

Two Cases of Dance Composition Learning Using Technology in Dance Education Study Program in Indonesia

Saian Badaruddin^(⊠), Juju Masunah, and Rita Milyartini

Post Graduate School, Art Education Program, Universitas Pendidikan Indonesia, Bandung, Indonesia Badaruddinsaian@upi.edu

Abstract. The development of technology today is a sign of the progress of modern civilization and the use of technology in learning dance composition is a way not to be left behind with technological advances in the world. This article aims to describe the results of case study research on the use of technology in learning dance composition at Universitas Pendidikan Indonesia and Universitas Negeri Padang. The paradigm used is qualitative. This research uses the case study method. The research was conducted from September to December 2021. The research participants were two lecturers teaching dance composition courses at Universitas Pendidikan Indonesia and Universitas Negeri Padang. Data were obtained through observation, interviews, and literature study. Data analysis using triangulation. The research findings explain that the technology used to create dance works currently includes Mapping Arts, Virtual Reality (VR), Augmented Reality (AR), telepresence technology, and Pepper's ghost. The results showed that technology in dance composition learning at Universitas Negeri Padang predominantly uses Mapping Arts, VR, and LMS platforms, while the Universitas Pendidikan Indonesia uses digital platforms, LMS, Paper ghost, and a combination of VR with teleholography.

Keywords: Dance Composition · Mapping Arts · Virtual Reality · Augmented Reality · Telepresence Technology

1 Introduction

In the era of Revolution 4.0 towards Society 5.0, the use of technology is not only in the field of science but also in the social and artistic fields [1, 2]. The development of technology is currently seen as a manifestation of the progress of modern civilization that has an impact on changes in human life. If you look at the relationship between technology. The phenomenon of combining technology and art is often used to produce works and innovative forms of learning in the field of art education. It can be seen today that many creators are trying to combine the concepts of virtual and real worlds into a single unit such as the concepts of virtual reality and augmented reality [3]. On the other hand, in art education learning technology, creators have begun to develop innovative

learning models and learning media using digital platforms since the launch of highspeed internet technology. Seeing the various forms of technology developed in today's world, of course, also has an impact on the arts sector and art education, especially in the process of learning dance composition.

Indonesia has 13 Universities that have good dance study programs that concentrate on art studies, art creation, and art education. There are two universities with art education study programs that are attracting attention in using and developing technology for learning dance composition and technology in creating dance, namely the Department of Drama, Padang State University, and the Department of Dance Education, UPI Bandung. Both study programs have advantages in developing technology for dance learning, as is the case at UPI Bandung which has developed a Digital Platform-Based learning model and has packaged video technology-based learning since 1998 until now, Masunah an interview, 2021. Padang State University has developed Mapping Art in staging student dance compositions since 2008, said Desfiarni, 2021 when interviewed. The use of this technology has contributed and developed rapidly in the dance creation and dance composition learning industry, making it more interactive and becoming a guide for other art study programs throughout Indonesia.

In the current era of the Covid pandemic, of course, changing the pattern and concept (offline) to (online), these forces dance educators and dance creators to adapt and innovate in the process of learning and creating dance. These problems provide opportunities and creative ideas to stay side by side with technology as a means of creating dance and as a messenger in dance learning. As stated Fletcher [4], That technology in learning its current existence cannot be separated anymore. Its existence can connect various kinds of new knowledge and global information that can be accessed in education. From this background, of course, it is important to review further the use of technology in dance creation and technology that supports the learning process of dance composition so that its usefulness can be analyzed further and can categorize the types of technology used in dance disciplines.

