

Examining The Influence of Dance Movement Literacy on Pedagogical Readiness Among Preservice Elementary School Teachers

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ABSTRACT

Dance Movement Literacy has been increasingly recognised as an important component of teacher education because it integrates movement competence with pedagogical development. However, limited research has examined how its dimensions contribute to pedagogical readiness among prospective elementary school teachers. This study investigated the influence of Movement Accuracy, Spatial Awareness, Expressive Quality, and Learning Experience on pedagogical readiness. A quantitative cross-sectional design was employed involving 99 prospective elementary school teachers selected through convenience sampling. Data were collected using validated questionnaires and analysed using descriptive statistics, Pearson's correlation, and multiple linear regression. The findings revealed that the regression model explained 69.5% of the variance in pedagogical readiness ($R^2 = .695$). Expressive Quality emerged as the strongest predictor ($\beta = 0.519$, $p < .001$), followed by Movement Accuracy ($\beta = 0.220$, $p = .003$) and Learning Experience ($\beta = 0.193$, $p = .001$). Spatial Awareness did not significantly predict pedagogical readiness ($\beta = 0.080$, $p = .327$). The regression model also demonstrated a large overall effect size (Cohen's $f^2 = 2.28$), indicating substantial explanatory power. The findings suggest that Dance Movement Literacy extends beyond movement performance by strengthening instructional communication, practical teaching competence, and professional readiness. Integrating movement-based pedagogies into Primary School Teacher Education programmes may therefore enhance the preparation of prospective teachers for learner-centred classroom practice.

Keywords: *dance movement literacy, pedagogical readiness, embodied learning, laban movement analysis, teacher education, preservice elementary teachers*

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INTRODUCTION

Preparing competent and adaptable teachers has become a central objective of contemporary teacher education as schools respond to increasingly complex learning environments and the demands of twenty-first-century education. Prospective elementary school teachers are expected to develop more than pedagogical knowledge. Strong communication skills, creativity, reflective thinking, and professional confidence are equally important for creating meaningful learning experiences. These competencies are particularly critical in elementary classrooms, where teachers assume multiple roles as instructors, facilitators, motivators, and classroom managers. Teacher education programmes, therefore, require learning experiences that foster holistic professional development rather than relying primarily on theoretical instruction.

Improving the quality of teacher preparation continues to be a national priority in Indonesia. Curriculum reforms and competency-based teacher education programmes have strengthened the emphasis on professional standards, yet many preservice teachers still experience difficulties applying pedagogical knowledge in authentic classroom settings. National education policies consistently identify student-centred learning, creativity, communication, and reflective teaching as essential competencies for future educators. Integrating these competencies into teacher preparation before teaching practicum remains a persistent challenge. This situation highlights the need for instructional approaches that strengthen pedagogical readiness during the early stages of teacher education.

Embodied and arts-based pedagogies have attracted increasing scholarly attention because they promote learning through physical engagement, reflection, and authentic experience (Hegna & Orbaek, 2021;

Jusslin, 2022). Dance, from this perspective, extends beyond artistic performance and becomes a meaningful educational medium that supports cognitive, affective, social, and professional development. Contemporary scholarship also recognises dance as a form of literacy through which individuals communicate ideas, construct knowledge, and express meaning using movement (Nurharini et al., 2019). Movement literacy reflects a broader capability that includes understanding, interpreting, performing, and intentionally applying movement through body awareness, spatial understanding, expressive communication, and coordinated movement execution (Engdahl & Ceder, 2023). These perspectives suggest that movement-based learning contributes to teacher development in ways that extend well beyond technical dance proficiency.

Research conducted in teacher education has reported a wide range of educational benefits associated with dance and movement experiences. Dance-based learning has been linked to greater creativity, stronger communication skills, improved self-confidence, intercultural awareness, empathy, and the development of professional identity among preservice teachers (Jusslin, 2022; Leonard et al., 2024). Movement-oriented pedagogies have also been associated with improvements in instructional design, classroom management, collaborative learning, and teaching self-efficacy (Lee, 2025; Yong et al., 2025). Studies grounded in embodied learning further indicate that authentic movement experiences enable prospective teachers to connect theoretical understanding with practical application, strengthening both professional confidence and readiness for classroom practice (Capella-Peris et al., 2019; Mulyati & Sopiah, 2023). Existing evidence therefore supports movement-based learning as a valuable component of teacher preparation.

This study builds on these perspectives by adopting the concept of Dance Movement Literacy (DML), defined as the integrated ability to understand, perform, interpret, and communicate movement through cognitive, physical, and expressive dimensions (Ofer, 2019). Dance Movement Literacy views movement as a pedagogical resource rather than simply a physical skill, recognising its role in supporting communication, creativity, reflection, and professional learning. The concept is grounded in Laban Movement Analysis (LMA), a framework that explains human movement through the interconnected dimensions of Body, Effort, Space, and Shape (Balès, 2006). Applications of LMA have expanded across dance education and movement pedagogy because the framework provides a systematic approach for analysing movement quality, bodily awareness, and expressive communication (Larsson et al., 2024; Mattsson & Larsson, 2021). Drawing on this theoretical foundation, Dance Movement Literacy is operationalised through four dimensions: Movement Accuracy, Spatial Awareness, Expressive Quality, and Learning Experience.

Pedagogical readiness refers to the extent to which prospective teachers possess the knowledge, instructional skills, confidence, and professional competence required for effective teaching. Previous studies consistently identify pedagogical competence, teaching self-efficacy, professional knowledge, and field experience as important determinants of teaching readiness (Brown et al., 2019; Manasia et al., 2019; Umar et al., 2021). Movement-related competencies, in contrast, have received considerably less attention despite their potential contribution to teacher preparation, particularly within elementary education programmes.

Research examining movement competence, embodied learning, expressive communication, and dance education has generally treated these constructs as separate areas of inquiry. Movement competence is commonly investigated within physical education, expressive communication within classroom interaction, and embodied learning as a broad pedagogical approach. Limited attention has been given to understanding how these competencies function collectively as an integrated movement-based construct that supports pedagogical readiness. Laban Movement Analysis provides a comprehensive framework for analysing human movement (Kennedy, 2013), while Embodied Learning Theory explains how knowledge develops through bodily experience and active participation (Kosmas et al., 2017). Teacher education research has rarely integrated these complementary perspectives to explain how movement-related competencies contribute to pedagogical readiness. This gap limits current understanding of Dance Movement Literacy as a unified pedagogical construct.

