

# **The Lesson Plan for Equalizer Mixing Method for Popular Music Standard Band at Sichuan Conservatory of Music, China**

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## **Abstracts**

The purposes of this research were: (1) To study the equalizer mixing teaching method. (2) To construct the lesson plan for the equalizer mixing method. (3) To evaluate the lesson plan. The hypothesis is: (1) Verify the effectiveness of the experimental lesson plan. (2) The ratio of comprehensive evaluation results greater than 7 points shall be at least 60%.

Quantitative and experimental research are adopted in this study. The population was 12 third-year undergraduate students majoring in modern music production. The sample is 25 third-year undergraduate students majoring in modern music production of Sichuan Conservatory of Music, Chendu, Sichuan Province, China. Sampling method: Systematic sampling. The research tools are (1) a Lesson plan; (2) Practical exercises; (3) Sample evaluation and analysis. The data analysis used in this research is the percentage and mean.

The research results were: (1) Through the studying and teaching of equalizer theory, students' understanding of equalizer principles and parameters has been deepened, and their ability to use equalizers has been effectively improved. (2) The researcher constructed a 10-week lesson plan divided into four main stages. At the last stage of the lesson plan, the expert group gave the evaluation results and obtained complete evaluation data for the researcher to analyze the data. (3) Through the research of this experimental course, the proportion of samples with an evaluation result of >7 points is higher than 60%, and the proportion of samples with an actual result of >7 points is as high as 83.3%, 23.3% higher than the expected goal. At the same time, the evaluation result shows that the proportion of samples with an evaluation result of >8 points is also 50%.

**Keywords:** Equalizer; Equalizer mixing method; Equalizer lesson plan

## **Introduction**

Modern music work includes lyrics and melody creation, arrangement production, recording production, mixing, and master tape processing. Any link plays a vital role in the quality of the music work; Gibson, D. (1997 : 5) .Especially in the mixing stage, the mixing engineer needs to reasonably integrate all music materials to give the work a good sense of balance, dynamics, and space. The final quality of work is inseparable from excellent mixing production. In the mixing process, the equalizer is a very important tool that can play a very important role in the frequency adjustment and tone color shaping of sound materials. At the same time, with the rapid development of digital technology, especially computer music production technology, the music production and mixing mode under the traditional industrialization mode has undergone earth-shaking changes. Today, with the prevalence of digital technology, the music production mode can become more personalized and independent without relying on the mode of the traditional singing company. The mixing

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processing will also become more digital and integrated, especially for students majoring in music production. It is a very important skill to quickly and accurately grasp the principle and use of equalizers and to use them to complete the mixing processing of work.

Through checking the engineering documents of some mixing, it is found that they have many problems in the use of equalizers, lack of understanding of equalizer-related knowledge, insufficient grasp of the useful skills of equalizers in different musical instruments, too much attention to the timbre personality of monorail sound materials and neglect the overall balance. In brief, most students have unreasonable frequency adjustments in their mixing works. That is, they do not have a comprehensive understanding and use of the equalizer and lack a comprehensive and clear grasp of the equalizer principle and use skills, which directly leads to their problems in the mixing process. Mastering and using the equalizer well is an important key to opening and entering the subject of mixing. Whether the equalizer is reasonably used directly affects the final listening sensation of the mixed music works in frequency. Therefore, the researcher creates an experimental teaching plan for students' problems in the use of equalizers in mixing pop music standard bands to help students understand the basic principles and main types of equalizers more comprehensively. Improve students' ability to use equalizers in actual mixing.

#### **Basic concept of mixing**

Izhaki, R. (2008 : 5-263) has a basic definition of mixing: it is a kind of processing of multi-channel sound materials formed by completed recording, sampling, or synthesis. These multi-channel materials are balanced and adjusted into multi-channel finished products. More importantly, Mixing is a sound display of musical emotion, innovative ideas, and performance.