Several studies on technology in dance creation and technology used as a supporting tool in dance learning have been studied previously. Twyla Tharp in 1970 had designed the animated doll for her television choreography entitled "Catherine Roda." The effort was very successful and became an animation, although brief, showing that expressive dance movements can be obtained from mathematical and electronic processes [5]. Buff Brennan at the University of Wisconsin-Madison in [5] records and analyzes dance moves using Laban's Notation Analysis category system. The purpose of this research is to determine the individual motion profile of dancers. Then the movements are coded to the computer keyboard with software that records events accurately to one-twentieth of a second. Milla Parrish, researched Dancing the distance: iDance Arizona videoconferencing reaches rural communities. This study describes the use of video conferencing with the help of the internet network to facilitate learning the art of dance and composing dances for rural areas [6]. Furthermore Octavian [7] research about iDance Arizona videoconferencing reaches rural communities. This study describes the use of video conferencing with the help of the internet network to facilitate learning the art of dance and composing dances for rural areas. Furthermore Octavian [7] researched the application of Android-based augmented reality technology as a medium for learning the basic

movements of the bedana dance. In his research, he reviews the use of augmented reality (AR) which is implemented for the basic movements of the bedana dance and then becomes a database in android apps that are used for dance learning. On the other hand, examining the use of animation technology in learning dance, this study used Bengkulu sword dance as an animation object [8]. This research was conducted to increase students' interest in learning dance and to be able to apply noble values in traditional dance. Komalasari, et al., also researched "Multimedia Design for Android-Based Folk Dance Learning as Student Self-Directed Learning in Lectures" [9]. This research produces an android-based multimedia development product for independent dance learning by students.

Previous research provides an overview of the use of technology in dance learning, both for recording dance, conveying dance knowledge, and creating dance. However, there are no research results that examine the use of technology in learning dance composition. The purpose of this research is to describe the use of technology in dance education, especially in learning dance composition in two different places. This is done to see the extent to which technology is used in the process of creating dance works and learning dance compositions.

The development of technology in Indonesia started in the 90s when technology is used to make human work easier and more optimal. In the world of dance, especially the process of composition and choreography, the art of dance is currently developing very rapidly. Miroto develop new concepts in dance work with the help of a technology called "Teleholographic Reality" [10]. In this concept, it aims to unite the body virtually which is packaged into a holographic choreography that has been recorded in the form of HD-resolution video. The recorded images are combined with the original body at one time and then arranged so that it becomes a show at one time but in a different place. Not only that but Hary Nuriman has also been discussed as an innovator in the use of animation in dance design models and motion capture for dance based on virtual reality [11]. Nuriman, examined the use of motion recording device. Motion capture is used as a tool to change the shape of the motion performed by the body and is combined with new media. If we look at some of these technologies, we can review several technologies that can be used in dance creation and support dance learning in detail.

Video mapping or often called mapping art is a method of lighting or light projection that can produce an optical illusion aimed at an object. Visually it can change shape according to what is projected. Substitution generally uses a certain media or object in the form of certain animations or graphics. Likewise, as stated by Catanese that video mapping is a method of lighting or light projection until the conclusion produces an optical illusion of the object [12]. The substitution generally uses a medium or object, as well as a field. In the performing arts industry, mapping art or video mapping is used to add an element to performing arts to make it look more lively and spectacular. In the process of creating a dance, mapping art is used by the choreographer to support the atmosphere or setting of the dance performance, and it can even present dancers based on video illustrations according to the concept and arrangement of the dance compositions that the choreographers want to create. Mapping art used must use an object, either in the form of a certain architectural building or a flat area of a performance stage, it can even be projected on the window pillars and facades of a certain building [13].

Virtual reality consists of interactive computer simulations, where users can experience real situations through sensory to one or more of their five senses [14]. In performing arts, virtual reality is currently used as a medium for virtual stage performances and even virtual art exhibitions that can be felt by real users in the virtual world. Likewise in the world of dance, choreographers design dance animations and then arrange them so that they can combine virtual dance works with real dancers on stage simultaneously [15].

Talking about augmented reality (AR) is currently widely used globally and is increasingly popular in the community [16] In this AR technology can insert certain information into the virtual world and display it in the real world with the help of equipment such as webcams, computers, Android phones, or special glasses [17]. In the world of education, the use of AR is in great demand, this is very interesting for learning. The capacity of using AR to overlay rich media into the real world for viewing via webenabled devices such as mobile phones and tablet devices means that information is available to students at the right time and place [17, 18]. It can be seen that there are many learning models based on Android multimedia by presenting AR features so that they can see objects in the form of graphics such as the shape of musical instruments, dance clothing, and even types of motion, as was done by Nuriman [11] who tried to create mask dance graphics in the form of AR design.