The present study addresses this theoretical gap by conceptualising Dance Movement Literacy as a multidimensional construct in which Movement Accuracy, Spatial Awareness, Expressive Quality, and

Learning Experience operate as complementary dimensions that influence pedagogical readiness among prospective elementary school teachers. Integrating the structural principles of Laban Movement Analysis with the experiential perspective of Embodied Learning Theory provides a unified framework for explaining how movement competencies support teacher preparation and extends existing scholarship beyond discipline-specific movement education.

This study examines the influence of Dance Movement Literacy on pedagogical readiness among prospective elementary school teachers by investigating the effects of Movement Accuracy, Spatial Awareness, Expressive Quality, and Learning Experience. The findings are expected to advance the theoretical development of Dance Movement Literacy as a multidimensional construct within teacher education while providing practical guidance for designing movement-based pedagogies, embodied learning experiences, and curriculum innovations that strengthen the pedagogical readiness of future elementary school teachers.

LITERATURE REVIEW

Dance Movement Literacy

Preparing prospective elementary school teachers involves more than equipping them with pedagogical knowledge. It also requires developing the communication skills, creativity, classroom management abilities, and professional confidence needed to respond effectively to diverse learning environments. As expectations for teachers continue to evolve, teacher education programmes are increasingly incorporating learning experiences that integrate cognitive, physical, and social dimensions of professional development.

Dance Movement Literacy (DML) has emerged as a meaningful approach to supporting holistic teacher preparation. Rather than viewing dance solely as an artistic activity, contemporary perspectives recognise it as a form of literacy through which individuals understand, express, and communicate ideas using purposeful movement. Through movement-based experiences, prospective teachers can develop body awareness, spatial understanding, expressive communication, and reflective practice—competencies that are closely connected to effective teaching. Previous studies have also shown that dance and movement activities can enhance creativity, self-confidence, collaboration, and instructional communication, suggesting that movement literacy has value beyond physical skill development.

The potential contribution of Dance Movement Literacy to pedagogical readiness can be understood through Embodied Learning Theory and Laban Movement Analysis (LMA). Embodied Learning Theory proposes that meaningful learning emerges through the interaction between bodily experience, cognition, and reflection, while LMA provides a framework for understanding movement through the dimensions of Body, Space, Effort, and Shape. Together, these perspectives suggest that movement is not simply a physical action but also a medium through which professional knowledge and teaching competence are developed. Drawing on these theoretical foundations, this study conceptualises Dance Movement Literacy as a multidimensional construct consisting of Movement Accuracy, Spatial Awareness, Expressive Quality, and Learning Experience, each of which may contribute to the development of pedagogical readiness.

Although previous studies have explored movement competence, non-verbal communication, and experiential learning in teacher education, these aspects have generally been examined independently. Consequently, limited attention has been given to understanding how they function collectively as dimensions of Dance Movement Literacy. Moreover, empirical evidence on this relationship remains scarce within Indonesian teacher education, particularly among prospective elementary school teachers. To address this gap, the present study examines how the four dimensions of Dance Movement Literacy jointly influence pedagogical readiness, providing a more comprehensive understanding of movement-based competencies in teacher preparation.

Laban Movement Analysis as a Theoretical Foundation

This study adopts Laban Movement Analysis (LMA) as its theoretical foundation. Developed by Rudolf Laban, LMA provides a systematic framework for understanding human movement through four interconnected dimensions (Body, Effort, Space, and Shape) (Ziegelmaier et al., 2020). The framework has been widely applied in dance education, physical education, movement analysis, and teacher preparation programs (Larsson et al., 2024; Mattsson & Larsson, 2021).

LMA is particularly relevant because the dimensions assessed in this study correspond closely with the movement competencies emphasized by the framework. Movement accuracy reflects body control and movement execution, spatial awareness corresponds to the Space dimension, expressive quality aligns with Effort and Shape, and learning experience represents the developmental process through which movement competence is acquired. Previous studies have shown that LMA enhances movement awareness, creativity, observation skills, and pedagogical understanding, making it a suitable framework for examining Dance Movement Literacy among prospective elementary school teachers (Dania et al., 2013; Whittier, 2006).

Movement Accuracy and Pedagogical Readiness

Movement Accuracy refers to the ability to perform movements with precision, coordination, and consistency. Within Laban Movement Analysis (LMA), this competency is closely linked to the Body dimension, which focuses on body control, coordination, and purposeful movement (Santos & Dias, 2010). For prospective teachers, movement accuracy involves more than technical proficiency. It also supports their ability to demonstrate learning activities clearly, model movements effectively, and deliver instruction with confidence. These abilities are especially relevant in elementary education, where physical demonstrations are often used to help students understand concepts and remain actively engaged in learning.

Research on movement education and embodied pedagogy has consistently highlighted the importance of movement competence in teacher preparation. Teachers with stronger movement control and coordination tend to demonstrate greater confidence when facilitating classroom activities and communicating instructional content (Chun, 2024; McMullen et al., 2016; Sevimli-Celik & Johnson, 2016). Movement competence has also been associated with clearer instruction, greater teaching confidence, and more effective teacher-student interactions. Much of the existing literature, nevertheless, treats movement competence as a broad indicator of teaching ability rather than examining movement accuracy as a distinct component of Dance Movement Literacy.

Evidence supporting the educational value of movement competence continues to grow, yet the specific contribution of Movement Accuracy to pedagogical readiness remains underexplored, particularly among Indonesian preservice elementary school teachers. Examining Movement Accuracy as a distinct component of the broader Dance Movement Literacy framework may provide a clearer understanding of how physical control and coordination contribute to teacher preparation.

