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Exploring the Impact of Integrating Technology-Enhanced Learning and Music as Teaching Tools and Pedagogies for Student Engagement in Private Nurseries in Beijing: A Qualitative Study

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Abstract

The use of technology-enhanced learning in early childhood education has increased gradually in recent years (Lindeman et al. 2021). At the same time, scholarly investigations have outlined the benefits of using music for language learning and the expansion of Nursery education in China. However, research on the effects of integrating music and technology-enhanced language learning in Chinese nurseries is limited. Some have argued that technology enhances student engagement, while others believe it might hinder traditional forms of learning. To address this gap, this research conducted a case study using an interpretive practice-based approach, including collaborative action research methods.

Over a 3-month period, I conducted action research in collaboration with teachers in two nurseries to investigate the impact of music and technology including teachers' related skills, on student engagement. The methodology included collaborations with teachers to co-develop lesson plans, post-lesson discussion. The data gathering adopted a qualitative approach. Both inductive and deductive processes were used in the thematic analyses of classroom observation and teacher interview transcripts (44, 130, and 75 pages, respectively).

The study considers seven key findings. Firstly, the use of technology and music, combined with the support of peers and teachers, fostered student engagement. Furthermore, the level of student engagement was impacted by various factors, including the practical experience and training of teachers; their teaching methods, emotional patterns, tone, and class content as well as their pedagogical beliefs and values. Finally, the exchange of thoughts and insights about educational identity, pedagogical autonomy, and teaching efficiency between the teachers and myself facilitated professional growth and, ultimately, supported student engagement.

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Author's Declaration

I declare that, except where explicit reference is made to the contribution of others, this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

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Chapter 1. Introduction

1.1 Setting the Scene

This study explored the impact of integrating technology-enhanced learning (TEL) and music as teaching tools and pedagogies for student engagement in private nurseries in Beijing, China. In particular, this study investigated students' learning engagement, as well as teachers' perceptions of the benefits and potential challenges of combining TEL and music in class. A qualitative research approach was adopted within a collaborative action research (CAR) framework, which involved two pilots with 50 students and two teachers, followed by the main study with 65 students and two different teachers from another two nurseries, totaling 6 months of fieldwork.

This chapter contains seven sections. In the second section, I introduce the general situation of English teaching in nursery schools in China. In the third section, I describe my personal motivation and outline the use of TEL combined with music in language classrooms for conducting this research. In the fourth section, I discuss the importance of chant and songs in teaching English as a foreign language in early childhood. I analyse the rationale of the study in the fifth section, before presenting the research aims and research questions in the sixth section. Finally, I elucidate the thesis structure and main content of each chapter.

1.2 General Situation of Technology-Enhanced English Learning in Nurseries in China

This section presents the categorisation and composition of nurseries in China, followed by an exploration of relevant issues reported in the literature regarding English teaching in private nurseries. Private nurseries, while numerous, face concerns about their profit-driven nature, with funding significantly affecting teaching quality (Ji et al.,2017). They often adapt educational goals based on parental demands to boost financial income and development. Such schools emphasise rote vocabulary learning while potentially neglecting broader language-learning strategies. China's early childhood education and care (ECEC) system operates independently,

leading to a focus on traditional transmission approaches to prepare students for exams, a practice rooted in China's examination history (e.g. add key reference to support statement). The integration of TEL is hindered by teacher- centred methods and inadequate professional development, despite significant progress in information and communication technology (ICT) infrastructure in many Chinese nurseries.

According to data from the Ministry of Education (2021), Chinese nurseries can be classified into several types. Of the 294,832 nurseries nationwide, 108,700 are run by educational departments, 1,614 by non-educational departments, 1,629 by local enterprises, 3,838 by public institutions, 483 by the military, and 11,860 by communities. In addition, there are 166,702 private nurseries, including 116,574 nonprofit ones and six independent Sino–foreign cooperative institutions. Public nurseries refer to those owned by government agencies, public schools, and other public institutions, with their funding provided by the government or relevant authorities. Some nurseries managed by education bureaus enjoy government-affiliated positions and teacher salary benefits. Nursery principals are appointed directly by education authorities, enterprises, or investing institutions. Private nurseries refer to those established and operated by individuals, partnerships, non-governmental organisations, or private enterprises/institutions.

In a comparative study of the organisational and individual psychological factors affecting 582 preschool teachers, Shi et al. (2022) found the teaching quality in private nurseries to be significantly impacted by funding and high teacher turnover to be an issue. A prevalent phenomenon is that educational goals in private nurseries may be adjusted based on parents' demands. Specifically, as teaching pedagogies serve as approaches and means for teachers to achieve educational objectives and jointly accomplish teaching tasks with children (Husbands & Pearce, 2012), positive feedback from parents can enhance a nursery's financial income and development, which makes private nurseries highly attentive to parents' feedback. As a result, some nurseries are enthusiastic about showcasing students' English learning achievements.

Additionally, some nurseries or teachers, in their pursuit of rapid knowledge acquisition, may not adequately consider the characteristics of children's knowledge acquisition (Li & Cutting, 2011). In research on ECEC in China, Qi and Melhuish broadly outline that 'unlike countries that offer universal childcare services such as the United Kingdom, France, and the Scandinavian countries, China's childcare

education (ages 3 to 6) does not belong to the national education system, which starts in primary school' (2017, p. 268), which has influenced the pedagogy within nurseries. Due to the significant autonomy given to preschools in developing pedagogical plans and curricula, teachers advocate traditional transmission approaches to promote lexical growth amongst students.

Traditional transmission approaches are also aimed at positioning students well for future examination-based competitive situations after they graduate from preschool. Meng-Ying, Li (2021) provides evidence that examinations in China are much more than simple assessments; they are an essential component of social mobility. The author highlights that the intensity of this culture of competitive examinations originates in China's examination history.

This tendency towards exam-oriented education, combined with deeply ingrained teacher-centred instructional methods (Zhang, 2014), has led to the marginalisation of TEL applications in basic education. This situation has caused progress in the application of TEL in Chinese nurseries to stagnate over the past 5–7 years, with a limitation primarily to demonstrative purposes in teaching (Ding et al., 2019). Furthermore, the literature reveals that digital technologies are mainly employed for teacher-centred purposes as they are primarily regarded as teaching tools (Ding et al., 2019).

In China, the central government has formulated and implemented various policies and projects regarding ICT infrastructure and teacher training (Wang, Liu & Zhang, 2018). However, as mentioned above, early childhood education in China operates independently from primary education and is thus not integrated into these projects. Nevertheless, recent research suggests significant progress in ICT infrastructure in most Chinese nurseries, such as computers, printers, scanners, digital cameras, video players, and internet access. Some well-funded nurseries have even established independent multi-media classrooms and computer rooms (Liu, Toki, & Pange, 2014).

The next section introduces the theoretical basis of this study.

1.3 Personal Motivation and the Use of Technology-Enhanced Learning Combined with Music in Language Classrooms

In this section, I first introduce my personal background, including my work and teaching experience. I then focus on the significance of using TEL combined with music in language classrooms.

In addition to the research gaps discussed in the previous section, my work experience at a training school co-founded with friends in 2016, along with preliminary field observations and teaching experiences at the beginning of my doctoral degree in Glasgow, have significantly contributed to enhancing my personal motivation. Specifically, I co-founded a before century (BC) after-school training school that offered English classes to 3–7-year-olds on weekday evenings and weekends. The school opened in October 2016 and closed in December 2021.

In BC English, more than half of the students typically came from private nurseries, which are funded by individuals. I managed five teachers at the centre and co-taught several groups of 3–7-year-olds. I observed that although the pupils who attended private preschools allocated a greater amount of time to learning English within their nurseries, they presented unsatisfactory academic performance in my language school. 'Unsatisfactory' refers to these pupils' English proficiency versus the expectations of their parents or teachers, as demonstrated in tests and communication.

Crucially, this dissatisfaction does not necessarily reflect negatively on the nursery or its English teachers, as several factors could have been at play. However, this observation sparked my curiosity about English teaching methodologies in nurseries and how students learn there.

In August 2017, the year before I started my doctoral studies, I conducted a month-long research project into the current situation of English teaching in 18 private nurseries in Beijing to gather preliminary research into this topic. I informally observed five classrooms and distributed 30 questionnaires to qualified English teachers, which explored, amongst other issues, their philosophies and cognitions of teaching, the textbooks they used, and their self-reflections on the classes they taught (Li, Park & Chen, 2017). According to my classroom observations, activities within the class centred on teachers using flashcards (with pictures) to play word guessing games. Another common game involved the teachers holding a card that was visible to every child and reading the word aloud. During these teaching periods, I observed

that rhymes, chants, songs, and jingles were rarely employed.

Notably, the teaching of English with TEL in Chinese nurseries is still in a beginning stage and requires further research (Liu, Toki, & Pange, 2014). In addition, the studies that suggest that using music to teach in nurseries facilitates students' attention (Dzanic & Pejic, 2016; Sousa, 2005), combined with my experience of using songs to teach English, focussed my attention on the potential of using music in this study.

Driven by these reasons, I developed an idea for how TEL and music could be combined as a teaching method in the English classroom within Chinese nurseries. In July 2019, I co-taught at a Chinese summer camp in Scotland aimed at children aged 3–5 years living in and around Glasgow. In the 1-month class, we chose different picture books as the main teaching materials each week, specifically selecting picture books that were popular amongst nurseries in Glasgow.

To determine this, I surveyed parents in advance. The Chinese versions of the picture books used in class were translated by me and used Chinese materials openly available online. For example, the picture book that we used in the first week was The Very Hungry Caterpillar (Carle, 1994), while the related Chinese song was called 'Hungry Caterpillar'. (https://www.youtube.com/watch?v=VEDyMcwebBg).

In class, the main technologies used included PowerPoint (PPT) presentations that consisted of the contents of the picture books and an online video player used for listening and singing activities. Animations to accompany the music were downloaded from open access platforms (e.g., YouTube, QQ music, and NetEase Cloud Music) and played on computers.

Based on this short-term course, I noted two points. Firstly, regarding the learning content, the students had already understood and learned the same content as they learned in English class while attending nursery school in Scotland; as such, when they approached the Chinese versions of the picture books, we found that they exhibited no fear and were even intrigued by the unfamiliar language. In fact, when the teachers taught the picture books, the students were willing to participate in the discussions.

Because of their familiarity with the stories, they were active in speculating on the development and expression of the Chinese versions. In the learning process, students could see the contents and pictures projected on the wall. During the entire process, they focused on the content of the story and did not wander off to do other things.

When the students studied the songs, we found that as long as the teacher taught them the song lyrics along with the rhythm of the music, they memorised the lyrics rapidly. Additionally, when the teacher played animation videos simultaneously, the students exhibited a significantly high level of interest in singing. These observations inspired me to consider integrating TEL combined with music into language teaching.

The next section discusses the significance of chants and songs in the pedagogy of English-language learning for young learners.

1.4 Importance of Chants and Songs in Early Childhood Teaching English as a Foreign Language

Research in the neuroscience of music has outlined that music is like language (Adorno and Gillespie, 1993). Music assists in teaching English to nursery students because language and music processing can trigger new neural connections that support the development of both. More recent research has uncovered how the brain can develop neural connections depending on experiences - also known as plasticity and that cognitive and emotional processes are interconnected through neural networks across brain areas (Odena, 2018). Using music to teach English in nurseries facilitates teaching, attracts students' attention, and cultivates their interest (Tasnim, 2022)

Furthermore, incorporating rhymes and songs into early childhood English instruction may create an engaging and enjoyable learning environment. Young children are naturally drawn to music and rhythm, and integrating chants and songs into language lessons captures their attention and stimulates their interest (Blasco-Magraner et al.,2021). This lively and interactive approach promotes active participation, making language learning an engaging and memorable experience for young learners.

Moreover, chants and songs provide a multi-sensory learning experience. Juntunen

(2020) has found that combining music, rhythm, movement, and gestures activates different senses and stimulates various areas of the brain. This multi-sensory approach enhances young learners' cognitive development and improves memory retention, allowing them to more effectively absorb and internalise new vocabulary, sentence structures, and pronunciation patterns.

In addition, Isnaini and Aminatun (2021) note that chants and songs may support the development of language skills, including listening, speaking, and pronunciation. Through repetitive patterns, catchy melodies, and rhymes, young learners are exposed to authentic language usage and natural intonation. They can acquire new vocabulary, practise pronunciation (Sousa, 2005), and develop their oral fluency while enjoying the musical aspect of the learning process. Further relevant literature in this field is reviewed in Chapter 2.

The next section introduces the research rationale for the present study's use of music and TEL in English teaching.

