





A Study on the Role and Practice Model of Vocal Music Teaching in College Students' Mental Health in the Context of Embedded Computer Network Systems

Lu Wang^{1*}  and Jianchao Wang² 

¹Music Academy Music Academy, Henan polytechnic, ZhengZhou, 450046, China
19010@hnzj.edu.cn

²Luoyang Normal University Conservatory of Music, Luoyang, 471934, China
wangjianchao1981@163.com

Corresponding author: Lu Wang, 19010@hnzj.edu.cn

Abstract. The Internet world takes information technology as the axis, so as to carry out related things. It affects our life mode, work mode, education mode and other aspects, and is accompanied by us to explore the mysteries of the unknown field. The development of information technology and the scope of information application are growing at an unexpected rate. This also requires us to adapt to new changes and new models. This research compares the teaching effect of the mental health course without background music aesthetics by comparing the psychological quality level, classroom subjective experience and objective materials of college students before and after the implementation of the mental health course. Analysis of the data shows that the method in this paper has a certain accuracy, and its efficiency is 7.77% higher than that of the traditional model. The above results show that the integration of background music aesthetics into the mental health course can improve college students' level of involvement in the classroom, a relaxed state of mind, a positive and pleasant psychological atmosphere, improve their satisfaction with the classroom, and better internalize the teacher's leadership. Students in a mental health classroom with music performed better in classroom objective behavior than students in a traditional mental health classroom.

Key words: mental health course, teaching effect, computer, vocal music teaching

DOI: <https://doi.org/10.14733/cadaps.2024.S8.166-179>

1 INTRODUCTION

Mental health is the foundation of talent quality. Only with mental health can college students' morality, intelligence, physique and beauty be fully developed. Only mental health can cultivate

college students' practical ability and innovative spirit. College students are the future of the country and the hope of the nation. It is the primary task of college education to cultivate them into high-quality talents with healthy body and mind, which requires us to attach importance to the development and research of mental health education in colleges and universities[16]. In recent years, the rapid development of computer and network technology has exerted a lot of new influences on college students' mental health. College students can share high-quality resources on the Internet, obtain information more conveniently, and communicate with each other more conveniently. However, while the Internet brings great convenience to college students' study and life, it also has a lot of negative influences on college students' mental health. Many college students don't know how to restrain and control themselves when surfing the Internet, and they are addicted to the illusory world of the Internet, so they can't extricate themselves, and suffer from network dependence and network[14].

The unique psychological characteristics of college students in this period make them have a particularly sharp perception, so they are also easy to accept new things. Therefore, using music education is easier for college students to accept than traditional simple theoretical preaching, and its role is also easier to show. In college mental health education, the use of music education plays a very important role in solving college students' psychological problems, and also has high theoretical research value for music psychology and psychiatry[9]. Music is of great significance to regulate college students' emotions, relieve pressure, cultivate sentiment and improve their personality the integration of Embedded Systems can enhance the effectiveness of music education for college students. By incorporating interactive devices and software applications into music instruction, educators can create immersive learning experiences that resonate with the unique psychological characteristics of college students.

With the rapid development of computer networks in China and the great increase of the number of Internet users in China, the influence of information transmitted by computer networks on people's psychological health, especially college students, is growing continuously[11]. The influence of the network on their psychology is extremely complex, with both positive and negative influences that cannot be ignored[1]. The purpose of this study is to analyze the influence of the network environment on college students' psychology and mental health education work, combine the successful experience of vocal music teaching, explore the ideas of college students' mental health education in the network environment, and propose measures to implement network-based education for college students' mental health[13]. The innovations are:

(1) On the basis of summarizing the experience and lessons of traditional college students' mental health education and the practical experience of online education, this paper tries to carry out the theoretical analysis of college students' mental health work in the network environment, and try to combine the actual situation to discuss how to use the network effectively and effectively. Carry out the mental health education of college students in the new era.

(2) Through the long-term observation and recording of vocal music video teaching with research purposes, research outlines and research plans through the observation method, the teaching mode, teaching group, and teaching process are different from offline vocal music courses.

In order to reflect the role of music in college students' mental health education, the structure is as follows: The first chapter is the introduction. This part mainly expounds the role of vocal music teaching in college students' mental health under the background of computer network, the research background and significance of practical model, and puts forward the research purpose, methods and innovation of this paper. The second chapter is a summary of relevant literature, summarizing its advantages and disadvantages, and putting forward the research ideas of this paper. The third chapter is the method part, focusing on the role and practice of combining computer network with vocal music teaching. The fourth chapter is the experimental analysis. In this part, experiments are

carried out on data sets to analyze the performance of the model. Chapter five, conclusion and prospect. This part mainly reviews the main contents and results of this research, summarizes the research conclusions and points out the direction of further research.

