COGNITIVE SCIENCES AND HUMAN DEVELOPMENT

Music-based Language Programme for Preschool Teachers' Training and Lesson delivery: A Pilot Trial

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ABSTRACT

Language delay in preschoolers is linked to learning difficulties and persistent communication issues. Studies show that early music-making positively impacts young children's language development. Music-based Language Programme aims to enhance preschoolers' language skills by training preschool teachers to deliver quality music lessons with language-focused objectives. This pilot trial aimed to determine the feasibility of teacher training for the programme's delivery. Furthermore, the secondary aim was to evaluate the acceptability of the programme's implementation by stakeholders. Methods: The 6-week one-arm pilot trial took place in Sarawak, Malaysia (October to November 2021). It included preschool visits, parent briefings, teacher training, and music lesson delivery. The participants included teachers ($n = 4$), preschoolers ($n = 11$), parents ($n = 11$), and the principal ($n = 1$) in a preschool that practiced inclusion. A non-probability-purposive sampling recruitment strategy was employed amid the COVID-19 pandemic. The study used a case study mixed methods approach to collect data through reports, observations, group discussions, feedback, questionnaires, and documentation. Results: There was a high rate of participant retention (100%) and completion of data collection tasks (91–100%). Additionally, there was a favourable shift (7–27%) in three teachers' self-efficacy ratings before and after the teacher training and a reasonably high implementation fidelity (87%). There were no adverse events related to the study participants. Conclusion: The study demonstrated promising results across multiple participant levels, as it was perceived to be feasible, acceptable, and appropriate by teachers, preschoolers, the principal, and parents. The findings provided direct implications for the progression of the pilot trial to the full-scale main study.

Keywords: language delay, music-based language programme, teacher training, preschool, pilot trial

1 INTRODUCTION

1.1 Background

Language delay in early childhood is a prevalent condition worldwide (Law et al., 2017; Saeed et al., 2018; Sices & Augustyn, 2023; Wake et al., 2012). Preschoolers with language delays are more likely to develop language-based learning disabilities, which have detrimental long-term implications for schooling, health, and well-being (Feldman, 2019; Law et al., 2015; Soifer, 2011; Wake et al., 2015). These challenges may, in turn, impose a financial, health, and mental well-being burden on individuals, families, communities, and the nation (Langbecker et al., 2020; Livingston et al., 2018).

Music and language development are strongly linked and have been the subject of extensive academic research (Bernstein, 1976; Brandt, 2019; Jackendoff, 2009; Patel, 2012; Politimou et al., 2019; Sloboda, 1989). There is growing evidence that early involvement in active music-making positively impacts young children's language development. These impacts are evidenced in aural perception and language skills (Anvari et al., 2002; Bonacina et al., 2021; Dege & Schwarzer, 2011; Habibi et al., 2016; Kraus & Strait, 2015; Moreno et al., 2011; Moreno et al., 2015; Patel, 2011; Williams et al., 2015), and specifically language learning in children with language delay (Brayfindley, 2001; Groß et al., 2010; Knight et al., 2016; Lederer, 2018; Pitts, 2016; Pitt, 2019; Seeman, 2008; Weiss, 2009).

Patel's OPERA hypothesis (2011) provides an explanation on why music-making would benefit language in speech sound encoding. According to the OPERA hypothesis, the benefits of music-making are driven by adaptive plasticity in speech-processing networks, which occurs when five conditions are met. The five conditions are Overlap (in the brain networks that process an acoustic feature used in both music and language); Precision (music places higher demands on these shared networks than language); Emotions (music-making elicits strong positive emotions); Repetition (musical activities are frequently repeated); and Attention (a focus that is associated with music-making). This theoretical stance has major repercussions for integrating music into child language development.

Previous preschool music-based interventions have produced positive effects on measures of phonology and vocabulary development but were delivered by external music experts (Habibi et al., 2022; Moreno et al., 2011; Moreno et al., 2015) or researchers (Patscheke et al., 2016; Patscheke et al., 2019), which may have resulted in short-term and less sustainable effects. An effective and potentially more sustainable method may be provided through teacher training, upskilling, and improving the resources accessible to preschool teachers (Bolduc et al., 2021; Ibbotson & See, 2021; Hoffman et al., 2019; Lorenzo et al., 2014).

In the present study, the teacher-led Music-Based Language Programme (MBLP$^©$) is a newly developed, eclectic early childhood music approach to enhance preschoolers'' language skills through music-making. Specifically, it is for preschoolers with language delays or at risk for language difficulties, not due to the secondary characteristics of other neurological developmental

problems, in an inclusive practice classroom. The MBLP$^{©}$ was developed based on research findings (Bolduc et al., 2021; Habron, 2016; Kayili & Kuşcu, 2020; Kell, 2014; Pitts, 2016; See & Ibbotson, 2018; Tóth-Bakos, 2016), framed by Patel's OPERA hypothesis (2012, 2014), and aligned to Malaysia's PERMATA National Curriculum with the principles of learning through play. Furthermore, it emphasises developmentally appropriate content, musical activities, and instructional methods and is adapted to the needs of young children in Malaysia.

