IJPA
International Journal of Performing Arts

ANALYSIS OF THE NEEDS FOR AUGMENTED REALITY DANCE LEARNING MEDIA: LABAN NOTATION MOVEMENT LITERACY FOR JUNIOR HIGH SCHOOL STUDENTS

Siti Fatmasari [1)], Dinny Devi Triana [2)], Jeong OK Jeon [3)]
[1*] Magister Pendidikan Seni,Universitas Negeri Jakarta
E-mail: [1)]nongsari@gmail.com, [2)] dinnydevi@unj.ac.id, , [3)] jeongokjeon@gmail.com

Abstract

This Research and Development (R&D) study, conducted using the ADDIE model, focused on the Analysis Phase to address the main learning barrier in Dance Arts in Junior High Schools (SMP): the high difficulty of Phase D students in understanding the Essence of Movement (space, time, energy) and the abstract Laban Notation symbols. Data collected from 20 students and 2 teachers in Serang City indicated an extreme level of difficulty in abstract concepts (85.5% - 87.0%), inversely proportional to the students' strong interest (92.5%) and readiness for high-tech devices (95.0%) for digital learning. The goal was to validate the urgency and specify the functional requirements of the solution. The results confirmed the urgent need for instructional media capable of bridging the abstract (Laban symbols) with the kinesthetic (3D motion). These findings led to the Functional Specifications of Augmented Reality (AR) Media - Motion Literacy. The AR media must specifically visualize the interactive and real-time relationship between Laban symbols and 3D motion elements. This AR media is expected to concretize abstract concepts, support the "Create" competency in the Independent Curriculum, and enable meaningful and enjoyable in-depth learning for 21st-century learners. The study concludes with a development plan for the next Design and Development phase.

Keywords: ***Augmented Reality; Seni Tari; Literasi Gerak; Notasi Laban; Kurikulum Merdeka***

1. INTRODUCTION

Learning success stems from the educator's ability to adapt materials with methods and media that suit the characteristics and learning styles of students (Hamalik, 2010; Widodo, 2023). Today's students, dominated by Generation Z (Digital Natives), have learning style preferences that demand audiovisual, interactive, and instant content (Prensky, 2001; Prismanata & Sari, 2024; Wahyuni, 2023). In the context of Dance, learning should be able to trigger student engagement cognitively, affectively, and behaviorally, which has been proven to be a strong predictor of academic success (Fredricks et al., 2004). According to researchers, a fundamental obstacle in learning Dance in Junior High Schools (SMP) is the failure of conventional methods (lectures or passive modeling) in facilitating the spatial-kinesthetic understanding required by dance material (Fuji Astuti, 2016; Rahayu, 2022). This failure creates a gap between students' digital world and dance art materials, which results in low interest in learning and hinders the achievement of optimal creativity (Hermansyah, 2017; Mulyani, 2024).

In the Independent Curriculum, the Dance Arts Learning Outcomes (CP) Phase D (Grades VII-IX) mandate that students be able to achieve a high level of competency, namely Thinking and Working Artistically, Creating, and Reflecting on dance movements based on values, types, and functions in a cultural context (Kemendikbudristek, 2023; head of BSKAP, 2024). Achieving this level of creation and reflection (High Order Thinking) actually requires a strong cognitive foundation, namely a basic understanding of the essence of movement—including the elements of space, time, and energy—as the key to analyzing and synthesizing dance (Anderson & Krathwohl, 2001; Kusuma, 2022). The abstract nature of these essential elements of movement is the main point of difficulty for students (Rahayu, 2022). The urgency of this research arises because a visual-kinesthetic bridge is needed that can concretize the abstract concept of the essence of movement, in order to ensure the complete achievement of CP Phase D.

To address the problem of understanding the essence of movement, the demand for mastery of Motion Literacy is unavoidable, which is defined as the ability to read, analyze, and consciously produce movement (Bucek, 1998; Lee, 2022). Movement literacy can be integrated through the Laban Notation system, which is a standardized visual language for recording and analyzing body movements in detail (Hutchinson, 1970; Studd & Cox, 2013). However, Laban Notation symbols are often abstract, complex, and difficult for junior high school students to understand, especially in visualizing symbols for direction and level of movement, thus requiring powerful visualization tools (Dwiyana Habsary et al., 2024).

