COGNITIVE PSYCHOLOGY OF COLLEGE STUDENTS IN DANCE COURSE UNDER THE MULTIMEDIA TEACHING MODE

Xue Yang¹,²

Abstract
Dancing helps to cultivate the aesthetic judgement and enhance physical quality of college students. The application of multimedia can make dance teaching more attractive and targeted. This paper mainly studies the cognitive psychology of college students in dance course under the mode of multimedia teaching. Firstly, the author summed up the advantages of multimedia teaching in dance course. Next, the heart rate indices of students were measured in the traditional teaching mode and the multimedia teaching mode. The measured results of the two teaching modes were compared in details. The results show that college students under multimedia teaching mode had smaller cognitive load, easier learning and better performance than those under traditional teaching mode; it is also observed that the multimedia teaching mode aroused greater interests and prolonged the period of efficient learning than the traditional teaching mode. The research results provide new insights into the dance teaching to college students.

Key words: Multimedia, Education, Dance, Cognition, Psychology.

Received: 05-02-19 | Accepted: 31-07-19

INTRODUCTION
The dance courses offered by colleges and universities can increase the interest of students in learning to a certain extent, ease the pressure of learning, strengthen physical quality, and improve the aesthetic and moral level. The purpose of dance teaching in colleges is to cultivate both the hobbies and dance skills of the students. In the traditional education mode, such teaching purposes cannot be achieved satisfactorily. In recent years, multimedia technology has been introduced into college dance teaching and widely used (Erwin & Rieppi, 1999).

In previous studies, scholars compared the multimedia teaching with traditional teaching: First, in the traditional teaching, the music is often played with simple music equipment, which is not enough to meet the students’

¹Huaiyin Normal University, Huai'an 223300, China.
²Sangmyung University, Seoul 03016, Republic of Korea.
E-Mail: 8201711038@hytc.edu.cn

learning needs, and further affect the dance teaching negatively (Shavinina, 2001; Smith, 1997); second, the traditional teaching mode of dance teachers is often single. Their main task is to break down complex dance movements into simple movements, but without the multimedia technology, the teaching is not vivid enough so that the students cannot understand the teaching content well, with a low learning efficiency (Smithautard, 2006; Cunningham, 1992; Rosendahl, Tittelbach, & Strauss, 2003; Brown & Desforges, 2011). Multimedia teaching has many advantages over traditional teaching. It mainly involves complex information in different forms such as sound, image, and video etc. for information communication, while the traditional teaching only has simple information communication. Under these two teaching modes, the students’ cognitive psychology also varies greatly. But it’s often overlooked by scholars (Catterall, 1980; Brewer, 1997; Bradley-Johnson, Johnson, & Jacob-Timm, 1995).

This paper studies the cognitive load and cognitive psychology of college students by the
changes of physiological indexes of traditional teaching and multimedia teaching modes. The research findings can be applied in the dance teaching practice of higher education.

MULTIMEDIA TECHNOLOGY, DANCE TEACHING AND COGNITIVE PSYCHOLOGY

Application of multimedia technology in dance teaching in colleges and universities

Multimedia technology is an information communication technology emerging with the development of computer technology. It has been widely used in pedagogy, such as dance courses in higher education. Compared with the traditional teaching mode, the multimedia technology can display the difficult dance movements more vividly without being limited by the physical strength of the teachers. It can also help the students to deeply understand the tricks in the movement and master the essentials. The perfect application of multimedia technology in college dance teaching can improve the deficiencies in traditional dance education to a certain extent, and further promote students’ aesthetic level of art.

More attention has been paid to the improvement of students' comprehensive level and the cultivation of comprehensive quality for the education in the 21st century. In this context, many universities have called for the introduction of multimedia teaching mode, because this mode can improve students' learning ability. College dance courses can cultivate students' love for life and the pursuit of good things, and also improve students' physical fitness and cultivate their personal temperament, artistic sentiment and music level. In these respects, the multimedia teaching mode can ensure a better teaching effect.

