Using 3D Motion Capture Study Chinese Opera Performance Movements

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Summary

Chinese traditional opera has been a part of Chinese culture for 800 years, and the skill of the performers is of great importance. Each learner's training process has a specific pattern, which makes it possible to explore the process of training and presentation of excellent performers. In recent years, a modern method has developed. The training of Chinese opera performers now depends on the availability of a national college. The college is divided into advanced elementary school, middle school, vocational high school, and college. During the total study period of 12 years, most students are supported by the government and receive a vocational high school diploma followed by a bachelor's degree when they graduate. The curriculum includes general subjects, professional courses, and professional skills. The general subjects and professional courses meet the standards established by the Ministry of Education, whereas the professional skills vary according to the department requirements.

In addition to the traditional performance that can be put on the stage, what kind of quantity and quality creates a mixed mode with causal relationships that can maintain its own unique art style? Training related to sports or human factors and ergonomics (HF&E) are designed to prevent human bodies from being injured, but their exploration directions and significance are completely different in essence. Performing expresses the content of the artistic creation, while the emphasis of sports is about the possibility for humans to pursue the limits in competition. HF&E puts emphasis on how to prevent humans from being injured during work. Therefore, in terms of the training on performing motions, Chinese opera art has been creating a complex modular system mode evolved from training for hundreds of years, which has caused the learning

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requirements for motion training to turn into a combination of procedural motions due to the abundant creations made by artists.

This paper investigated whether the teaching methods for Chinese opera performance would cause teaching and learning improvements due to the use of 3D capture motion analysis system and whether digital media technology could help improve the effectiveness of Chinese opera motion teaching. Teaching effectiveness was achieved in the teaching and learning process by means of media technology, and the effectiveness of the process was verified by research methods and analytic logic. This study presented an unprecedented research method in Chinese opera history. Other than the related course design required by modern Chinese opera schools, this study investigated whether the formalism causes the loss of Chinese operas beautifulness over time. To answer this question, the researcher scouted the existence of causal relationships by means of scientific research on the teaching scene.

There is an argument that the stylization of performance is looked down because people cannot understand the essential meaning of it. It is believed that the emphasis of formalism will shape Chinese opera into a meaningless and rigid style. If the aforesaid situation happens to the education of Chinese opera performance, it must be abandoned and the participants forced to go back to the core issue of art essence. Of course, as to the development and inheritance of Chinese opera, there is no doubt that Chinese opera is indeed a highly-developed formalized art due to the integration of abundant materials that evolve into a module which can be procedural by means of compiling or aggregating so as to demonstrate the beautiful artistic style of Chinese opera.

As can be seen, Chinese opera performance is not the same as a general procedural module, and its rich performance is by no means equal to the formalism on the representation. Therefore, Chinese opera performers present a highly-connected relationship, a natural essence, and an appropriate performing style through the motions and the characters in opera stories. This paper argues that the two groups of Chinese opera teaching hold different views in terms of quality and quantity. It is not that the training methods used for hundreds of years do not work today, but their effectiveness is different from that in the past. We therefore question how Chinese opera education should re-activate to make a further study on "the causal relations that are familiar to the artists."

According to the procedural concepts of Chinese opera, performance proceedings can be divided into two types: visible and invisible. They both are applied to present the way of thinking how Chinese opera is been looked and heard. This one-shot case study is conducted by using Perception Neuron (Noitom Ltd., Miami, FL), a motion capture equipment, for capturing the

movements of instructor and participants into a pre-experimental design. In data analysis, a statistics method of bivariate correlation is used to compare the differences of body motions between instructor and participants variables such as right hand, left hand, hips, right foot, and head (Data $N = 6,750$ / per subject [2.5 s × 60 frames × 5 limbs × 3 variables × 3 axis = 6,750], capturing time, velocity, acceleration, and angular velocity of the five limbs). The results indicate that it has a high probability of causing variations in students' learning during teaching because the experienced quality of the teaching and learning clearly indicates how the high degree of cognition difference influence comes into being. This issue of differences of body motions between instructor and participants variables not only for the visible but also for the invisible performance proceedings, a procedural logic that has been developed over the centuries in the field of Chinese opera.

This research investigated the specific movements of Chinese opera performances from the instructor and nine subjects. The results suggested that the skill of accomplished performers not only lies in their movements but also in specific regulations of movements. This research was to explore the nature of Chinese opera and the teaching and learning assisted by 3D motion analysis and technology experiments so as to verify whether there were correlation coefficients and expressions. In addition to the effectiveness of teaching, it also explained the professional attributes that could be understood by the Chinese opera performers. This method can be used to educate Chinese opera learners to avoid certain unexpected interferences from the routine training.