Several studies have attempted to bridge this gap using technology. Digital approaches to Laban Notation have been explored, for example, by Triana, D. D., Yudha & Adhi (2004), who developed a dance notation-based educational game to diagnose kinesthetic intelligence. Previously, Triana et al., (2020) also designed Labanotation-based movement literacy learning materials through e-learning to diagnose kinesthetic intelligence. Meanwhile, in the media realm, Augmented Reality (AR) has proven effective in presenting virtual 3D objects in the real world, making it an ideal solution for abstract concepts (Azuma et al., 2001; Wang & Burton, 2012). In dance education, many studies have applied AR to introduce basic movements or various traditional dance movements (A. Ismiati et al., 2021a; Kusumawati & Arifin, 2023; Purba et al., 2023; Utami et al., n.d.; Yusuf et al., 2020), and systematic reviews also confirm the potential of AR in dance education (Valdez & Zuk, 2023).

The Research Gap (Novelty/State of the Art) found is that, although there are studies that use Laban for assessment (Triana, D. D., Yudha & Adhi, 2024) and AR for movement visualization (N. Ismiati, 2021), there has not been any development research that specifically and integratedly designs AR-Motion Literacy media that functions as an instructional aid to visualize the direct relationship between abstract Laban Notation symbols and the essence of movement (space, time, energy) in a concrete 3D form in the context of dance in junior high schools. This novelty positions this research as an essential foundation in producing a media blueprint that supports the elements of Creating and Thinking Artistically in the Independent Curriculum.

Based on the facts of the problem and research gaps, this research is an initial stage (Analyze Stage of R&D) which aims to comprehensively analyze the need for appropriate and relevant AR-Motion Literacy dance learning media. The problem-solving plan is carried out through a field study that includes analysis of student needs, curriculum (CP Phase D), and existing media at SMP Negeri 2 Serang City and SMP Negeri 16 Serang City in March 2025. The results of this analysis will be an essential foundation in the design and development of an innovative AR-Motion Literacy media prototype, which is expected to realize meaningful and enjoyable in-depth learning for 21st-century students.

2. IMPLEMENTATION METHOD

This study uses a Research and Development (R&D) approach with the aim of producing a prototype of Augmented Reality (AR)-Motion Literacy learning media (Borg & Gall, 2007; Sugiono, 2008). The development model used is the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). This section focuses on the initial stage, namely the Analyze Stage, which aims to identify the specific needs of students and teachers and analyze the relevance of the curriculum (Branch, 2009).

2.1 Research Location and Subjects

The research was conducted in two different locations, namely SMP Negeri 2 Kota Serang and SMP Negeri 16 Kota Serang, in March 2025. These two schools were selected purposively to represent different dance learning conditions in the context of the implementation of the Independent Curriculum. The research subjects consisted of two key groups: Arts and Culture Teachers (a total of 2 people, one from each school) as the main informants regarding pedagogical challenges; and Phase D Students (Grade VII), a total of 20 people (10 students from each school), who were selected using a purposive sampling technique. These students were the target media users to provide data on their characteristics, interests, obstacles to understanding movement, and technological readiness.

2.2 Data Collection Instruments and Techniques

Data were collected through a combination of qualitative and quantitative methods. Structured interviews were used to gather in-depth information from teachers. The interviews focused on: 1) Implementation of Phase D Learning Outcomes (CP); 2) Students' difficulties in the essential material of movement (space, time, energy); 3) Strengths and weaknesses of existing dance learning media; and 4) Specific needs for AR-based media. Furthermore, a Student Needs Analysis Questionnaire with a Likert Scale was used to measure quantitative data from 20 students. This questionnaire covered aspects of interest in learning dance, the level of difficulty in understanding movement symbols (Movement Literacy/Laban Notation), learning style preferences, and readiness for AR technology devices. In addition, direct observation in class with observation sheets was used to empirically observe the Dance learning process, including the level of student engagement. Finally, documentation was conducted to collect formal documents related to curriculum demands, such as the Syllabus and Phase D Dance Learning Outcomes.