1.5 Rationale of the Study

While studies in China have highlighted ICT's significance in nursery students' development, limited research has explored the combination of TEL and music for educational purposes in nursery contexts. This research aims to bridge this gap by investigating students' engagement in English classes with technology-enhanced language teaching with music (TELT-M) and teachers' perceptions of this approach in Chinese nurseries.

Technology Enhanced Learning (TEL) use in early childhood education is developing rapidly in China. A series of studies in China have also illustrated the significance of ICT in nursery students' learning activities. For example, one study indicates that ICT can be crucial in children's mental development, abstract thinking, and later academic performance (Gao & Zhang, 2015). Yuen et al. (2017) propose the facilitative role of ICT in art learning for nursery students. However, there is limited research exploring the impact of technology-assisted language learning in Chinese early childhood education. This gap underscores the need for studies that investigate the effectiveness of TEL strategies tailored to the linguistic and cultural context of Chinese early

childhood education.

Despite the scarcity of research on TEL in Chinese early childhood education, insights from studies conducted in other contexts can provide valuable guidance and justification for further exploration. Drawing upon international literature and best practices in TEL research can inform the development of culturally relevant and effective language learning interventions for young children in China.

As Siraj-Blatchford and Siraj-Blatchford (2006) note, the availability and use of technology have been widely promoted and are being used to serve children earlier. Although recent studies have reported negative effects of long exposure to ICT use on young children, such as musculoskeletal and visual symptoms, many researchers worldwide have proven the importance of young children using ICT at school (Christakis et al., 2004). Many nursery school students are already familiar with ICT, and have been termed ‘digital natives’ (Prensky, 2001), and some use ICT at home as educational and entertainment tools. Due to its inherent characteristics, ICT can easily be adapted to an individual’s specific needs and abilities while appealing to their interests. Especially at the nursery stage, ICT functions in various fields of children’s development and learning (Edwards & Bird, 2017; Haleem et al., 2022). Other researchers argue that if nursery teachers can apply ICT effectively, it will improve children’s language (Nikolopoulou et al., 2019) and social abilities (Lorusso et al., 2018).

When it comes to using music in language teaching has been shown to benefit young learners by improving vocalisation techniques, pronunciation, and cognitive development. Incorporating music, particularly English chants, into early childhood education holds the potential to enhance language learning and creativity in children.

MacNaughton and Williams (2009) state that the same vocal cords are used for singing and speaking. Singing not only serves as an avenue for refining students’ vocalization techniques but also facilitates the practice of pronunciation. In other words, the progression of singing and language development occurs in a mutually reinforcing manner. The employment of uncomplicated lyrics, coupled with melodious tunes, can consequently augment students’ lexical repertoire, to a certain extent. Millington (2011) advances the notion that singing contributes to stimulating cognitive development in young children, thereby enhancing their mnemonic

capacities. Moreover, the encouragement of lyrical modification during singing activities fosters heightened levels of creativity in children.

Many scholars and educators have developed music teaching pedagogies that use music to create a relaxed study environment, focus on students, and enhance their motivation to study. Seminal works and ideas have highlighted the effectiveness of incorporating music into language teaching; for example, language teachers have emphasised the potential of music to enhance reading skills; explored the integration of music and linguistic intelligence for mutual learning; and discussed how music can assist language learning (Torppa & Huotilainen, 2019). Moreover, English chants cannot be neglected when teaching English to young learners. Teaching English with chants involves chanting long sentences into rhythmic words so that students can sing the sentences and repeat them unconsciously. This provides an environment in which students can freely construct their knowledge. However, to the best of my knowledge, few researchers have systematically investigated the use of chants in the specific context of English classes in Chinese nurseries.

Overall, while there has been a growing body of research worldwide on the application of technology and media in teaching, scholarly investigations into the use of technology and media among preschoolers are lacking (Dore & Dynia, 2020). Moreover, to the best of my knowledge, even less research has explored the application of TEL combined with music for educational purposes in nursery contexts. As such, this research aimed to bridge this gap by exploring students' learning engagement in English classes with TELT-M in nurseries in China. as well as teachers' perceptions towards this teaching method. Specifically, it explored students' engagement while learning English in such classes through a Collaborative Action Research (CAR) approach with teachers in two private nurseries in Beijing. Thus, I hoped to obtain recommendations and guidance for the implementation of this teaching approach based on actual experience.

1.6 Research Aims and Research Questions

The aim of this research was to reflect on the problems associated with English teaching in Chinese nurseries and explore how music and TEL can enhance learner engagement. In particular, it investigated how TEL with music in English teaching

affects student engagement, as well as teachers' views on using this as a method for increasing children's engagement.

This study's findings will potentially be useful for the professional development of English teachers, as well as for addressing some of the current problems associated with teaching English to children in Beijing, including changing some of the more outdated rote-teaching concepts and incorporating more innovative educational concepts. In addition to practical applications, my intention was for the research findings to contribute to conceptual and related knowledge domains, specifically focusing on teaching pedagogies for early childhood education and the relationship between music integrated TEL and student engagement.

The two research questions (RQs) that guided this study are as follows:

RQ 1. What emotional and behavioural engagement responses do students have in nurseries in Beijing when experiencing TELT-M?

RQ 2. What factors influence the effectiveness of TELT-M in promoting learner engagement?

For RQ 2, the following two sub-questions were examined:

RQ 2.1. What and how much impact do teachers perceive TELT-M to have as a teaching tool on student engagement?

RQ 2.2. What roles do teachers' skills and perceptions play in the effective use of TELT-M?

Thus, this study was driven by two overarching RQs aimed at revealing the dynamics of TELT-M within the context of Beijing's nurseries. RQ1 delved into the realm of the emotional and behavioural engagement responses exhibited by students while undergoing TELT-M sessions. By investigating these responses, this study aimed to gain a comprehensive understanding of the impact of TELT-M on students' engagement, thereby elucidating the potential benefits and challenges associated with this pedagogical approach.

RQ2 then disclosed the inquiry towards identifying the multifaceted factors that contribute to the overall effectiveness of TELT-M in fostering learner engagement. Sub- question 2.1 revolved around the perceptions and impacts that educators attribute to TEL and music as pedagogical tools and aimed to uncover the insights and perspectives of teachers regarding the influence of TELT-M on student engagement, thus providing valuable perspectives on its perceived efficacy and implications.

Sub-question 2.2 centred on the critical role played by teachers' skills and perceptions in the successful implementation of TELT-M and explored the complex relationships between educators' competencies, attitudes, and ability to effectively utilise TELT-M.

By examining this inter-relationship, this study aimed to identify the details that explain the proficiency of teachers in using TELT-M to promote optimal learner engagement. The RQs and sub-questions collectively formed a comprehensive framework aimed at understanding the multifaceted dimensions of TELT-M and its implications within the nursery context in Beijing.

1.7 Structure of the Thesis

This thesis comprises seven chapters, the remainder of which are organised as follows:

Chapter 2 presents a review of the relevant literature. Given that my research focused on the impact of integrating music and TEL on student engagement in English classrooms, the chapter first discusses the most relevant definition of engagement and subsequently provides separate discussions on the application of TEL and music in the classroom. Furthermore, it examines previous research on the effects of combining TEL and music on student engagement.

Chapter 3 presents the theories that underlie research related to the TELT-M pedagogy, followed by the lesson plans co-developed with participating nurseries. This includes the choice of picture books as the theoretical support for the teaching materials, as well as references to game-based teaching, collaborative integrative methods (e.g., music and body movement), and scaffolding methods (e.g., interactive whiteboards [IWBs] and projectors) in the design of lesson plans.

Chapter 4 explains the qualitative methods that I used in this study. It first introduces the interpretive paradigm and qualitative methods used, which encompassed a combination of classroom recording and interviewing deployed within a CAR framework. I explore the interpretivist research paradigm and consider the ontological and epistemological stances that I adopted in this study. In addition, I combined the Leuven Scale of Involvement and Sustained Shared Thinking and Emotional Wellbeing (SSTEW) scale. It subsequently details the design of the study and the development of the fieldwork in China, including an analysis and summary of two pilot studies. I discuss ethical considerations, such as the researcher's internal and external position, and present a mind map for theme generation. Then, I concentrate on the process of data analysis, describing how the data were systematically analysed, predominantly through thematic analysis.

Chapter 5 presents the empirical findings, under six broad themes, as well as sub-themes and categories, which resulted in 36 codings. All of them emerged from the interviews and observations: (1) factors that affect behavioural and emotional engagement with children in the classroom, (2) factors that promote engagement, (3) barriers to using music combined with technology in class, (4) teachers' reflections on student engagement, (5) teachers' reflection on students engagement and CAR and (6) themes related to vocabulary retention as well as multi-level scaffolding. These themes are all explained and illustrated with direct references to primary data.

Chapter 6 presents the discussion, beginning with the important elements of the seven key findings (KFs) that address the RQs. Referring to the relevant literature, said findings are discussed in relation to student engagement in the English classroom when applying augmentative technology and music. KF1 and 2 explore combining augmentative technology with music to increase student engagement; KF3 discusses how a lack of practical experience and training in using augmentative technology in conjunction with music can affect a teacher's ability to successfully apply this pedagogy; KF4 focusses on how a teacher's lack of attention to teaching style, emotional state, or even tone (language) and content in the classroom can lead to passive student engagement; KF5 discusses how teachers who have a clear understanding of student engagement and of core teaching values and beliefs can positively impact student engagement; KF6 considers how teachers and CAR researchers reflect on teacher identity, pedagogical autonomy, and teaching skills,

which can have a positive impact; and lastly, KF7 highlights the importance of multilevel scaffolding for increasing student engagement. Finally, the relationships amongst the seven KFs are discussed, and the main points and arguments of the chapter are summarised.

The concluding Chapter 7 answers the two main RQs before summarising the research history and highlighting its original theoretical and practical contributions. It also examines the findings' implications and provides recommendations to enhance the impact of future applications of TELT-M on student engagement. The chapter concludes with the limitations of the study, recommendations for future research, and final reflections.

Chapter 2 Literature Review

2.1 Introduction

This chapter critically examines the pertinent literature concerning student engagement in English-language classrooms, with a particular focus on the use of music and TEL. It delves into the intricate relationship between the integration of music and TEL and its impact on fostering student engagement.

This chapter comprises six sections. Section 2.2 discusses relevant definitions of engagement, before Section 2.3 discusses TEL, including the advantages and disadvantages of applying such technology in English classes, its relationship with classroom engagement, and the barriers to using it. Then, Section 2.4 reviews literature related to the application of music in the classroom, including the role of music as a facilitator of multi-sensory learning; the relationship between music and emotions in second-language acquisition (SLA); the impact of music on students' memory, interest, and engagement in language learning; and the challenges of using music in the classroom. Next, Section 2.5 discusses the role of music and TEL in facilitating students' engagement in the classroom. Section 2.6 then discusses the awareness of integrating enhanced technologies into early childhood education, and Section 2.7 examines the critical role of music in early childhood education. Section 2.8 illustrates the literature with the engagement of students in utilizing technology to enhance language acquisition in early childhood education. Finally, Section 2.9 summarises the chapter.

To search for relevant research, I used several electronic databases, including the British Education Index, Education Resources Information Center (ERIC), Google Scholar, The Organization for Economic Cooperation and Development (OECD), Research Gate, Social Science Citation Index, Springer, Taylor and Francis Group, and the University of Glasgow's online library. After initiating the search with a concise set of key terms, such as 'technology-enhanced learning', I discovered that over 1 million records were available in the database of the University of Glasgow. This abundance of published literature presented a challenge in terms of data management. As a result, I included additional relevant keywords to refine the search

parameters.

I subsequently conducted a comprehensive exploration using the following key terms, initially covering areas related to instructional reinforcement and music education: ‘TEL’, ‘engagement’, ‘music in education’, ‘ICT in English teaching’, ‘action research’, ‘early childhood education’, ‘scaffolding’, ‘pre-primary education with technology enhanced learning’, ‘technology-enhanced learning with music’, ‘video and audio instruction for young learners’, and ‘IWB’. Following the incorporation of these search terms, I quickly assessed the relevance of publications by reviewing their titles and abstracts to determine whether they were pertinent to my study. During the search process, I did not impose any restrictions on publication date, as some earlier publications were foundational to certain theories or concepts. My research consequently included some older literature, which I accessed by reviewing physical copies in libraries or scanned copies online. Additionally, a few Chinese-language publications were featured in my work, particularly those concerning the development of early childhood English education in China, which were not available through international journal databases. In such cases, I translated the search criteria into English to conduct relevant literature searches in Chinese databases, primarily using the CNKI (中国知网) platform.