2 RELATED WORK

Clement S proposed that mental health should be classified according to the level of happiness felt by individuals, and this level should be able to go from a lower state of happiness to a moderate state, and then to a continuous state of the most energetic and higher state [6]. Beronio K proposed that mental health includes three aspects, namely emotional, psychological and social well-being [3]. Through the statistics and analysis of the questionnaire results, Young K S found that 20% of the people will have "Internet addiction" in the network environment, they need to surf the Internet every day, and it is difficult to break away from the network environment [21]. BrennerV separates the concept of Internet mental health from the concept of Internet-based mental disorder and studies it as an independent concept. However, its definition of Internet mental health is still based on the traditional concept of mental health, and does not grasp the concept of Internet mental health. The core point of the environment [4]. SmithKline believes that the study of college students' network psychology should be carried out from three aspects: rational analysis, network behavior and related characteristics. Ren Jie took Guangzhou college students as the research object, and used the questionnaire survey method to investigate the behavior and psychological status of Guangzhou college students in the network environment. He believes that the network environment has a significant impact on the psychology of college students. Condition effects are particularly meditative [18]. Qi Yinxia compiled the "Internet Psychological Questionnaire for College Students" [15], taking the interpersonal relationships, psychological pressure, adaptability, depression state, anxiety self-assessment, and psychological age as the main indicators. The classic definition given by Alexander is that each pattern describes a problem that is constantly emerging in our environment, and then describes the core of the solution to that problem. In this way, you can use those existing solutions countless times without repeating the same work [19]. Bunni.Tobias believes that putting online student netizens' psychological status and academic performance is actually an "educational accountability system" [5]. Howard. Creely said that since he started to implement online transcripts, students are very concerned about their grades, and the meeting between teachers and parents is also very different from before, shortening the distance and saving time [10]. John Suler introduces this psychological experience, the frustration and anger that people experience, the lack of response to information, and also opens a door for people to absorb their various troubles and worries in the cyberspace where there is no response to them. A black hole psychological experience called cyberspace [12].

In the main mechanism of college students, the second signal system controls and dominates the first signal system, which is also the result of the regulation of consciousness to emotion, showing the implicit characteristics of rational concealment of the real feelings in the inner world. In short, music is an effective way for college students to release their emotions. As we all know, repressed emotions must be released. Only through music appreciation, repressed emotions will turn into a calm state, which is also necessary for health. Using statistical methods, this paper points out the proportion and severity of College Students' mental health; Using sociological investigation methods, this paper clarifies the root causes of College Students' mental health; Using pedagogical methods, this paper points out the shortcomings of modern college students' mental health education; Using the concept of art and art pedagogy and the method of comparative education to sort out the internal relationship between music and mental health education; Based on the principles of health care therapeutics, this paper puts forward specific measures for mental health education and self-education with music.

3 METHODOLOGY

3.1 Image Feature Extraction

The ordered combination of multiple frames of images forms video information. Feature extraction of images is the process of studying how to obtain effective information and data from images and obtain digital image representation. Features are these digital information extracted from the image. With these vector or symbolic style features, it is possible for the computer to learn and recognize these features and achieve accurate recognition and classification of images [8].

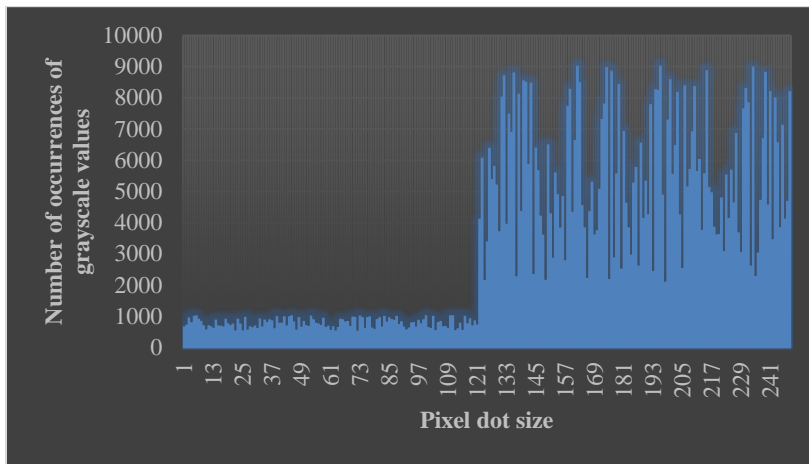


Figure 1: Grayscale Histogram.

Each pixel in the grayscale image has its own grayscale value. In Figure 1, the abscissa represents the size of the grayscale value of the pixel, and the number of times the grayscale value appears in the image is represented by the ordinate. In an image, the level of gray value reflects the intensity of the image. The main means of identifying the human body or object in the image is to obtain the gradient of the image, and the essence of the gradient is the edge. We generally convert the color image to a grayscale image first, and then calculate the gradient value of the grayscale image. On the other hand, the color in the image is easily affected by the light intensity and angle, so converting the original image into a grayscale image can extract image features more accurately and efficiently. After the feature information of the image is extracted, the information can be used for image recognition. Image recognition can be understood as the process of classifying images. We often need to extract unique features in images to reflect the difference from other images, so as to classify images. Therefore, the image features should not only reflect the unique information of this image, but also be able to distinguish the difference from other images according to this feature, so as to achieve the purpose of image classification. At the same time, the criterion for judging whether an image feature is qualified is whether the feature has a smaller degree of discrimination in image groups of similar categories. On the contrary, the degree of discrimination in image groups of different categories should be as large as possible.

