



PROSPECTS AND CHALLENGES OF DIGITAL TECHNOLOGY BASED DANCE ASSESSMENT

Nursilah¹, Anjani Ayu Rizki Ramadhani², Berliana Fajriani³

^{1,2,3} Jakarta State University, Indonesia.

E-mail:¹⁾ nursilah@unj.ac.id, ²⁾ anjanil1ayu@gmail.com, ³⁾ berlianafajriani@gmail.com

Abstract

This article explores the dynamic prospects and challenges that arise in digital-based dance assessment. In an era where digital technology is increasingly integrated in various aspects of life, dance is undergoing a significant transformation, particularly in terms of assessment and evaluation. This research aims to identify and analyze how technologies such as artificial intelligence, sensor-based movement analysis, and virtual reality, can provide new methods of objective and detailed dance assessment. Through a qualitative approach involving interviews with dance professionals, analysis of relevant literature, and case studies, this article reveals how technology can support and enrich dance assessment practices. The results show that while digital-based technologies offer the possibility of more precise and in-depth assessment, aspects such as artistic interpretation and the uniqueness of dance expressions cannot always be effectively measured with digital methods. This article contributes to the discussion on the integration of technology in dance by highlighting the importance of finding a balance between the utilization of technology and the preservation of aesthetic and traditional values in dance. In conclusion, while digital technology has great potential in dance assessment, there needs to be awareness and strategies to overcome its limitations in order to maintain the integrity of dance.

Keywords: *artistic interpretation, dance aesthetic value, dance assessment and evaluation, digital technology, motion analysis*

Abstract.

This article explores the dynamics of emerging prospects and challenges in digital-based dance assessment. In an era where digital technology is increasingly integrated into various aspects of life, the art of dance is experiencing a significant transformation, especially in terms of assessment and evaluation. This research aims to identify and analyze how technologies such as artificial intelligence, sensor-based movement analysis, and virtual reality, can provide new methods for objective and detailed dance assessment. However, on the other hand, this reliance on technology also raises a number of challenges, including the issue of losing the essence of dance, authenticity, and accessibility. Through a qualitative approach involving interviews with dance professionals, analysis of related literature, and case studies, this article reveals how technology can support and enrich dance assessment practices. The research results show that although digital-based technology offers the possibility of more precise and in-depth assessment, aspects such as artistic interpretation and uniqueness of dance artistic expression cannot always be measured effectively with digital methods. This article contributes to the discussion regarding the integration of technology in dance by highlighting the importance of finding a balance between the use of technology and the preservation of aesthetic and traditional values in dance. In conclusion, although digital technology has great potential in dance assessment, there needs to be awareness and strategies to overcome its limitations in order to maintain the integrity of the art of dance

Keywords: *movement analysis, aesthetic value of dance, artistic interpretation, assessment and evaluation of dance, digital technology*

1. INTRODUCTION

In Indonesia, traditional dance performing arts competitions and festivals have become a culture. This competition is usually organized by an arts organization and participated by studios and various stakeholders such as dancers, teachers, guardians, judges, administrators, and others. Dance competitions are marketed and perceived by participants as a place to connect with dancers, to showcase and share what is learned in the dance studio, and to receive feedback from a trusted panel of experts (Schupp, 2018). Most dancers who participate in dance competitions compete for the highest honors from the jury. The jury's assessment and evaluation will be given at the end of the performance of all participants, but this method is considered outdated.

In the ever-growing digital era, performing arts, especially dance, is experiencing a significant evolution. Technological advances have paved the way for a variety of new methods in dance assessment, which not only challenge traditional ways of evaluating this art, but also provide new opportunities for exploration and innovation. This article aims to explore various aspects related to the prospects and challenges faced in digital-based dance assessment. Technological developments such as virtual reality, artificial intelligence, and sensor-based movement analysis have enabled dancers and choreographers to explore new dimensions in the creation and evaluation of dance works. On the one hand, this technology opens up opportunities for more objective and detailed assessments, allowing for more accurate motion analysis and more constructive feedback. On the other hand, this reliance on technology also brings a number of challenges, including issues of accessibility, authenticity of artistic expression, and the potential loss of traditional aesthetic values in dance.

