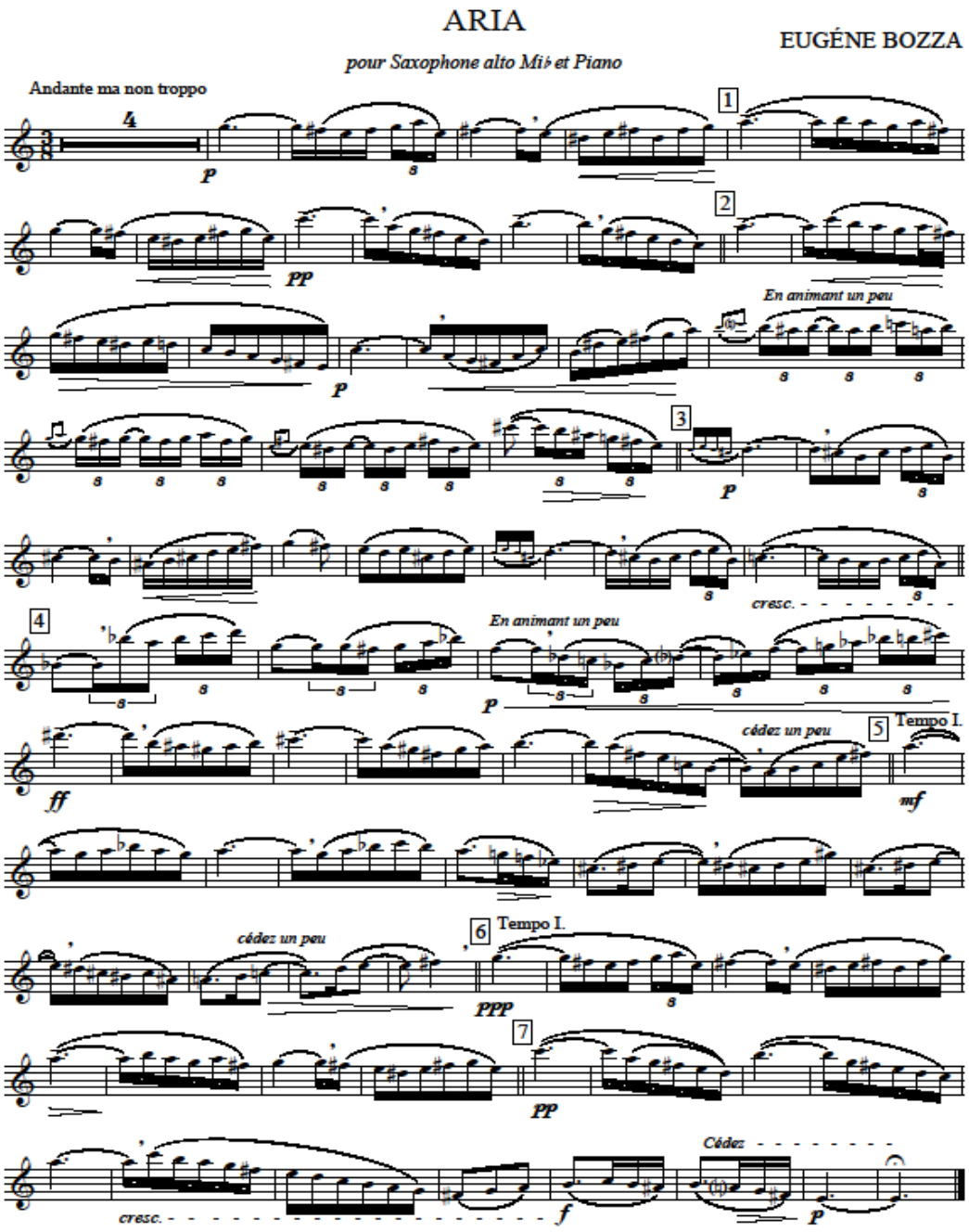
2) If the researcher wanted to amend some details of the research project, the researcher had to inform MU-SSIRB by completing the Protocol Amendment Form for consideration and certification before beginning doing the research. After considering and certifying, MU-SSIRB would send the researcher an acceptance letter with date of consideration and certification. After that, the researcher was able to begin doing the research.