3.2 Speech Feature Extraction

Speech features mainly include the following categories: mel-frequency cepstral coefficients (MFCC), linear prediction coefficient (LPC) and perceived linear prediction parameter (PLP). Usually, impulse response filter is used to preprocess the original speech information, frame the audio, and then

optimize it by windowing function. As a window function, the band-pass filter can balance each frame of speech and make the audio curve relatively smooth. Hamming window is the most widely used window function at present. It improves the sharpness of sound waves, makes speech signals more continuous and smooth, and reduces the spectral distortion caused by speech overlap. Recognition of words in uninterrupted speech signals is one of the original uses of mel-frequency cepstral coefficients. Mel-frequency cepstral coefficients accomplishes the task of speech recognition by simulating the principle of human hearing. The human ear is very sensitive to the change of critical bandwidth. A speech contains a variety of tones, and the frequencies corresponding to different tones are different. Nonlinear transformation can reflect the conversion relationship between frequency and MFCC, and the conversion calculation between them is shown in Formula 1, where f represents linear spectrum:

$$Mel(f) = 2595 * \lg(1 + f / 700) \quad (1)$$

3.3 Basic Bp Algorithm Formula Derivation

The basic BP network algorithm contains two propagation directions: forward propagation of the input signal and backward propagation of the output error, which means that the calculation of the actual network output is carried out in the direction from input to output, but the correction of the weights and thresholds of the network layers is carried out in the reverse direction from output to input, as shown in Figure 2.

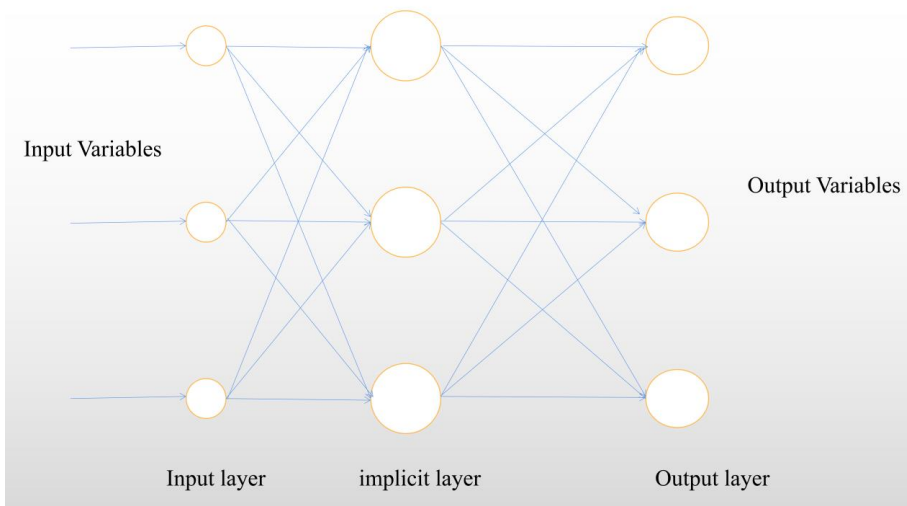


Figure 2: BP Neural Network Structure.

Forward propagation process of the input signal:

The input net_i of the i th node of the implicit layer of the network:

$$net_i = \sum_{j=1}^M w_{ij} x_j + \theta_i \quad (2)$$

The input y_i of the i th node of the implicit layer of the network :

$$y_i = \phi(net_i) = \phi\left(\sum_{j=1}^M w_{ij}x_j + \theta_i\right) \quad (3)$$

The input net_k of the k th node of the implicit layer of the network:

$$net_k = \sum_{i=1}^q w_{ki}y_i + a_k = \sum_{i=1}^q w_{ki}\phi\left(\sum_{j=1}^M w_{ij}x_j + \theta_i\right) + a_k \quad (4)$$

The input o_k of the k th node of the implicit layer of the network. :

$$o_k = \Psi(net_k) = \Psi\left(\sum_{i=1}^q w_{ki}\phi\left(\sum_{j=1}^M w_{ij}x_j + \theta_i\right) + a_k\right) \quad (5)$$

3.4 Voice Mfcc Parameters Calculation

The calculation process of MFCC parameters is shown in Figure 3.

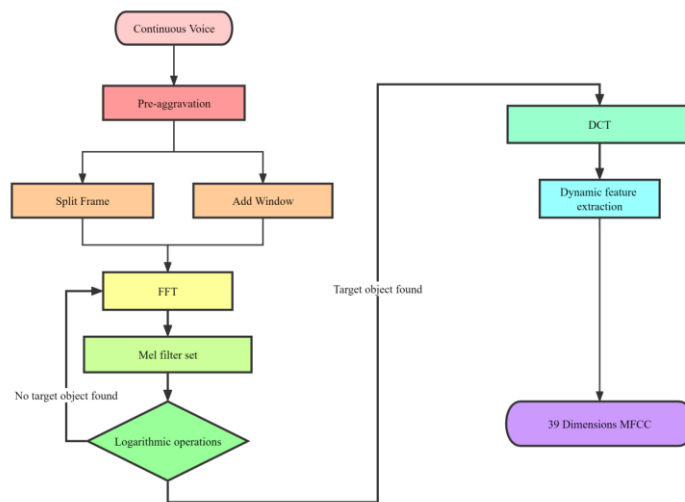


Figure 3: MFCC Flow Chart.