Spatial Awareness and Pedagogical Readiness

Spatial Awareness refers to an individual's ability to perceive, organise, and respond appropriately to the surrounding environment while moving. It enables individuals to understand their position in relation to people, objects, and available space, making it important for decision-making and performance in activities that require movement and coordination (Kušar & Volgemut, 2016; Mohan et al., 2023). Within Laban Movement Analysis (LMA), Spatial Awareness corresponds to the Space dimension, which considers how direction, distance, pathways, and positioning shape interaction with the environment. This competency has particular relevance to teaching because classroom practice requires teachers to move continuously, organise learning spaces, monitor students, and respond to interactions occurring throughout the classroom.

Studies of embodied pedagogy and learning environments indicate that the effective use of classroom space can support communication, classroom management, and student participation (Kariippanon et al., 2021; Shapiro et al., 2024). Teachers with stronger spatial awareness may be better able to position themselves

strategically, maintain visual contact with students, organise collaborative activities, and adjust their movements in response to classroom dynamics. These behaviours can help create a learning environment that is both organised and engaging, making spatial competence an important aspect of effective teaching practice. Previous research has rarely examined Spatial Awareness as an independent dimension within Dance Movement Literacy, despite its apparent relevance to classroom practice.

Empirical evidence concerning the relationship between Spatial Awareness and pedagogical readiness remains limited, especially in the context of Indonesian preservice elementary school teacher education. Including Spatial Awareness within a multidimensional Dance Movement Literacy framework may therefore help clarify how the ability to understand and use space contributes to prospective teachers' readiness for classroom practice.

Expressive Quality and Pedagogical Readiness

Expressive Quality refers to the ability to communicate thoughts, emotions, and intentions effectively through verbal and non-verbal cues, including tone of voice, facial expression, gestures, and body movement (Golzadeh et al., 2018; Romano et al., 2011). Within Laban Movement Analysis (LMA), this competency is closely related to the Effort dimension, which describes the dynamic and expressive qualities of movement. Expressive behaviour is particularly important in teaching because the way teachers use their voices, gestures, facial expressions, and body language can shape how students interpret instructional messages and respond during classroom interaction.

Research has consistently identified non-verbal communication as an important element of effective teaching (Abekah Keelson et al., 2024; Mahmud, 2014). Teachers who use gestures, facial expressions, and body language purposefully can attract students' attention, reinforce verbal explanations, and build more positive classroom relationships. Research in dance education and embodied pedagogy likewise suggests that expressive movement can strengthen learner engagement, emotional connection, and active participation by making learning experiences more meaningful (Cui, 2026; Tokida et al., 2024). Most existing studies, nevertheless, have approached expressive communication as a separate instructional skill rather than positioning it within a broader framework of Dance Movement Literacy.

The importance of non-verbal communication in education is well established, yet relatively little empirical attention has been given to Expressive Quality as part of a multidimensional Dance Movement Literacy framework. This gap is particularly evident in research involving Indonesian preservice elementary school teachers. Conceptualising Expressive Quality as a core dimension of Dance Movement Literacy may therefore provide a more integrated understanding of how embodied communication contributes to pedagogical readiness.

Learning Experience and Pedagogical Readiness

Learning Experience refers to prospective teachers' meaningful participation in movement-based activities that contribute to the development of pedagogical knowledge, practical skills, and professional confidence (Madsen, 2024; Poh & Arroyo, 2027; Romar et al., 2020). In the context of Dance Movement Literacy, learning experiences involve more than the acquisition of movement techniques. They may include collaborative activities, teaching simulations, reflective practice, creative exploration, and other opportunities that allow prospective teachers to connect theoretical knowledge with realistic teaching situations.

Experiential learning has long been recognised as an important component of teacher education. Active participation followed by reflection can help prospective teachers strengthen instructional competence, develop their professional identity, and gain confidence in managing classroom practice (Theelen et al., 2022). Research in dance education similarly indicates that movement-based learning can encourage creativity, collaboration, and reflective thinking, all of which contribute to meaningful professional development (Petsilas et al., 2019; Yetti, 2018). Existing studies have generally treated experiential learning as a broad pedagogical approach rather than considering Learning Experience as a specific dimension of Dance Movement Literacy.

The educational benefits of experiential learning are widely recognised, yet limited research has investigated Learning Experience as a distinct component of Dance Movement Literacy and its relationship with pedagogical readiness. Evidence from Indonesian preservice elementary school teacher education is particularly limited. Incorporating Learning Experience into the proposed multidimensional framework may therefore offer a more complete account of how participation in movement-based learning experiences contributes to the preparation of prospective teachers.

Conceptual Framework

Based on the preceding literature, this study proposes a conceptual framework that examines the relationship between Dance Movement Literacy and pedagogical readiness. The framework integrates four dimensions of Dance Movement Literacy (Movement Accuracy, Spatial Awareness, Expressive Quality, and Learning Experience) into a single model to explain their contribution to pedagogical readiness among preservice elementary school teachers. Unlike previous studies, which have primarily investigated these dimensions separately, the present framework considers their simultaneous influence within a unified model. This integrated approach provides a more comprehensive understanding of how movement-based competencies contribute to teacher preparation and serves as the basis for the hypotheses tested in this study.

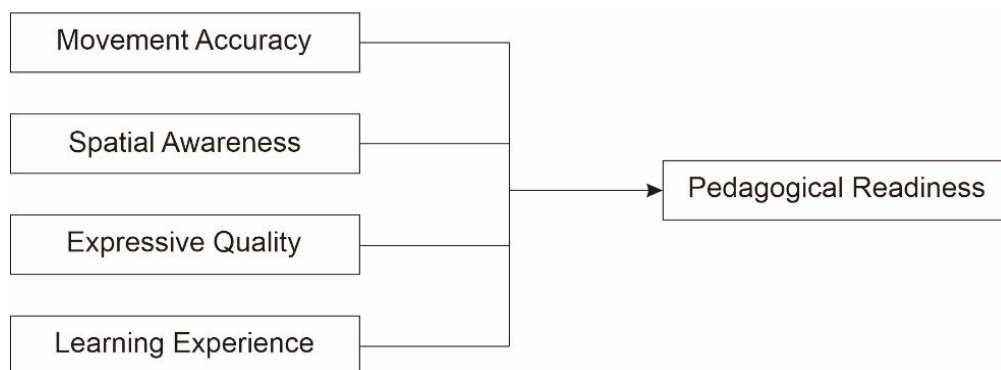


Figure 1. Proposed conceptual framework of the study.