2.2 Engagement

This section provides a synthesis of the literature review regarding the conceptualisation of engagement and subsequently elaborates on two specific dimensions of engagement, namely behavioural engagement (Sub-Section 2.2.2) and emotional engagement (Sub- Section 2.2.3). In Sub-Section 2.2.4, I discuss factors that influence students’ engagement and the research pertaining to disengagement. After that,2.2.5 explores the relationship between language, communication and learner engagement. Finally, section 2.2.6 provides a comprehensive exploration of the concepts related to disengagement.

2.2.1 Understanding Engagement

Engagement refers to students’ capacity to maintain focus and avoid distractions

(Hirsh- Pasek et al., 2015). Numerous authors have criticised the disorientation that results from the absence of agreement regarding the definition of engagement. Azevedo (2015) offers the following definition:

> *Engagement has been used to describe everything, including student academic performance and achievement; classroom behaviours; approaches to interacting with instructional materials; students' self-perceptions of beliefs in handling individual and contextual aspects of learning situations; students' enactment of cognitive, motivational, affective, metacognitive, and social processes; particularly in academic contexts (e.g., classrooms, intelligent tutoring systems); teacher practices in learner-centred classrooms; and features of instructional and learning contexts designed to initiate, sustain, and foster learning.* (p. 84)

Engagement is a multi-faceted concept that encompasses students' motivation, cognition, and behaviour. It is widely acknowledged to involve the interplay of behaviour, emotions, and cognition (Fredricks et al., 2004; Lam et al., 2014; Heemskerk & Malmberg, 2020). It could be developed and recognised into three dimensions. Initially, they primarily emphasised behavioural engagement through the adoption of engagement theory, followed by the dimensions of emotional and cognitive engagement (Newmann, 1991; Zimmerman & Christakis, 2005). In the following subsections, I discuss the specific content of behavioural and emotional engagement. Due to the young age of my research subjects (i.e., 4–5 years old), conducting in-depth interviews would have been unsuitable, and observing cognitive engagement in the classroom would have presented difficulties, as it is not easily observed in young children. Cognitive engagement is a vital aspect of learning that is significant in knowledge acquisition and retention. However, in young children, cognitive engagement is not easy to observe or measure due to several factors, as follows: The difficulty of the distinction between cognitive and behavioural engagements, with the former emphasising the mental effort exerted by students, which is less amenable to direct observation (Appleton et al., 2006). In other words, even though children might display inattentiveness or be distracted at times, they might be engaged in cognitive activities such as reflection, problem-solving, or the mental organisation of information.

These internal processes are not easily discernible through classroom observations. Additionally, some children may exhibit active participation through enthusiastic interactions, while others may display more reserved and introspective behaviour. If classroom observation had been the primary research approach, there could have been a propensity to misconstrue quiet or reserved behaviour as disengagement, leading to

inaccuracies in the observational outcomes. As such, my discussions and research did not focus on monitoring cognitive engagement.

2.2.2 Definition of Behavioural Engagement

Behavioural engagement refers to the actions and practices displayed by students in their learning, as indicated by measures such as their attention, engagement in the classroom, and task-related behaviours (Olivier et al., 2020). Researchers have conceptualised behavioural engagement as the observable behaviours and attitudes that students exhibit when engaging in academic tasks (Finn, 1989; Skinner, Pitzer & Brule, 2014). Students who actively participate behaviourally in their learning often demonstrate behaviours such as attending classes on time, being attentive, concentrating, taking notes, persisting in completing tasks, engaging in academic discussions with peers, and asking questions (Finn, 1989; Fredricks et al., 2004; Mahatmya et al., 2012). Conversely, students who lack behavioural engagement in their learning often demonstrate behaviours such as skipping classes, being inattentive in class, being distracted, and withdrawing from academic tasks (Skinner, Pitzer and Brule, 2014).

2.2.3 Definition of Emotional Engagement

Emotional engagement refers to students' affective responses related to academic tasks (Skinner, Furrer & Marchand et al., 2008), as well as their interest in learning (Furrer & Skinner, 2003; Skinner, Furrer & Marchand et al., 2008), sense of belonging to the educational organisation, and perception of the value of learning (Finn, 1989; Voelkl, 2012). Attempts to understand emotional engagement's dimensions began with Finn's (1989) 'engagement–identification' model, which posits a positive relationship between students' actions (behavioural engagement) and their identification with the educational organisation (emotional engagement), during which they develop a sense of belonging to the educational organisation and personal value for their academic success.

Skinner, Kindermann and Furrer (2008) clearly consider the behavioural and emotional dimensions of engagement as 'the quality of students' engagement with

learning activities in classrooms, ranging from energised, enthusiastic, focussed, emotionally positive interactions with academic tasks to apathetic withdrawal' (p. 494). In their study, emotional engagement involves students' emotional experiences and interests, as well as their academic interactions with teachers and peers (Skinner, Furrer & Marchand, 2008). Other research has suggested that students who report more interactions with others, particularly with their teachers, are likely to experience positive emotions such as satisfaction, enjoyment, and excitement, which can result from knowledge acquisition (Naude et al., 2014). By contrast, students who lack emotional engagement may not be interested in the subject and may report negative emotions such as boredom, disinterest, frustration, and anxiety, which can lead to them exhibiting decreased effort in learning (Skinner, Furrer & Marchand, 2008).

2.2.4 Factors That Influence Students' Engagement

Researchers believe that academic engagement is malleable, contextual, and dynamic, as well as easily influenced by students' individual characteristics or environmental factors (Wang & Degol, 2014; Amerstorfer & Von Münster-Kistner, 2021; Lu et al. 2022). In other words, level of academic engagement can vary amongst individual students. Additionally, students may not display the same level of engagement in all situations but instead may exhibit different levels of academic engagement in different environments, depending on factors such as their interests in specific subjects. For example, students interested in English may pay more attention and be more willing to participate in activities but may not invest the same level of effort if they lack interest in another subject, such as mathematics.

Chinese scholars have also discussed the influence of the learning environment on students' engagement, which can be facilitated through interactions with teachers and peers or enhanced technological support. In a classroom study in Chinese secondary schools, Li, Jin, Edirisingha et al. (2021) highlight how the presence of teachers (i.e., their promotion of classroom interactions and implementation of teaching strategies) impacts students' classroom participation. This finding was supported by Liu, Zhen, Ding, et al. (2018). In their investigation of the developmental mechanisms of elementary students' engagement in relation to teacher support (both academic and emotional), they discovered that teacher support not only enhances students' academic self-efficacy and academic enjoyment but also serves as an intermediary

factor in experiencing activated pleasure. Students are thus more likely to focus on positive, self relevant information, leading to increased levels of positive learning attitudes and engagement. Considering these factors, the present study included a focus on how they affect behavioural and emotional engagement.

2.2.5 the relationship between language, communication and learner engagement

The relationship between student engagement and language in the classroom is intricate and symbiotic, as language serves as both a facilitator and an outcome of active student involvement in the learning process (Reschly et al., 2020). Language functions as a conduit for instructional interactions, facilitating engagement and fostering learning (Zhang & Hyland, 2022). In educational contexts, effective communication relies not only on the transmission of information but also on eliciting emotional responses from students.

Language and communication in class act as facilitators of student engagement by serving as a medium through which educators may convey information, encourage dialogue, and facilitate interaction (Tiwari, 2021). Through verbal communication, teachers could create an environment that invites students to participate actively in discussions, ask questions, and express their thoughts and opinions. This active exchange of language fosters a sense of involvement and encourages students to take ownership of their learning journey.

Moreover, language plays a crucial role in shaping the quality of student engagement. As Gholam (2019) suggests, employing captivating communication strategies can enhance student interest and curiosity, thereby deepening their engagement with the learning content. Interactive discussions, for instance, provide students with opportunities to articulate their perspectives, exchange viewpoints with peers, and contribute to collective learning experiences. By actively participating in such linguistic exchanges, students become more invested in the learning process and develop a deeper understanding of the subject matter.

Students' proficiency in expressing themselves linguistically directly influences their confidence levels and willingness to engage in classroom settings (Schnitzler et al.,

2021). Those who possess strong language skills are more likely to participate actively in discussions, share their ideas, and contribute meaningfully to classroom activities. Conversely, students who struggle with language expression may feel hesitant to participate, which can impact their overall engagement and academic progress.

2.2.6 Disengagement

Most research on academic engagement has focussed on investigating indicators that represent high levels of engagement, as they indicate positive educational outcomes, such as students' academic achievement, self-efficacy, and well-being (Bowden et al., 2021). Skinner, Furrer and Marchand et al. suggest that disengagement is not simply non- engagement (Skinner, Furrer & Marchand et al., 2008); rather, it involves students' passivity and withdrawal from learning. Some researchers have argued that disengaged students exhibit both behavioural and emotional dimensions of disengagement (Skinner, Furrer & Marchand et al., 2008; Skinner, Pitzer & Brule , 2014). Students who are disengaged from learning often skip classes and exhibit drifting attention (i.e., behavioural), among other behaviours, and also report feelings of boredom and frustration (i.e., emotional). Research has displayed a negative correlation between academic engagement, particularly students' engagement in classroom activities (i.e., behavioural engagement), and negative emotions such as boredom (Dettmers et al., 2011). Students who feel bored with their learning tend to engage less in classroom activities.

Considering its multi-dimensionality (Fredricks et al., 2004), student disengagement from school can be influenced many factors. Several authors have confirmed the impact of the latter, such as family environment, socio-economic status, school expectations, and cultural background, on predicting student school engagement (Alexander, Entwisle & Horsey, 1997; Lee & Burkam, 2003). Other authors have underscored the significance of focusing educational interventions on internal risk factors, including school policies, curriculum development, and student relationships within the educational community. Other researchers (Marks, 2000; Ares & Gorrell, 2002) have highlighted that a relevant curriculum is one factor that most significantly impacts student engagement in school activities, a finding corroborated by Weng and Li (2018) in research conducted in Chinese nurseries.

In addition to the curriculum, teacher instruction and learning activities are also crucial in influencing student engagement (Bergdahl & Bond, 2022). As Ali et al. (2019) mentioned if students do not feel valued, respected, or supported by their teachers or peers, they may develop a negative attitude towards the learning process. This can manifest as disinterest, withdrawal, or resistance to participating in class activities and ultimately hinder their engagement and overall learning experience.

Furthermore, teachers can exert control and vary in terms of support for autonomy (Jang et al., 2010). A recent study found diverse teacher responses: some expressed frustration with 'certain types of students' and ignored those who exhibited disengagement, while others adopted a more proactive approach by setting a faster work pace than the students to activate them and counteract passivity in the classroom (Bergdahl & Bond, 2022). The authors identified that teacher behaviour significantly influences the spectrum from disengagement to engagement in learning, and vice versa.

Furthermore, scholars in China have outlined how excessive academic pressure and stress can result in learner disengagement (Chyu & Chen, 2022). When students feel overwhelmed by high expectations, intense competition, or a fear of failure, they may experience increased anxiety and a reduced willingness to engage in learning. This could lead to a decline in participation, motivation, and overall academic performance. The present study included a focus on the characteristics or nature of learner disengagement and related factors, such as the impact of the learning environment, teacher instruction, and learning activities.

The next section provides a detailed exploration of the advantages and disadvantages of using TEL in early childhood language classrooms. It also discusses the most used types of TEL and their potential relationship with student engagement.

2.3 Technology-Enhanced Learning

In this section, I review both the advantages and disadvantages of applying TEL in the English classroom as discussed in the literature (Sub-Section 2.3.1), followed by the barriers to applying such technology (Sub-Section 2.3.2). Finally, in Sub-Section

2.3.3, I discuss the relationship between TEL and classroom engagement.

2.3.1 Advantages and Disadvantages of Applying Technology Enhanced Learning in the English Classroom

TEL is an important concept in the field of education. Lowyck (2014) proposes arguments concerning the relationship between learning theory and technology. The dynamic evolution of society and education influences the selection and use of learning theory and technology (Teräs, 2020). Learning theory and technology are intricately linked, as they intersect in processes such as information processing and knowledge acquisition.

Educational technology has consequently transitioned the paradigm of learner support from centralised planning and teacher control to a more collaborative approach that emphasises shared responsibility and learner autonomy (DarlingHammond et al., 2020).

As a new language-learning model, technology-enhanced language learning is becoming popular. Bernd and Markus (2001) argue that traditional language- learning theory and its influence on communicative learning still dominate to a certain extent, especially at the grass-roots level. Conversely, it is becoming increasingly clear that the availability of off- and online software tools provides exciting opportunities for language courses (Dhawan, 2020).

TEL is an approach to reducing educational inequality. Gulati (2008) believes that learning to use technology has become a global phenomenon. The internet is often seen as a value-neutral tool that helps individuals gain unhindered learning opportunities and overcome the limitations of traditional elite spaces.