Firstly, the high-frequency signal in the speech is amplified by the method of pre-emphasis. Since the amplitude of the high frequency signal in audio is smaller than that of the low frequency, the pre-emphasis method is used to make the spectral signal more balanced. The calculation method of the pre-emphasis is shown in (6).

$$y(t) = x(t) - ax(t-1) \quad (6)$$

Divide the signal into 20-40ms frames, usually 25ms. If the sampling frequency of the speech signal is 16kHz, there are $16,000 * 25/1000 = 400$ sample points in a frame. Usually, we will make adjacent frames have overlapping parts, and we will move 10ms (instead of 25ms) each time, which means that the overlapping samples of adjacent frames are $(25-10)/1000*16000=240$. Thus, the first frame is the first 400 sample points, and the second frame is the 160th to 560th sample points. If the last frame is not enough for 400 sample points, we usually add 0 at the back. DFT each frame signal:

$$S_i(k) = \sum_{n=1}^N s_i(n)h(n)e^{-j2\pi n / N} \quad (7)$$

Where $h(n)$ is an N-point window function (such as Hamming window), and K is the length of the DFT. With $S_i(k)$ we can estimate the power spectrum:

$$P_i(k) = \frac{1}{N} |S_i(k)|^2 \quad (8)$$

3.5 The Interaction Between Vocal Music Teachers and Computers

As a computer operator, he should have a deep understanding of the characteristics of the computer, structure, create and make his own works or teaching courseware according to the characteristics of the computer. For example, you can use the advantages of computers to structure courseware or works and organize details. The work or courseware is mainly composed of nine elements structured according to different principles, such as pitch, intensity mode, time value and position. The basic elements that operate according to different rules constitute new rules and new elements, and all these dynamically changing elements that move according to different levels of rules constitute a complex world. Only when the computer accurately "plays" can each music element adhere to its own rules. In the process of presenting each music element according to its own rules, a rich and colorful sound image has been formed: suddenly there is melody, suddenly there is harmony, and the form of rhythm has changed thousands of times; Suddenly, movies, animations and other images appear. The interaction between vocal music teachers and computers must follow these rules and realize "long-term interaction" on the basis of Science [17]. According to the principle of passive acceptance and interaction between music and students, everyone may hear different music. In reality, each of us has a different understanding of the world? The surface soil looks chaotic, but in fact, there are strict rules hidden inside. It will convey all the information in the classroom to the vocal music teachers in time and accurately, and the teachers can adjust their teaching in time, and also feed back the new information to the computer, so as to continue the cycle. If we don't understand and make use of the characteristics of computer, and don't interact with the characteristics of computer in teaching, then the digital teaching of vocal music and all this it expresses can't be talked about [2].

To strengthen the interaction between the technical form of computer a music, to give more and richer' colors to the digital vocal teaching, to emphasize the interaction between the humanistic aspects of computer music, especially the interaction between the curriculum, vocal training, vocal performance or lesson production and the characteristics of the computer, Diao' can make the establishment of new aesthetic principles of computer music becomes possible. Computer music production technology and multimedia systems are the result of technological development and indispensable technical and hardware support for a digital vocal teaching environment [7].

Computer music production technology refers to the technology of editing and organizing music information using relevant hardware and software. The multimedia system includes a computer wooden body and external devices such as: sound card, synthesizer (or MID worker keyboard), audio production software, sound source, mixer, digital recorder and MID worker connection cable, projector, etc. The computer can be derived from the sound source information to be properly processed and converted into digital information into hard disk, and then use the production software for each track of music for rhythm, melody, timbre, image level, reverb, delay and other aspects of the editing process, again and again through the sound source, mixer, digital recorder will be digital information into sound information recorded to tape or CD and other sound carriers.

4 RESULT ANALYSIS AND DISCUSSION

4.1 Pre- and Post-Test Results and Analysis of Mental Health Level

This experiment is a pre- and post-experimental design with a fixed group. The independent variables are: music appreciation and background music, and the dependent variables are the teaching effect of the mental health course, that is, the development level of college students' psychological quality and the subjective experience of the classroom. In this study, by adding aesthetic appreciation of background music to traditional mental health courses, it can improve the teaching effect of music mental health courses, and improve the psychological quality of college students and their subjective experience in mental health classrooms.

This study adopts a combination of quantitative research and qualitative research. On the one hand, a standardized scale is used; and so on. In the academic world, the reliability of qualitative research is generally not discussed at present, but the validity is guaranteed by the selection and control of research objects and the standardization of the research process.

| Factors | Mean | | | F-Value | P - Value |
|-----------------------------|-------------------|--------------------|-------------|---------|-----------|
| | Unselected groups | Traditional groups | Music Group | | |
| Somatization | 1.88 | 1.64 | 1.65 | 1.29 | 0.6 |
| Interpersonal relationships | 1.83 | 1.97 | 1.44 | 1.22 | 0.23 |
| Depression | 1.9 | 1.5 | 1.53 | 0.8 | 0.99 |
| Anxiety | 1.98 | 1.52 | 1.99 | 0.4 | 0.57 |
| Hostility | 1.67 | 1.68 | 1.71 | 1.95 | 0.29 |
| Psychotic | 1.88 | 1.9 | 1.74 | 1.01 | 0.78 |

Table 1: Difference Test of Unselected Group, Traditional Group and Music Group on Pretest.

First, at the beginning of the course, we administered the SCL-90 pre-test to the experimental class and the control class, and the results, as shown in Table 1, showed that there was no significant difference ($P>0.05$) in the pre-test of each factor of the scl-90 in all three groups, indicating that there was no significant difference in the pre-experimental psychological well-being between the unselected, traditional and music groups.