The multimedia technology can be applied to maximize the optimization of teaching resources. Multimedia technology can not only increase the interestingness of teaching content, stimulate students' interest, but also make them more engaged in specific situations and enhance the interactiveness of teaching, thereby improving the learning efficiency. Through the multimedia teaching mode, students can deepen their understanding of the teaching content and better combine theory and practice. In addition, the teaching pressure of teachers can be also effectively reduced so that the teachers can save a lot of time to explain theoretical knowledge, and avoid the troubles caused by personal demonstration. In the classroom, students can spend more time on learning dance movements. What’s more, multimedia technology can also provide students with a huge amount of resources. Using multimedia and the Internet, students can be exposed to the most cutting-edge information and technology, thus improving their dance level.

In dance learning, cognition should be placed first. Throughout the entire cognitive process, students receive multimedia information, then digest and remember. Due to large differences in information transfer process between the multimedia teaching and traditional teaching, students' cognitive psychology also varies greatly.

Multimedia technology allows students to watch more advanced dance works and gain inspiration. The teaching content in the classroom is not all-encompassing. Students can freely search for content that they are interested in according to their own aesthetic tastes, so as to learn more comprehensive knowledge, more effectively understand dance, and experience the whole cognitive psychological process more profoundly. The application of multimedia technology can better achieve targeted teaching. Besides, the cognitive psychological process varies from person to person. Although the traditional teaching mode has certain effects in the classroom, the individual differences of students determine their differences in cognitive level, and also their teaching effects. For this, multimedia technology enables the students to choose their own teaching content and teaching methods according to their own cognitive level, which is conducive to increasing the teaching efficiency of teachers and also improve the learning performance of students. Using the multimedia teaching, the teachers can play the teaching videos repeatedly, while students can learn without any time and space restrictions at any time and place, so as to discover their own deficiencies through the repeated cognition process, and they can imitate and learn through training, thus improving their own dance level. Compared with the tradition teaching mode, this teaching mode is more vivid, and in a short time, it can provide more targeted teaching resources for different students. It also makes the students' cognitive process smoother and the cognitive psychology more profound.
Multimedia technology and cognitive psychology

The cognitive process of human beings is a process from perception to information processing, and then to analysis and memory. By means of multimedia technology, people can perceive more abundant information, the acquisition of multi-source information makes the information processing more active, and people's memory is more profound at the stage of memory formation.

Specific to the field of dance teaching, multimedia technology provides various types of information such as sound, image and video, enriching the source of information for students, and mobilizing more sensory organs. In the process of information processing, students will find the information more vivid, and then help to mobilize their subjective initiative, so that they can better process their information for better memory and understanding.

EXPERIMENT DESIGN OF COGNITIVE LOAD IN MULTIMEDIA TEACHING

A significant difference between traditional education and multimedia education is that traditional education tends to emphasize only unified teaching, while multimedia teaching focuses on the individual differences of students. This will inevitably lead to the difference between the cognitive psychology and cognitive load of students under the two teaching modes.

The cognitive process of traditional education and multimedia education is shown in Figure 1.

Figure 1. Cognitive process of traditional education and multimedia education

With further research on human cognitive load, it’s found that the measurement of cognitive load is an urgent problem to be solved. So far, three types of measurement methods have been widely recognized, namely subjective measurement, task performance measurement, and physiological measurement.

Among them, the physiological measurement method is favoured by researchers because of its objective, real and stable characteristics. During the measurement course of physiological indicators, their changes are rarely controlled and regulated by subjective will, so it is an objective and accurate measurement method. In addition, physiological indicator measurements usually ensure continuity and facilitate subsequent analysis.

The measurement of physiological indicators often requires relatively expensive instruments. By contrast, the measurement of heart rate indicators is simple and convenient, and the related instrument is at a relatively low cost. Therefore, the heart rate indicator was selected as the index used by physiological measurement method.