Based on the proposed conceptual framework, the following hypotheses are formulated:

H1: Movement Accuracy has a positive and significant influence on pedagogical readiness.

H2: Spatial Awareness has a positive and significant influence on pedagogical readiness.

H3: Expressive Quality has a positive and significant influence on pedagogical readiness.

H4: Learning Experience has a positive and significant influence on pedagogical readiness.

METHODS

Research Design

This study employed a quantitative cross-sectional survey design to examine the influence of Dance Movement Literacy on pedagogical readiness among prospective elementary school teachers. A quantitative approach was selected because it enables the measurement of perceptions and experiences using standardized instruments and facilitates statistical examination of relationships among variables. The study focused on four dimensions of Dance Movement Literacy (movement accuracy, spatial awareness, expressive quality, and learning experience) as predictors of pedagogical readiness.

Research Setting and Participants

The study was conducted at a public university in Indonesia offering an undergraduate Elementary School Teacher Education programme. The institution was selected because it incorporates dance and movement activities into its teacher education curriculum, providing an appropriate context for examining the

relationship between Dance Movement Literacy and pedagogical readiness among prospective elementary school teachers. The name of the institution has been withheld to preserve anonymity during the peer-review process.

A convenience sampling technique was employed to recruit participants who were readily accessible during the data collection period and met the study's inclusion criteria. Participants were required to be actively enrolled in the elementary school teachers programme, have completed the relevant dance education course, and voluntarily agree to participate in the study. Convenience sampling was considered appropriate because the study focused on a specific and relatively homogeneous population with direct experience of the phenomenon under investigation. This approach also enabled efficient data collection within the academic semester while ensuring that participants possessed comparable educational backgrounds relevant to the research objectives.

A total of 99 preservice elementary school teachers participated in the study. The sample size was considered adequate for multiple linear regression analysis because it satisfied the minimum sample recommendations for examining relationships among four predictor variables and one dependent variable. Although convenience sampling may limit the generalisability of the findings beyond the study population, it is widely used in educational research involving accessible and homogeneous participant groups. Therefore, the findings should be interpreted within the context of Indonesian preservice elementary school teacher education.

Research Instrument

Data were collected using a self-administered questionnaire designed to measure Dance Movement Literacy and pedagogical readiness among prospective elementary school teachers. The instrument consisted of 25 items organized into five constructs:

Table 1. Constructs and Number of Questionnaire Items

No	Construct	Number of Items
1	Movement Accuracy	5
2	Spatial Awareness	5
3	Expressive Quality	5
4	Learning Experience	5
5	Pedagogical Readiness	5

All items were measured using a five-point Likert scale ranging from:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Four negatively worded items were included in the questionnaire and were reverse-coded prior to statistical analysis to ensure consistency in score interpretation. The questionnaire was developed through a systematic review of the literature on Dance Movement Literacy, Embodied Learning Theory, Laban Movement Analysis (LMA), and pedagogical readiness. Items measuring Movement Accuracy, Spatial Awareness, and Expressive Quality were constructed based on the movement dimensions proposed in LMA, while the Learning Experience and Pedagogical Readiness items were developed from studies on embodied learning and teacher education. Existing instruments and conceptual definitions reported in previous research were used as references to ensure that each construct reflected its intended theoretical domain. The wording of

several items was adapted to suit the context of Indonesian preservice elementary school teachers while preserving the original meaning of the constructs.

Validity and Reliability

Prior to data collection, the questionnaire was reviewed by a dance education expert to evaluate the relevance, clarity, and appropriateness of the items in relation to the study constructs. The expert review was intended to ensure that the instrument adequately represented the dimensions of Dance Movement Literacy and Pedagogical Readiness. Feedback from the expert was incorporated to refine the wording and content of several items. Following this content validation process, the revised questionnaire was pilot-tested with a group of respondents who had characteristics similar to those of the target population. The pilot-test data were then analyzed using Exploratory Factor Analysis (EFA) with Maximum Likelihood extraction and Varimax rotation to examine the construct validity of the instrument. A minimum factor loading of 0.50 was used as the criterion for retaining items. As presented in Table 2, all 25 items had factor loadings above the required threshold, ranging from 0.514 to 0.854. Therefore, all items were retained for use in the main study.

Table 2. Exploratory Factor Analysis of Measurement Items

Construct	Item	Factor Loading	Decision
Movement Accuracy	MA1	.626	Retained
	MA2	.568	Retained
	MA3	.549	Retained
	MA4	.639	Retained
	MA5	.810	Retained
Spatial Awareness	SA1	.687	Retained
	SA2	.683	Retained
	SA3	.739	Retained
	SA4	.740	Retained
	SA5	.745	Retained
Expressive Quality	EQ1	.657	Retained
	EQ2	.842	Retained
	EQ3	.837	Retained
	EQ4	.827	Retained
	EQ5	.768	Retained
Learning Experience	LE1	.825	Retained
	LE2	.854	Retained
	LE3	.799	Retained
	LE4	.584	Retained
	LE5	.720	Retained
Pedagogical Readiness	PR1	.600	Retained
	PR2	.550	Retained
	PR3	.700	Retained
	PR4	.626	Retained
	PR5	.514	Retained

Exploratory Factor Analysis (EFA) was conducted using maximum likelihood extraction with Varimax rotation. The results showed that all 25 items had factor loadings above the minimum criterion of 0.50, with values ranging from 0.514 to 0.854. Therefore, all items were retained for further analysis.

Following the construct validity assessment, the internal consistency of the retained items was evaluated using Cronbach's Alpha coefficient. As presented in Table 3, the overall instrument, consisting of 25 items, achieved a Cronbach's Alpha coefficient of .957, indicating excellent internal consistency. Since this value exceeded the recommended threshold of .70, the instrument was considered reliable and suitable for use in the main study and subsequent statistical analyses.