Teleholography is a concept that combines Augmented reality and the body in reality which are united at the same time [10]. Teleholographic Reality Show requires two different rooms that have different functions and facilities. The first room functions as a "room for teleholographic reality shows" while the second room functions as "an augmented reality show [10]. The teleholographic concept uses a tool in the form of glass to project an image to become a hologram that looks real. Teleholography unites a virtual body, which has been recorded in High Definition (HD) video, with a real body. The recording is done on stage using holographic technology and produces three-dimensional images, interacting directly from different spaces in real-time (live) with live performers on stage [10, 19].

A digital platform is a group of technologies that are used as a basis for developing applications, processes, or other technologies (fields) in general, which can be in the form of several digital websites [20]. For a more specific learning platform, it is referred to as an LMS platform or Learning management system. LMS is a software application for online activities, and electronic learning programs (e-learning programs). A strong LMS should be able to do the following: use self-service and self-guided services [21]. Art learning using several LMS platforms is very helpful in increasing students' technological knowledge, as proposed by Govender and Khoza to develop education in line with technological developments one must have three components of knowledge, namely, content knowledge (CK), pedagogic knowledge (PK) and Technology Knowledge (TK) [22]. In the world of art education and art learning, these two platforms are often used in the dance learning process, even with some of these platforms do not limit the space for creativity in the art learning process.

2 Methods

This study uses a qualitative paradigm. Qualitative research is research that creates descriptive information and data in the form of written or spoken words from each attitude of the people studied [23]. This research uses a case study method or approach (Case Study). Robert K. Yin, explains that:

The case study is a concept that is suitable if it is used to answer questions related to how or why the researcher has little opportunity to control the events being investigated. And when the focus of the research lies on present-day phenomena [24].

Nawawi explains that "case study information can be obtained from many parties being studied, in other words, the information in this research is collected from various sources" and "the case study method as a category of descriptive approach is research that is tried intensively, in detail and in-depth on an organism (person), institution or indication with a small area or subject" [25, 26].

Case study data collection techniques According to Yin, "the implementation of data collection there are 6 sources, namely: documents, archive records, interviews, direct observation, participant observation, and tangible devices" [27]. The case study research technique according to Yin, is as follows: a. Defining and designing research, b. Prepare, collect and analyze information, c. Analyzing and formulating [27]. The data collection in this study were direct and indirect interviews and interviews using zoom meetings. Furthermore, direct observations of the field and interviews were addressed by the lecturers who teach dance composition courses at the dance education department at the University of Indonesia Education, namely Ayo Sunaryo and Putri Lilis Dyani. Furthermore, the second interview was addressed to Veny Rosalina, Herlinda Mansyur, and Desfiarni BM a lecturer in the dance composition course at the dance department of Padang State University. Furthermore, direct observation of the learning process at the process of using technology is used in creating art and supporting dance composition learning.

The analysis technique in this study uses descriptive analysis based on the process of a conceptual model and research questions and the collection of some documentation data in the form of photos and recordings then presented as a case study report and continued with the identification process to conclude this case study. After getting an overview of the conclusions, then they are analyzed using pattern matching to compare the initial predictions or assumptions with actual events [27].

3 Results and Discussion

3.1 The Use of Technology in the Department SENDRATASIK UNP

Dance composition is a core subject in the ballet major, in this course, you must produce dance products, both individually and in groups. To produce these products in this pandemic era using technology both in the learning process and in the work process. At this time, the UNP ballet major is 21 years old in carrying out education in the arts, one of which is the concentration in the field of dance. To produce graduates who have good competence, of course, several courses must be carried out gradually in each semester [28]. Like the composition course, which is carried out in stages with levels I and II, then followed by choreography courses so that students can get maximum competence in the field of dance skills. Talking about dance compositions, of course, many models and forms can be applied in creating dance works, one of which is by utilizing technology. Student creativity is certainly not spared by the guidance and direction of the lecturers in applying it, as shown in Fig. 1 is an application of video mapping or often referred to as mapping art which is applied to student dance works to support the atmosphere or setting of a performance so that looks more real and easy to understand by the audience based on the aesthetic experience they witnessed.