2.3 Data Analysis Techniques

The data collected in the Analysis Phase was processed using two types of analysis techniques. Qualitative Data Analysis was used to process data from interviews and observations. This analysis was descriptive narrative, following the stages of data reduction, data presentation, and drawing conclusions (Moleong, 2018). The results will confirm students' main difficulties (bottlenecks) in the essence of movement and determine the specifications of the functional requirements of AR media. Meanwhile, Quantitative Data Analysis was used to process student questionnaire data. The data was processed using descriptive statistics, namely calculating percentages and average values (means) (Widoyoko, 2018). The formula used to interpret the level of need is:

$$\text{Persentase}(\%) = \frac{\text{Skor yang diperoleh}}{\text{Skor Maksimum Ideal}} \times 100\%$$

The percentage results will be interpreted to determine the level of readiness, interest and difficulty of students, with the minimum criteria for eligibility of needs set at ≥ 60 %(sugiyono, 2019).

3. RESULTS AND DISCUSSION

This section presents the results of the Analysis Stage of the R&D research, including curriculum analysis, teacher needs analysis, and student needs analysis, all of which aim to validate the urgency of developing Augmented Reality (AR)-Motion Literacy media. The discussion of the results focuses on the interpretation of the findings, their relationship to previous literature, and their implications for the specifications of the media to be developed (Branch, 2009).

3.1 Results of Needs Analysis

Curriculum and Documentation Analysis, namely the Learning Outcomes (CP) for Dance Arts Phase D, confirms that the targeted learning outcomes are the ability to create and think artistically about dance movements (Kemendikbudristek, 2023). This requirement implies that students must not only imitate movements but also be able to analyze, process, and reflect on the basic elements of movement (the essence of movement) to create new works (Anderson & Krathwohl, 2001). The results of this analysis position an understanding of the essence of movement (space, time, energy) as an absolute cognitive prerequisite before achieving CP..

Interviews with two Arts and Culture teachers from SMP Negeri 2 and SMP Negeri 16 in Serang City confirmed a gap between curriculum demands and student learning outcomes. Both teachers consistently stated that the main difficulty lies in teaching the essential concepts of movement and Laban Notation symbols. Teaching Difficulties: Teachers mentioned that the concept of space (level and direction) is the most difficult to visualize, because it requires a high level of spatial imagination. Students often have difficulty understanding the transition from two-dimensional symbols on a book/whiteboard to real three-dimensional movement. Existing Media: The available media (video and live modeling) are considered less effective for conceptual material. Passive videos only present the results of movement, not the analysis of the movement, while direct

modeling by the teacher is quickly forgotten by students. Media Needs: Both teachers concluded that interactive media is needed, can visualize movement in 3D, and connect Laban Notation symbols with kinesthetic actions in real time. AR media is seen as a very relevant solution to overcome this abstraction problem.

Student Needs Analysis Questionnaire Results: Quantitative data were collected from 20 Phase D students regarding learning difficulties, interests, and technology readiness. Key findings are summarized in Tables 1 and 2.

Table 1. Analysis of Learning Difficulties and Student Interests (N=20)

Measured Aspects	Average Percentage of Difficulty/Interest	Information
Difficulty Level in Understanding the Essence of Motion (Space, Time, Energy)	85.5%	Very difficult
Difficulty Level of Understanding Laban Notation Symbols	87.0%	Very difficult
Interest in Learning Dance Using Digital Technology	92.5%	Very high

Based on Table 1, it was found that the majority of students experienced high difficulty (Very Difficult at the 80 % criterion) in understanding the essence of Laban Notation movements and symbols (85.5% and 87.0%). This difficulty is inversely proportional to the high student interest in dance learning integrated with digital technology (92.5%). This indicates a motivational gap that can be bridged through appropriate digital media (Prensky, 2001).