However, technology-intensive learning also has drawbacks. An over-reliance on TEL may undermine the development of essential cognitive and motor skills in young children. Hands-on activities and manipulative play, which are critical for fostering fine motor skills, spatial awareness, and problem-solving abilities, may be neglected when technology takes centre stage (Vedechkina & Borgonovi, 2021). The immersive nature of TEL may restrict children’s exploration of the physical world

and hinder their ability to engage in creative and imaginative play.

Another concern is the potential for increased screen time to negatively affect children's attention spans and concentration abilities. Research suggests that excessive screen use in early childhood may contribute to attention problems and difficulties in selfregulation (Tamana et al., 2019). Constant exposure to highly stimulating and rapidly changing visual stimuli on digital devices may hinder children's ability to sustain attention during other activities, including traditional classroom interactions.

Passive screen time refers to sedentary screen-based activities that involve passively receiving screen-based information, such as watching television. Some evidence suggests that specific types of TV programmes can be advantageous for preschool children (Linebarger & Walker, 2005). Nonetheless, one study observed that children tend to derive lesser learning outcomes from TV compared with equivalent real-life experiences (Anderson & Pempek, 2005). Notably, TV viewing has been found to have particularly adverse effects on infants and toddlers, especially those under 2 years old. Early exposure to TV has been associated with attentional problems (Christakis et al., 2004) and been illustrated to exert detrimental effects on various cognitive aspects, including cognitive development, reading recognition and comprehension, mathematical proficiency, and short-term memory (Zimmerman & Christakis, 2005), as well as on language development and vocabulary (Linebarger & Walker, 2005). Furthermore, no commercial TV programmes have been reported to demonstrate any benefits for children under age 2 (Garrison & Christakis, 2005).

The concept of TEL is significant in education, with learning theory and technology being interrelated and influenced by societal and educational developments. Technology- enhanced language learning – a new model – is gaining popularity and coexists with traditional language learning theories. The availability of off- and online software tools presents exciting opportunities for language courses (Deshpande & Shesh, 2021). Learners benefit from technology integration by experiencing new techniques and increased learning possibilities. However, concerns exist about technology's drawbacks, including potential negative impacts on essential cognitive and motor skills, students' attention spans, and creative play. Passive screen time, particularly TV viewing, can have detrimental effects on young children's cognitive development and language skills (Domingues-Montanari, 2017). Hence,

while TEL offers advantages, careful consideration is required to mitigate its potential negative consequences.

2.3.2 Barriers to Applying Technology-Enhanced Learning

Barriers to the application of TEL in educational processes can be referred to as preexisting conditions that impede the successful incorporation of advanced technology into teaching methods (Brenner & Brill, 2016). Over the past two decades, numerous barriers have been extensively discussed, including hardware and software, instructor support, and teacher willingness (Ertmer, 1999; Nikolopoulou and Gialamas, 2015), which have been categorised by Ertmer (1999) as first- and second-order barriers. Firstorder barriers are external obstacles that teachers confront, such as inadequate hardware and software, limited time availability, a lack of adequate support, and inadequate teacher training. By contrast, second-order barriers are internal obstacles associated with instructors' willingness, beliefs, competencies, and established classroom practices.

The literature has identified several specific obstacles. Using Ertmer's (1999) model, I summarise them as follows: (1) first-order barriers: insufficient equipment and resources; time constraints; insufficient training; a lack of support in the technical, pedagogical, financial, and managerial domains; inadequate support from parents or the community; limited classroom space; curriculum constraints; high-stakes examinations; and broader economic, political, social, and cultural obstacles; and (2) second-order barriers: teachers' negative attitudes and beliefs, lack of confidence, inadequate knowledge and skills, and the persistence of established beliefs and instructional methods (Winter et al., 2021; Bui, 2022).

2.3.3 Relationship Between Technology-Enhanced Learning and Classroom Engagement

Numerous studies have indicated that technology can be used as a potential method for diversifying the educational encounters of young children in classrooms while promoting active learning (Richards, 2015). According to Boticki et al. (2015), technology offers novel learning opportunities, including the creation of authentic learning environments that enrich students' educational experiences. In addition, one

study has shown that the incorporation of technology into the learning process increases learner engagement (Rashid & Asghar, 2016). Furthermore, Haleem et al. (2022) argues that technology yields highly motivating effects, thus serving as a valuable tool for reinforcing students' learning progress.

Children's ability to play and learn can be enhanced if they are permitted to experience enjoyment and have access to amusement during classroom activities involving advanced technology. Baek and Touati (2017) have found that boredom or a lack of entertaining activities can result in a loss of interest in education, which can contribute to academic failure (Israel et al., 2016; Noorhidawati et al., 2015). Educational content produced for learning and entertainment captures children's attention through its design, which is largely considered playful. Children find TEL activities entertaining from both a cognitive and a socio-emotional perspective. Fun can translate into motivation and interest in acquiring content in an educational context (Atwood-Blaine & Huffman, 2017). Children participate in recreational activities for the purpose of experiencing enjoyment (Shafer, 2013). When children appreciate the activity and what they are doing, they are motivated to learn and are more likely to persist (Lumby, 2011). In turn, such motivation and perseverance affect students' classroom participation.

Classrooms receive specific benefits from technology, including the provision of immediate feedback (Shirley and Irving, 2015), which is crucial in self-regulated learning through the provision of insights into a student's performance on a task (Du et al., 2023). Thus, the integration of technology in classrooms facilitates autonomous learning, granting students the ability to assume responsibility for their individual learning journeys and create personalised paths (Pombo et al., 2018). Students become active co- creators of their own learning processes as a result of this transition.

Similarly, researchers have considered the role of support in collaborative learning, which enables students to collaborate and share knowledge (Akpabio and Ogiriki, 2017). This aspect is especially beneficial for enhancing interactions amongst learners and educators, as technology enables the sharing of comments, feedback, collaboration, and meaningful discussions (Boticki et al., 2015).

In the next section, I discuss the rationale for the application of music in the

classroom and the relationship between using music in class and student engagement.

2.4 Applying Music in the English Classroom

This section presents a comprehensive review of the literature in the field of music. This review yielded significant insights that prompted the organisation of the following four sub-sections: firstly, Sub-Section 2.4.1 delves into the role of music as a powerful facilitator of multi-sensory learning. Through engaging multiple senses, music can enhance language-learning experiences and support learners' cognitive processes. Sub-Section 2.4.2 then explores the intriguing relationship between music and emotions and emphasises how music can evoke various emotional responses, creating a conducive and emotionally enriched learning environment for language learners.

Next, Sub-Section 2.4.3 focusses on the impact of music on students' memory, interest, and engagement in the language-learning process. Studies have revealed that incorporating music in educational settings can positively influence memory retention and motivate learners to actively participate in language activities. Additionally, learnerstend to exhibit heightened interest and enthusiasm when music is integrated into language lessons, leading to increased engagement and improved language learning outcomes.

Lastly, Sub-Section 2.4.4 addresses the challenges associated with effectively using music in the language-learning classroom. These challenges may include selecting appropriate music that aligns with specific language objectives, managing potential distractions, and striking a balance between the educational benefits of using music and its potential entertainment value. By examining these challenges, educators can develop strategies to maximise the advantages of incorporating music into language teaching while mitigating potential drawbacks.

Through these four interconnected sub-sections, this section aims to provide a comprehensive understanding of the multifaceted role of music in language education, shedding light on its potential as a valuable tool for enhancing language- learning experiences and outcomes, while also acknowledging the practical considerations and challenges that educators may encounter when incorporating music into their

pedagogical practices.

2.4.1 Role of Music as a Facilitator of Multi-Sensory Learning

In this sub-section, the primary focus is on the potential of integrating music into the classroom environment to facilitate multi-sensory learning and enhance student engagement. As Crowther (2012) notes, integrating music into classroom activities allows for a multi-sensory learning experience, engaging students at multiple levels. When students are exposed to music, it activates different sensory modalities such as auditory, visual, and kinaesthetic, thus enhancing their learning experience. Music can stimulate various regions of the brain, facilitating cognitive processes related to attention, perception, and memory (Crowther, 2012; Trimble & Hesdorffer 2017).

Mendelson et al. (2016) investigated the effect of multi-sensory music intervention on the attention and engagement of children with developmental disorders in a study that involved students in Grades 2–5. They found that a multi-sensory music intervention significantly improved participants' attention and engagement levels. The combination of inherent auditory, visual, and kinaesthetic stimuli in music attracted multiple senses, fostering active engagement and enhancing students' classroom engagement.

Furthermore, Juntunen (2020) focussed on students from primary to upper grades and found that integrating music into classroom activities can be achieved through various methods, such as the use of musical instruments, the incorporation of movement and dance, or the integration of music into group projects and presentations. By creating a multi-sensory learning environment, educators can harness the power of music to promote students' engagement and provide them with a comprehensive learning experience. Cornett (2007) argues that the development of control over balance, body movements, and the use of the senses is crucial in preparing children for active involvement and concentrated attention. Moreover, sensory-based learning has been noted to have the dual effect of promoting alertness while simultaneously relaxing muscles, which facilitates the establishment of neural pathways for learning and improves the ability to maintain focus on tasks.

2.4.2 Relationship Between Music and Emotions in Second Language

Acquisition

The connection between music and emotion in the English classroom has been studied by many scholars, such as in examinations of whether teaching new concepts and vocabulary would decrease learners' levels of anxiety and inhibition (Bokiev et al., 2018). The social bonding outcomes of collective singing behaviour in the European University Choral Fraternity, as mentioned by Pearce et al. (2016), indicated that group singing can increase the sense of closeness towards unfamiliar individuals. In a more recent study, Papageorgi et al. (2022) found that singing can also help learners acquire certain English words and expressions present in lyrics, which enhances their confidence. These English words and phrases from song lyrics can be used in future verbal communication.

Furthermore, based on research in the field of SLA, Krashen (1982) contends that emotional factors such as motivation, self-confidence, and anxiety are essential in SLA. He argues that high levels of motivation and self-assurance and low levels of anxiety are likely to result in successful SLA. By contrast, if students of languages lack confidence and experience extreme anxiety, their emotional filtering will be elevated, resulting in a decline in language proficiency. This inhibition leads to the inability to acquire language (Krashen, 1982). The primary consequence of the affective filter hypothesis refer to a low-anxiety, peaceful classroom environment that elicits feelings of happiness in students is necessary for successful SLA. This is where music and songs can be helpful. In addition to its calming effects, music can be useful in language instruction, as it increases students' motivation, which is essential for an effective learning process. According to Kelly et al. (2002), the identification of real-world materials in the classroom energises the learning environment and promotes positive attitudes towards education. Thus, they effectively complement classroom instruction. Positive emotions can increase students' intrinsic motivation and interest in learning.

Due to the association of songs with emotions and the incorporation of authentic and meaningful lyrics for learners are likely to capture students' interest. The application of songs may encourage the exposure of language students to authentic input. Several studies (Hallam, 2010; Blasco-Magraner et al., 2021) have discussed the positive effect of songs as well as music on the emotional state of both young people and

adult language learners. Aguirre et al. (2016) investigated how songs motivate 7–9-year-old English as a second language (ESL) students to acquire the language. The researchers concluded that students prefer learning English through songs, as they positively impact their learning motivation. Songs create a more interactive and favourable environment, which boosts students' confidence in learning a new language. Thus, students actively participate in class and become more engaged in the activities conducted during lessons.

According to Tyng et al. (2017), the emotional centres in the brain contribute to better memories of relaxed and enjoyable situations. The integration of knowledge content with pleasant and entertaining learning processes enhances the efficiency and durability of extracting English words, grammar, and expressions from the context. In other words, entertainment-based learning may naturally reduce students' learning anxiety. Furthermore, Alexander, Aragón, Bookwala et al. (2021) suggest that joyful entertainment experiences are a form of happiness and that this sense of happiness enters the brain and stimulates individuals to seek joy. The brain's pleasure centres are closely connected to the brain's emotional centres, to the extent that people can better remember experiences associated with this emotion (Alexander et al., 2021).

Moreover, Osborne et al. (2014) support the idea that using songs to alleviate students' anxiety is effective, as songs serve to motivate and boost their confidence. This aligns with the findings of Dong Li. (2022) who conducted a study in Chinese primary and secondary schools that revealed that using appropriate action songs not only enhances students' learning enthusiasm but also alleviates students' burden, enabling them to concentrate better in the classroom.

2.4.3 Impact of Music on Students' Memory and Interest in Language Learning

This section discusses the relationship between language and music from the of language acquisition and the structure of the human brain. This includes an examination of the impact of language on memory, as well as its influence on students' interest and engagement in language learning.