The high creativity of dance students certainly produces new forms in every journey of their work [28]. Mapping art is not only a supporting medium in a dance work but can also be designed in such a way according to the needs and creativity of students, said Herlinda, 2021 when interviewed. Until now, it is not only mapping art that is used by students to support their work projects in dance composition and choreography courses but also uses virtual reality which is presented through *Video Tron*, it can be seen in Fig. 2, that virtual reality provides a 3D sensation in the form of animation and graphics that can be integrated into dance works. These graphics are arranged and designed to give the appearance of other animated characters from several videos that are animated.

On the other hand, the concept of learning dance composition has certainly changed since the COVID-19 pandemic, of course, the teaching staff did not escape their creativity to take advantage of several LMS platforms so that Asynchronous and Synchronous



Fig. 1. Video mapping on UNP sendratasik student dance works (title batanghari 2050).



Fig. 2. Virtual reality in the dance work of the UNP alumni. Documentation: Fadjri 2021.

learning with the virtual world can still be carried out. There are several platforms used to support dance composition learning in the UNP ballet major in the form of the *Zoom meetings platform* and *Google Classroom* to coordinate learning in the pandemic era, which currently has limited face-to-face learning.

Some dance composition learning materials are given synchronously through zoom meetings then an exploration stage is carried out using several methods that students want to explore, then the form of lecture assignments is coordinated using a Google Classroom page. Of course, this activity is still controlled face-to-face to get the maximum experience and abilities of students, said veny, 2021 when interviewed. Because learning to create works of ability in a practitioner must be done a lot compared to the virtual world. Technology is used as a tool in developing creativity so that it remains consistent with the times.

3.2 Use of Technology in the Department of Dance Education UPI Bandung

Learning Composition of dance is also studied at the dance education department of UPI Bandung, in this course, you must produce dance products, both individually and in groups. To develop the potential in dance work, of course, technology does not escape being used in the learning process.

The Dance Education Study Program is constantly adapting, and trying to anticipate various issues of changes in the world of education in the context of globalization. Its realization in 1993 opened the S1 level by implementing a flexible curriculum and is now a dance education department that gives students the freedom to choose courses to produce quality graduates who are supported by additional abilities outside of their scientific field and can compete in the world. Work.

One of the subjects that can develop scientific competence in creating dance is dance composition and choreography taught by Ayo Sunaryo as one of the lecturers in charge of the course. The development of technology also makes lecturers produce the latest findings and methods in the process of learning dance composition by using technology as a supporting tool in learning dance composition and in using technology in creating dance works. With the development of the concept, technology teaching has also changed, namely guidance to students in the learning process" [29].

Especially in the current era of the covid pandemic, the role of a teacher must be more creative because they have to adapt to technological advances, of course, this is due to changes in learning procedures caused by the social behavior of the community [30–33].

Therefore, Sunaryo tries to take advantage of technology and create a digital platform-based learning model through the YouTube channel for learning dance compositions. It can be seen in Fig. 3. Some of the materials are used to support learning asynchronously so that students can access the material more freely. On the other hand, for synchronous learning, Sunaryo still uses several LMS platforms in the form of Google Classroom and Zoom Meetings as well as Spots provided by UPI itself, so that in the virtual face-to-face meeting process for dance composition learning, we can continue to run and monitor its progress. Technology is not only used to support dance learning but it is also used simultaneously in the process of creating and creating dance.



Fig. 3. Learning dance composition through the Youtube digital platform by Ayo Sunaryo.