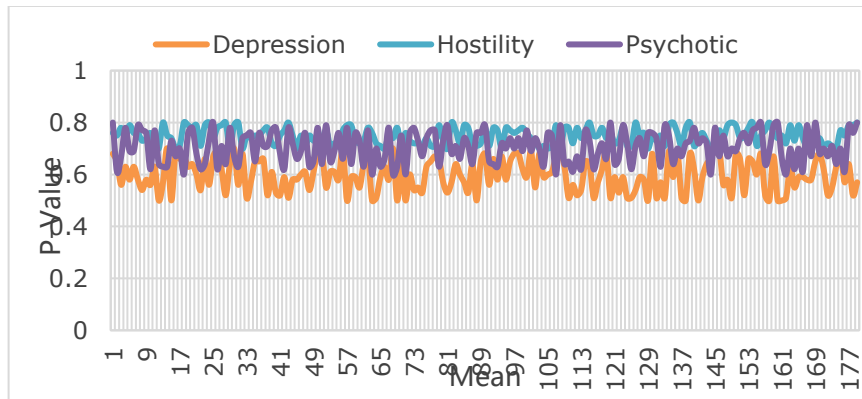


Figure 4: The Difference Test of the Post-Test Among the Unselected Group, the Traditional Group and the Music Group.

The test results in Figure 4 show that there is no significant difference in each factor of mental health between the pre-test and post test of the unselected group in the mental health test. Although the post test mean value of all factors has increased, the difference is not significant. It shows that there is no significant difference in the mental health level of college students who do not take mental health courses before and after a semester.

In the traditional teaching mode, excellent teaching resources are monopolized by well-known institutions, which to a certain extent causes the relative unfairness of education. In order to share excellent educational resources, we must break the monopoly of such educational resources, narrow the educational gap, and promote educational fairness, so as to promote the relative fairness of excellent vocal music teaching resources within the whole society. The emergence of new models of vocal music teaching under the background of "Internet +" such as MOOCs, mobile APPs, WeChat, etc. has narrowed this "knowledge gap" in education. It brings together a large number of excellent vocal music teaching resources on the Internet, to The zero-threshold condition allows more vocal music lovers to receive high-quality classroom education in these excellent vocal music teaching resources. That is to say, under the background of the "Internet +" era, vocal music teaching such as MOOCs, mobile APPs, and WeChat The new model will share the excellent vocal music teaching resources with the whole society, so that students in different groups and different classes can benefit from the network teaching resources, thus breaking the educational gap and popularizing the excellent vocal music teaching resources. It is beyond the reach of traditional vocal music classroom teaching to improve students' vocal music singing skills and strengthen students' singing level. The new model of vocal music teaching under the background of "Internet +" can not only enhance its own popularity and reputation with the help of college alliances and various network platforms. It has social influence, and can use social capital to deepen and develop its own courses, improve teaching levels, and continuously improve the quality and level of its own teaching staff. Therefore, under the background of "Internet +", MOOCs, mobile APPs, WeChat, etc. The emergence of a new model of vocal music teaching has achieved the sharing of excellent teaching resources, which is really beneficial to the sharing of learning resources among different groups of students.

4.2 Analysis of the Difference Between Positive and Negative Emotional Experiences

Comparison of positive emotions between music group and traditional group is shown in Figure 5.

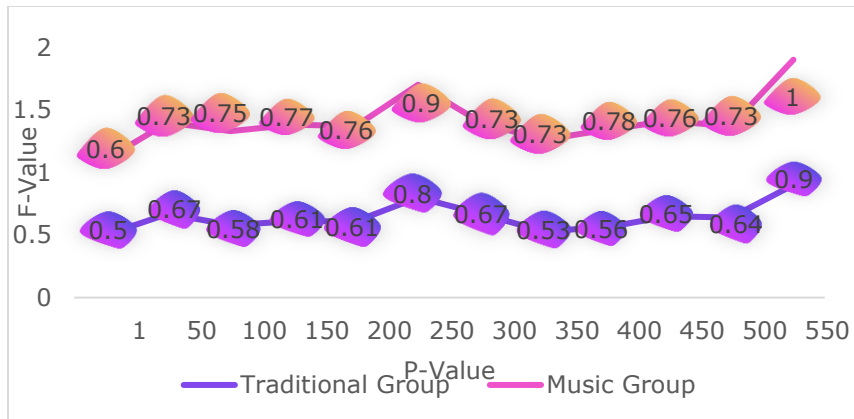


Figure 5: Comparison of Positive Emotions in the Music Group and the Traditional Group.

It can be seen from Figure 5 that in mood measurement, there is no significant difference in positive emotions between the music group and the traditional group by t-test ($p > 0.5$). Measured, the positive emotions of the music group are significantly higher than those of the control class, and the difference is statistically significant ($p < 0.5$). There is also a significant difference. The music group is larger than the traditional group. When measured, the positive emotions of the two groups of classes have decreased, and the difference between the two groups is not significant. Through the variance analysis of the mean value of the four positive emotions before and after the music group, it was found that there was a significant difference ($p < 0.1$), in which there was no significant difference between the performance before and after the traditional group ($p > 0.5$).