Similarities exist between language and music in the context of learning. Engh (2013)

asserts that the close connection between music and language has been confirmed in various fields, such as anthropology, cognitive science, psycholinguistics, sociolinguistics, SLA, and first-language acquisition. In particular, the use of music in English-language learning has long been common practice. The author concluded that using music in language learning is effective.

Additionally, the close relationship between music and language has been supported by research, which indicates that music and musical activities are typically natural components of children's development. Papadimitriou et al. (2021) found that music can promote auditory and language development in infants and even assist young children in acquiring auditory and language skills. As with language learning, young children can benefit significantly from the social interaction involved in learning music. Thus, music interventions may have long-lasting effects on language learning.

The aforementioned studies aimed to determine the reasons for the strong connection between music and language. From a structural perspective of the brain, Peretz et al. (2015) argue that music and language analysis occur in similar regions of the brain and that the processing of music and language grammar appear to share similarities. This suggests that the brain uses the same resources to process both music and language. This view is supported by Brown (2006), who claims that language and the generation of melodic phrases engage the same functional areas of the brain, indicating cognitive parallels between music and language.

The structural characteristics of the brain have led many to believe that music training can promote structural changes in the brain and facilitate language development. Besson et al. (2011) argue that the connection between improvements in music and language skills suggests shared aspects between the two domains that allow for the transfer of training. They speculate that this connection arises from the fundamental functions of language and music, which are both primarily used for expressing emotions. This aligns with the findings regarding 5–6-year-old children by Linnavalli et al. (2018), who conclude that music skills can influence language skills. Their study suggested that music can regulate the brain in a manner similar to exercise, thus benefiting physical health. Consistent music training was observed to bring structural changes to the primary auditory and motor regions of the brain while enhancing its functional plasticity. These structural changes in the brain not only benefit the individual's musical abilities but also facilitate other skill domains, including

language, cognition, emotion, and auditory processing.

In addition to its impact on language, music is particularly associated with language and memory. Murphey (1990) suggests that songs may enhance memory by facilitating unconscious mental rehearsal, such as when the ‘ear worm’ phenomenon occurs. Thus, studies have been conducted to explore how music can facilitate language learning. Trinick (2012) examined the use of songs for language instruction amongst New Zealand primary school students. His findings indicate that common repetitive patterns in songs can help children internalise language and practise syntax and semantics. Songs also provide meaningful context for children’s language learning. Furthermore, Ferreri and Verga (2016) outline the advantages of using songs to enhance memory through the mnemonic effect.

Moreover, Yousefi et al. (2018) focus on the impact of music on SLA, particularly vocabulary acquisition. Their study involved a group of students learning a second language in Iran. Their results identified positive effects of music on vocabulary retention in both the short and long term. This finding is supported by Nie et al. (2022), who found that 7–11-year-old Chinese children who had received prior music training performed significantly better in terms of language memory compared with those who had not received music training.

According to Al-efeshat and Baniabdelrahman (2020), in addition to its effect on memory, music stimulates thought by engaging numerous brain regions, including the right hemisphere. By stimulating various regions of the brain, music can promote tranquil and organised behaviour. Using music and songs in the classroom has an interesting and entertaining aspect that engages learners in various activities. Incorporating songs into English classes has several benefits, as it can enhance students’ grammar skills and pronunciation. Playing music in the classroom aids in developing one’s speaking abilities. Moreover, singing can stimulate intrinsic motivation and attention, making it enjoyable for learners of all ages.

The next sub-section focusses on the challenges of using music in the language classroom.

2.4.4 Challenges of Using Music in the Classroom

Early childhood teachers face many challenges when using music in the classroom. A lack of formal music or music education training, for instance, may impede these instructors' use of music with their students. In fact, evidence suggests that teachers' self- reported lack of musical aptitude and knowledge inhibits the application of music (Rajan, 2017). Along with professional development deficiencies, some preschool teachers have asserted that they struggle to gain access to music educational materials (Rajan, 2017), such as classroom instruments, technology for playing audio recordings or videos, and research-based music plans for lessons or modules.

In addition, educational policies exacerbate the difficulties that early childhood teachers face in using music. Over the past decade, policies impacting early childhood education have primarily focussed on increasing the academic development of pupils in preparation for high-stakes standardisation in primary school (Persellin, 2007). Within the context of early infancy in China, Yang and Li (2019) present similar perspectives in their respective works. Given these changes, a need exists for a more in-depth examination of the use of music and the role of technology in early childhood education settings.

In the next section, I focus on the role of combining music and technology in enhancing student engagement in the classroom.

2.5 Role of Music and Technology-Enhanced Learning in Facilitating Students' Engagement in the Classroom

The previous section descried the close relationship between music and language learning. As Bokiev et al. (2018) highlight, using music as a tool in English teaching can enhance student engagement and make learning enjoyable. However, it is crucial to recognise that such learning requires long-term and sustained efforts and is most effective when students have opportunities for various forms of language input and expression. Relying solely on formal classroom teaching may be insufficient for maintaining students' learning motivation and meeting their personalised learning needs (Seven, 2020). As such, incorporating music into English teaching can be a beneficial supplement to formal learning methods.

In addition to the advantages of music, some scholars have proposed the integration of music and TEL in the classroom. Waddell, Perkins and Williamon (2019) suggests that music learning should be combined with enhanced technological devices. As mentioned in Section 1.5, modern students – as digital natives – naturally engage with TEL; if students can participate in classroom activities through TEL combined with music and genuinely attempt to understand the subject, they may experience more enjoyment and engagement.

In the following section, I provide a brief overview of the role of TEL in early childhood education, followed by a review of the relevant literature.

2.6 Technology-Enhanced Learning in Early Years Education

Most early childhood teaching methodologies are built upon game-based and student-centred practices, which facilitate exploratory learning (Mertala, 2017). In Section 3.3, game-based instruction is elaborated upon in more detail.

By contrast, students' attitudes towards the use of TEL in the early years vary. Hosokawa and Katsura (2018) argue that the use of technology can hinder children's development by displacing traditional play activities, thereby impeding the development of crucial social skills. According to Kennington and Meaton (2009), the potential of children's exposure to technology is undervalued. Wohlwend (2015) takes a positive stance on children's technology use, as her research indicates that technological advancements can facilitate collaborative work and positively impact learning and engagement. Moreover, Hourcade (2015) asserts that children and adults perceive computers differently, citing instances in which children learn from their peers through observation, a behaviour that adults may misinterpret as inactivity. The expectation of continuous child participation may thus obscure opportunities for observation and reflection, a potential disadvantage of active learning (Pound, 2011).

In fact, it is uncertain whether TEL has positive or negative effects (McCarrick & Li, 2007), as not all educators or teachers generate equivalent impacts. Similar to how some teachers perform well while others do not, various types of technology use may have varying outcomes. If teachers' pedagogical philosophies misalign with their

perceptions of technology's applications, they may employ technology inefficiently or refrain from using it at all (Ertmer, 2005). Early childhood educators should ensure that children's learning is child initiated, child centred, exploratory, open ended, socially interactive, and characterised by positive learning attitudes (Brooker, 2003). Shifflet et al. (2012) thus assert that teachers are obligated to evaluate available resources and consider more efficient use strategies.

The next section provides an overview of the critical role of music in early childhood education.

2.7 Music in Early Education

The scaffolding role of music in early childhood education is evident through the emotional communication between infants and caregivers (Malloch & Trevarthen, 2009).

Music and similar auditory materials can enhance emotional and affective semantics far beyond infants' levels of language comprehension and cognitive grasp.

The regulating capabilities of lullabies serve as a clear illustration; these musical exchanges foster an intimate and nuanced rapport between caregivers and infants, starting from the initial months after birth (Barrett et al., 2012). Across diverse cultures, maternal singing to infants is ubiquitous, which further substantiates how music's interpersonal nature is effortlessly and consistently realised.

Music is a fundamental element of children's interaction patterns with the world, creative play, development, and emotional regulation, which underscores the presence of musical scaffolding (Williams et al., 2015). The value of music in daily life, during both early childhood and throughout the lifespan, offers sociological and theoretical underpinnings for the numerous benefits observed in therapeutic practices, while also presenting opportunities for facilitating the integration of such strategies into everyday ecological contexts. Music permeates the early childhood period, serving as a medium for fostering understanding and facilitating interaction, which is intricately linked to early developmental trajectories. Research has indicated that even infants possess musical capacities (Virtala & Partanen, 2018), while

observational data underscore the integral role of music in children's everyday play (Voyajolu and Ockelford, 2016). Musical activities are a vital component of the early childhood landscape, facilitating both creative exploration and learning through counting, storytelling songs, and games (Barrett et al., 2019).

As Voyajolu and Ockelford (2016) have discovered, music constitutes a central facet of early childhood, with shared cultural practices between parents and children supporting its development. As their observational research indicated, musical games encompass high levels of playfulness, multi-modality, repetition, and selectivity, enabling children to engage independently and creatively within them.

Next section, I will review the literature of the young learners' engagement in using technology to support language learning.

2.8 Learner's engagement in using technology to support language learning in early-year education

In this section, I discuss technology is recognized as beneficial for literacy and exploratory learning in early childhood supported by some studies. Additionally, I reviewed the research of using Interactive Whiteboards for multisensory language learning experiences. Moreover, I discussed some concerns about using technology in early childhood education.

Technology is regarded as a valuable resource for literacy development and exploratory learning, aligning with children's interests in meaningful ways (Edwards et al., 2020; Johnston, 2018). Numerous studies have also emphasised children's use of technology for literacy learning or development, such as the two-year study conducted in primary schools introduced by Yelland (2018). Fleer (2020) observes six preschool students in Australia using digital technology in various activities and spaces within early childhood care and educational settings, incorporating technology into their play. This approach could meet students' psychological and emotional needs, aiding better engagement in classroom activities. She argues that games psychologically develop children, as evident when children progress from using objects as placeholders in games to using the ideas of objects to support the game plot and eventually to using words.

Conclusions drawn from a study conducted by Rogowsky et al. (2018) in a childcare centre in eastern United States support this assertion. Here, kindergarten teachers showcased interactive alphabet games through technology, allowing children to match letters with corresponding sounds or images, thereby reinforcing letter recognition skills. Meanwhile, they noted significant differences among groups of students in post-test completion, indicating that game-based learning through educational software can enhance preschool children's literacy.

Another application of digital technology in early childhood education for students is improving their language learning, especially language experience in the classroom. Celik and Karatepe (2018) published a study examining 45 fourth-grade pupils (aged 9 and 10) in language classes. They noted that language learning through multisensory materials not only had a profound impact on learning experiences but also made learning more concrete and enjoyable. For instance, interactive whiteboards (IWBs) combine visual, auditory, and kinaesthetic modes, providing a multisensory learning experience. The interactive nature of IWBs may promote active participation and engagement among students. Through touch-based interactions, children can manipulate digital content, such as letters, words, and images, fostering hands-on exploration and experimentation in language learning activities (Rodić & Granić, 2022).

On the other hand, while digital technology offers significant potential benefits for young children's learning experiences, it also raises valid concerns. Vidal-Hall et al. (2020) emphasise several of these concerns in their study. One prominent issue is the potential for time constraints when integrating technology into educational activities. The allocation of sufficient time for technology-mediated learning tasks can be challenging within the constraints of structured classroom schedules. Additionally, some learners may struggle with the complexity of using technology effectively as a learning tool, especially at a young age, which could impede their educational progress.

Moreover, Ricci et al. (2022) raise concerns regarding the over-reliance on technology and its potential negative impact on social interactions and cognitive development. Excessive screen time and passive consumption of digital content may detract from opportunities for hands-on experiential learning, which is essential for

young children's holistic development (Canadian Paediatric Society et al., 2017).

However, it is crucial to note that the suitability and effectiveness of digital technology in early childhood education heavily depend on how it is integrated into teaching practices. Teachers play a pivotal role in mediating children's interactions with technology and shaping their digital experiences to align with educational goals (Bourbour & Davoud, 2017).

In conclusion, technology offers valuable opportunities for literacy development and exploratory learning in early childhood, as supported by multiple studies. However, there are concerns about potential negative impacts on social and cognitive development. Nonetheless, with educators' guidance, technology may enhance learning outcomes and provide engaging experiences for young children, emphasising the critical role of teachers in shaping its use.

2.9 Chapter Summary

This chapter began by providing an overview of the relevant literature on the definition of student engagement in the classroom. In Section 2.2, I focussed on the conceptualization of engagement, specifically highlighting behavioural and emotional engagement. Behavioural engagement pertains to students' learning actions and practices, while emotional engagement relates to their affective responses towards academic tasks. Various factors, such as individual characteristics and the learning environment, influence students' level of engagement. After that, I discussed the relationship between language, communication and learner engagement. By contrast, disengagement involves students' passivity and withdrawal from learning, influenced by internal and external risk factors, curricula, teacher instruction, and learning activities. This study aimed to explore the characteristics of learner disengagement and related factors, with a focus on the impact of the learning environment, teacher instruction, and learning activities.