The MBLP$^{©}$ is designed to be integrated into the preschool curriculum and delivered by the preschool teachers in a natural classroom setting to ensure the sustainability of effective language intervention. Early childhood educators may face significant barriers, including a lack of musical knowledge, pedagogy, time, support, and, most importantly, the appropriate attitudes and beliefs about their ability (self-efficacy) to deliver the music-based language intervention effectively (Biasutti et al., 2021; Buchan et al., 2019; Ibbotson & See, 2021; Fricke et al., 2013; Valdebenito & Almonaci-Fierro, 2022; Vannattan-Hall, 2010). However, early childhood educators have positive attitudes towards music, indicating an opportunity for professional learning and development (Barrett et al., 2019). The MBLP$^{©}$ teacher training programme, founded on Bandura's (1977, 1986) social cognitive theory of motivation, has embedded five aspects (attitudes and beliefs, knowledge, application, structure, and activities) to strengthen teachers' music competence and self-efficacy in music teaching.

1.2   Research Objectives

A pilot trial can help to validate the feasibility of the processes as well as potential resources, human, data management, and scientific issues that may arise during the main study and are critical to the main study's success (Lancaster & Thabane, 2019; Thabane et al., 2010). Thus, this trial aims to determine the feasibility of training non-music specialist preschool teachers in delivering MBLP$^{©}$ lessons and the acceptability of MBLP$^{©}$ by relevant stakeholders.

The specific objectives were to:

1. determine the retention rate of teachers and preschoolers,
2. determine the completion rate of data collection tasks,
3. determine to what extent teacher training may affect teachers' music teaching self-efficacy,
4. describe the implementation's fidelity,
5. obtain the perspectives of teachers on teacher training, and
6. obtain the perspectives of teachers, preschoolers, the principal, and parents on the acceptability of MBLP$^{©}$.

2   METHODS

The Human Research Ethics Committee at Universiti Malaysia Sarawak approved the study for preschoolers involving teachers and parents (application No HREC (NM)2020(1)/07). A week before the launch of the study, informed consent was sought from parents, and information letters

were provided. The Consolidated Standards of Reporting Trials (CONSORT) extension to the pilot and feasibility trials checklist informed the study (Lancaster & Thabane, 2019). The CONSORT provides comprehensive exposition and clarification for each item. In most instances, a straightforward adaptation or exclusion of items that are not relevant would be sufficient (Lancaster & Thabane, 2019).

2.1   Trial Design

The pilot trial used a convergent mixed methods approach to assess the feasibility of training preschool teachers to deliver MBLP$^{©}$ and its acceptability among stakeholders in a real-world setting. The quantitative and qualitative data and their integration were used to increase the credibility and validity of the findings when different methods yielded similar results (Creswell & Creswell, 2018). The data was collected through reports, observation, group discussion, feedback, questionnaires, and preschoolers' portfolios.

2.2   Participants

2.2.1   Recruitment

The pilot trial required a class with at least one preschooler with primary language development difficulties, identified by teachers, and informed consent from all parents. Recruitment commenced in September 2020 and ended in March 2021. A non-probability-purposive sampling recruitment strategy was employed amid the COVID-19 pandemic when most preschools and nurseries were closed for internships, research, study groups, or visits during this time.

The recruitment involved calling preschool principals in Kuching District ($n = 6$), surveying them to identify children with language development delays in their early childhood care and education (ECCE) centres, and determining their willingness to participate in the research. Most centres had small classes or children aged over 5 years. Preschool A was the most receptive, with classes for young children aged between 33 and 60 months. Furthermore, it strictly enforced standard operating procedures to ensure the health of the children and teachers in the preschool amid the COVID-19 pandemic. As a result, Preschool A was invited to participate in the study.

2.2.2   Participants

Teachers: One teacher from each baby, toddler, and junior class, respectively, and the preschool supervisor were suggested by the principal to join this pilot trial.

Children: A class of 11 preschoolers in the only junior class of this preschool were invited to join the MBLP$^{©}$ programme with their parents' consent.

2.3   Interventions

The principal author, TS, designed the MBLP[©1] to train non-music specialist preschool teachers to help preschoolers with and without language delays improve their language skills in a group setting. It is based on Patel's OPERA hypothesis (2011, 2012, 2014), culturally appropriate features from world-renowned early childhood music programmes (Orff, Kodály, and Dalzroze), and the Heggerty Phonological and Phonemic Awareness Pre-Kindergarten Curriculum. It is an eclectic music approach aligned with the Malaysian ECCE PERMATA curriculum. It focuses on music-making activities that enhance seven developmental skills: musical, learning, language, social, emotional, sensory, and motor (see Figure 1). The programme includes a 13-hour teacher training and model lesson plans with teaching resources.