Gibson, D. (1997 : 5) also mentioned that the quality of a musical work is affected by these eleven factors: concept, melody, rhythm, harmony, lyrics, arrangement, instrumentation, song structure, performance, quality of the equipment/recording, the mix. They must at least guarantee good basic quality in every aspect. This musical work's quality will improve if one aspect is done well. He also pointed out that Mixing is only one of these eleven aspects, but it is the most important aspect because it can hide some bad shortcomings and show the best aspects. Mixing is also a work of sublimation, and one of the important principles is to make the best use of the advantages and bypass the disadvantages.

Moylan, W. (2006 : 4), Huber, D. M., & Runstein, R. (2010 : 5) have defined mixing. After the author's collation and summary: Mixing is processing all completed music materials (mainly audio materials). In this process, mixing engineers need to process the sound materials of each track scientifically and artistically (also can be considered as rational and perceptual creation), It mainly includes frequency processing, dynamic balance processing, timbre processing, and spatial sense processing of audio materials. In all processing processes, mixing engineers need to pay attention to the balance control of sound materials so that all sound materials have good timbre, reasonable spatial sense, and three-dimensional sense in the final rendered music. Mixing engineers need to have strong comprehensive knowledge and practical ability. Therefore, to become an excellent mixing engineer, we need to master a lot of music theory knowledge, acoustic knowledge, effector use knowledge, and practical ability. We also need to establish a good artistic appreciation and music aesthetic ability. As Izhaki, R. (2008 : 5-263) mentioned, mixing can achieve or destroy a record. Mixing is an important catalyst to improve the quality of music works. Mixing engineers should strengthen the noumenon of music as much as possible, improve the emotion of works and the emotion it conveys so that the charm of music works can be

fully displayed.

### **Main role of equalizer in mixing**

Izhaki, R. (2008 : 5-263) proposed that the main role of an equalizer in mixing mainly includes 14 aspects:

1. Balanced frequency spectrum
2. Shaping the presentation and timbre of instruments, Separation, Definition
3. Conveying feelings and mood
4. Creative use
5. Interest
6. Depth enhancements
7. More realistic effects
8. Stereo enhancements
9. Fine level adjustments
10. Better control over dynamic processors
11. Removing unwanted content
12. Compensating for a bad recording

Using an equalizer to achieve spectrum balance in mixing is very important. This defect is easily detected if a mix is not handled well in frequency balance, which will also directly affect the listening sense of the work. Therefore, the main function of the equalizer is also to correct the frequencies that are too abrupt in the sense of hearing or to supplement the missing frequencies in part of the sound to achieve frequency balance. Reasonable use of the equalizer can also shape the timbre of the sound material, retain the important fundamental frequencies and harmonics in the sound material, and remove the redundant frequency bands that do not belong to the sound. By increasing or attenuating the frequency, the sound's brightness, fullness, and clarity can be increased, and the expressiveness of the sound can be improved.

It is also very important to use descriptive terms to deal with the relevant feelings brought by different frequencies. This can be achieved by using the equalizer to deal with the sound in the actual mixing through intuitive auditory feelings.

### **Research Objectives**

1. To study the equalizer mixing teaching method.
2. To construct the lesson plan for equalizer mixing method.
3. To evaluate the lesson plan.