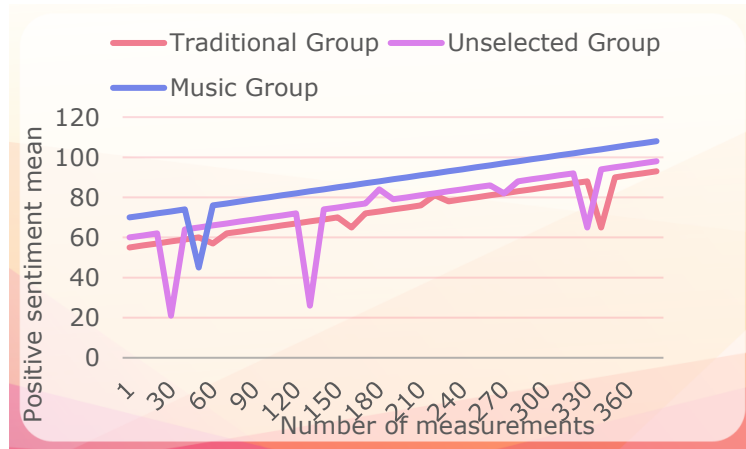


Figure 6: Positive Emotions in the Music and Traditional Groups.

As shown in Figure 6, we visually see the differences in positive affect between the music group and the traditional and unselected group classes and the respective trends in change, which remained basically the same. In addition, the first few times the three groups differed very little, and later the music group classes all had higher positive emotions than the traditional group classes.

In the process of enjoying music, our most direct experiences are emotional in nature. The unfolding process of music is also the monologue of the author's inner world, which is the original manifestation or reproduction of the process of human mental activity. Therefore, the process of music unfolding is similar to the process of human psychological activity, especially the process of emotional expression. While understanding the psychological connotation of the work, the listener himself will also have an emotional experience, and will be assimilated or infected by the music, thus producing psychological resonance and emotional resonance, the effect of which is incomparable to other art forms. Since music has such a great charm for college students, it is perfectly feasible to reasonably apply the influence of music on emotion and emotion, and reasonably use the unique cognitive way of music to adjust college students' psychological environment and prevent psychological disorders.

A comparison of the positive emotions of the music group and the traditional group is shown in Figure 7.

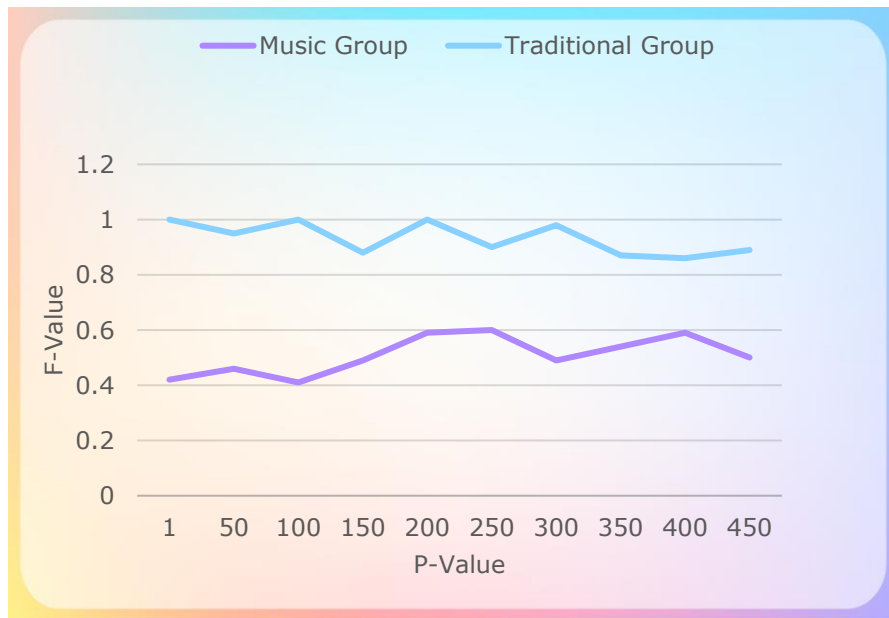


Figure 7: Negative Emotions in the Music Group Compared to the Traditional Group.

It can be seen from Figure 7 that there is no significant difference between the music group and the traditional group ($P > 0.5$), and there is no significant difference between the measurement experimental group and the control group. Similarly, the comparison of negative emotion measures before and after the music group class, and the comparison of negative emotion before and after the traditional group class, the analysis of variance was not statistically significant.

As shown in Figure 8, we can intuitively see the differences and changing trends of negative emotions among college students in music group, traditional group and non-selected group. The negative emotions of college students in the three classes fluctuated, while the music group was relatively stable, but there was no significant difference among the three groups.

