

## **Experiment on the e-learning of traditional dances through the utilization of stereoscopic**

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**Abstract:** The aim of this paper is to propose e-learning platform through utilization of stereoscopic video conferencing for the education of traditional dance. Two Experiments were conducted on educators and students. To the educator, the stereoscopic video conferencing diminishes the online social distance and brings a sense of reality. To the students, the stereoscopic video conferencing creates more educational motivation than regular video conferencing platforms.

**Keywords:** Performance E-learning; Stereoscopic Education; Heritage Preservation.

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### **1. Introduction**

Digital education has become generalized in the modern days. Method wise, the digital education has created virtual reality, and in genre it has transformed from culture to art. It has brought to our lives the enhance form of variety and access to education to human lives.

Renowned management consultant Peter Drucker predicted in his own work, Next Society, that e-learning will become a milestone for adult lives' lifetime education and that non-conventional ways of education like such will become a trend. Digital education such as e-learning has currently taken place as one of the social phenomenon general trend.

Like the movie Avatar where you can watch 3D motion picture with enhanced real life-like technology , development in high-speed communications network is not only e-learning's texts but also images, vocal records, clips, and many different types interaction such as media and massive data.

At first in the world of ‘dance’, the use of digital technology was considered to be an effort made to make the stage or the role of the dancer appear more unique. The use of digital technology has expanded and evolved greatly especially in dance performances and the types of usage itself have widened. And now we have come to an age where dance records, movement analysis, computerized moves, and even education have become available to us at all times through technology. But still these diverse mechanizations are less than accessible for traditional Korean dances.

Thus this experiment was proceeded in order to test on how much stereoscopic can eliminate the doubts that the students might have of the masters and professional dancers and also if it can truly assist the apprentices despite the distance and no physical presence of each other. It is also the intension to explain the contribution that this program might make in preserving the traditional dance as intangible cultural heritage.

This thesis suggests the new education system of traditional dances using the network program of stereoscopic and also describes the current educational system of traditional dances and the dances themselves.

It also carries the description of the ways the education system of traditional dances effects preservation and transmission, with all records evaluations made through HCI (Human-Computer Interaction).

## **2. Related works**

### *2.1 Case of E-learning in the Subject of Dance*

The cases where digital technology were used on the education of dances are the motion capture data archive (Umino, 2008), and the use of video annotation by Gina Cherry (2003). Kavakli (2004) used videos of 2D/3D graphics, interactive images, and text to teach traditional Grecian and English dances for WEBDANCE project.

The three cases have used digital technology for dance education, but have presented the limits as the beginners showed difficulty to understand the movements through non-real time environment.

In order to overcome these limitations, the researches and tests on using ‘video conferencing’ for real time e-learning system for dance education, is being carried out actively. The pro of real time e-learning is that the student can actually interact with the teacher in different time space and locations. Mila Perrish (2008) utilized video conferencing to teach some of the students out of the city with iDance Arizona, and proceeded the dance education program. There also is another example where the Dance in Australia and New Zealand (DANZ) also used video conferencing, under the title of “real people in real time” to close down the gaps of cultural differences and allow long distance education through 12 students located in Queensland and

two different Maori tribes people in New Zealand, finally creating a collaborative dance performance.

## *2.2 Education through stereoscopic*

The features of stereoscopic greatly increase in various education fields. And many surveys tell us about educational achievements using stereoscopic.

In Illinois, Rock Island-Milan, the education sector of the state had conducted a project for students to take a class in the subject of Geology with 2D and 3D projector clips, separately. As a result, the group of students whom have taken the course through 2D projector clips have achieved an educational achievement of 9.7% on average, whereas the ones who used the 3D projector have increased a high percentage of 35% of their educational achievements. Yoshio Yamagishi (2011) had utilized stereoscopic 3D contents while practicing PC assembly, and have compared the effectiveness with same information with 2D contents assembly. Comparing the computer assembly time and satisfaction, the 3D contents turned out to increase the scale of interest towards the subject. Norman M. Joseph (2011) also utilized stereoscopic for the awareness practice of Astronomy and has compared the case where stereoscopic is not used. And it resulted as that stereoscopic increase the educational achievements. It is foreseen that stereoscopic will be more utilized for various courses, in the future.

## **3. Methods**

### *3.1 Experiment Design*

For an evaluation, the HCI's User Evaluation Method was implied. Instead of measuring the result by a simple evaluation, there were surveys for the users about their personal experiences and satisfactions. The experiment was largely divided in two with 'the preference alteration experiment of the educator of the video conferencing and stereoscopic video conferencing', 'the experiment of students' satisfaction between videoconferencing and stereoscopic videoconferencing'.