### **Research Methodology**

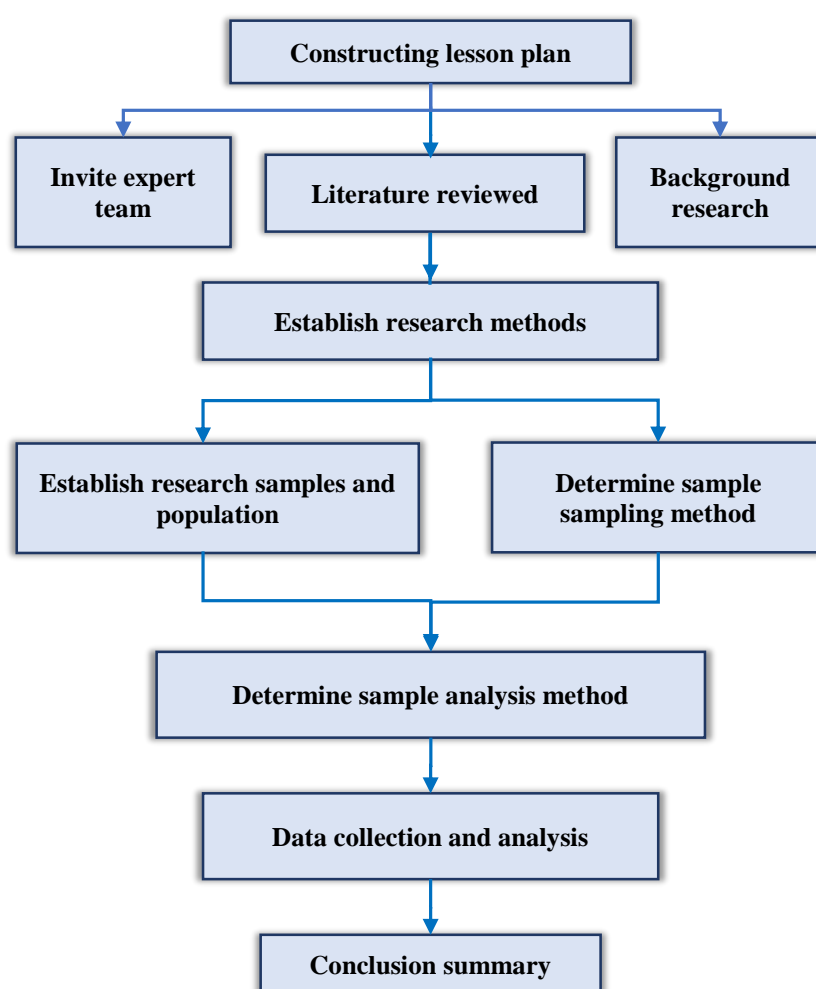
This research adopted the methods of quantitative research. Taking the 12 third-year undergraduate students majoring in modern music production of Sichuan Conservatory of Music of China as the sample group, this thesis summarizes and analyzes the students' learning results through practical teaching and case analysis.

## Research Scope

The scope of this thesis is mainly divided into the following points

1. Expound the basic use method and skill of equalizer.
2. Expound the methods and skills of mixing popular music works in the form of standard band.
3. Evaluate students' application of equalizer in the mixing of popular music works in the form of standard bands through practical teaching.

## Conceptual Framework



**Figure 1** Conceptual framework for research

## Research Results

### Study the equalizer mixing teaching method

Through the systematic study of equalizer knowledge and various parameters, as well as the use of methods and skills of equalizer in mixing, students can have a deeper understanding and cognition of equalizers. At the same time, combined with the demonstration operation in the actual teaching, it greatly improves the students' skills in using the equalizer in the actual mixing.

### Construct for lesson plan for equalizer mixing method

The researchers constructed a summary of this lesson plan, mainly including the following contents:

- 1) Learn equalizer theory.
- 2) Invite experts to form an evaluation expert group.
- 3) Constructing a lesson plan.
- 4) Teach the principle and main parameters of equalizer.
- 5) Teach the use skills of equalizer in mixing.
- 6) Guide students to practice.
- 7) Students submit practical exercises.
- 8) The expert group evaluate the works.
- 9) Data collation and analysis of expert group assessment results.

### Evaluate the lesson plan

This research concludes that the evaluation results of this experimental course can achieve the expected objectives of the evaluation committee. The expected goal of the expert group for this experiment course is at least 60% of the samples whose score is more than 7 points. The actual result is more than 7 points, accounting for 83.3% of the samples, 23.3% higher than the expected goal. At the same time, the evaluation results show that the proportion of samples whose score is more than 8 points is 50%. On this basis, it can fully prove the effectiveness of this study.