Table 3. Reliability Analysis of the Research Instrument

Instrument	Number of Items	Cronbach's Alpha	Interpretation
Overall questionnaire	25	.957	Excellent

Data Collection Procedure

Data collection was conducted during the academic semester through questionnaire administration. Participants received information regarding the purpose of the study, confidentiality procedures, and voluntary participation requirements before completing the survey. The questionnaire was distributed either in printed form or through an online platform, depending on participant accessibility and institutional arrangements. Respondents were informed that their responses would be used solely for research purposes and that their identities would remain anonymous. Completed questionnaires were screened to identify incomplete responses and data-entry errors before statistical analysis.

Data Analysis

The data were analysed using IBM SPSS Statistics. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were first computed to summarise respondents' characteristics and describe the levels of Dance Movement Literacy and Pedagogical Readiness. Pearson's correlation analysis was subsequently performed to examine the bivariate relationships among the study variables before conducting regression analysis.

Prior to hypothesis testing, several assumptions of multiple linear regression were evaluated to ensure the suitability of the data. Normality was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests, while multicollinearity was examined using Tolerance and Variance Inflation Factor (VIF) values. The linearity assumption was evaluated using the Test for Linearity, and homoscedasticity was assessed through visual inspection of the scatterplot of standardised residuals against standardised predicted values.

The research hypotheses were tested using multiple linear regression analysis to determine the influence of Movement Accuracy, Spatial Awareness, Expressive Quality, and Learning Experience on Pedagogical Readiness. Statistical significance was determined at the .05 level. In addition to reporting the regression coefficients, the coefficient of determination (R^2) was used to evaluate the explanatory power of the model, while Cohen's f^2 was calculated to assess the overall effect size of the regression model and determine the practical significance of the findings.

Ethical Considerations

Ethical principles were observed throughout the study. Participation was voluntary, informed consent was obtained from all respondents, and confidentiality of participant information was maintained. No personally identifiable information was reported in the study findings. Data were stored securely and used exclusively for academic research purposes.

RESULTS AND DISCUSSION

Preliminary Analysis

Preliminary analyses were performed to examine whether the data satisfied the assumptions required for multiple linear regression analysis. Normality was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. As presented in Table 4, all study variables produced significance values greater than .05 for both tests, indicating that the data were normally distributed. These results suggest that the normality assumption required for regression analysis was satisfied.

Table 4. Results of the Normality Tests

Tests of Normality	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Movement Accuracy	.080	99	.115	.982	99	.191
Spatial Awareness	.080	99	.116	.984	99	.294
Expressive Quality	.082	99	.096	.984	99	.262
Learning Experience	.084	99	.081	.976	99	.070
Pedagogical Readiness	.062	99	.200*	.978	99	.089

Multicollinearity was subsequently examined using tolerance and Variance Inflation Factor (VIF) statistics. As shown in Table 5, tolerance values ranged from 0.390 to 0.696, while VIF values ranged from 1.437 to 2.563. All values satisfied the recommended criteria of tolerance values greater than 0.10 and VIF values below 10, indicating that multicollinearity was not present among the predictor variables.

Table 4. Results of the Multicollinearity Analysis

Model		Collinearity Statistics	
		Tolerance	VIF
1	Movement Accuracy	.390	2.563
	Spatial Awareness	.460	2.175
	Expressive Quality	.563	1.776
	Learning Experience	.696	1.437

The linearity assumption was then evaluated using the Test for Linearity. As presented in Table 6, the relationships between Movement Accuracy, Spatial Awareness, and Expressive Quality with Pedagogical Readiness demonstrated significant linearity ($p < .001$) and non-significant deviation from linearity values ($p > .05$), indicating that these relationships were linear. However, Learning Experience showed a significant deviation from linearity ($p = .007$), suggesting that its relationship with Pedagogical Readiness may not be fully linear. Nevertheless, the variable was retained in the regression model because of its theoretical relevance and the overall suitability of the regression model for the study objectives.

Table 6. Results of the Linearity Test

Variables	Sig. Linearity	Deviation from Linearity
Movement Accuracy	.000	.649
Spatial Awareness	.000	.961
Expressive Quality	.000	.722
Learning Experience	.000	.007

Homoscedasticity was assessed through visual inspection of the scatterplot of standardized predicted values and studentized residuals. As illustrated in Figure 2, the residuals were randomly dispersed around the zero line without forming a systematic pattern or funnel-shaped distribution. This finding indicates that the variance of the residuals remained relatively constant across the predicted values, suggesting that no substantial heteroscedasticity was detected.