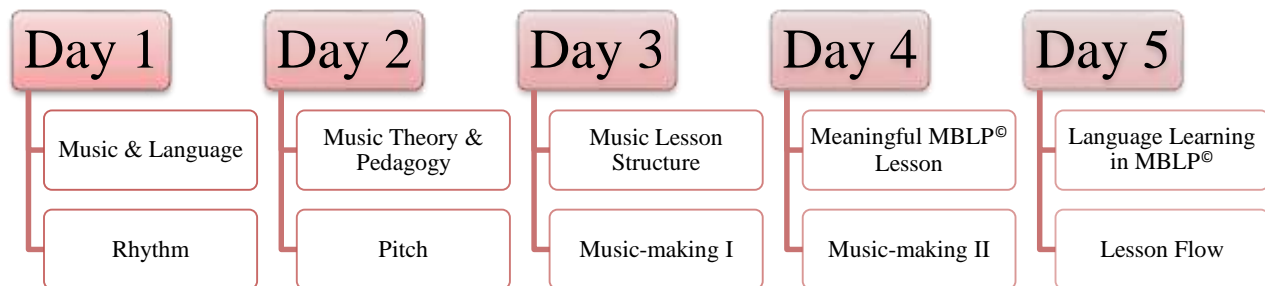**Figure 1.** MBLP[©] music-making activities that enhance seven developmental skills.

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[1] TS is a doctoral candidate in the learning sciences at the Faculty of Cognitive Sciences and Human Development, UNIMAS. She is a certified music teacher in Yamaha Music Courses, Orff, Suzuki, and Musicgarten music approaches and trained in the Kodály and Dalcroze approaches. TS was the researcher and trainer for this research.

While the MBLP$^©$ teaching resource offers teachers a tool—music-making activities with music and language learning objectives—that focus on developmentally appropriate practice, the training helps non-music specialist preschool teachers to confidently and competently deliver music-making lessons. The training sessions addressed essential musical knowledge, skills, and pedagogy through five sub-components: 1) briefing, 2) workshop, 3) mock teaching, 4) interactive reflections, and 5) observations.

The MBLP$^©$ teacher training was conducted in-house in English by TS face-to-face during suitable times according to the preschool's timetable. The briefing and workshop were 1.5 hours long, while the remainder of the sessions were one hour per session. The workshops were founded on three key features: first, a focus on content by providing teaching skills on specific content (e.g., chanting a new song rhythmically to teach vocabulary). Second, teachers' involvement and active participation by inviting teachers for meaningful discussion, planning, practising, and feedback, and last, harmonisation between the MBLP$^©$ and the preschool curriculum. The workshop was conducted according to the topics listed in Figure 2.

Day 1	Day 2	Day 3	Day 4	Day 5
Music & Language	Music Theory & Pedagogy	Music Lesson Structure	Meaningful MBLP$^©$ Lesson	Language Learning in MBLP$^©$
Rhythm	Pitch	Music-making I	Music-making II	Lesson Flow

Note, Music-making activities I: chanting, singing, solfege with hand sign. Music-making activities II: listening, dancing, and musical games.

Figure 2. The content of the workshop with instructional and practical training sessions.

2.4 Procedure

Upon receiving approval from the UNIMAS Human Ethics Committee, informal interviews with the principal and supervisor were conducted to assess their readiness for implementing MBLP$^©$ and possible adaptation.

Pre-intervention activities included observation of a typical preschool day, teacher training, parent interviews, and language skills assessment (see Figures 3 and 4). During the MBLP$^©$ intervention, trained teachers delivered music lessons in 30-minute sessions thrice weekly. The sessions were observed and recorded by TS. Preschoolers were given feedback forms with a Smiley Face Likert Scale to rate their satisfaction with the music-making. These forms were compiled into their MBLP$^©$ portfolio.

After two weeks of intervention, the final session was a round-up session of music-making to celebrate the goals achieved (e.g., learning to sing "Self-introduction song" and "Number song,"
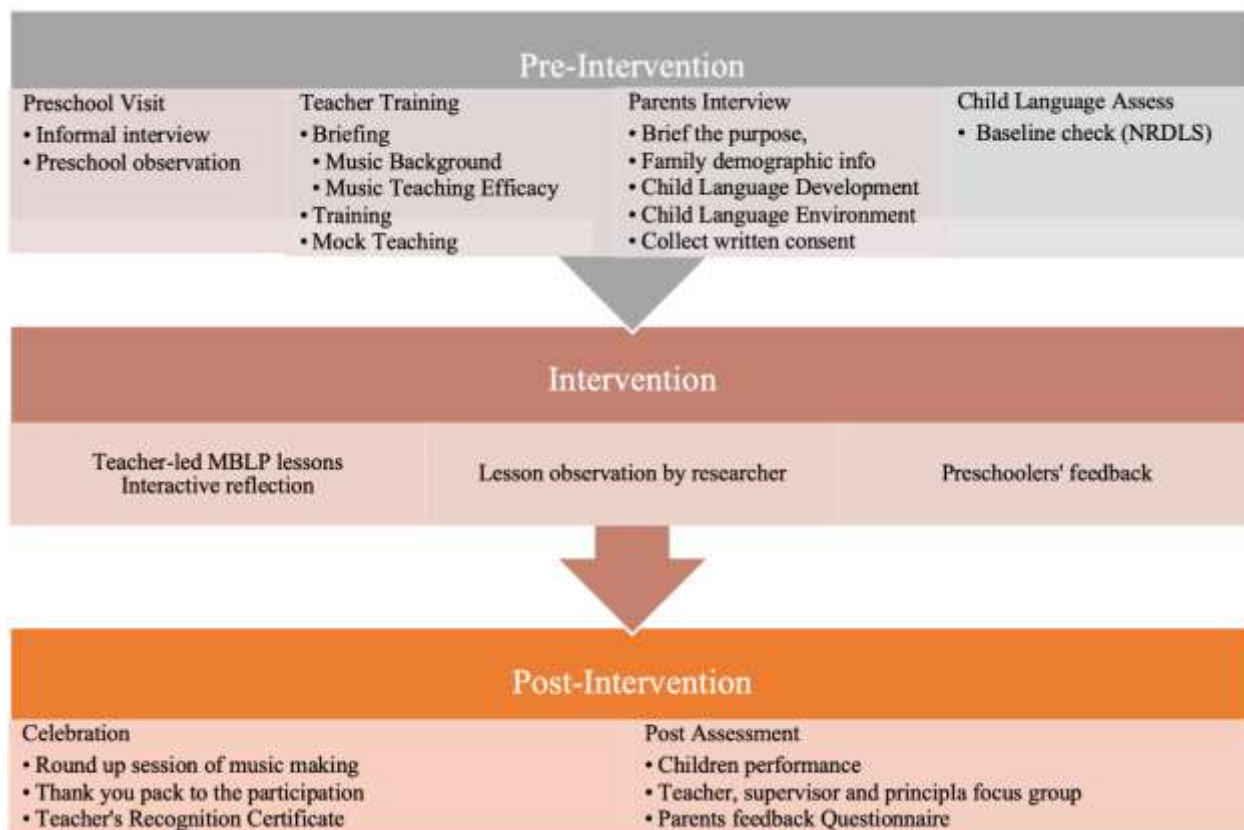
tapping the steady beat, and so on). This final session was followed by a post-assessment of individual performance, a token of appreciation for their participation, a focus group to discuss the practicality and acceptability of the MBLP$^©$ implementation, and a collection of parents' feedback.