## Discussion

Focusing on the research purpose of this paper, the lesson plan created this time has significantly improved and achieved remarkable results in the use of equalizer by students in mixing, mainly reflected in the following aspects:

### Study the equalizer mixing teaching method

Through the study and collation of the literature, the researchers found that the systematic learning of equalizer principles and main parameters has a positive and important significance for the rational use of equalizers. The researchers detailed the parameters of common types of equalizers in the form of pictures and words by consulting the official user manuals of mainstream digital equalizer plug-in brands such as Avid, Waves, Sonnox Oxford, and Fabfilter. It is hoped that students can accurately understand the role of various parameters in the equalizer and provide clear theoretical knowledge for students to master and use it. At the same time, Izhaki, R. (2008 : 5-263), Bartlett, B. (2012 : 137-144) and Huber, D. M., & Runstein, R. (2010 : 5) have also explained the types and use methods of equalizers in their related works, which can effectively help to mix engineers to master the basic use methods of equalizers quickly. This study has also learned a lot of experience from the above literature, providing strong theoretical support for the teaching of equalizers in

mixing.

V Välimäki, & Reiss, J. D. (2016 : 1-26). Audio equalization is a vast and active research area. The extent of research means that one often needs help identifying the preferred technique for a particular problem. His thesis systemically provides a deep understanding of the problems and approaches in audio equalization, their relative merits, and applications. Digital signal processing techniques for modifying the spectral balance in audio signals and applications of these techniques are reviewed, ranging from classic equalizers to emerging designs based on new advances in signal processing and machine learning. Audio mixing is a highly cross-adaptive transformation since the processing of an individual track depends on the content of all tracks involved. Multitrack audio mixing is also an extremely important part of music production.

An essential component of music production, mixing remains an esoteric matter with few established best practices. Research on the topic is challenged by a need for more suitable datasets and consists primarily of controlled studies focusing on a single type of signal processing. However, in isolation, one of these processes needs to pay more attention to the multidimensional nature of mixing. For this reason, this work presents an analysis and evaluation of real-life mixes, demonstrating that it is a viable and necessary approach to learning more about how they are created and perceived.

Therefore, there is no fixed standard for mixing. The quality of mixing works depends on the mixing engineers' mastery of theoretical knowledge and aesthetic understanding of art. The same work is different after mixing by different mixing engineers, but a bad mix is easy to identify. Mixing has always been a work combining art and technology. It is necessary to constantly improve the artistic aesthetic ability and master the theoretical knowledge of equalizers for rational use in future mixing.

### **Construct for lesson plan for equalizer mixing method**

This lesson plan is in the form of practical experimental courses. The researchers divide the teaching plan into four chapters in a step-by-step manner, mainly including the following four chapters: introduction to the basic principles and main parameters of the equalizer, introduction to the use methods and processing skills of equalizer in mixing, and students independently complete the mixing practice of the designated works using an equalizer. The expert group made a comprehensive evaluation of the mixed works submitted by the students. The creation of such a teaching plan is also inspired by Izhaki, R. (2008 : 5-263), Huber, D. M, & Runstein, R. (2010 : 5), and other teaching methods that divide knowledge points into chapters. It is a progressive process from theoretical explanation to practical operation. The experimental results show that this step-by-step teaching method is reliable and effective.

### **Evaluate the lesson plan**

This research takes quantitative research as the main method. An expert evaluation committee composed of three experts objectively evaluates the works submitted by students. The evaluation method is the percentage and mean analysis. This can effectively reflect the scientific and effectiveness of the evaluation and avoid the deviation of the evaluation results caused by the evaluation differences. This evaluation also fully reflects the reliability of this method and can more comprehensively reflect the accuracy and objectivity of the evaluation results.

## Recommendation

### Theoretical Recommendation

This study's lesson plan and practical case evaluation analysis method can be used as teaching samples of equalizers in popular music standard band mixing. Other teachers can directly use the design of this teaching course or provide a reference for the equalizer in mixing teaching. This lesson plan is applicable to students of music production majors who have a certain mixing foundation. It can also help students with a certain foundation learn equalizer.

### Practical Recommendations

In this study, the allocation of lesson periods in the curriculum plan is only a basic suggestion. In actual teaching, teachers need to make appropriate adjustments according to the different qualities of students and teaching content.

This study's series of tests and evaluation analysis methods can be used as a reference for courses of the same teaching type. Still, they cannot be mechanically applied to all mixing teaching courses.

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