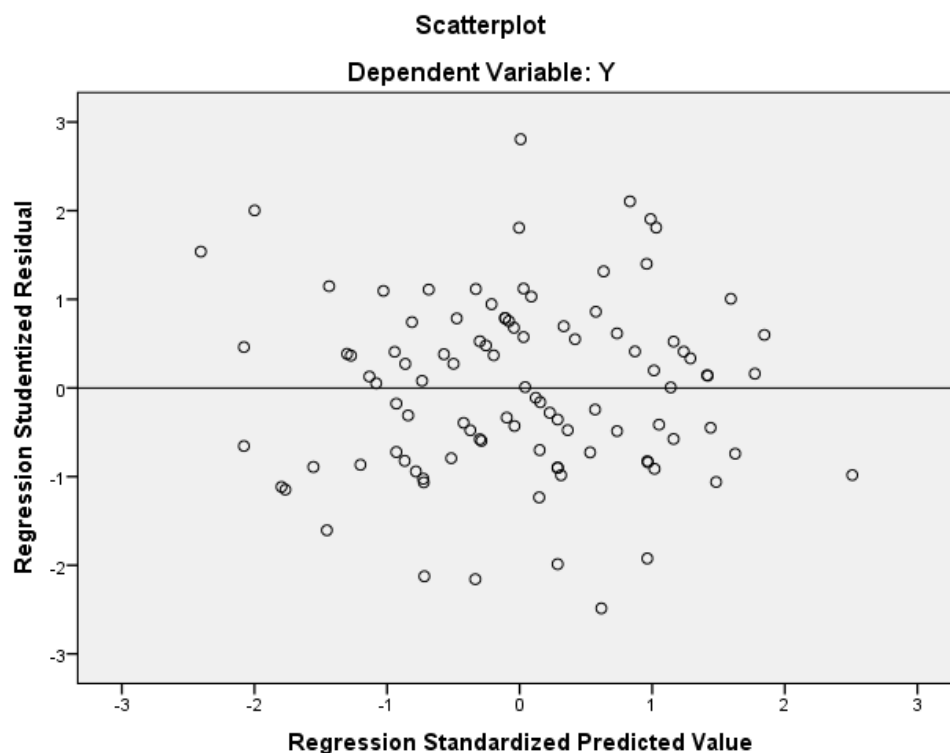


Figure 2. Scatterplot of Standardized Residuals

The preliminary analyses indicated that the assumptions for multiple linear regression were generally satisfied. The data were normally distributed, no evidence of multicollinearity or heteroscedasticity was detected, and the linearity assumption was met for three of the four predictor variables. Although Learning Experience exhibited a significant deviation from linearity, the variable was retained because of its theoretical relevance and the overall adequacy of the regression model. Therefore, the analysis proceeded to hypothesis testing.

Descriptive Statistics

A total of 99 prospective elementary school teachers participated in this study. The demographic characteristics of the respondents are presented in Table 7. The sample consisted predominantly of female students (92.9%), with male students representing 7.1% of the participants. All respondents were enrolled in the sixth semester of the Elementary School Teacher Education programme, indicating a relatively homogeneous sample in terms of academic level.

Table 7. Respondent Characteristics

Characteristic	Category	n	%
Gender	Male	7	7.1
	Female	92	92.9
Semester	Sixth semester	99	100.0

Descriptive statistics were subsequently calculated to examine respondents' perceptions of Dance Movement Literacy and Pedagogical Readiness. As presented in Table 8, all study variables recorded mean scores within the high to very high categories, indicating generally positive perceptions among the respondents.

Table 8. Descriptive Statistics of the Study Variables

	Mean	Std. Deviation	Interpretation
Pedagogical Readiness	75.47	13.138	High
Movement Accuracy	79.35	10.344	High
Spatial Awareness	77.25	10.248	High
Expressive Quality	74.67	9.781	High
Learning Experience	81.13	10.645	Very High

Learning Experience recorded the highest mean score ($M = 81.13$, $SD = 10.65$), placing it in the very high category. This result indicates that respondents perceived movement-based learning experiences as a particularly valuable component of their professional preparation. The remaining dimensions recorded high mean scores. Movement Accuracy achieved a mean score of 79.35 ($SD = 10.34$), suggesting that respondents were generally confident in their ability to perform and demonstrate movements accurately during learning activities. Spatial Awareness followed closely with a mean score of 77.25 ($SD = 10.25$), reflecting positive perceptions of respondents' ability to understand and utilise spatial relationships while performing movement tasks.

Expressive Quality recorded a mean score of 74.67 ($SD = 9.78$), which also falls within the high category. Despite being the lowest-rated dimension of Dance Movement Literacy, the result indicates that respondents generally perceived themselves as capable of expressing ideas, emotions, and intentions effectively through movement. Pedagogical Readiness achieved a mean score of 75.47 ($SD = 13.14$), corresponding to the high category and suggesting that the respondents considered themselves adequately prepared to undertake instructional responsibilities as prospective elementary school teachers.

The overall pattern of the descriptive findings indicates that respondents demonstrated favourable perceptions across all dimensions of Dance Movement Literacy and pedagogical readiness. The consistently high mean scores suggest that the participants possessed positive movement-related competencies alongside a strong sense of readiness for future teaching practice. Learning Experience emerged as the most highly rated dimension, highlighting the perceived importance of authentic and embodied learning experiences in supporting teacher preparation.

Hypothesis Testing

Before conducting multiple linear regression analysis, Pearson's correlation analysis was performed to examine the relationships among the study variables. The results are presented in Table 9.

Table 9. Pearson Correlation Matrix of the Study Variables

No	Variables	1	2	3	4	5
1	Movement Accuracy	1				
2	Spatial Awareness	.693**	1			
3	Expressive Quality	.600**	.606**	1		
4	Learning Experience	.542**	.404**	.264**	1	
5	Pedagogical Readiness	.757**	.617**	.712**	.498**	1

As shown in Table 9, all four dimensions of Dance Movement Literacy were positively and significantly correlated with Pedagogical Readiness ($p < .01$). Among the predictor variables, Movement Accuracy demonstrated the strongest positive correlation with Pedagogical Readiness ($r = .757$), followed by Expressive Quality ($r = .712$), Spatial Awareness ($r = .617$), and Learning Experience ($r = .498$). These findings indicate that higher levels of Dance Movement Literacy are generally associated with greater pedagogical readiness among prospective elementary school teachers. Furthermore, the intercorrelations among the independent variables ranged from .264 to .693, indicating low to moderately strong positive associations without suggesting problematic multicollinearity. This finding is consistent with the multicollinearity

diagnostics reported in Table 5 and supports the inclusion of all predictor variables in the subsequent multiple linear regression analysis.

Multiple linear regression analysis was subsequently conducted to examine the influence of Movement Accuracy, Spatial Awareness, Expressive Quality, and Learning Experience on Pedagogical Readiness. As presented in Table 8, the regression model was statistically significant, $F(4, 94) = 53.597$, $p < .001$, indicating that the four predictor variables collectively explained a substantial proportion of the variance in pedagogical readiness. The model accounted for 69.5% of the variance ($R^2 = .695$, Adjusted $R^2 = .682$), demonstrating strong explanatory power. Based on Cohen's (1988) criteria, the model also produced a large overall effect size ($f^2 = 2.28$), indicating that Dance Movement Literacy has substantial practical significance in predicting pedagogical readiness among prospective elementary school teachers.

Table 10. Multiple Regression Model Summary

Model	R	R ²	Adjusted R ²	SE of Estimate	F	df	p	Cohen's f ²
1	.834	.695	.682	7.406	53.597	(4, 94)	< .001	2.28

H1. Movement Accuracy and Pedagogical Readiness

Hypothesis 1 proposed that movement accuracy positively influences pedagogical readiness among prospective elementary school teachers. The regression coefficients for all predictor variables are presented in Table 11.