Note. Pictures From the top left to the clockwise order show briefing to teachers, teachers' mock teaching, and briefing to parents.

Figure 3. Three pre-intervention activities.

A 5-minute video clip was created by TS to inform the parents regarding the general flow of the music-making scenarios delivered in the MBLP$^©$ lessons. The video clip attached to a Google Feedback Form was sent to the parents two weeks after the intervention was completed. A focus group reflection via Zoom meeting was convened to obtain input from teachers and the principal on the MBLP$^©$ delivery. Teachers and the principal received participation certificates as a token of appreciation for participating in the pilot trial.

Pre-Intervention

Preschool Visit	Teacher Training	Parents Interview	Child Language Assess

• Informal interview
• Preschool observation
	• Briefing
	  • Music Background
	  • Music Teaching Efficacy
	• Training
	• Mock Teaching
		• Brief the purpose,
		• Family demographic info
		• Child Language Development
		• Child Language Environment
		• Collect written consent
			• Baseline check (NRDLS)

Intervention

Teacher-led MBLP lessons Interactive reflection	Lesson observation by researcher	Preschoolers' feedback

Post-Intervention

Celebration	Post Assessment
• Round up session of music making • Thank you pack to the participation • Teacher's Recognition Certificate	• Children performance • Teacher, supervisor and principla focus group • Parents feedback Questionnaire

Note. NRDLS = the New Reynell Developmental Language Scales

Figure 4. The procedure of the pilot trial.

2.5   Outcomes

2.5.1   Feasibility

The feasibility of teacher training in delivering MBLP[©] was determined by collecting multiple data on the following: 1) the willingness of stakeholders (i.e., teachers and parents of preschoolers) to consent to participation; 2) the retention rates from baseline to post-intervention assessment; 3) the completion rate of data collection tasks; 4) the potential change in teachers' music teaching self-efficacy (MTSE) after delivering the MBLP[©] lessons; 5) the fidelity of lesson delivery; and 6) the teacher's perception of teacher training. The completion rate is a measure used to describe the data collection procedure and quality of data collected in an online survey or the portion of a questionnaire that has been completed (Lavrakas, 2008). In this study, it is calculated by dividing the number of completed surveys or interviews by the number of respondents.

2.5.2   Acceptability

The acceptability of the MBLP[©] among all stakeholders was assessed by gathering the perspectives of teachers, preschoolers, the principal, and parents through feedback questionnaires with a combination of closed and open questions, focus group discussions, and portfolios.

2.5.3   Others

Other than feasibility and acceptability, several investigations were conducted to ensure the smooth flow of the pilot study. These included the possibility of adaptation (pre-informal interviews with the principal and supervisor, preschool visits). Furthermore, background information was collected through an online questionnaire, a structured interview, and a language skills assessment to better understand the participants. All data collection is illustrated in Table 1.

Table 1. Details of data collection.