The specific experimental process is as follows:

(1) 30 college students were randomly selected to participate under the multimedia dance teaching experiment. The whole dance course lasted for 30 minutes, and the heart rate watch was worn during the experiment;

(2) Another 30 college students were randomly selected to participate in the traditional dance teaching experiment. The whole dance course lasted for 30 minutes, and the heart rate watch was worn during the experiment;

(3) With the teaching contents in (1) and (2) the same, the changes in heart rate indicators were analysed after the experiment.

ANALYSIS OF EXPERIMENTAL RESULTS

Overall analysis

Figure 2 shows the average heart rate changes of 30 college students under the two teaching modes. It can be seen from Figure 2 that the average heart rate of the students was not much different at the first minute of the experiment, indicating that the students were not fully engaged in the learning state; in the initial stage of the experiment, that is, within 15 minutes, the heart rate of students under the
traditional teaching mode was significantly higher than that of the students under the multimedia teaching mode, indicating that the students’ cognitive load was higher under the traditional teaching mode; in the middle and late stages of the experiment, that is, from 15 minutes to 30 minutes, the students' heart rate under the traditional teaching mode declined significantly, while under the multimedia teaching mode, the student's heart rate still maintained a relatively stable level, which proves that under the multimedia teaching mode, students can maintain efficient learning for a longer period of time.

**Figure 2. Average heart rate changes with time**

![Heart rate changes with time](image)

To verify the above theory, all heart rate data were divided into four groups, namely:

1. The data of the first 15 minutes under the traditional teaching mode, numbered T1;
2. The data of 15 to 30 minutes under the traditional teaching mode, numbered T2;
3. The data of the first 15 minutes under the multimedia teaching mode, numbered M1;
4. The data of 15 to 30 minutes under the multimedia teaching mode, numbered M2.

Figure 3 shows the mean difference of the four groups of data.

After independent sample T test, the following conclusions are drawn:

1. There was a significant difference between T1 and T2 (p<0.05), indicating that the student’s heart rate changed significantly in the fifteenth minute or so under the traditional teaching mode, and after 15 minutes, the students’ cognitive process was hindered;
2. There was a significant difference between T1 and M1, T2 and M2 (p<0.05), indicating that the cognitive process of students varied under the traditional teaching mode and multimedia teaching mode;
3. There was no significant difference between M1 and M2 (p>0.05), indicating that under the multimedia teaching mode, the students' heart rate did not change significantly within 30 minutes, and it’s same to the students' cognitive psychology.

**Individual analysis**

Due to the differences in students themselves, individual students may have different changes in the two teaching modes. This paper makes statistics on individual changes in students. The specific criteria for statistics are shown in Table 1. The statistical standards were classified into three grades, which correspond to three states: the stable state with the heart rate changes lower than 6, the non-stable state with the heart rate changes higher than 12, and the intermediate states of the two.

**Table 1. Individual statistical standards of students**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Heart rate changes (beats/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Stable</td>
<td>≤6</td>
</tr>
<tr>
<td>B</td>
<td>Not stable</td>
<td>≥12</td>
</tr>
<tr>
<td>C</td>
<td>Between A and B</td>
<td>6~12</td>
</tr>
</tbody>
</table>
CONCLUSIONS

By comparing the heart rate changes of college students in the 30min dance course under the multimedia teaching mode and the traditional teaching mode, the following conclusions have been drawn:

(1) Under the traditional teaching mode, students learned normally within the first 15 minutes of the course; after 15 minutes, the heart rate dropped significantly, that is, students' cognitive psychology was disordered;

(2) Under the multimedia teaching mode, the students' heart rate fluctuated little during the whole teaching process, indicating a stable cognitive process of students;

(3) Within the first 15 minutes of the course, the students' heart rate under the traditional teaching mode was higher than that the multimedia teaching mode; the students' cognitive load was lower under the multimedia teaching mode.

Acknowledgement

China Education Information Technology Research 2018 Youth Project: Traditional Dance Movement Collection and Teaching Resource Library Construction Based on Motion Capture 186140095.

REFERENCES


