

Research on the Piano Teaching Model of “Four-Fold Music Intelligence View” Based on the Theory of Cognitive Science

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Abstract: Through the inspiration of cognitive science theory, close combination of piano teaching subject orientation and knowledge structure, the creation of a “ Quadruple music intelligence view” teaching model, namely through the construction of music, music technique acquisition, music composition processing and the generation of music capacity can explore a set of suitable “teaching” and “learning” mode for piano course to promote the popularization, the inheritance and development of piano teaching.

1. The Connotation of Piano Teaching

1.1 The Essence of Piano Teaching

Piano education is the teaching of “tone, performance and connotation “. In other words, the aim of piano teaching is to guide students to use the right technology to play the right tone with a reasonable means of performance to play the music. Therefore, the emphasis of piano teaching is to cultivate students' abilities at three levels: technique, music and connotation.

“Techniques -- music -- connotation”, these three layers are not only progressive, but also overlapping. They are not only related to each other, but also restrict each other. (FIG.1) from the perspective of teaching, only by training impeccable finger skills can we use our fingers to express pleasant music. Only by having the skills to express music can we express the core connotation of music. So their relations are mutually progressive and overlapping parallel. A piano teacher cannot separate the music performance from empty talk finger techniques. Similarly, we should not talk about the performance of music and the content of the music without the help of finger techniques. Otherwise it is just talk on paper, so the three are interrelated and inseparable.

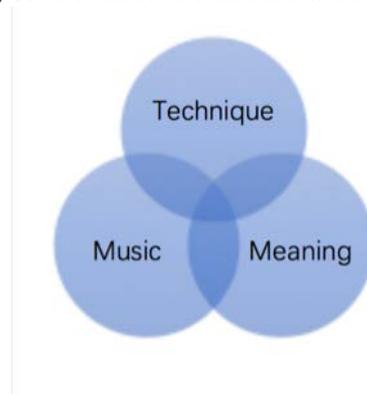


Figure 1: “technique - music - connotation” diagram

The piano is an instrument with mechanical characteristics. The performer is implementer. The performance makes connotative tone. The implementation process is a mechanical operation process. In this concept, the piano is static, the process of playing is mechanical, the tone produced is a physical concept, and the connotation of tone is processed by the performer. (See figure 2)