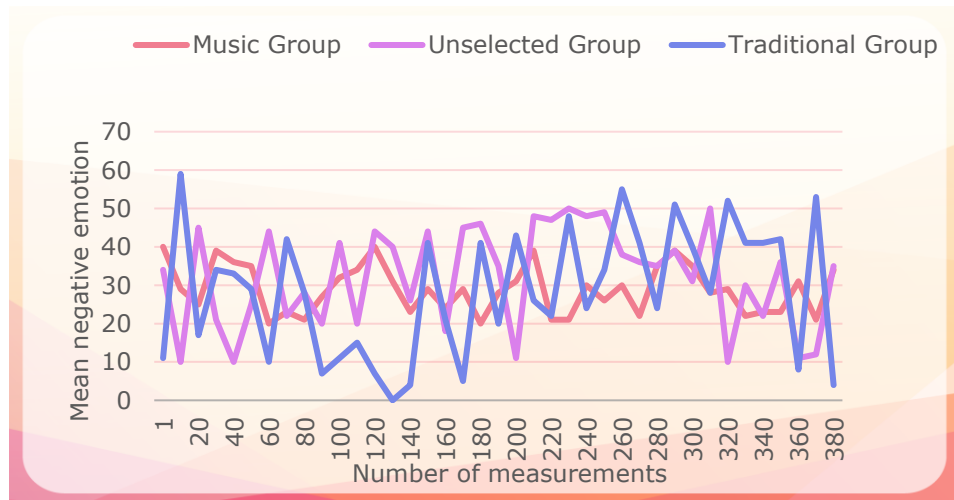


Figure 8: Results of Negative Affect Measures in the Music and Traditional Groups.

This study makes a comparative study on the teaching effect of mental health courses without background music aesthetics by studying the psychological quality level, subjective experience and objective materials of college students before and after the implementation of mental health courses. In the aspect of overall psychological quality, by joining the unselected group that has not taken any mental health courses as the control group, we can clearly see that the traditional mental health courses and the mental health courses with background music appreciation bring more positive effects to college students. Through the objective measurement and statistics of the scale, as well as the researcher's observation records in the whole process, the combination of quantitative and qualitative research methods shows more objectively and vividly that music has brought positive effects to mental health courses. According to the data analysis, this algorithm has a certain accuracy, and its efficiency is improved by 7.77% compared with the traditional model. The above results show that the integration of background music aesthetics into the mental health course can improve college students' involvement in the classroom, relax their mood and positive and pleasant psychological atmosphere, improve their satisfaction with the classroom, and internalize their teachers' guidance better, thus improving their psychological level and realizing the course objectives.

In terms of content, integrating background music into mental health curriculum is a comprehensive experience of psychological knowledge and artistic aesthetics. Students not only feel the knowledge and ideas conveyed by the teacher, but also give full play to their emotional guidance function and emotional suggestion function through the appreciation of background music in the teaching process, and unconsciously enter the musical learning environment. In a lively and relaxed classroom atmosphere, individuals get a sense of spiritual relaxation and security, and their positive emotions are easier to be awakened, which is in line with the psychological demands of college students to enter the psychological classroom to seek introspection and emotional experience. The aesthetics of classroom music not only directly affects the experience of positive emotions and improves college students' learning attention in the classroom, but also further improves the teaching effect of mental health courses through this experience, promotes mental health, so as to improve the quality of College Students' mental health and realize the combination of mental education and aesthetic education.

5 CONCLUSIONS

The study did a comparative study of the effects of teaching a mental health course without background music aesthetics by starting with college students before and after the implementation of the mental health course on their mental quality level, subjective classroom experience, and objective materials. In terms of overall mental quality level, by adding the unselected group who did not take any mental health courses as a control group, we clearly see the more positive effect brought by the traditional mental health course and the mental health course with background music appreciation to college students. By combining quantitative and qualitative research methods through objective measurement statistics of the scale and the researcher's observation records throughout, the positive effect of music on the mental health curriculum was expressed more objectively and graphically. Analysis of the data shows that the algorithm in this paper has a certain degree of accuracy and is 7.77% more efficient than the traditional model. The above results indicate that the integration of background music aesthetics in mental health courses can enhance college students' engagement in the classroom, a relaxed state of mind, and a positive and pleasant psychological atmosphere, resulting in higher satisfaction with the classroom and better internalization of the teacher's leadership, thus improving their psychological level and achieving the course goals. In conclusion, this paper illustrates the role of music in debugging emotions, the relationship between the aesthetic function of music and college students' emotions, and the cultivation of good sentiments in college by music as a carrier of cultural communication. By summarizing the theoretical basis of music in college students' mental health education, specific measures for music in college students' mental health education are proposed. Use the practical function of music to carry out rich campus activities and create a good atmosphere. Use the teaching function of music to educate students aesthetically and stimulate their aesthetic ability. Use the therapeutic function of music to provide psychological counseling to students and solve psychological problems. Music education contains many contents of mental health education, so colleges and universities should pay full attention to the role of music for college students' mental health education and use music as the main carrier to carry out mental health education education.

Lu Wang, <https://orcid.org/0000-0003-2196-1284>

Jianchao Wang, <https://orcid.org/0009-0008-4481-2824>

REFERENCES

- [1] Avidor, S.; Ayalon, L.: Changes in Positive and Negative Affect as Predictors of Change in Felt age: Results from the Health and Retirement Study, *The journal of Positive Psychology*, 12(6), 2017, 605-612. <https://doi.org/10.1080/17439760.2016.1221121>
- [2] Barker, E. T.; Howard, A. L. ; Galambos, N. L.: Tracking Affect and Academic Success Across University: Happy Students Benefit From Bouts of Negative Mood, *Developmental Psychology*, 2016(1), 2016, 10-15.
- [3] Beronio, K.: Intervention for Promoting Meaning in Life in Adolescents: Evaluation of the Process and Results, *Temas Em Psicologia*, 25(4), 2017, 1813-1828. <https://doi.org/10.9788/TP2017.4-14En>
- [4] Brenner, V.: Drinking Under Control Programmes: Perception of Alcohol-Related Harm Reduction Measures in Poland. Results of Qualitative Study Among Outpatient Alcohol Treatment Providers, *Alkoholizm I Narkomania*, 30(3), 2017, 161-170. <https://doi.org/10.5114/ain.2017.72310>
- [5] Bunni.; Tobias.: From Social to Sale: The Effects of Firm Generated Content in Social Media on Customer Behavior, *Social Science Electronic Publishing*, 80(1), 2015, 47-51. <https://doi.org/10.1509/jm.14.0249>