3) If research participants severely faced an adverse event and an unexpected event, the researcher had to report this issue to MU-SSIRB by completing the Adverse Event Report Form or send MU-SSIRB the report copy sent to scholarship givers. After considering the adverse event report, MU-SSIRB would send the researcher a letter with consideration date.

4) If the researcher completely did the research within a year, the researcher had to send MU-SSIRB the research project progress report called "Annual Research Report Form". After receiving the report, MU-SSIRB would send the researcher an acceptance letter with closure of the project.

5) If the research project was done for more than a year, the researcher had to send MU-SSIRB the research project progress report called "Annual Research Report Form for renewal of the research project. After receiving the report, MU-SSIRB would send the researcher the acceptance letter with renewal of the research project (**according to The Announcement of The Faculty of Social Sciences and Humanities, Mahidol University on Fee Collection Criteria and Rate for Consideration of the Research Project Requesting Research Ethics Certification of MU-SSIRB, 2014 dated 17th November 2014, Article 1.2 (1) renewal of certification of research project having to pay fees at the amount of 1,000 baht **).

APPENDIX D
MUSIC SCORES FOR PLAYING



APPENDIX E
GUIDELINES FOR MUSIC INSTRUCTION

Class / Week	Exercises 30 Min.	Piece development 30 Min.
1	**Intonation**: Long tone with tuner C Major scales JML page 8 D Major thirds 1 Orientation / Broken 3rd tuning **Assignment:** The first week is basic training, the main training students' listening comprehension and the correct position of embouchure controlling	Unit 1 <<Aria >> Teacher demonstrate part 1 and 2, the dynamic should be soft and being control
2	**Intonation**: Accuracy long tone with electric tuner pitch of F and D Major scales The tone quality has to be in tune, when the students play the pitch has to in the main. Broken 3rd tuning JML page 8 D Major thirds 2 **Assignment**: Mainly review the knowledge learned last week, the second week, the correct control	Unit2 <<Aria>> Listen part 1.2 about chromatic scale park have to looking care for.

Class / Week	Exercises 30 Min.	Piece development 30 Min.
3	**Intonation**: long tone JML page 8 D Major thirds 3 **Assignment**: The Embouchure controlling, the mouth lip should not be too tight, making softly. When plays any note have to using the ear much done mouth.	Unit3<<Aria>>part 3-4 *Part 4 the high D# have in tune Using the air sport , play low D# first and then play high D# repeat and repeat
4	**Intonation**: Long tone with tuner Broken 3rd tuning JML page 9 Minor thirds 1 **Assignment**: About the listening, when the student playing can't find the pitch have to sing with the tuner	Unit4<<Aria>> Play part 1-4 making the music smooth.
5	**Intonation**: JML page 9 Minor thirds 1-2Play long **Assignment**: This week the technique is hard than before, the exercise tone we use **No** tuner, Try to find the pitch .intensify students practice use ear sing first.	Unit5<<Aria>> Play part 5-6 the quartet note have in tune play with piano

Class / Week	Exercises 30 Min.	Piece development 30 Min.
6	**Intonation** : JML page 9 Minor thirds 1-2-3 **Assignment**: This Minor practice about our ear, The tone quality mast be smooth, the music note longer than last week, let students try to using in one breath.	Unit6<< Aria>> Play 1-7 part play all create
7	**Intonation**: review page 8-9 **Assignment**: In this week we are have to review about all we learn before, about the intonation technique and exercise let students in this study method can quickly mastery some idea for they are practice. And look at the piano score, Listening to the piano park and saxophone of harmony	Unit7<<Aria>> Play with piano again
8	**Last week for general review** **Assignment**: This is last week for teach; Today have to let students play all things in individual. Show them about they are log book, let them know how they change.	Unit8<<Aria>> play in the master class to show us using JML idea can help us good at intonation

BIOGRAPHY

NAME	Miss Xu Zhang
DATE OF BIRTH	09 February 1990
PLACE OF BIRTH	Liaoning, China
INSTITUTIONS ATTENDED	Mahidol University, 2009-2013 Bachelor of Music Mahidol University, 2013-2015 Master of Arts (Music)
HOME ADDRESS	College of Music, Mahidol University Salaya Campus 25/25 Phutthamonthon Sai 4 Road Salaya,Phutthamonthon Nakhonpathom, 73170 Thailand Tel. 0839905254 Email : 674308739@qq.com