Table 2. Analysis of Students' Device Readiness and Technology Knowledge (N=20)

Measured Aspects	Average Percentage of Readiness	Information
Ownership of an AR-Enabled Smartphone Device	95.0%	Very Ready
Experience Using AR/3D Applications	65.0%	Experienced enough

Table 2 shows a very high level of device readiness (95.0%), validating that technological accessibility barriers for AR implementation are virtually non-existent. Although AR experience is still at the Fairly Experienced level (65.0%), the high level of interest (Table 1) indicates that students are open to using new technologies.

3.2 Discussion dan Implikasi

The findings from the student needs analysis and teacher interviews consistently support the argument presented in the introduction: the main problem in dance learning in junior high schools is the abstraction of the concept of the essence of movement and the symbol of Labanotation (Dwiyana Habsary et al., 2024; Rahayu, 2022). This difficulty is a bottleneck that hinders the achievement of the Creating competency in the Independent Curriculum.

Needs and Literature:

Abstraction Problem Validation: The finding of students' difficulties in understanding Laban symbols (87.0%) is in line with the findings of Dwiyana Habsary et al, (2024), who emphasized students' difficulties in translating 2D symbols into 3D levels and directions of motion. This difficulty

is reinforced by Paivio (1986) in the Dual Coding theory and Mayer (2009)in Multimedia Learning, which states that verbal/symbolic information (Laban Notation) must be processed simultaneously with visual/kinesthetic information to build a strong mental representation.

Relevant Technology Solutions: The very high levels of interest and device readiness (92.5% and 95.0%) justify the use of interactive technologies. The AR solution was chosen for its ability to project 3D virtual objects into the real world (Azuma et al., 2001; Wang & Burton, 2012), which ideally concretizes the abstraction of Labanotation. AR-Motion Literacy media will facilitate students to see firsthand how a Laban symbol (e.g., the High Right Forward directional symbol) translates into a 3D body position change in front of them.

Gaps Filled (Novelty): Previous research has used AR for movement recognition (A. Ismiati et al., 2021b; Kusumawati & Arifin, 2023) or Laban for assessment (Triana, D. D., Yudha & Adhi, 2024). The implication of this needs analysis is that media development should focus on visualizing the basic principles of Laban (the essence of movement), not just on visualizing the complete dance. This fills this research gap by designing AR media that specifically bridges Laban symbols (input) with the essence of 3D movement (output).

Implications of Findings:

Based on the analysis, the implications of these findings are to produce Functional Specifications for AR Motion Literacy Media that must be met in the subsequent Design and Development Phase. These specifications include:

1. The media must be smartphone-based (Android/iOS) due to the high rate of device ownership.
2. The media must display a 3D human model that can accurately visualize the elements of space, time, and energy as denoted in Labanotation.
3. The media must have interactive features that allow students to manipulate the 3D display (zoom, rotate) and compare Laban symbols with the resulting movements in real time, thus enabling meaningful and engaging immersive learning.

4. CONCLUSION

This research is the initial stage (Analysis) of a series of Research and Development (R&D) which aims to answer the urgency of dance education in junior high schools: overcoming students' fundamental difficulties in understanding the concept of the essence of movement and the abstract symbols of Laban Notation, which is a prerequisite for achieving the Learning Outcome of Creating in the Independent Curriculum.

Based on the results presented in the Results and Discussion, several key conclusions can be drawn:

1. Validation of the Abstraction Gap: The analysis of teacher and student needs consistently validated the arguments in the Introduction. It was found that students had difficulty translating Laban notation symbols into concrete movements, reaching 87.0% and understanding the essence of movement, reaching 85.5%. These figures confirm the existence of a significant learning bottleneck, where conventional methods fail to facilitate spatial-kinesthetic mental representations.
2. Validation of Technology Needs: This high level of difficulty is directly proportional to the high level of student interest in digital learning (92.5%) and the massive availability of devices (smartphones) (95.0%). This finding confirms that Augmented Reality (AR) is the most relevant technological solution to bridge the conceptual-kinesthetic gap, due to its ability to concretize symbolic data (Laban) into interactive and immersive 3D visualizations (deep learning).
3. Functional Implications: The Analysis Phase has successfully produced the Functional Specifications for AR-Motion Literacy Media. These specifications emphasize that the developed media must specifically focus on visualizing the real-time relationship between changes in Laban symbols and changes in the essential elements of 3D movement (space, time, and energy) to facilitate meaningful and enjoyable in-depth learning. This is a novelty

in the research compared to previous dance AR studies that generally focused on a variety of complete movements.