Measures	Sources	Methods	Instruments	Types
Feasibility				
Willingness	T, C	Survey	Consent form	Quan
Retention rate	T, C	Record	Logbook	Quan
Completion rate of data collection	T, C, P, Prin	Record	Logbook	Quan
Teachers' MTSE	T	Survey	MTSE[a] Questionnaire	Quan
Fidelity	RSR	Observation	Fidelity Checklist[a]	Quan
Perspective	T	Survey	Feedback form[a]	Qual
Acceptability	T, Prin	Focus group,	Structured list of questions	Qual
	C	Documentation	Portfolio	Qual
	P	Survey	Feedback Form[a]	Qual
Music background	T	Survey	MBS[a]	Quan + Qual
Language ability	C	Assessment	NRDLS[a]	Quan
Language developmental status	P	Structured Interview	ALDeQ[a]	Quan + Qual

Note. T = teachers; C = preschoolers; P = parents; Prin = principal; RSR = researcher; MTSE = Music Teaching Self-Efficacy; MBS = Music background survey; NRDLS = the New Reynell Developmental Language Scales; ALDeQ = the Alberta Language Development Questionnaire. Quan = quantitative; Qual = qualitative. [a] Instruments are described in the Appendix.

2.6   Data Analysis

The study's aims guided the analysis of both quantitative and qualitative data sets. Descriptive statistics described the data collection tasks' retention and completion rates. Additionally, the comparison regarding the music teaching self-efficacy of four teachers undergoing teacher training before and after their training was made. All written and videotaped feedback responses from reflection meetings, Google Forms, inputs in Google Classroom, and focus group sessions were transcribed, deductively coded according to the study aims, charted into the framework matrix, and interpreted accordingly.

3   RESULTS

3.1   Participants

This study involved four female teachers (T1–T4) and eleven children (C1–C11) in a junior class of Preschool A. The teachers were all between 20 and 50 years old and had 1–10 years of experience working with young children. They had not attended any music workshops except for the supervisor. However, they positively perceived music's role in early childhood care settings (see Table 2).

Table 2. Teachers' information.

	T1	T2	T3	T4
Age range	20–30	20–30	20–30	40–50
Gender	Female	Female	Female	Female
Position	Supervisor	Teacher in the toddler group	Teacher in the baby group	Teacher in the junior class[b]
ECE Experience (years)	7	2	2	10
Music training	Attended workshop	None	None	None
Music engagement	Weekly	Weekly	Daily	Daily
Average positive rating of music's role[a]	5	5	6	4

Note. T1–4 =Trained teachers in the Pilot Study. ECE = Early childhood education [a] Perception of music's role: important; useful; difficult; enjoyable; and learnable was measured using a 7-point Likert scale, with 0 = not at all; 1 = low; 2 = slightly; 3 = neutral; 4 = moderate; 5 = very; 6 = extremely. [b] Teacher from the junior class is the Chinese Language teacher.

The preschoolers were eight boys and three girls, aged between 2 years 9 months and 4 years 7 months (M = 3:07), all speaking their first language, Chinese, except C1 and C10, who spoke in English. Before the intervention, five preschoolers were identified as at risk for language impairment using the Alberta Language Development Questionnaire (ALDeQ). The New Reynell Developmental Language Scale (NRDLS) assessed their language comprehension and production abilities. Four preschoolers were below 75% of the expected developmental rate in comprehension and production, and one showed delayed development in production skills (see Table 3).

Table 3. Preschoolers' information.

	Age (y:m)	Sex	First language	Developmental status [a]	Comprehension Age equivalent	Production Age equivalent
C1	2:09	B	English	0.87	2:04	2:05
C2	2:10	B	Chinese	0.37	<2:00	<2:00
C3	3:02	G	Chinese	0.74	2:11	3:03

C4	3:03	B	Chinese	0.60	2:03	<2:00
C5	3:04	B	Chinese	0.32	<2:00	<2:00
C6	3:06	B	Chinese	0.42	2:05	2:06
C7	3:07	G	Chinese	0.91	3:01	3:01
C8	3:10	B	Chinese	0.64	3:03	3:05
C9	4:02	G	Chinese	0.91	3:05	3:06
C10	4:07	B	English	0.77	3:10	3:02
C11	4:07	B	Chinese	0.86	6:05	4:09

Note. [a] An ALDeQ Total Score of -1.25 (*SD* = 0.66) or lower indicates that the child is at risk for language impairment. The equivalent age shaded in green indicates that the child's ability is more advanced than the standardisation sample of the NRDLS. The equivalent age shaded in red indicates that the child's ability falls below 75% of the expected developmental rate (e.g., a comprehension skill expected in a 3-year-old is not present in a 4-year-old). B = boy; G = girl.

3.2 Recruitment and Retention Rate

The principal suggested that four teachers who had informed consent participate in the MBLP[©] teacher training. All teachers completed the 13-hour training and mock teaching. All trained teachers participated in the 6-week-long pilot trial.

Parents of 11 preschoolers agreed and signed the informed consent to participate in the pilot trial. All preschoolers participated in the 6-week-long pilot trial. Inevitably, some preschoolers arrived late or were absent during some of the MBLP[©] lessons. Nonetheless, no teachers or preschoolers dropped out of the pilot trial.

3.3 Completion rate of data collection

The completion rate of data collection was high, from 91% to 100% (see Table 4).

Table 4. Number of completed data collection task from all stakeholders.