Sunaryo tries to create a dance with the ENGKLE model "*Entering in Environment, Navigation, Googling, Knitting and Validating, Locking and Presenting, and Evaluation*" [9, 34].

This model was carried out as a stage of the motion exploration process until the compilation was then applied to the *teleholographic* concept by Miroto in the collaborative work of The Forest in October 2019 virtually to the public.

It can be seen in Fig. 4, Fig. 5, Fig. 6, and Fig. 7 that the process of combining a motion exploration with a *teleholographic* concept also uses the OBS application as an intermediary to deliver animation to the screen and the Zoom platform to coordinate dancers at the same time.



Fig. 4. The appearance of the OBS application in the performance of The -Forest Dance.



Fig. 5. Monitor performances of performers from various countries who live in the performance of The -Forest Dance.



Fig. 6. Miroto is guiding teleholographic activities using Zoom and OBS in the performance of The -Forest Dance.



Fig. 7. Setting the Stage in implementing Teleholography in the dance performance of The -Forest.

3.3 Discussion

Both universities have used technology to facilitate and keep up with the times in the process of learning dance composition and creation of dance works, of course, not all currently developing technologies can be used for learning dance composition and dance creation, this is adjusted to the needs that can contribute to creating dance work. The advantages of the technology used in the Padang State University ballet education department are: application in the use of video mapping or often referred to as mapping art which is applied to student dance works to support the atmosphere or setting of a performance to make it look more real and easily understood by the audience. Catanese revealed that video mapping is a method of lighting or light projection until the conclusion produces an optical illusion of the object [12]. As for the use of virtual reality is also used by the works of alumni education sendratasik. Several works were produced in the last five years using mapping art technology, namely the Batang Hari dance 2025, Rampak Galembong Festival BRI National level created by alumni of the UNP sendratasik education while for the learning process UNP uses digital platforms and LMS platforms in transforming the learning process. The use of technology used by the dance education department at the University of Indonesia Education is more diverse and more specific in the learning process with various digital platforms, YouTube, and LMS platforms. As well as the results of learning products using technology since the launch of the VCD and DVD interactive learning, the UPI Department of Dance Education has become a pioneer. Currently, in supporting student work and developing technology to create dance, the dance education department has used several technologies such as The use of technology used by the dance education department at the University of Indonesia Education is more diverse and more specific in the learning process with various digital platforms, YouTube, and LMS platforms. As well as the results of learning products using technology since the launch of the VCD and DVD interactive learning, the UPI Department of Dance Education has become a pioneer. Currently, in supporting student work and developing technology to create dance, the dance education department has used several technologies such as The use of technology used by the dance education department at the University of Indonesia Education is more diverse and more specific in the learning process with various digital platforms, YouTube, and LMS platforms. As well as the results of learning products using technology since the launch of the VCD and DVD interactive learning, the UPI Department of Dance Education has become a pioneer. Currently, in supporting student work and developing technology to create dance, the dance education department has used several technologies such as the teleholographic concept, which is a concept that combines Augmented reality and the body in reality which are united at the same time [10]. Of course, this is supported with the help of the OBS Broadcasting application as an intermediary in delivering animation to the screen.

Of the technologies that have been used between the two universities, of course, all universities have used technology both in the learning process of dance composition and the process of dance creation, this is very helpful in developing technology in the world of dance so that it does not lag behind other fields of science. The technology that has been produced will certainly have an impact on progress in the world of learning dance composition and dance creation for now and the next generation.

4 Conclusion

Several technologies that have been used and can be utilized in the process of rich dance and dance creation can be in the form of Mapping arts, *Virtual Reality (VR), Augmented reality (AR), Teleholographic, Paper ghost, Digital Platform, and LMS.* All of them can be used according to user needs in the dance industry. The findings are based on case studies at two universities that are oriented toward the field of dance, that the UNP Sendratasik department has used several technologies in its student work from the results of the learning process of dance composition and choreography in the form of mapping arts and virtual reality (VR) while also supporting dance composition learning. Using several LMS platforms as a tool to support the learning process in the current covid pandemic era.

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