Attendees of first experiment were in two categories, teachers and learners. 10 of the appointed teachers were traditional dance educators from Daejeon city in Korea whom have taught 10 students individually for 20 minutes each through video conferencing and took a survey during their 10 minute rest until the next session. Next they met the students for the dance sessions through stereoscopic video conferencing platform. Before the experiment, all 10 educators had stated that they had never given out or received dance lessons through an online system.

Second experiment was conducted with the participation of Yeonhee Jo who is the traditional dance major in Chungnam University where she had taken the role of evaluating the system after her teaching session as an educator. And 20 volunteers in the age of 20s to 30s were invited.

The education content was designed according to the general traditional dance education programs and the interview information of Song Jaeseop, the Seungmoo Dance tradition holder and Daejeon's Intangible Cultural Asset number 15.

The course is divided in 3 parts: ① Theory education about traditional dance, ② Basic positions of traditional dance with upper body-oriented still movement, ③ Basic movements of traditional dance with lower body-oriented movement.



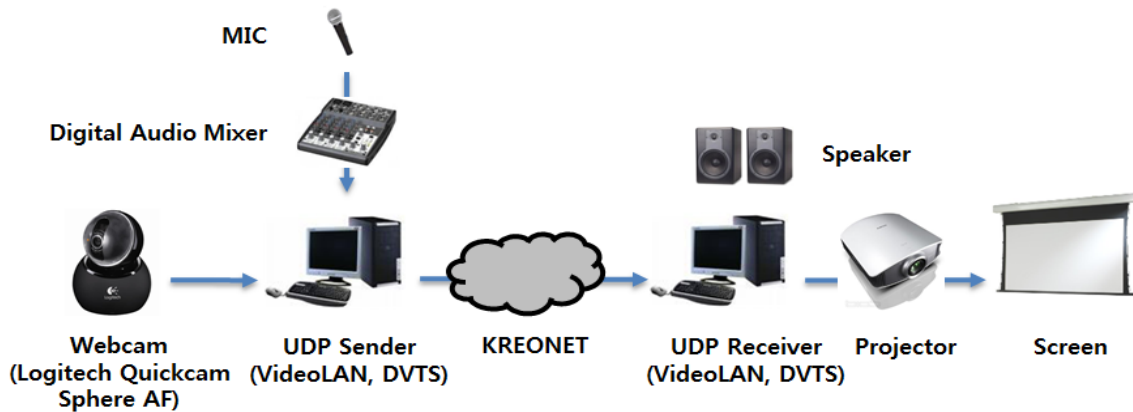
**Figure 1.** Screenshot of stereoscopic video conferencing (experiment of student satisfaction)

### *3.2 Education Quality Satisfaction and Evaluation*

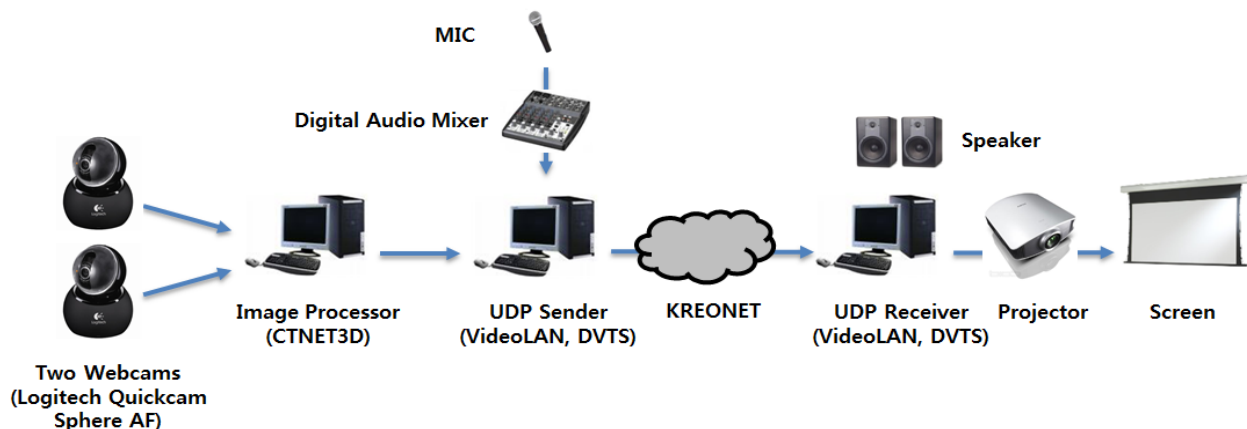
The Dance Education E-learning Evaluation Index was created in order to measure the satisfaction on the dance learning experience. The recent E-learning Evaluation Index is based on the evaluation index of Garrison (2001). But because the evaluation index of Garrison's was created for a text-oriented non-real time e-learning system, it was modified based on the professional's interview and movement-oriented real time e-learning evaluation framework. The traditional dance e-learning platform can be evaluated by its 3 sides: ① Cognitive presence, ② Social presence, ③ Teaching presence. Each quality was used for 13 questions of satisfaction.