Table 11. Regression Coefficients for Hypothesis Testing

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	-25.059	7.360		-3.405	.001
	Movement Accuracy	.520	.116	.410	4.494	.000
	Spatial Awareness	.023	.108	.018	.214	.831
	Expressive Quality	.555	.102	.414	5.449	.000
	Learning Experience	.197	.084	.160	2.338	.022

Movement accuracy significantly predicted pedagogical readiness ($\beta = .410$, $t = 4.494$, $p < .001$). The positive standardized coefficient indicates that higher levels of movement accuracy were associated with greater pedagogical readiness. Hypothesis 1 was supported.

H2. Spatial Awareness and Pedagogical Readiness

Hypothesis 2 proposed that spatial awareness positively influences pedagogical readiness among prospective elementary school teachers. The regression results presented in Table 8 indicated that spatial awareness did not significantly predict pedagogical readiness ($\beta = .018$, $t = 0.214$, $p = .831$). The relationship was not statistically significant, indicating that spatial awareness did not uniquely contribute to pedagogical readiness after controlling for the other dimensions of Dance Movement Literacy. Hypothesis 2 was not supported.

H3. Expressive Quality and Pedagogical Readiness

Hypothesis 3 proposed that expressive quality positively influences pedagogical readiness among prospective elementary school teachers. As presented in Table 8, expressive quality significantly predicted pedagogical readiness ($\beta = .414$, $t = 5.449$, $p < .001$). Among the four predictor variables, expressive quality produced the largest standardized regression coefficient, indicating that it was the strongest predictor of pedagogical readiness. Hypothesis 3 was supported.

H4. Learning Experience and Pedagogical Readiness

Hypothesis 4 proposed that learning experience positively influences pedagogical readiness among prospective elementary school teachers. The regression results shown in Table 8 demonstrated that learning experience significantly predicted pedagogical readiness ($\beta = .160$, $t = 2.338$, $p = .022$). Although the standardized effect was smaller than that of movement accuracy and expressive quality, the positive relationship indicates that richer learning experiences contributed to higher levels of pedagogical readiness. Hypothesis 4 was supported.

Three of the four proposed hypotheses were supported. Movement accuracy, expressive quality, and learning experience significantly predicted pedagogical readiness, whereas spatial awareness did not exhibit a statistically significant relationship. Expressive quality emerged as the strongest predictor of pedagogical readiness, followed by movement accuracy and learning experience.

Discussion

This study investigated the relationship between the four dimensions of Dance Movement Literacy and pedagogical readiness among prospective elementary school teachers. The findings indicate that Dance Movement Literacy plays a meaningful role in preparing future teachers, although the contribution of each dimension differs. Movement Accuracy, Expressive Quality, and Learning Experience significantly predicted pedagogical readiness, whereas Spatial Awareness did not demonstrate a significant influence after the effects of the other dimensions were considered. These findings reinforce the view that movement-based competencies extend beyond physical performance and contribute to broader aspects of professional teacher development. Embodied Learning Theory provides a useful explanation for these results by suggesting that movement experiences facilitate the integration of cognitive, affective, and psychomotor learning, thereby strengthening the competencies required for effective classroom practice.

Expressive Quality emerged as the strongest predictor of pedagogical readiness, highlighting the importance of non-verbal communication in effective teaching. Successful teaching depends not only on subject knowledge but also on a teacher's ability to communicate ideas clearly, maintain students' attention, and foster meaningful classroom interactions through gestures, facial expressions, and body language. Prospective teachers who communicate confidently through movement are therefore more likely to feel prepared to manage classroom interactions and facilitate learning effectively. Embodied Learning Theory explains this relationship by proposing that cognition and communication are grounded in bodily experience, allowing physical actions to shape the way knowledge is understood and communicated (Abdu et al., 2021; Bara et al., 2020; Chettaoui et al., 2022). Expressive movement should therefore be viewed as more than an artistic skill because it functions as a pedagogical resource that enhances instructional communication and learner engagement.

Previous studies have similarly reported that expressive communication improves teaching effectiveness and encourages greater student participation (Chalmers & May, 2020; Lum, 2018). Teachers' use of gestures, facial expressions, and body language has been shown to improve instructional clarity, strengthen classroom relationships, and increase students' motivation to learn. The present study builds on this evidence by demonstrating that Expressive Quality represents a core dimension of Dance Movement Literacy and contributes more strongly to pedagogical readiness than the other movement-related competencies examined. This result also supports the findings of Sugevin and Wibowo (2026), who highlighted that expressive and experiential dance learning enhances creativity and active participation, both of which are fundamental for effective classroom communication. This finding suggests that expressive movement skills deserve greater emphasis in teacher education programmes rather than being confined to dance or performing arts courses (Engdahl et al., 2023). Expanding opportunities for prospective teachers to develop these skills may strengthen classroom communication, instructional confidence, and overall pedagogical competence.

Movement Accuracy also contributed significantly to pedagogical readiness, indicating that the ability to perform movements precisely supports effective teaching practice. Accurate movement enables prospective teachers to demonstrate learning activities with confidence, particularly when modelling procedures, leading

classroom demonstrations, or facilitating coordinated physical activities. These capabilities strengthen classroom interaction and help create more engaging learning experiences for students. Embodied Learning Theory suggests that repeated and purposeful movement practice allows prospective teachers to connect physical experience with pedagogical knowledge, making it easier to apply movement competence in authentic teaching situations.

Earlier research has consistently linked movement competence with teaching effectiveness and teacher self-confidence (Gavigan et al., 2024; Marinšek et al., 2026). The present findings extend this understanding by positioning Movement Accuracy within the broader construct of Dance Movement Literacy rather than treating it solely as a psychomotor skill. Similarly, Agustini et al. (2022) reported that movement-related competence, particularly body flexibility, significantly contributed to students' dance performance, underscoring the importance of physical competence in supporting effective movement execution. Accurate movement appears to strengthen teachers' ability to communicate concepts, demonstrate procedures, and guide meaningful learning experiences. Teacher education programmes should therefore provide prospective teachers with authentic opportunities to refine movement accuracy through practical teaching experiences and movement-based instructional activities.