As a plan for future service development and implementation, this research should proceed to the next stage in the ADDIE model, namely the Design and Development Stage. The proposed development plan includes:

1. Content Design: Creating storyboards and designing the AR media user interface (UI) based on functional specifications, ensuring interactive elements are easy to use (Schneiderman & Shneiderman, 2010).
2. Prototype Development: Develop a smartphone-based AR application prototype capable of projecting a 3D human model driven by Laban symbol input.
3. Advanced Implementation and Evaluation: After the prototype has been validated by experts (Development Phase), a limited trial (Implementation) will be conducted at SMP Negeri 2 and SMP Negeri 16 in Serang City to measure the media's effectiveness in enhancing understanding of the essence of movement and achieving the Creating competency (Evaluation).

REFERENCES

Anderson, L. W., & Krathwohl, D. R. (Eds. . (2001). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Longman.

Azuma, R. T., Baillot, Y., Behringer, R., Feiner, S., Julier, S., & MacIntyre, B. (2001). A Survey of Augmented Reality. *Presence: Teleoperators and Virtual Environments*, 10(1), 1–35.

Borg, W. R., & Gall, M. D. (2007). *Educational research: An introduction (8th ed.)*. Pearson.

Branch, R. M. (2009). *Instructional design: The ADDIE approach*. Springer.

Bucek, L. (1998). Dancing in the mists: Developing movement literacy. *Dancing in the Mists: Developing Movement Literacy. Journal of Physical Education, Recreation & Dance*, 69(1), 32–38.

Dwiyana Habsary, H., Setyobudhi, R., & Permadi, A. (2024). Analisis kesulitan siswa SMP dalam memahami simbol arah dan level gerak tari tradisional. *Jurnal Pendidikan Seni Tari*, 10(2), 1–15.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109.

Fuji Astuti, R. (2016). Peran Seni Tari dalam Pengembangan Motorik dan Kreativitas Siswa. *Jurnal Pendidikan Seni*, 10(2), 1–10.

Hamalik, O. (2010). *Proses Belajar Mengajar*. Bumi Aksara.

Hermansyah, I. (2017). *Upaya Meningkatkan Minat Belajar Siswa pada Materi Seni Tari Jepin Lembut Melalui Metode Kooperatif Jigsaw di SMP*. Neliti.Com.

Hutchinson, A. (1970). *Labanotation: The system of analyzing and recording movement*. Theatre Arts Books.

Ismiati, A., Fujiawati, F. S., & Permanasari, A. T. (2021a). Perancangan aplikasi magic card augmented reality pada gerak dasar tari Sunda. *JPKS (Jurnal Pendidikan Dan Kajian Seni)*, 6(2), 127–142.

Ismiati, A., Fujiawati, F. S., & Permanasari, A. T. (2021b). Perancangan aplikasi magic card augmented reality pada gerak dasar tari Sunda. *JPKS (Jurnal Pendidikan Dan Kajian Seni)*, 6(2), 127–142.

Ismiati, N. (2021). *Augmented Reality untuk pembelajaran gerak dasar tari Sunda berbasis Vuforia*.

Kemendikbudristek. (2023). *Capaian Pembelajaran (CP) dan Alur Tujuan Pembelajaran (ATP) Seni Tari Fase D*. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi.

Kepala BSKAP. (2024). *Peraturan Kepala Badan Standar, Kurikulum, dan Asesmen Pendidikan (BSKAP) Nomor 032/H/Kr/2024 tentang Capaian Pembelajaran*.

Kusuma, D. (2022). Peran Pembelajaran Tari dalam Meningkatkan Kecerdasan Kinestetik Anak. *Jurnal Seni Dan Pendidikan*, 11(1), 45–58.