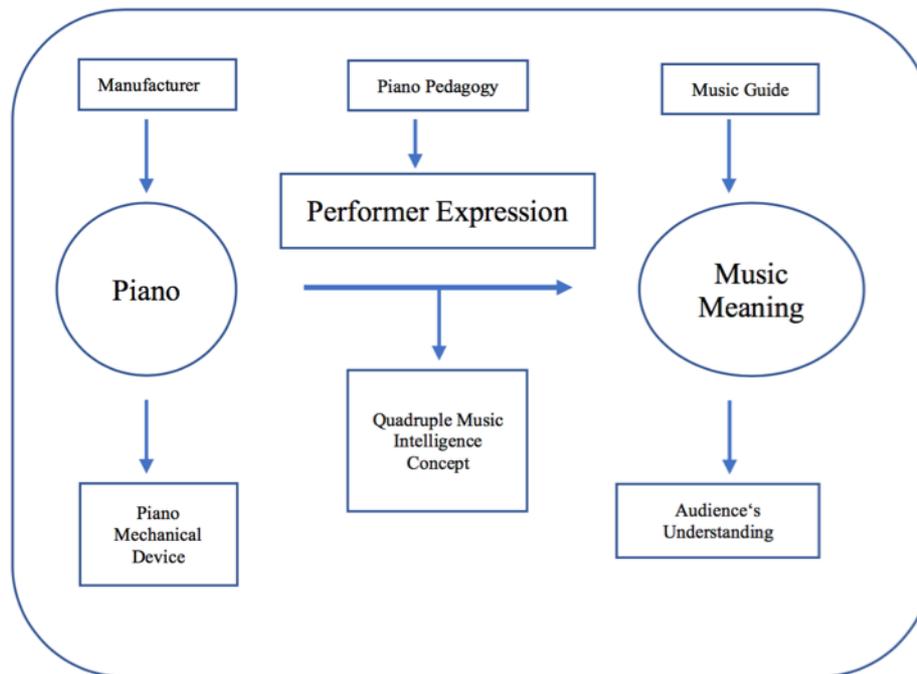


Figure 2: piano-performer - listener diagram

1.2 Piano Teaching from the Perspective of Cognitive Science

According to Piaget, “knowledge is not passively accepted by the individual through feeling or communication, but is actively constructed by the cognitive subject, and the construction is realized through the interaction of old and new experience. Piano performance teaching is full of the analysis, experience and expression of music timbre, which is not only obtained by external stimulus, but the result of the interaction between the external environment and the inner psychology of the cognitive subject. Learners are the subjects of composition processing and the active constructors of the meaning of knowledge. As for the impact of learning environment on the effective formation of meaning construction, Piaget put forward four factors of Constructivist learning environment, that is, “context, collaboration, conversation, meaning construction”. Under the guidance of teachers, learner-centered learning should be advocated, and the creation of real situations should be regarded as a necessary prerequisite to achieve the ultimate goal of “meaning construction”. According to the theory of constructivism, the author thinks about how to guide students to immerse themselves in music elements, harmony, tonality and culture, and absorb nutrients from them, assimilate and conform to the new schema so as to help students keep playing the accurate and persuasive music.

Piano “teaching” and “learning” is an extremely complex and dynamic process, that is, guiding students to obtain scientific, rigorous and convincing tone through a series of psychological, physical and physiological composition processing as well as through external information input and stimulation of music emotion, humanistic environment, performance techniques and music ontology.

2. “Four-Fold Music Intelligence View” Piano Teaching Model

2.1 The Theoretical Basis of “Four-Fold Music Intelligence View” Piano Teaching Model

Physical cognitive view emphasizes on its essence, that is, cognition is physical. Physical experience plays a key role in the cognitive process, and concept is the basis of cognitive activities. Concepts can be divided into two categories: Abstract and concrete. Piano performance and teaching are a dual concept, and the process of performance is a specific concept -- playing the piano, that is, making tone; the result of performance is an Abstract concept, namely “tone”. As a

result of piano performance, we cannot see or touch it. Although we can hear the tone, we may not be able to perceive its existence. How to distinguish the quality of piano performance timbre, in fact, is to use Abstract concepts to judge whether the specific concept is reasonable and correct. Professor Rolf Zwaan, of Florida state university, said: “we don't 'think' like computers do. We don't think by manipulating Abstract signals in our brains.” In other words, when we read an article, our brain reactivates the traces left by previous experiences, giving meaning to the words mentioned in the article, just as our brain simulates the situation in the story.

Therefore, the thinking pattern of piano performance is not relied on our brains to control tones and notes but to feel it with heart and body. Piano performance should be the learning process of “music-image-scene-move-empathy-technique- performance”.

2.2 The Structure Design and Meaning of the Teaching Model of “Four-Fold Music Intelligence View

According to the above characteristics of piano performance and teaching, the author created the “four-fold music intelligence view” piano teaching model with the main line of “music tone construction”, “music skill acquisition”, “music composition processing” and “music capability generation”. “Music tone construction” refers to the establishment of the concept of tone. Through learners' listening and learning, they can find the corresponding music images, scenes and the “illustration” of the composer's performance of the work. Under the guidance of the teacher, they can construct the expectation of the performance of the work.” Acquisition of musical skills” refers to the mastery of techniques. On the basis of musical tone construction, it seeks for the performance techniques needed to achieve the expectation of music. “Music processing” refers to the processing of music composition to reach the realm of empathy, to process the information of works, to adjust and achieve the best performance movement and paradigm. Finally, through the first three steps, “music can be generated.”