Learning Experience also showed a significant positive relationship with pedagogical readiness, emphasising the value of active participation in movement-based learning. Experiences that encourage reflection, participation, and practical application help prospective teachers connect theoretical knowledge with authentic classroom practice (Bannink & Dam, 2007; Putman et al., 2026; Quesenberry et al., 2018). Students who engage directly in movement-based learning develop greater instructional confidence, stronger classroom management skills, and broader professional competence than those who rely solely on lecture-based instruction (Sevimli-Celik & Johnson, 2016). These findings reinforce the importance of experiential learning in preparing future teachers for the complex demands of classroom practice.

Embodied Learning Theory offers further insight into this relationship by describing learning as a continuous interaction among physical experience, cognition, and reflection. Active participation in movement-based activities enables prospective teachers to internalise pedagogical concepts through direct experience rather than abstract understanding alone. This process supports deeper learning and facilitates the transfer of knowledge into real teaching situations. Previous research has likewise shown that experiential and embodied learning approaches strengthen teacher self-efficacy, reflective practice, and instructional competence. The present study extends this body of knowledge by identifying Learning Experience as a key dimension of Dance Movement Literacy that contributes to pedagogical readiness. Incorporating authentic movement-based learning experiences into teacher education programmes may therefore enhance prospective teachers' readiness for professional practice.

Spatial Awareness did not significantly predict pedagogical readiness after the influence of the other dimensions was taken into account. Although spatial awareness remains an important aspect of movement competence, its contribution to pedagogical readiness appears to be less direct than that of expressive communication, movement accuracy, or learning experience. Classroom organisation and movement coordination represent important teaching skills, yet pedagogical readiness also depends on communication, instructional decision-making, confidence, and reflective practice (Bezusova et al., 2019; Niemi & Kangas, 2026; Shahini, 2025). Prospective teachers may therefore place greater emphasis on expressive and experiential competencies when judging their readiness to teach.

This finding can also be understood in relation to previous literature on dance, which suggests that spatial competence is an important component of movement performance and instruction, although evidence of its direct relationship with teaching effectiveness remains limited. In dance contexts, spatial awareness supports body orientation, movement patterns, positioning, and coordination within the performance space (Cross, 2018; Ravn, 2017). However, these functions may not translate directly into broader pedagogical readiness among prospective elementary school teachers, whose teaching responsibilities require a wider combination of instructional, communicative, and reflective competencies. This difference in context may explain why Spatial Awareness did not emerge as an independent predictor in the present study. Rather than

exerting a direct effect, spatial competence may operate together with other movement-related or pedagogical abilities. Future research could therefore apply more comprehensive analytical approaches, such as Structural Equation Modelling (SEM), to examine possible indirect, mediating, or interaction effects.

The findings also have important implications for the Elementary School Teacher Education curriculum. The significant contributions of Expressive Quality, Movement Accuracy, and Learning Experience indicate that Dance Movement Literacy should be recognised not only as a component of arts education but also as a pedagogical approach that strengthens communication, instructional effectiveness, and learner engagement. This implication is consistent with Depari et al. (2021), who demonstrated that dance education contributes not only to artistic development but also to broader educational outcomes, including character formation and holistic learner development. Teacher education programmes should provide prospective teachers with greater opportunities to participate in movement-based learning activities that promote expressive communication, accurate instructional demonstrations, and reflective practice. Integrating these experiences into professional education courses, microteaching, and school-based practicum would strengthen pedagogical readiness by enabling prospective teachers to apply movement-based instructional strategies in authentic classroom settings.

Curriculum developers and teacher education institutions should also consider integrating Dance Movement Literacy throughout teacher preparation programmes rather than limiting it to dance courses. Such an approach would support current educational priorities that emphasise active, learner-centred, and inclusive teaching while encouraging balanced development across the cognitive, affective, and psychomotor domains. Future research should employ longitudinal, experimental, or Structural Equation Modelling (SEM) designs to examine the causal mechanisms through which Dance Movement Literacy shapes pedagogical readiness across different educational contexts.

CONCLUSION AND RECOMMENDATIONS

This study demonstrates that Dance Movement Literacy is an important contributor to Pedagogical Readiness among prospective elementary school teachers. Three dimensions of Dance Movement Literacy (Expressive Quality, Movement Accuracy, and Learning Experience) significantly contributed to pedagogical readiness, whereas Spatial Awareness did not show a significant independent effect. These findings suggest that movement-based competencies extend beyond physical performance and support the development of instructional communication, professional confidence, and effective teaching practice. The study also extends the application of Embodied Learning Theory by showing how movement-related competencies contribute to teacher preparation within the context of primary education.

The findings provide practical implications for teacher education by highlighting the importance of integrating movement-based pedagogies into the Primary School Teacher Education curriculum. Providing prospective teachers with opportunities to develop expressive communication, accurate movement demonstrations, and authentic movement-based learning experiences may strengthen their pedagogical readiness and better prepare them for learner-centred classroom practice. These findings support the view that Dance Movement Literacy should be recognised as a pedagogical resource that contributes to holistic teacher development rather than being confined to arts or physical education courses.

Limitation

Several limitations should be acknowledged. The study employed a convenience sampling approach involving prospective elementary school teachers from a single institutional context, which may limit the generalisability of the findings. In addition, the cross-sectional design does not allow causal relationships among the variables to be established. Future research should employ experimental, longitudinal, or Structural Equation Modelling (SEM) approaches to examine the causal pathways through which Dance Movement Literacy influences pedagogical readiness. Expanding the study to include participants from multiple teacher education institutions and diverse educational settings would also provide a broader understanding of how movement-based competencies contribute to teacher preparation across different contexts.

Credit authorship contribution statement

First Author: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing – original draft. Second Author: Methodology, Resources, Project administration, Validation, Writing – review & editing. Third Author: Supervision, Formal analysis, Funding acquisition, Validation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical Declaration

All participants provided informed consent prior to their involvement in the study. They were informed about the study's purpose, procedures, and their right to withdraw at any time without consequence.

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