- [6] Clement, S.: Multigroup Multilevel Structure of the Child and Parent Versions of the Positive and Negative Affect Schedule (PANAS) in Adolescents with and Without ADHD, *Psychological Assessment*, 32(4), 2019, 14. <https://doi.org/10.1037/pas0000796>
- [7] Cordes, M.; Vocks, S.; Duesing, R.: Effects of the Exposure To Self- and Other-Referential Bodies on State Body Image and Negative Affect in Resistance-Trained Men, *Body Image*, 21(1), 2017, 57-65. <https://doi.org/10.1016/j.bodyim.2017.02.007>
- [8] Giebe, C.; Lffler, L.; Menrad, M.: Future Role of Bank Advisors and Traditional Bank Branches in the Age of Digitalization—An Empirical Investigation, *Open Journal of Business and Management*, 10(3), 2022, 14. <https://doi.org/10.4236/ojbm.2022.103082>
- [9] Hitoshi, T.; Yukiko, U.; Yuri, M.: Negative Affect During a Collective (but Not an Individual) Task Is Associated with Holistic Attention in East Asian Cultural Context, *Frontiers in Psychology*, 2017(8), 2017, 12-83. <https://doi.org/10.3389/fpsyg.2017.01283>
- [10] Howard.; Creely.: Sleep in Children with Neurodevelopmental Disabilities, *Neuropediatrics*, 46(3), 2015, 199-210. <https://doi.org/10.1055/s-0035-1550151>
- [11] Ivanova, I. V.; Tasca, G. A.; Hammond, N.: Negative Affect Mediates the Relationship Between Interpersonal Problems and Binge-Eating Disorder Symptoms and Psychopathology in a Clinical Sample: A Test of the Interpersonal Model, *Eur Eat Disord Rev*, 23(2), 2015, 133. <https://doi.org/10.1002/erv.2344>
- [12] John, S.: Measuring the complex Syntax of School-Aged Children in Language Sample Analysis: A Known-Groups Validation Study [advance publication], *International Journal of Language & Communication Disorders*, 21(7), 2020, 65-66.
- [13] Laura, H.; Alastair, C.; Daniel, F.: The Latent Structure of Negative Symptoms in the General Population in Adolescence and Emerging Adulthood, *Schizophrenia Bulletin Open*, 2022(1), 2022, 1.
- [14] Merry, M.; Silverman, M. J.: Effects of Patient-Preferred Live Music on Positive and Negative Affect and pain with Adults on a Post-Surgical Oncology Unit: A Randomized Study, *The Arts in Psychotherapy*, 72(3), 2021, 101-109. <https://doi.org/10.1016/j.aip.2020.101739>
- [15] Qi, Y.: Positive and Negative Affect in the Daily Life of world Trade Center Responders with PTSD: An Ecological Momentary Assessment Study, *Psychological Trauma : Theory, Research, Practice and Policy*, 12(1), 2021, 75-83. <https://doi.org/10.1037/tra0000429>
- [16] Rachel, S.; Richard, E.; Adrian, W.: The Role Of Cognitive and Metacognitive Factors in Non-Clinical Paranoia and Negative Affect, *Psychology and Psychotherapy*, 91(2), 2019, 169-185. <https://doi.org/10.1111/papt.12154>
- [17] Setyadharma, A.; Bowo, P. A.; Suseno, D. A.: A New Insight of Specification Error in Regression: Excluding Education Variable from a Model, *IOP Publishing Ltd*, 4(8), 2022, 125-130.
- [18] SmithKline.: More Than a (negative) Feeling: Validity of the Perceived Stress Scale in Serbian Clinical and Non-Clinical Samples, *Psihologija*, 48(1), 2015, 5-18. <https://doi.org/10.2298/PSI1501005J>
- [19] Sense,F.; Maab,S.; Gluck,k.; van rijm,H.: Within-Subject Performance on a Real-Life, Complex Task and Traditional Lab Experiments: Measures of Word Learning, Raven Matrices, Tapping, and CPR, *Journal of Cognition*, 2(1), 2019, 35-40. <https://doi.org/10.5334/joc.65>
- [20] Volkhard, S.; Roland, J.; Wolfgang, J.: Results of the Statistical Linear Mixed Effects Model, Separately for (1) the Objective and Subjective Measures And (2) the Cross Test, Mallett Tests, and Nonius Bias Tests, 12(3), 2015, 19-21.
- [21] Young, K.S.: Neuroticism and Negative Affect Measures as Predictors of Psychological Distress, *Psychological Reports*, 75(1), 2016, 321-324.