In Section 2.3, I explored TEL in English-language classes, discussing its advantages and disadvantages, barriers to its implementation, and its relationship with classroom engagement. TEL is important in education and is driven by societal and educational developments and intertwined with learning theory. Integrating technology into

language learning opens new opportunities and techniques, benefiting learners with increased possibilities and the potential reduction of educational inequality. However, concerns exist regarding technology's potential impacts on essential skills, students' attention spans, and creative play, as excessive screen time may hinder children's cognitive development and language skills. The integration of TEL into instruction faces external obstacles, such as a lack of equipment and support, as well as internal obstacles related to teachers' attitudes and beliefs. Despite these challenges, technology can diversify educational experiences, promote active learning, and improve learner engagement by providing immediate feedback and fostering autonomous and collaborative learning, thus empowering students to take charge of their learning journey and actively participate in the learning process.

In Section 2.4, I delved into the role of music in facilitating multi-sensory learning, engaging students on multiple levels, and stimulating various brain regions related to attention, perception, and memory. It further explored the relationship between music and emotions in SLA, emphasising how music can evoke emotional responses, reduce anxiety, and positively impact motivation and language-learning outcomes. The section discussed the impact of music on students' memory, interest, and engagement in language learning, highlighting the shared brain processes between music and language and how music training can promote structural changes in the brain, thus benefiting language acquisition. Lastly, the section addressed the challenges of effectively using music in the language-learning classroom, such as the lack of music education training and resources, as well as policy influences that prioritise academic learning over the incorporation of music into early childhood education. Through exploring these aspects, the section aimed to elucidate the potential benefits of music in language education, while acknowledging the practical considerations and obstacles that educators may encounter.

Section 2.5 revealed how it is crucial to provide students with various language input and expression opportunities beyond traditional classroom methods. Additionally, integrating music with TEL in the classroom may further enhance students' engagement and enjoyment, particularly because modern students are digital natives who naturally engage with technology.

Sections 2.6 and 2.7 delved into the associations between TEL and music with early childhood education while also discussing their influences within the context of early

childhood education.

Lastly, in Section 2.8, the focus has been on the utilisation of technology to enhance early-year learners' literacy development and language skills while fostering positive learning experiences. It is recognised as a valuable tool that aligns with children's interests, as evidenced by various studies highlighting its efficacy in literacy learning and exploratory education. Additionally, digital technology, such as an IWB, is shown to improve language learning experiences by providing multisensory engagement and interactive opportunities. However, concerns regarding the suitability and challenges of integrating technology in early childhood education persist, emphasising the crucial role of teachers in effectively implementing technology in teaching practices to address these issues.

In the next chapter, I discuss the design of the TELT-M pedagogy and curriculum planning used in this research at the nursery level.

Chapter 3 Designing the Technology-Enhanced Language Teaching with Music Pedagogy and Lesson Plans for Participating Nurseries

3.1 Introduction

This chapter focusses on the design of the lesson plan which applied in the field work. Meanwhile, I also explore the primary theoretical basis for the rational design of the curriculum in my research. This theoretical basis collaborative integrated approaches (Saricoban & Metin, 2000; Macedonia & Klimesch 2014), and the scaffolding method (Vygotsky, 1978; Wells, 1999).

In this research, collaborative efforts were made in selecting two picture books as teaching materials – namely The Very Hungry Caterpillar by Carle (1994) and Walking Through the Jungle by Lacome (1998). These picture books were not simply treated as standalone materials but rather viewed as comprehensive English textbooks. The teachers and I collectively analysed and divided them into various classes with different vocabulary and sentence patterns, all within a coherent story context (see extended extract of lesson plan in Appendix E).

The decision to use picture books as a primary teaching resource stemmed from my previous experience assisting a foreign publisher with the adaptation of picture books for Chinese schools and nurseries, such as Oxford Reading Tree Traditional Tales: Level 1: The Ugly Duckling (Teresa & Nikki, 2011). Recognising the versatility of picture books for second-language learners, I consulted the participating teachers to consider their flexible applications for language learning and reading materials. The teachers were actively involved in determining which picture books to use based on specific learning objectives and the diverse abilities and grades of the students. Thus, despite conducting the pilot enquiry and main data collection in different nurseries, the same picture book was employed, with adaptations tailored to each nursery's student language proficiency and cognitive abilities.

This chapter comprises five sections, the remainder of which are organised as follows: Section 3.2 presents the lesson plan design, which was underpinned by collaborative teaching frameworks, including collaborative integrative teaching methods (Section

3.3), and scaffolding methods (Section 3.4). These approaches were collectively chosen and refined through collaborative discussions and insights. Section 3.5 concludes the chapter by summarising the collaborative decisions and strategies that informed lesson plan design.

3.2 Design of Lesson Plans

In this section, I discuss the importance of considering the elements of educational activities. I also consider the role of picture books; the rhythmic and musical text in picture books facilitates the integration of music into teaching as well game-based teaching pedagogy. In addition, I focus on the collaborative efforts between teachers and the researcher, which played a vital role in shaping the design of English activities to align with the established goals.

In China, research on early childhood activities began relatively late, and limited research has been conducted on the design of early childhood educational activities and their elements. Ni (2000) mentions that early childhood activities emphasise objects and subjects. The subject of the activities is the children, while the objects include both things that interest them (e.g., tangible entities in children's sensory activities, including people and things in the surrounding environment) and the foundation of their psychological activities (e.g., children's mental representations and concepts of people and things in the external world; Ni, 2000). As such, in the initial stage of designing class activities, I considered what may be included in educational activities (i.e., the theme and tasks) and how to organise each one (i.e., the procedures or steps, forms, and methods of the activities). Specifically, I also considered the basic components of early childhood educational activities, mainly referring to the human factors/subjects of the activities (i.e., teachers, children), the objects of the activities (e.g., purposeful operating materials, organisational language, and professional language), and the rules (e.g., internal evaluation and judgement of effective and ineffective operations).

According to Coppola et al. (2004), the teaching plan is the main basis of education's structure, as well as its core. Thus, I planned the lessons first and then conducted the fieldwork in nurseries. I made the lesson plans and discussed them with the teachers in each nursery and then they applied the revise version in the main data collection.

Scholars have proposed different views on the elements of lesson design from various perspectives. Farrell (2002) defines a lesson plan as ‘a sequence of correlated lessons around a particular theme or it can be specified as a systematic record of a teacher’s thoughts about what will be covered during a lesson’ (p. 30). He adds that the daily curriculum plan is a written description of how students achieve specific goals. It describes the teaching behaviours that affect students’ learning. According to Spratt et al. (2005), curriculum plans provide guidance for teachers in the selection and usage of teaching materials.

When it comes to the materials, the picture books were chosen. The appeal of repetition and rhythm is that these features satisfy a fixed pattern of cognitive needs for children (Bland, 2018). As classic features of traditional folk and fairy tales, repetition and predictability are also valued and regularly used by authors of contemporary picture books. Predictability and repetition work as reminders for the storyteller to recall the narrative line and as linguistic scaffolding for children’s listening (Cook,2000). This is also true for second-language learners. Repeating certain phrases and words helps students understand, remember, and recall them later, using them as part of their language learning. With predictability, listeners feel that they can better control and understand the contents because they can usually predict the next line. *The Very Hungry Caterpillar*, one of the picture books that I chose, offers a lucid illustration of repetition and predictability: the caterpillar eats one piece of fruit on Monday, two items on Tuesday, and increasing numbers of items until Sunday. Throughout this process, the caterpillar also grows. Teaching this story in the ESL classroom enables students to actively use what they hear and remember, as the repetition facilitates their learning about inner boundaries, while the predictability helps them guess the next line (Linse, 2007).The repetitive sentence pattern of ‘he eats through… but he is still hungry’ helps students predict that the caterpillar is going to eat more after they learn that ‘he is still hungry’.

In addition, the rhythmic and musical text in some picture books makes it easier to integrate musical elements into teaching, which echoes my study. Singing the musical text directly and composing new words for familiar tunes can promote the development of phonological and phonemic awareness (Degé & Schwarzer, 2011). In the picture book *Walking Through the Jungle*, when children hear repetitive words

and phrases, they start to play with language. The following is an example line from the book: ‘Walking Through the Jungle, what can you see? I can see a monkey looking at me’. Teachers can invite children to join in with the repetitive parts using their voices while tapping on their knees rhythmically. The story is set in the jungle: as the protagonist discovers an increasing number of new animals in the jungle, the suspense is also heightened. The whole story also includes many hints and rhythms.

According to Hitchcock et al. (2002), the goals of educational activities are the plan and blueprint for implementing them, while their implementation is the means of achieving said goals. The knowledge and skills that children must acquire are reflected in goals based on standards and benchmarks; educators would compose these goals with multiple pathways for achieving them (Hitchcock et al. 2002In the lesson plans, all activities were designed based on the learning goals, and the aim was to achieve the goals directly or indirectly through different activities. For instance, in the hungry caterpillar lesson plan, to deepen students’ understanding of the evolution of butterflies, which was one of the learning goals, I planned a role-play activity for the third-class hour. This activity was designed to help the students understand complex and abstract concepts in a visual manner. This activity also helped the students review the words they had learned. When they played the roles of the caterpillar’s food, they actually used related words for food and heard their peers using them. Thus, this role-play activity helped the students achieve the vocabulary teaching goal.

Moreover, effective organisation can enhance the effectiveness of education activities, allowing effective education resources to produce the greatest educational synergy and exert the greatest educational effects in a particular spatiotemporal context (Galvis, 2018). The design of early childhood education activities is essentially the preplanning of early childhood learning experiences, and these activities’ organisation is the approach and means employed to implement them.

Games are at the core of early learning activities, with children being the central figures in early education (Lucas,2017). Wallerstedt and Pramling (2012) argue that games and learning cannot be separated. In fact, research has noted that games are more efficient than teacher-directed instruction (Han et al., 2010) in fostering children’s social and emotional development and academic progress (Ashiabi, 2007). Ashiabi (2007) mentions that games benefit children’s development by enhancing

their knowledge foundation and fostering skill acquisition through interactions with others and their surroundings. According to research, game-based learning practices more positively impact children's academic concept learning than direct instruction (Han et al., 2010).

Notably, game-based learning goes beyond simply creating games for students to play; rather, it involves designing learning activities that progressively introduce concepts and guide users towards achieving specific goals. Lieberman et al. (2011) highlight that positive electronic games can enhance memory-related learning and decrease classroom tardiness, absences, and negative behaviour. Furthermore, evidence suggests that children prefer active electronic games over traditional games (Yeh-Lane, 2011). The learning needs of the 'net generation' (Oblinger, 2004) have changed, and the increasing use and acceptance of communication technologies have sparked growing interest in the learning potential of games and computer games. Computers improve preschoolers' attention and motivation, and rapid feedback helps them interact (see Section 2.3.3: Relationship Between Technology-Enhanced Learning and Classroom Engagement).

As such, in designing the lesson plans, I primarily considered two types of games namely games involving music and body movement and interactive digital games on IWBs. Firstly, games involving music and body movement are beneficial for kinaesthetic learners, as they acquire knowledge through practical activities, meaning that they can achieve an enhanced understanding through active participation (Gilakjani, 2012). Some kinaesthetic learners prefer to move around while trying to memorise information (Dornyei, 2005), and they are more comfortable in environments that allow physical activity. They tend to engage in field trips and experiential learning outside of the classroom, which allow them to learn freely and gain first-hand experience.

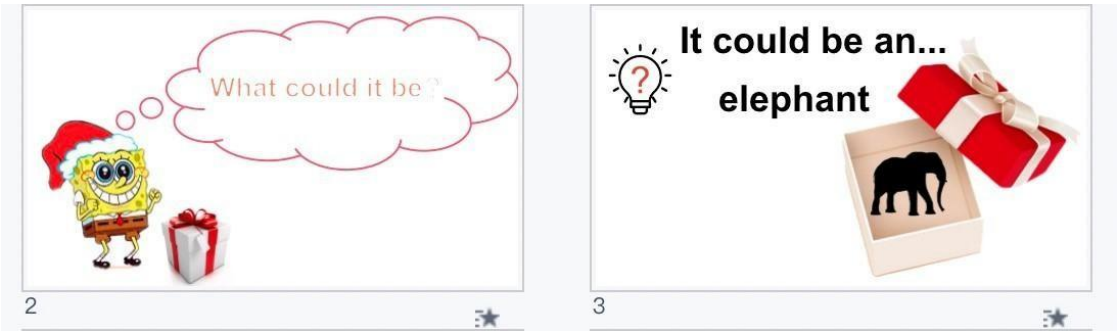
In the lesson plans, I co-designed various activities and games with the teachers, such as listening to and singing along with Miss Bri's song '*What Will the Caterpillar Eat Next?*'(available Open Access at https://www.youtube.com/watch?v=uYRPJ3FhYBw) and then performing body movements with the teacher. When the music played, the teacher guided the students in performing body movements and encouraged them to design their own actions based on different foods. During this process, students became fully engaged. They learned word pronunciation from the music and

memorised the words by creating different movements. When the teacher asked about the meanings of their actions, students could better understand the words as they explained.