This article examines the dynamics involved in digitally based dance assessment, considering both the opportunities presented and the challenges that arise. By understanding these two aspects, the full potential of technology can be explored in developing and preserving the art of dance, while maintaining the essence and cultural richness that has long existed in this art form. Key aspects related to the integration of technology in dance assessment include: the impact of digital technology on the objectivity and precision of assessment, the challenges faced in implementing digital technology in dance assessment, including accessibility issues, loss of the essence and authenticity of dance artistic expression, and the potential the incompatibility of technology in capturing artistic nuances, dance professionals and choreographers respond to the use of technology in dance assessment, and how this affects traditional and contemporary dance practices, in the context of preserving aesthetic and traditional values in dance, how digital technology can be balanced to respect and maintain aspects of dance. non-technical aspects in dance, as well as what are the long- term implications of the application of digital technology in dance assessment on the development and evolution of the art of dance

2. IMPLEMENTATION METHOD

The research methods used in this research include:

2.1. Study Literature

A comprehensive literature review regarding the use of technology in dance assessment. This includes collecting data from books, journal articles, and online sources that are relevant to



this topic. The aim is to understand the historical, theoretical and practical context of the use of technology in dance assessment, as well as identifying existing research gaps.

2.2. Online Surveys

Develop and distribute online surveys aimed at dance professionals, including dancers, choreographers, and dance educators. Objective The use of this method is to collect quantitative data regarding their perceptions, experiences and attitudes towards the use of technology in dance assessment. The tool used is a survey platform in the form of Google Forms.

2.3. Deep interview

In-depth interviews were conducted with a selected sample of survey respondents to obtain more detailed insight. The sources in this research were activity organizers, choreographers, dancers and judges. What we want to achieve is to understand personal experiences, challenges and perceived opportunities related to digital-based dance assessments. The interviews used were semi-structured and conducted virtually and face-to-face.

2.4. Case analysis

Case analysis is used to investigate several case studies where digital technology has been implemented in dance assessment. It is to understand the practical application of technology and its impact on dance assessment in various contexts. Cases come from projects or dance assessment programs that have implemented digital technology.

2.5. Data analysis

Using qualitative data analysis software to process and analyze the data collected. Identify patterns, trends, and relationships in data to answer research questions

2.6. Discussion and Conclusion

This stage is carried out by integrating the results of literature studies, surveys, interviews and case analysis. Develop a comprehensive understanding of the prospects and challenges of digital-based dance assessment, and provide recommendations for future practice. This research method is designed to provide a holistic and multidimensional view of the topic qualitatively to obtain a deep and balanced understanding.

3. RESULTS AND DISCUSSION

3.1. The Effectiveness of Technology in Dance Assessment

The results of research on the effectiveness of technology in dance assessment reveal several key findings related to the use of advanced technology in the context of dance assessment. This research focuses on the implementation of digital technology tools in evaluating technical and artistic aspects of dance.



Figure 1. Implementation of digital technology tools in evaluating dance (Image source: Youtube/Real Art Official)

First, research shows that technology, especially AI and movement sensors, is very effective in measuring the technical parameters of dance. For example, AI can be used for precise movement analysis, assessing a dancer's synchronization and coordination with great objectivity. This technology allows a deeper analysis of aspects such as speed, rhythm and movement quality that are difficult to assess manually (Wei et al., 2014)

However, research also reveals an important dilemma: although technology increases objectivity in the assessment of technical aspects, its ability to assess subjective aspects of dance, such as artistic expression and emotional interpretation, remains questionable. A number of respondents expressed concern that reliance on technology might ignore the expressive nuances that are at the heart of dance. For example, AI assessments may not fully capture the expressive richness of movements interpreted by dancers, or the emotional nuances they convey through dance.

Additionally, although virtual reality offers new experiences in enjoying and evaluating dance, there is a gap in its ability to fully capture the essence of “presence” and “space” in live dance. VR may limit the spontaneous interactions and emotional connections that often occur in live dance performances.

Overall, the research results show that while digital technology brings significant improvements in the objectivity and precision of dance assessment, especially from the technical side, there is a need to develop a more holistic approach that also takes into account the artistic and expressive values unique to the art of dance. The dancer is considered an artistic agent and digital technology simultaneously creates a non-utilitarian experience that has the potential to be enjoyable and enhances the viewer's perceptual abilities (Gray, 1989).

3.2. Dance Community Response

In the context of digital-based dance assessment, research results show mixed responses from the dance community. Acceptance of technology in dance assessment varies, depending on the individual's perspective on technology and their personal experiences in dance.



Figure 2. The enthusiasm of the dance community towards digital-based dance assessments (Image source: Youtube/Real Art Official)



Some dance practitioners, especially those involved in contemporary and experimental dance, show an open and accepting attitude towards digital technology. They view technology as a valuable tool for improving quality and precision in scoring, as well as a means for new artistic exploration. For them, exploring the potential that various technologies can be used to enable new ways of using and producing knowledge about dance also invites reflection on the way we understand dance (Bleeker, 2016). The use of technologies such as movement analysis and virtual reality is seen as a means to develop more precise dance techniques and to create innovative audience experiences.