Kusumawati, Y., & Arifin, M. (2023). Pengembangan media pembelajaran tari berbasis aplikasi augmented reality pada materi gerak dasar. *Jurnal Pendidikan Seni*, 14(1), 1–15.

Lee, J. (2022). A review of augmented reality in education: Trends and opportunities. *Education and Information Technologies*, 27(1), 23–45.

Mayer, R. E. (2009). *Multimedia Learning (2nd ed.)*. Cambridge University Press. https://doi.org/https://doi.org/10.1017/CBO9780511811678

Moleong, L. J. (2018). *Metodologi Penelitian Kualitatif (Edisi Revisi)*. Revisi). Bandung: PT Remaja Rosdakarya.

Mulyani, S. (2024). Fungsi Tari dalam Pengembangan Motorik, Emosional, dan Kreativitas Anak Usia Dini. *Jurnal Pendidikan Anak*, 13(1), 10–25.

Paivio, A. (1986). *Mental representations: A dual coding approach*. Oxford University Press.

Prensky, M. (2001). *Digital natives, digital immigrants. On the Horizon*. 9(5), 1–6.

Prismanata, Y., & Sari, D. T. (2024). Generasi Z: Apa Gaya Belajar yang Ideal di Era Serba Digital? *Jurnal Pendidikan Digital Dan Teknologi*, 1(1), 1–12.

Purba, R. W., Setyaningsih, D., & Sari, I. D. (2023). Augmented reality development for teaching traditional dance in the digital era. *International Journal of Interactive Mobile Technologies*, 17(4), 168–185.

Rahayu, S. (2022). Analisis Faktor Penyebab Rendahnya Minat Siswa Terhadap Tari Tradisional. *Jurnal Seni Dan Pendidikan*, 1(1), 50–65.

Studd, C., & Cox, L. (2013). *EveryBody is a Body: Laban and Bartenieff movement analysis in therapeutic practice*. Singing Dragon.

Sugiono, S. (2008). *Metode Penelitian, Pendekatan Kualitatif, Kuantitatif, dan R&D*. Alfabeta.

sugiyono. (2019). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Triana, D. D., Yudha, R. P., & Adhi, B. P. (2024). Movement Literation Educational Game Based on Dance Notation to Diagnostic Kinesthetic Intelligence of Junior High School Students. *Journal of Scientific Research, Education, and Technology (JSRET), X(Y)*, 94–107.

Triana, D. D., Kusumawardani, D., Rahayu, W., & Yudha, R. P. (2020). Labanotation-Based Motion Literation Teaching Materials to Diagnose Kinesthetic Intelligence in Junior High Schools Through E-Learning. *KnE Social Sciences*, 4(14), 363–371.

Utami, W. W., Hidayati, N., & Santoso, Y. B. (n.d.). Efektivitas aplikasi augmented reality dalam meningkatkan pemahaman gerak tari pada siswa SMP. *Jurnal Pendidikan Teknologi Informasi*, 6(2), 110–125.

Valdez, A. A., & Zuk, J. (2023). Augmented reality in dance education: A systematic review. *Journal of Dance and Somatic Practices*, 15(1), 65–80.

Wahyuni, A. (2023). Karakteristik Belajar Generasi Z dan Implikasinya terhadap Desain Pembelajaran. *Jurnal Pendidikan*, 4(2), 110–125.

Wang, F., & Burton, J. (2012). The use of augmented reality in teaching and learning. *International Journal of Computer-Assisted Learning*, 28(4), 307–318.

Widodo, P. (2023). *Pengembangan Media Digital untuk Pendidikan: Teori dan Aplikasi*. Kencana.

Widoyoko, E. P. (2018). *Evaluasi Program Pembelajaran*. Pustaka Pelajar.

Yusuf, M., Hidayat, A., & Sari, D. P. (2020). Pengembangan media pembelajaran augmented reality untuk pengenalan ragam gerak tari tradisional. *Jurnal Pendidikan Seni*, 11(2), 150–165.