Secondly, regarding interactive digital games on the IWB, we designed many games that could be presented in PPT so that students could interact with the IWB to further explore and understand the stories in the classroom. For example, in a section of the Walking Through the Jungle theme, we designed a game that involved the popular character SpongeBob, who was required to open a gift box. Students went up to the IWB individually or in groups, guessed what animals might be inside the gift box, clicked on it, and then compared what SpongeBob saw with what they initially guessed. The goal was for students to understand the meaning of 'It could be…' sentences while simultaneously familiarising themselves with words about the animals in the picture book (see Appendix G: A Screenshot of PowerPoint Used in Class).

Figure 3.1 displays a screenshot of a PPT slide presented by the teacher during the course.

Figure 3. 1 Screenshot of a Lesson Plan (PowerPoint)



Furthermore, the game forms employed in this research emphasised adult guidance. As Fisher et al. (2013) note, two distinct types of games – children's free play and adultguided games – are focal points of current educational research. Free play is typically characterised as flexible, voluntary, and child led, involving a variety of roles, with many being defined as pretend play (Fisher, et al., 2013; Holt, et al., 2015). Adultguided games alternate between instruction and free play (Weisberg, et al., 2013a). Relative to free play, adult-guided games lie between direct instruction and spontaneous play. These games can be initiated by either children or adults.

However, researchers have highlighted that the concept of free play is somewhat ambiguous. Although free play is spontaneous, children are not necessarily born free players, as children-led play often depends on their prior experiences (Wallerstedt & Pramling, 2012); furthermore, their interest is influenced by adults (Brooker, 2011).

Similarly, like free play, adult-guided games are child led, with children being the controllers of the games (Weisberg et al. 2013b). Children learn within game environments they set for themselves, while their teachers reinforce learning experiences by playing the roles of commentators, partners, and questioners or providing new interactive choices (Fisher et al. 2013).

The lesson plans were designed for English activities, which was reflected in many facets. In terms of objectives, a dual, multi-dimensional structure was applied to the objectives of the activities. In terms of content, a collaborative integrative model was applied, combining language with music and body movement which will be introduced in next section.

3.3 Integrative Approach Involving Music and Body Movement

This section primarily discusses the potential positive effects of integrating music and movement in the classroom on language learning and development.

Macedonia and Klimesch (2014) discovered that linking unfamiliar words with physical movements improves retention. Their research suggested consistency between knowledge and body moment is easier for student to remember. Deep processing and audio-visual information create strong moods that increase network connections and variety. Therefore, the more complex the target network, the more likely it is that the vocabulary will be used and acquired in context.

Moreover, the connection of nodes activates students' auditory, visual, and touch senses when they learn a language by combining music and body movements. However, the activation of interconnected nodes is not the only pertinent aspect. Music in early childhood classrooms also improves English-language learners' (ELLs') reading (Peregoy & Boyle, 2008; Saricobanand & Metin, 2000). In diverse

early education classes, both the forms of music and the teachers' musical competence matter greatly to the training of creativity and value. Music is an essential medium of learning. It makes classes relaxing and pleasant, creating a favourable environment for children's growth. Breathtaking music and meaningful learning experiences meet the needs of different learners and extend support through the combination of music and songs. Organising orderly and open music activities and creating an atmosphere of trust, respect, and sharing are crucial to the growth and development of children. For years, music has been instrumentalised to foster the reading, writing, and learning abilities of students (Ohman-Rodriguez, 2004). Gardner (1993) notes that, amongst all types of intelligence, musical intelligence is developed first among young learners; for example, many children have the natural tendency to hum. It is thus beneficial to foster their interest in music alongside their ability to read and write. In summary, after identifying the causes, teachers and researchers have proposed teaching ELLs through music, thus justifying the motivations of teachers.

Krashen (1982) explains that the affective filter must be weak for effective learning to occur. He claims that the presence of negative emotions among pupils serves as a filter for receiving comprehensible input. If students experience negative emotions while engaging in the language-learning process, it is likely that these negative emotional variables will subsequently inhibit their comprehension of understandable material. Conversely, if the student sustains a heightened degree of positive attitude throughout the learning process, comprehension of the language input may be hindered. The efficacy of the filter will be correspondingly diminished. A favourable attitude towards acquiring new knowledge is indicative of the presence of a weak filter. Songs are one approach for generating a weak emotional filter and enhancing language learning, as singing provides a casual learning environment. From a cognitive standpoint, songs provide possibilities for developing automaticity in the language process, which can be defined as knowing what to say and expressing language without pauses. Because many children's songs are repetitive in nature, non-native English speakers may benefit from hearing the same words and phrases used repeatedly in these songs. Since music is beneficial to the development of literacy in pupils, Peregoy and Boyle (2008) make the following recommendation in their book for teaching K–12 English learners: 'Sing a song a day! Songs are a great way to bring beauty, joy, and light-heartedness into the classroom' (p. 127). According to Saricoban and Metin (2000), the structure of many songs, particularly

folk songs, consists of repeated verses that rhyme and other discourse elements that make them simple to understand. Because much of the language that young ELLs will hear is conversational in nature, using songs can help students prepare for the genuine language they will hear.

There are a variety of classes in which music can be used to cultivate and increase language comprehension capabilities, as well as vocabulary. According to Hill-Clarke and Robinson (2003), music can increase listening and speech abilities, as well as focus, memory, and abstract thinking patterns. In addition, they state that participation in musical activities improves students' learning abilities.

Songs can be used to illustrate and/or practise language skills, such as sentences, vocabulary, pronunciation, rhythm, and word class. They can represent the prosodic qualities of the language, including stress, rhythm, and voices, which can all be found in the language's prosody. Songs that are sung in the children's mother tongue are advantageous not only to ELLs but also to children whose first language is not English.

When teaching a new song, teachers must resort to direct instruction. The following methods for teaching songs may be beneficial to both teachers and students (Isenberg & Jalongo, 2009, p. 240-241):

- *Play the song in the background for several days so it is familiar when it is introduced to the children.*
- *Teach children the chorus first while you sing the verses.*
- *Sing along with a recording and have children join in when they feel most comfortable.*
- *Use lined poster paper to create a song chart.*
- *Create a rebus song sheet to help children remember the verses of songs.*
- *Teach the song one phrase at a time, then combine the phrases.*
- *Teach the actions to an action song first, then teach the words (or vice versa).*

In the hungry caterpillar lesson plan, the words in the picture book laid the vocabulary foundation during the first class. Students were subsequently asked to watch the video of a song titled 'The Hungry Caterpillar's Food' by Miss Nina and sing the song with accompanying movements. In the third class, the teacher taught another song about a hungry caterpillar. As the students had learned about the related words, the class began by playing the song 'What Will the Caterpillar Eat Next?' by

Miss Bri. The students learned about the contents and the melody, and the teacher explained the key words or phrases that had not been mentioned in the previous class. When teaching a song, the teacher played the video beforehand so that students could become familiar with the contents and melody, such as in the warm-up and activity of the second class and in the review of the third class. The teacher subsequently led the students in singing together and taught one phrase at a time with movements. According to the lesson plan, the teacher was required to guide students in performing body movements while singing the song because, at this level, children's attention spans are short, and they can usually only process one concept at a time.

This section has emphasised the language-learning benefits of music and movement. Research indicates that music has been shown to stimulate the auditory, visual, and tactile senses, contributing to the support of language learning. Furthermore, studies have suggested that incorporating body movement into the learning process can be beneficial, especially for young children, given their limited attention spans and the activities embedded in the lesson plan. The following section provides an overview of the use of the Interactive Whiteboard (IWB) or projector as a primary scaffolding tool in the classroom and its integration into the lesson plans.

3.4 Scaffolding Method

This section describes how scaffolding, particularly by using tools such as IWBs, can facilitate classroom learning and development. Wells (1999) implemented Vygotsky's (1978) ZPD framework through the application of scaffolding, outlining three fundamental attributes of pedagogical scaffolding: (1) the inherently dialogic character of discourse, where in knowledge is collaboratively constructed; (2), the import of the contextual activities within which comprehension is situated; and (3) the pivotal function of intermediary artefacts in facilitating cognitive engagement (Wells, 1999).

In my lesson plans, I used pre-teaching vocabulary as a scaffolding teaching method to help students later comprehend the whole story. Furthermore, as English is a second language for Chinese children, they may not be familiar with the social context of English. Thus, it was advisable to build a scaffold between the English language and their life experiences using some intelligible and acceptable resources,

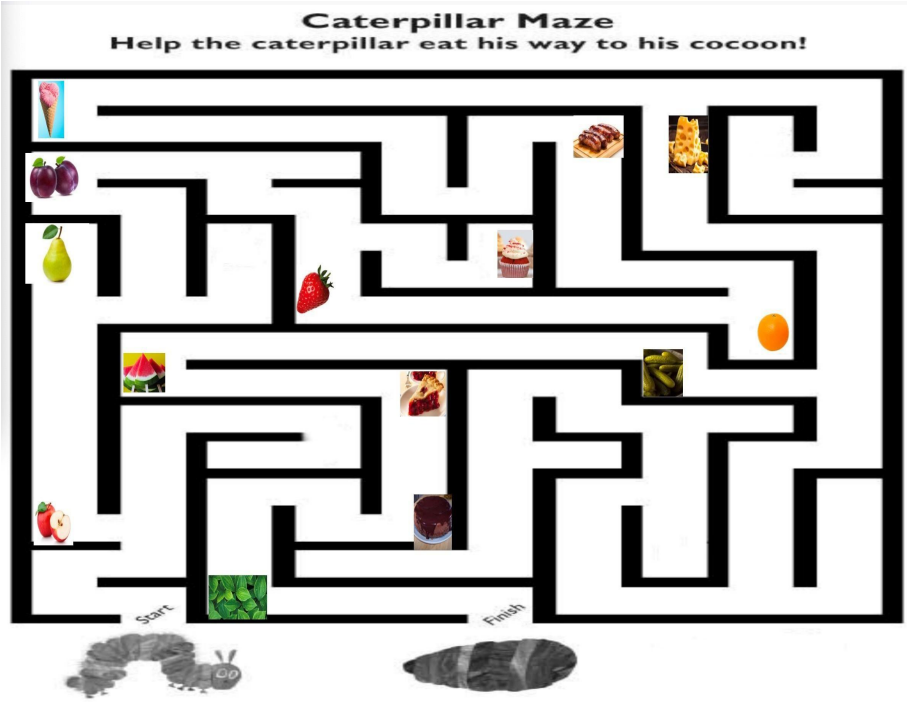
ways, and means that were close to their life experiences, thereby creating an intelligible connection for the children's English learning.

As many researchers have mentioned, IWBs serve as a practical scaffolding tool for children in the classroom. Masoumi et al. (2023) have indicated that the implementation of an IWB as a scaffolding tool in preschool classrooms yields positive outcomes. Therefore, I selected IWBs as the main scaffolding tool for pre-teaching the vocabulary. The teachers used an IWB to present the words in photos to the students. Moreover, when abstract words were being taught, I thought that the children would find it difficult to understand the abstract sensory experience represented by language only based on simple language expression and intuitive presentation. In this case, showing the students pictures or videos of real objects on the IWB and providing real objects, if necessary, would help (see Appendix E: Sample Lesson Plan).

In the lesson plans, teachers were also expected to ask students to share their own experiences or ideas about the vocabulary. Here, the students could connect the vocabulary with their own lives after thinking. Launching classroom learning from the prior knowledge of students was another scaffolding technique used in the lesson plan for the first class. Scaffolding can also be used as a metaphor for describing and explaining the role of adults or more knowledgeable peers in guiding children's learning and development (Lajoie, 2005). Collaborative learning may be used to implement group consultation and discussion amongst learners. For example, I used a maze game (see Appendix F: A Screenshot of PowerPoint Game) that required the students to be divided into different groups. They then discussed how to find their way out of the maze in front of the IWB. The goal of the game was to practise group consultation and discussion abilities.