Teacher	CD	Preschoolers	CD	Parents	CD	Management	CD
Music Background	4/4	NRDLS	10/11	ALDeQ	11/11	Feedback	2/2
Self-efficacy	4/4	Portfolio	10/11	Feedback	8/11		
Feedback	4/4	Performance	10/11				
Rate of completed data collection tasks							
100%		91%		91%		100%	

Note. CD = the number of completed surveys or interviews/the number of respondents; NRDLS = the New Reynell Developmental Language Scales; ALDeQ = the Alberta Language Development Questionnaire.

The results of the retention rate and data collection completion rate indicated that all participants were able to advance through the training. However, one of the youngest preschoolers, who was 34 months old and undergoing psychological evaluation for language and social interaction delays, participated in only three of the six MBLP©lessons. This preschooler was unable to complete the portfolio evaluation task or respond to individual assessments. As the preschool was not equipped with a shadow teaching system and the preschooler had little social contact with unfamiliar adults, it was difficult to get his response on the language assessment. Future research on the provision of teacher-aides to preschoolers in a comparable context may shed light on the evaluation process.

3.4 Teacher Training

3.4.1 Teachers' Music Background

All the teachers had no prior music training; however, one had completed over 20 hours of training in music teaching (see Table 5). Regardless, they all expressed an interest in music-making in one form or another, specifically singing (score range of 4 to 6). Listening was commonly practised, too, with a range of scores from 3 to 6. Teacher 3 (T3) frequently engaged with instruments (the traditional Malaysian drum–*Gendang*), and T4 sometimes played *Gendang* and created lyrics to a familiar tune. Other than T3, all teachers had frequent music-making experiences in front of others. T2 and T3 rarely engaged in music-making with a recording. All teachers perceived the high value of music, believed in the usefulness of music, enjoyed music making, and believed music could be learned, even though T1 and T4 reported that music was difficult.

Table 5. Overall profile of teachers' musical background and belief in the role of music.

	T1	T2	T3	T4
Music Education	Attended music teaching training	None	None	None
I Frequency of engagement in music-making activities				
Listening	3	6	5	6
Singing	4	5	5	6
Instrument playing	0	0	4	3
Composing	0	0	0	3
Average	3.5	5.5	4.7	4.5
II Frequency of engagement in music-making activities in different situations				
Individually	0	6	4	5
In group	5	5	2	5
In front of others	5	4	1	5
With a recording	4	1	1	3
Average	4.7	4	2	4.5

III Perception of the role of music and the ability to learn

How important is music in life	4	5	5	6
How useful is music	5	5	5	6
How difficult is music	5	3	3	4
How enjoyable is music making	6	5	4	6
I believe music can be learnt	5	5	5	6
Average	5	4.6	4.4	5.6

Note. T = Teacher. Survey responses were based on a 7-point Likert scale. For Parts I & II: 0 = never to 6 = all the time; Part III: 0 = extremely not to 6 = extremely. For the last item: 0 = strongly disagree to 6 = strongly agree.

3.4.2 Teachers' MTSE

Descriptive statistics of teachers' MTSE are presented in Table 6. Three teachers increased the overall MTSE from 7.1% to 25.7%. In contrast, one teacher (T3) showed a decline of 8.3% after delivering the MBLP$^{©}$ lessons. T3 is a Chinese language teacher with minimal English proficiency.

Table 6. Changes in preschool teachers' MTSE.

	T1		T2		T3		T4	
Self-Efficacy	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Music skills	53.3%	78.7%	59.3%	68.7%	60.7%	48.7%	88.0%	96.7%
Pedagogy	42.1%	70.0%	55.0%	65.7%	50.7%	46.4%	90.0%	96.4%
Integration	43.3%	76.7%	73.3%	73.3%	66.7%	50.0%	86.7%	93.3%
Self-improvement	50.0%	80.0%	60.0%	70.0%	50.0%	50.0%	90.0%	100%
Overall	44.9%	70.6%	55.4%	64.0%	53.3%	45.1%	83.7%	90.9%
Changes		+25.7%		+8.6%		-8.3%		+7.1%

Note. T = teacher.

The findings are consistent with a previous study (Barrett et al., 2019) that highlighted positive attitudes towards music, indicating an opportunity for professional development and learning. Despite the fact that these educators are not music specialists, they valued music, saw its utility, relished creating it, and believed it could be learned. Notably, T3 was unable to enhance her music teaching self-efficacy because she found it doubly difficult to conduct music-making activities in English.

3.4.3 Lesson Delivery Fidelity

There was only one junior class in this preschool, and T1 delivered the full MBLP$^©$ lessons throughout the trial period. The lesson delivery fidelity observation was conducted by TS. According to the observation report, T1 adhered to at least 75% of the lesson plans and consistently addressed each lesson's goal (100%). T1 prepared well for the MBLP$^©$ lessons (88%). T1 delivered the lessons like the trained approach (84% of the time) and was well received by the preschoolers. Most preschoolers (91%) participated in all music-making activities of the MBLP$^©$ lessons, albeit at varying levels.

According to the findings, teacher training with three key features, namely content-focused teaching skills, engaging teachers in meaningful dialogue, planning, practice, and feedback, and aligning the MBLP$^©$ with preschool curriculum, appears promising in assisting preschool teachers to deliver MBLP$^©$ lessons using the provided model lesson plans.