On the other hand, a number of traditional dance practitioners expressed concerns about the influence of technology on artistic and aesthetic values in dance. They tend to see technology as a tool that can reduce or even replace important aspects of dance, such as emotional expression and rich artistic interpretation. These concerns primarily relate to the loss of human contact and authenticity in dance scoring, which are considered key elements in dance traditions. As they believe that technology deprives the body of the right to explore its disciplines and can sabotage the 'meaning creation' of dance practice directly (Bond & Morrish, 1995).

Furthermore, the research results also found that the adoption of technology in dance not only affects dance practice itself, but also the way dancers and choreographers practice, teach and develop their work. Some respondents stated that the use of technology had encouraged them to experiment with new styles and forms in dance, while others expressed concerns about its impact on the preservation and transmission of dance traditions.

Both responses are a consequence of the way we situate ourselves in cultural and technological discourse: whether we start with technology and return to culture, or start with culture and move on to technology (Tredinnick, 2008).

Overall, the results of the study suggest that while digital technology offers significant opportunities for innovation and improvement in dance assessment, there is an important need to strike a balance between the use of technology and respect for traditional values and artistic expression in the art of dance. This emphasizes the importance of dialogue and collaboration between the dance community and technology experts to ensure that the use of technology supports and enriches the art of dance, rather than replacing it.

3.3. Challenges in Technology Integration

Research related to the challenges in integrating technology in digital-based dance assessments reveals several key aspects that are challenges in implementing this technology. One of the main issues faced is technology accessibility. The research results show that there is unequal access to advanced technology in various dance communities, especially among those in areas with limited resources or in communities that have less exposure to the latest technological developments. This creates a gap in the ability to adopt and utilize technology in dance assessment, thereby potentially increasing disparities between different groups within the dance community.

Furthermore, the research results also highlight concerns about preserving dance traditions. Many traditional dance practitioners express concern that the use of technology could reduce or even eliminate important elements in traditional dance, such as the richness of expression and interpretation that is unique to each culture. They worry that technology may not be able to appreciate or capture certain nuances and subtleties that are so important in traditional dance.

There is also the challenge of balancing the use of technology and respect for the non-technical aspects of dance. Although technology can provide objective and detailed analysis of the technical aspects of dance, such as movement accuracy and coordination, there are difficulties in assessing the expressive and emotional aspects that are at the core of the art of dance. This raises the question of how technology can be used to support, rather than replace, a holistic and holistic assessment of dance.

Finally, there are challenges in the acceptance of technology by the dance community itself. Some respondents expressed resistance or skepticism towards the use of technology in dance, seeing it as a threat to the traditional and artistic essence of dance. This shows the need for a sensitive and inclusive approach in integrating technology into the world of dance.

3.4. Long Term Implications

The results of research on the long-term implications of technology integration in digital-based dance assessments reveal several important aspects that may shape the future of dance. One of the key findings is that digital technology, when used effectively, has the potential to revolutionize the way dance is taught, studied and evaluated.

In the context of dance education, the use of technology such as sensor-based movement analysis and augmented reality (AR) learning tools has shown potential to enhance dancers' learning experiences. This allows dance educators to provide more objective and detailed feedback to students, as well as facilitating a better understanding of dance technique through visualization and movement analysis. It is hoped that this will pave the way for a more interactive and technology- integrated approach to dance education.



Figure 3. Use of digital technology tools in dance performances
(Image source: Youtube/Real Art Official)



Additionally, technology also enables the exploration of new and innovative dance styles. Choreographers and dancers are increasingly using digital tools to experiment with dance concepts and presentations, leading to the development of new, more diverse and multidimensional dance forms. In this way, technology not only acts as a tool for assessment, but also as a catalyst for artistic innovation.

However, the research also highlights some concerns about the long-term impact of technology on the essence of dance. There are concerns that over-reliance on technology could diminish the aesthetic values and artistic expression that have long been a hallmark of dance. Therefore, it is important for the dance community to find a balance between utilizing technology for innovation and maintaining the essence of the art of dance.

On the other hand, this research also highlights the need for awareness and strategies in facing challenges such as technological accessibility and preserving traditions. In facing these challenges, technology allows us to archive dance in an open source or public format, this is considered an effort to overcome access gaps and ensuring that technology supports the preservation and development of dance is important (Matters, 2004).

3.5. Recommendation

The results of this research demonstrate the great potential as well as significant challenges in the integration of digital technologies into dance assessment, highlighting the expansion of possibilities as well as the need for approaches that are sensitive to traditions and artistic expression.