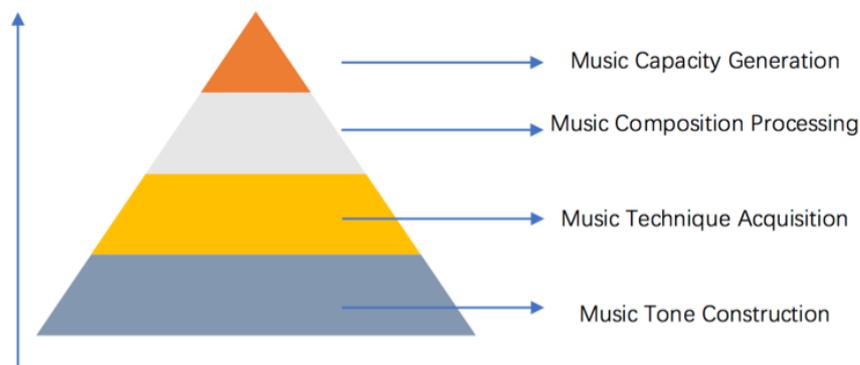


Figure 3: four-fold music intelligence view

2.3 Elaboration on the Process of “Four-Fold Music Intelligence View” Teaching Model

1) Musical tone construction is the establishment of correct tone concept. The piano occurs when the fingers press the keys, which are driven by a series of mechanical devices and their power, and make tones by striking strings. The starting point of tone is the moment when the fingers touch the keys. The difference and advantage of the way of touching the keys in this moment affect the quality of tone.

When finger press the key, there are four “degrees” that affect the tone, namely, the height, speed, depth and angle. Any combination of the four of different properties will produce tone with different quality. For example, higher height, faster speed, deeper depth and acute angle (the angle between the fingers and the piano keys) produces thicker, deeper, stronger and more singing tone. On the contrary, lower height, slower speed, shallower depth and acute angle produces thinner and ethereal tone.

2) Musical skill is acquired, that is, music performance skill is acquired. Through the guidance and foreshadowing in the early stage, students have a good concept of tone, through the teacher's

tone (music) -led technical explanation as the “stimulus input” to comply with the requirements of the work itself, through the students' tone for the purpose of technical training to obtain new technical “schema”, through the music “schema” acquired in the early stage, the short-term auditory information is stored, and the sensory information is used to further perceive the external world and process the data. Through technical training and music expression, the cognitive level is finally reached. These skills and knowledge are applied and stored for a long time. These skills and knowledge are accumulated through teachers' teaching, exploration, interaction, stimulation, adjustment, re-stimulation and re-adjustment.

3) Music composition processing, that is, the processing of music information. The corresponding teaching tasks are customized according to the teaching objectives of the music. Music composition is not limited to music information, and all information related to works should be included. Each piano work has specific performance information, creation background and historical environment. For example, to play Bach's twelve-tone equal temperament, we need to have a comprehensive understanding and learning of Bach's musical Instruments, Bach's cultural environment, religious activities and Bach's creative characteristics, so as to comprehensively and correctly interpret the works.

4) Music can be generated, that is, the twin of intelligence and skills. Through the establishment of correct tone concept, technical practice and acquisition of new performance schemata as well as constant update, assimilation and adaptation, the macro “schemata” of playing piano works are gradually formed. The generation of music capacity is achieved through a complicated teaching process.

3. Conclusion

The “four-fold music intelligence view” piano teaching model constructed in this paper explores and analyzes the elements and operating mechanism of effective teaching, and analyzes the implementation process. Under the dual wings of cognitive science theory and piano teaching characteristics, according to my own teaching experience, I have studied a set of reasonable and diversified teaching models, and explored a set of methods and strategies to effectively improve the learning, teaching and performance of piano works.

The piano teaching reform still has a long way to go, and the teaching in this field still needs to be further studied and explored by using the “quadruple music intelligence view” teaching model so as to make greater contributions to the popularization and systematization of China's piano education.

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