3.4.4 Perspectives of the Teachers

All teachers agreed that the teacher training programme helped prepare them to deliver the MBLP$^©$ lessons. The teacher training provided them with a self-development opportunity to learn music knowledge, skills, and music-based pedagogy. Example quotes are presented below:

This teacher training programme [MBLP$^©$] *taught me how to learn music systematically, and it assisted me in delivering the Programme* [MBLP$^©$] *professionally* (T1).

We listen to music daily but have no idea what it signifies. Following my participation in the programme [MBLP$^©$]*, I have a better understanding of what music means to us and how it may assist us in helping children to learn language through music-making* (T2).

I have no musical background, and English is not my first language, but I am slowly learning both music and English through this training programme [MBLP$^©$]*. It would be wonderful if all teachers could be trained like us to prepare lessons and understand how to use music in language teaching. However, I will need ongoing assistance from teacher TS* (T3).

It's [MBLP$^©$] *a great programme; it teaches me the basic technique of using melody and movement when singing a song to the children. This pilot study is geared towards juniors but can also be applied to babies. I'm hoping to participate in the training programme* [MBLP$^©$ Follow-up] *again* (T4).

The findings indicate that teachers' value MBLP$^©$ teacher training that is integrated into their work environment. As a result, they exhibit enhanced competency and self-efficacy in utilising music as a tool for language enhancement. However, it is critical to continue with ongoing training. Another positive outcome of the training is that instructors from various age cohorts are motivated to impart their new knowledge and abilities to younger children (e.g., babies and toddlers).

3.5   Perspectives of the Stakeholders Regarding the Acceptability of MBLP$^©$ Delivery

Feedback was gathered from the principal, parents, and preschoolers about the acceptability of MBLP$^©$ delivery. The principal commented that the programme, which included a systematic sequence of teacher training, child assessment, and parents' feedback, was practical. After the intervention, she received positive feedback from parents about the children's interest in the MBLP$^©$ programme. The principal's quotes are presented below:

The children like to sing and enjoy singing at home, with rhythm coming out of their mouths.

I am happy to see the changes this programme [MBLP$^©$] *brought to the children and teachers within a month. I am very willing to adopt this systematic, practical, and helpful language learning through music activities in my preschool.*

The parents reported varying developmental changes in their children at home, ranging from significant improvement to little difference in their Google feedback forms. Two preschoolers with language delays improved their talking, and one improved in producing clear pronunciation in their singing. Approximately 88% (*n* = 7) of parents said their children liked and enjoyed the MBLP$^©$ lessons. One parent reported that her child, who had a language delay, was shy and could not keep up with his peers. In terms of the impact of the MBLP$^©$'s four focused components (singing, speaking, listening, and engagement), 38% of parents (*n* = 3) noticed improvements in their children on all four components; 38% (*n* = 3) on singing; one parent reported that there was an improvement in listening; and one parent reported that her child made an improvement but did not elaborate.

Regarding the acceptability of the MBLP$^©$ delivery, all parents reported that their children were happy about the MBLP$^©$ lessons. Four parents (50%) added that their children increased in confidence and vitality. One parent reported that these enthusiastic behaviours might only be seen in preschool. All parents reported that they would recommend MBLP$^©$ to others because it was enjoyable for the children. One parent suggested that the MBLP$^©$ might benefit children with difficulty speaking and expressing themselves. One parent requested that a session be held to teach parents the songs so that they could sing along with their children at home. In summary, the parents were positive about implementing MBLP$^©$ at the preschool.

The preschoolers' enthusiasm for music-making in the MBLP$^©$ lessons was documented by inviting them to select an emoji expression for each musical activity in their portfolio. The overall feedback for the MBLP$^©$ lessons was concluded from nine out of 11 preschoolers (two were absent on the last MBLP$^©$ lesson). On a 5-point Likert scale, ranging in 4-unit intervals from 1 (do not like it at all) to 5 (like it very much), three preschoolers selected the Very Happy emoji, another three selected the Happy emoji, two selected the Neutral emoji, and one selected the Not-so-happy emoji.

The findings revealed that all stakeholders, including teachers, preschoolers, the principal, and parents, viewed MBLP positively. This indicates that it is feasible to move forward with the main study.

4. CONCLUSIONS

This pilot trial aimed to determine the feasibility of training non-music specialist preschool teachers in delivering MBLP$^{©}$ lessons and the acceptability of MBLP$^{©}$ by the relevant stakeholders. The investigation included assessing the retention rate of teachers and preschoolers, the completion rate of data collection tasks, evaluating to what extent teacher training may affect teachers' music teaching self-efficacy, appraising the degree of implementation fidelity, and exploring the perspectives of various stakeholders about the MBLP$^{©}$.

The feasibility of conducting teacher training for non-music specialist preschool teachers to lead the MBLP$^{©}$ was demonstrated by the high retention rate of teachers and preschoolers, the high completion rate of data collection tasks, the positive change in teachers' self-efficacy, and moderately high implementation fidelity. Furthermore, all teachers agreed that the teacher training programme enhanced their music knowledge and teaching self-efficacy, preparing them for MBLP$^{©}$ lesson delivery. Although this training was designed for children aged 3 to 5, it may encourage teachers to use it with younger children as well (below 30 months, as shown in Figure 5). Nonetheless, because all of the material is in English, it is insufficient to prepare teachers who are not fluent in English comprehension.