Based on research findings on the integration of technology in digital-based dance assessment, several key recommendations can be provided to help overcome the identified challenges and maximize the potential of technology in the world of dance.

1. **Inclusive and Affordable Technology Development:** To address accessibility issues, research suggests that technological development in dance assessment should focus on solutions that are affordable and easily accessible to various dance communities. This includes making software and hardware more economical and developing platforms that are widely accessible, including in resource-limited areas.
2. **Technology Training and Education in Dance:** The importance of education and training on new technologies for dance practitioners is emphasized. Training programs and workshops can help dancers, choreographers, and dance educators understand and utilize technology effectively in their practice, both in learning and assessment.
3. **Balance between Technology and Art:** The main recommendation is to find a balance between the use of technology and the preservation of artistic and expressive values in dance. This includes an approach that respects and maintains the essence of dance while leveraging technology for innovation and improvement.
4. **Interdisciplinary Collaboration:** Closer collaboration between technologists, dancers, choreographers and dance teachers is recommended. This collaboration can encourage exchange

ideas and knowledge, which helps in developing technological solutions that better suit the needs of the world of dance. Expanding collaboration between disciplines in dance is the possibility of opening up communicative methods to the wider community. This means a shift from practice-based limitations towards developing communication with, as well as through, other media (Mokotow, 2007).

5. **Ongoing Research on the Impact of Technology in Dance:** It is recommended that further research be conducted to continue to monitor and analyze the impact of technology in dance. This research is important to understand the changes that have occurred over time and ensure that the use of technology remains relevant and beneficial to the dance community.

4. CONCLUSION

This article thoroughly explores the transformational impact that digital technology has had on dance assessment. From the use of artificial intelligence and sensor-based movement analysis to the use of virtual reality, technology has opened new avenues in how we measure, assess and appreciate the art of dance. The effectiveness of technology in assessing the technical aspects of dance has been a major highlight, providing unprecedented objectivity and precision. However, challenges arise in assessing subjective aspects of dance, such as artistic expressiveness and uniqueness of emotional expression, for which technology is often less capable.

Responses from the dance community to this technology integration have varied. On the one hand, there is excitement about the potential that technology offers in driving artistic innovation and technical improvement. On the other hand, there are concerns about how technology might obscure or even replace traditional artistic values. Issues such as technological accessibility and preserving traditions also stand out as important challenges that need to be addressed.

In the long term, the integration of technology in dance is expected to bring about significant changes in the way dance is taught, practiced and assessed. This article highlights the importance of finding a balance between technological innovation and preserving the artistic essence of dance. For the future, a more inclusive and holistic approach is needed, considering both the potential of technology and the importance of dance values.

This conclusion emphasizes that although digital technology brings many benefits to dance assessment, there is still a critical need to maintain a balance between technological advances and the preservation of the artistic and expressive core of the art of dance. The importance of dialogue and collaboration between technology and the dance community is also a key factor in the evolution of dance in the digital era.

REFERENCES

- Wei, Y., Yan, H., Bie, R., Wang, S., & Sun, L. (2014). Performance Monitoring and Evaluation in Dance Teaching with Mobile Sensing Technology. *Personal and Ubiquitous Computing*, 18(8), 1929–1939. <https://doi.org/10.1007/s00779-014-0799-7>
- Bleeker, M. (2016). Transmission in motion: The technologizing of dance. In *Transmission in*



IJPA

International Journal of Performing Arts



Motion: The Technologizing of Dance. <https://doi.org/10.4324/9781315524177>

Bond, K., & Morrish, A. (1995). Is technology the future for dance? : the Green Mill Dance Project papers. *Dance Studies Association, Vol. 27, N.*

Gray, J. A. (1989). *Dance Technology (Current Applications and Future Trends).*

Matters, M. (2004). Digital Video Preservation. In *The Dance Heritage Coalition.*

Mokotow, A. (2007). *WHY DANCE : The impact of multi arts practice and technology on contemporary dance* . The University of Melbourne.

Real ArtOfficial. (2023, June 25). Pasanggiri Jaipong 2023 Day 2 [Video]. YouTube.

<https://www.youtube.com/watch?v=MpTINUmnkwc&t=1090s>

Schupp, K. (2018). You've Got to Sell It! Dancing on the Competition Stage. In S. Dodds (Ed.), *The Oxford Handbook of Dance and Competition* (pp. 41–64). Oxford University Press.

Tredinnick, L. (2008). Digital Information Culture: The individual and society in the digital age. In *Chandos Publishing.* <https://doi.org/10.1533/9781780631677>