### *3.3 System Configuration*

The two types of e-learning platforms for the experiment target are as following. The two platforms were restricted from the factors that may cause effects such as screen for moving picture type, projector, sound, mike, and transmitting method. The DVTS transmission system was used for the two platforms. The DVTS (Digital Video Transport System) is an application that exchanges video streams with the IEEE1394 (Firewire) cable. This system is the internet protocol base audio, and visual communication tool. It holds an advantage where it does not require any additional equipment for the network due to the utilization of the digital video camcorder AV Codec. Two experiment is conducted through KREONET(Korea Research Environment Open Network). Anaglyph method is used for generation of stereoscopic. And it can be easily obtained through simple image processing application and only requires simple traditional projection.



**Figure 2.** System configuration of video conferencing.



**Figure 3.** System configuration of stereoscopic video conferencing.

## 4. Results

### *4.1 The preference alteration of the educator of the video conferencing and stereoscopic video conferencing*

10 traditional dance educators were asked of their preference of the correspondence education platform using video conferencing. Only 2 out of the 10 participants had stated that they would use the video conferencing correspondence education platform at first. After the stereoscopic experiment, 8 out of the 10 educators replied to the survey that they would reuse the correspondence education system using stereoscopic. 6 educators changed their mind to use e-learning platforms.

The 8 of them, who approved the suggested system have clarified that they had changed their minds about video conferencing correspondence education because of the real time experience that it offers, the time it might save by eliminating the need for transportation from the residence to the educational environment, and also that it will increase the opportunities to learn traditional dances by renowned dancers and artists in each fields. They could eliminate doubt about these e-learning platforms after using stereoscopic video conferencing.

Those who still have denied of the system after the experiment value their traditional education methods, also that it interferes in interacting with the learner about the 'breathing', considering it a challenge for the learners to receive education only through the visual aspect. Other than that, the fixed screen restricts the educator from giving out feedbacks. Especially due to the glasses, educator is hard to see participants' reactions.

The stereoscopic is presumed to be a great contribution in preservation and transmission of traditional dances as intangible cultural heritage, as it has even changed many traditional dance educators' opinions about the use.

### *4.2 Comparison of student satisfaction between video conferencing and stereoscopic video conferencing*

20 participants of each platform have been interviewed of their experiences and factors that the system might need to improve. 90 % ( 18 participants) have answered positively to the question whether if through their experience of such education system has made them more aware of the traditional cultures and the intangible cultural heritage. 70% (14 participants) have also answered positively on the question whether if the experience has increased their pride about their home country's traditional culture and intangible cultural heritage. Through these answers, we can conclude that the e-learning system comes of assistance to the popularizing the knowledge of our traditional cultures and intangible cultural heritage.

The participants answered about the question on the impression that they got during the participation that the stereoscopic video conferencing platform is reasonably better than video

conferencing. They have noted that they felt that the stereoscopic provides and nurtures the will to carry on. With their educational motivation and also felt as if the social distance between the learner and the educator had been reduced due to the interaction. Other than that, color separation of stereoscopic interfere them to recognize and interact with educator on the screen and it cause dizziness to them. Especially, they felt highest dizziness in the third step including moving their position.

## **5. Conclusions**

This experiment has revealed the pros-and-cons about the e-learning platform planning, experimenting, and analyzing in the relevance of traditional dances.

To the educator, the stereoscopic video conferencing diminishes the online social distance and brings a sense of reality, which increases their preference to reuse the system. Although the system may not entirely be able to replace the traditional dance education form, it could be widely utilized as a subsidiary method of education.

To the students, the stereoscopic video conferencing creates more educational motivation than regular video conferencing platforms. They also believe that the system could be even a bigger benefit is a stereoscopic system without the glasses could be developed.

The stereoscopic video conferencing platform may be utilized for such kind of education that requires the students' interest and motivation in short time. But in long course including often moving position, it will be better to use regular video conferencing.

This experiment is anticipated to serve to the personnel whom are first handed education content developers that may offer the educators an enhanced platform from the existing e-learning systems such as the stereoscopic video conferencing and conserving their positive beliefs on the use of e-learning, ultimately contributing in preserving and passing down the intangible cultural heritage and traditional dance education, as well as exchanging traditional cultures throughout the world.

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