All stakeholders, including teachers, preschoolers, the principal, and parents, recognised that MBLP$^{©}$ was well-suited to the preschool setting and atmosphere. The recognition could be due to the researchers' high participation strategy throughout the MBLP$^{©}$ design phase, which included co-developing the intervention components with preschool teachers and supervisors, in-house teacher training, and, most importantly, wholehearted support from the preschool principal, even in the absence of funding.

The findings provide direct implications for the progression of the research from the pilot trial to the main study. Nevertheless, some modifications are needed to improve the instruments for a more efficient data collection process in the main study. For example, the 5-point Smiley Face Likert scale will be reduced to a 3-point Smiley Face Likert scale as the preschoolers, particularly those aged below 4 years, had trouble choosing one of the five smiley faces. MBLP$^{©}$ is still in its early stages of development. Given the scarcity of preschool teacher-led interventions in promoting language learning through music, future research to further refine MBLP$^{©}$ is critical.

Figure 5. The MBLP© music-making lesson with the toddles.

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APPENDIX

Instruments	Details
Music Background Survey	The Music Background Survey was adopted from Vannatta-Hall (2010). This questionnaire was prepared in a Google Form, which contained 16 items: one open-ended, 10 multiple choices and five scored on a 7-point Likert scale ranging from 0 (Extremely Not) to 6 (Extremely). These questions provide a broad snapshot of various aspects of the participants' musical behaviours in their lives (e.g., frequency of musical activities engagement and in different situations) as well as an overall profile of the participants' musical background and belief in the role of music, such as how important music is in life and how valuable music is.
Music Teaching Self-Efficacy	The Music Teaching Self-Efficacy (MTSE) Questionnaire was adopted from Vannatta-Hall (2010) which adhered to Bandura's (2006) guidelines for developing self-efficacy measures as well as measures employed in the self-efficacy literature (e.g., Hendricks, 2009; McPherson & McCormick, 2006). This questionnaire was prepared in Google Form, which included 35 items scored on an 11-point Likert scale, ranging in 10-unit intervals from 0% (no confidence) to 100% (complete confidence) under five categories. The categories were music skills, pedagogy, integration, self-improvement, and overall.
Alberta Language Developmental Questionnaire	The Alberta Language Development Questionnaire (ALDeQ), developed by Paradise, Emmerzael, and Sorenson Duncan (2010), is a parent report providing information on the child's development and current abilities in the first language through an oral interview. The ALDeQ was chosen for this study as Malaysia is a multicultural country with diverse ethnic groups (such as Malays, Chinese, Indians, and Dayaks). It is a challenge to assess young children's first language development directly. The ALDeQ comprised sections on four topics, i.e., early milestones, current first language abilities, behaviour patterns and activity preferences, and family history. The questionnaire was adopted with permission from Paradis (2011) for use by Malaysian parents. TS filled it out through a Zoom interview, which took 30 to 45 minutes.
New Reynell Developmental Language Scales	The New Reynell Developmental Language Scales (NRDLS) is a widely used assessment tool to understand a child's language's typical and atypical development. It provides data from typically developing children between 2:00 and 7:06. The scale comprises Comprehension and Production. The Comprehension Scale has 72 items divided into eight sections (selecting objects, relating two objects, verbs, sentence building, verb morphology, pronouns, complex sentences, and inferencing). The Production Scale has 64 items divided into seven sections (naming objects, relating two objects, verbs, sentence building, verb morphonology, complex sentences, and grammaticality judgement). Using the Kuder-Richardson Formula 20, the internal reliability coefficients were 0.95 for Comprehension and 0.96 for

Production (Letts et al., 2014). The NRDLS was selected for the baseline assessment for this study to learn more about the areas of language difficulties preschoolers face. It has been employed to assess children's language ability in the local setting, as in Sarawak, Malaysia (Fadzillah & Lee, 2018).

Smiley Face Likert Scales	A Smiley Face Likert Scale is a rating scale that uses emoji faces to assess satisfaction levels. The scale typically ranges from sad to smiling faces. Recent research has validated the utility of emojis as a visual approach for eliciting children's voices and its implications in child research (Fane et al., 2018; Frischen et al., 2019; Hall et al., 2016).
Fidelity Checklist	Fidelity checklists are created by refining instructional content (i.e., adherence, duration, and quality of delivery) into a reduced list of intervention components that are then used to assess the presence of the components during delivery (Walton et al., 2020).
Feedback	There are three feedback approaches for teachers, preschoolers, and parents. 1) As the teachers were given the training material through Google Classroom, they were invited to share their feedback on training content and suggestions in Google Classroom. 2) The preschoolers' feedback form was an A4 paper with a Smiley Face Likert Scale. The rating scale used five faces, ranging from smiling to sad, to measure the preschoolers' satisfaction with music-making in the MBLP© lessons. 3) The parents' feedback form was an online Google Form. It included a 5-minute video clip and six open-ended questions in Chinese and English to invite parents' thoughts or feedback on the impact of the MBLP© on their children.