Figure 3.2 presents a screenshot of a maze game, as represented by a PPT screenshot.

Figure 3. 2 Screenshot of a Game Played on an Interactive White Board



3.5 Chapter Summary

This chapter has presented the framework underneath the design of lesson plans in class. Firstly, Section 3.2 discussed the significance of well-designed lesson plans and early childhood education activities for promoting effective learning. Lesson plans are crucial for setting specific objectives and guiding teaching behaviours that impact students' learning. The goals of such activities which mainly applied with game-based teaching pedagogies by using picture book are purposeful and adjusted based on children's development and classroom dynamics, with collaboration between teachers and researchers ensuring alignment with learning objectives.

Next, Section 3.3 discussed the potential positive effects of integrating music and movement in the classroom on language learning and development, particularly in enhancing student engagement. The section explored the connection between body movement and long- term word retention. Music in early childhood classrooms has been found to foster the development of ELLs' literacy skills and creativity. Songs contribute to a weak affective filter, thereby promoting language learning and spontaneous language generation. Furthermore, songs can be used to practise language skills and onomatopoeic features, and direct instruction is crucial when teaching new ones. Incorporating body movements while singing helps to create meaningful and enjoyable learning experiences, especially for young learners.

Finally, Section 3.4 discussed the scaffolding method, particularly the use of IWBs as a tool for facilitating classroom learning and development. The approach emphasises pre-teaching vocabulary, connecting learning to prior knowledge, and employing collaborative learning techniques to enhance engagement and problem-solving abilities. IWBs served as a practical scaffolding tool as they were used to display intuitive images and real objects to aid understanding. In the lesson plans, activities promoting group consultation and discussion were encouraged to foster collaborative learning. The scaffolding included guiding learners and providing support for their development and understanding. These theoretical frameworks also guided the formulation of my lesson plans in both the pilot studies and the formal CAR, wherein close collaboration with the teaching faculty was established, as discussed in Chapter 4 next.

Chapter 4 Methodology

4.1 Overview

This chapter outlines the methodology and methods of the research. It aims to introduce the rationale behind the methodological decisions that I made in this study and discuss my choices regarding the research design. This chapter is divided into ten sections, the remainder of which are organised as follows: Section 4.2 restates the research objectives and RQs. In Section 4.3, I explore the interpretivist research paradigm and consider the ontological and epistemological stances that I adopted in this study. In Section 4.4, I explain the methodological choice of a qualitative case study approach based on the research objectives, describe the process of engaging with participants, and introduce the two participating nurseries. In Section 4.5, I discuss the advantages, necessity, and process of conducting CAR in a case study setting. Section 4.6 then delves into the specifics of the combined qualitative methods (a literature review, semi-structured interviews, classroom observations, and research diaries) and explains why these data collection methods were suitable for exploring and addressing the RQs. In Section 4.7, I outline the process, findings, and reflections from two pilot studies. Next, Section 4.8 discusses ethical considerations, including the researcher's internal and external positionality, and presents a mind map for generating themes. Section 4.9 focusses on the data analysis process, outlining how the data were systematically analysed, primarily through thematic analysis. Finally, Section 4.10 summarises the chapter.

4.2 Research Aims and Research Questions

As mentioned in Section 1.6, this research aimed to investigate the impact of using TEL and music as a teaching method on students' behavioural and emotional engagement at nurseries. Specifically, it explored how the use of TEL with music in teaching English affects students' engagement as well as teachers' views about using this method to enhance students' engagement in class. The specific RQs that guided this study were as follows:

RQ 1. What emotional and behavioural engagement responses do students have in nurseries in Beijing when experiencing TELT-M?

RQ 2. What factors influence the effectiveness of TELT-M in promoting learner engagement?

For RQ 2, the following two research sub-questions were examined:

RQ 2.1. What and how much impact do teachers perceive TELT-M as a teaching tool to have on student engagement?

RQ 2.2. What role do teacher skills and perceptions play in the effective use of TELT-M?

4.3 Research Paradigm: A Constructivist Approach

The research paradigm employed in this study was constructivism, which serves as the theoretical framework that guides various assumptions concerning one's (1) ontology, (2) epistemology, (3) methodology, and (4) methods (Cohen et al., 2000). Ontology pertains to the study of existence and focusses on the nature of reality, or what reality constitutes. Within this context, the following two opposing perspectives exist: objectivism, which posits an independent reality, and constructivism, which supports the idea that reality emerges from social processes (Neuman, 2003).

In this study, my inclination lay towards social constructionism, which emphasises the subjective and individual construction of reality (Bryman, 2001); I believe that reality is subjective, multi-dimensional, and influenced by participants (Lincoln & Guba, 1985; Krauss, 2005).

My research background in the field of English further reinforces the notion that people's understanding of reality is contingent on individuals within their social and cultural contexts. Crotty argues that what is said to be 'the way things are' is really just 'the sense we make of them' (1998, p. 64). As such, the study of the social world entails exploring and interpreting individuals' experiences and interpretations of reality.

Conversely, epistemology refers to 'the branch of philosophy that studies the nature

of knowledge and the process by which knowledge is acquired and validated' (Gall et al., 2003, p. 13). An epistemological hypothesis focusses on how knowledge is created, acquired, and disseminated – in essence, what knowledge represents. The two primary competing epistemological views are positivism and interpretivism. Positivists posit that empirical facts exist independently of the researcher's thoughts and that their models of social reality are stable, leading to an additive understanding (Crotty, 1998; Neuman, 2003). Positivism emphasises factual knowledge gained through observation and experimentation, whereas interpretivism centres on individuals' culturally and historically contextualised interpretations of the world (Crotty, 1998).

Interpretivist/constructivist researchers think that humans construct, understand, and experience the world through their interactions with others and social systems (Maxwell, 2006). Within this paradigm, inquiry adopts an interpretative nature, aiming to understand specific phenomena rather than generalise findings to a group (Farzanfar, 2005).

In this study, I intended to explore students' individual perceptions, encompassing their emotions, thoughts, and behaviours, concerning their experiences of technology enhanced English-language teaching with music at private nurseries in China.

Given my constructivist ontology, this naturally led me to adopt an interpretivist epistemology. This epistemology emphasises individuals' understanding through language, experience, and perception of the social world, rather than focusing on the measurement and prediction of phenomena.

Informed by my constructivist ontology and interpretivist epistemology, as discussed above, I employed a qualitative approach to investigate the research problem. Qualitative methods embrace induction, discovery, and process-oriented approaches, prioritising a deeper understanding of research problems within their unique contexts over generalisation (Ulin et al., 2004).

My aim was not to generalise the findings of this research to all nurseries but rather to gain a deeper understanding of the participants' behavioural and emotional engagement through an interpretivist, qualitative approach. This approach involved using case studies to gather appropriate, in-depth, and contextualised evidence. This

approach is further expounded upon in the following sections.

4.4 Qualitative Case Study Approach

This section discusses the methodology that I employed to conduct my research. I used a qualitative research design and collected data from two private nurseries in Beijing. Based on my interpretive paradigm, the formulation of the research design was determined by the type of evidence or data required to address the RQs (Ritchie & Lewis, 2003). In this section, I first discuss the nature and advantages of the qualitative case study approach, followed by the selection of qualitative research, which was the focus of my empirical investigation.

Gerring (2004) highlights that a case study has an analytical focus on specific instances with the intention of revealing how interactions amongst events lead to specific outcome types. In cases in which many elements work together, a case study provides insights into how different factors interact. With the aim of examining how TEL with music affects students' engagement in class, I considered the 'big picture' of curriculum design, textbooks, and music to ensure that the contents and pedagogies used in this research would be appropriate. The research simultaneously presented teachers' views on the outcomes of English teaching and ways to improve them. This was achieved by using different data collection methods, which is a noted advantage of the case study method.

In addition, a case study is 'an empirical inquiry that investigates a contemporary phenomenon in depth and with its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (Yin, 2014, p. 143). Using the case study approach, I was able to appreciate a real-world event in the context of its occurrence and detect conditions that are extremely relevant to the researched phenomenon. All data collection occurred in China, and the primary objective was to investigate the potential applications of TELT-M in Chinese nurseries. This study considered a wide range of characteristics, including the diverse cultural backgrounds of teachers and students, the varying degrees of academic aptitude amongst pupils, and the physical settings of classrooms. The use of a case study contributed to the development of more in-depth knowledge of how English is taught and learned in the participating nurseries. The following two sub-sections present the case nurseries and

participants.

4.4.1 Case Selection

Two private nurseries were chosen as the cases for analysis, which are Forest and Villa nurseries. I contacted a total of five nurseries. However, one was temporarily closed due to renovations conducted by teachers during the COVID pandemic, while another nursery declined my request to access the school premises during the pandemic, citing a reluctance to accommodate external personnel. Finally, I chose one nursery as the pilot nursery. Then I consequently proceeded the main data collection at the other two selected nurseries. Contact with these nurseries' principals was established through personal connections, leveraging my prior experience in English teaching in Beijing.

Forest Nursery had one foreign teacher to teach students aged 4–5 years. His name was Tom, and he was from Pakistan. His mother tongue was Arabic, while English was one of Pakistan's official languages. Tom had 6 years of teaching experience in both private nurseries and a language training school. The class size at Forest Nursery was 25– 30 students per class, while each class had two to three teaching assistants. Students used a set of English textbooks called Time Joy, which are from Taiwan. The students were taught at different levels with the same series of materials. After I held discussions with the headmaster and the English teachers, they thought the picture books (*The Very Hungry Caterpillar and Walking Through the Jungle*) were suitable for students in the 4–5 age group in their nursery.

Villa Nursery was also in Beijing. It is an advanced private nursery located in a residential area comprising villas, and the nursery occupies a two-story villa. The teacher–student ratio was 1:4, as every class had four teachers in charge of the students. When the students had English class, those four teachers worked as the teaching assistants in class. In total, the school had 55 teachers, including six foreign teachers to teach English, the same as at Forest; one was assigned to teach 4–5-year-old students. The teacher was named Jack, and he was from Singapore. He had 2 years of teaching experience in international nurseries.

At Villa Nursery, students under the age of 6 use materials edited by their headmaster

that are based on picture books. When I suggested using the same picture books as the teaching materials at Forest Nursery, she accepted the suggestion willingly. As such, *The Very Hungry Caterpillar* and *Walking Through the Jungle* were also used as the main teaching materials at this nursery.

Table 4.1 provides information about the Forest and Villa nurseries.

Table 4. 1 The Two Case Nurseries: Forest and Villa

Nursery	Location	School size	No. of English teachers for 4–5year-old students	Teachers' nationality and teaching experience	Total no. of students	Materials in use	Teaching experience
Forest	Beijing	600 square metres	1	Pakistan	25/22	*Time Joy*	3 years
Villa	Beijing	750 square metres	1	Singapore	23/25	Headmaster edited textbooks based on picture books	7 years

As Palys states, '[T]here is no one best sampling strategy because which is best depends on the context in which researchers are working and the nature of their research objective (s)' (2008, p. 697). As such, the criteria for inviting nurseries to participate in this study (the two used in the study and the one for the pilot) in Beijing were as follows: firstly, all teachers were required to have obtained at least a bachelor's degree in education or linguistics and to possess rich experience of teaching young learners in China. Secondly, the headmaster of each school had to be interested in using the new pedagogy first and then fitting it into the whole school system for teaching English if it was successful. Finally, the students (aged 4–5 years) at the selected nurseries had to be ready for a technology-enhanced initiative. This meant that the nursery had to have the required TEL facilities, such as a projector or IWB system. Furthermore, the relationship with the participating nurseries was developed after they agreed to participate. The data quality and credibility of the research were assured, as I had built trusting relationships with the teachers, parents, and administrative staff there, who were all highly supportive of my research.

4.4.2 Research Participants

To develop a deeper understanding of students' behavioural and emotional engagement in technology-enhanced music and English teaching in private nursery schools in China, I conducted fieldwork in three nursery schools. One was used as the pilot fieldwork site, while the other two were the nurseries where I conducted my final data collection. Samples are chosen based on their traits or properties relevant to the researcher's primary themes and issues (Bryman, 2001). I chose these nurseries because the aim of my research was to explore the engagement of private nursery school students aged 4-5 years in the classroom. I also required the nurseries to have experience offering English classes. Crucially, the nurseries had TEL equipment in their classrooms, such as a projector or an IWB board, allowing the teachers to use the technology during this research. Forest and Villa fulfilled all these criteria. The participants in the research groups were children aged 4-5 years in three private nurseries in Beijing, China. In total, 65 students (main data collection) from these nurseries participated and formed the study groups for this research. The teachers (see Sub-Section 4.4.1) who taught those students were observed and interviewed.

In the next section, I describe how I used CAR to conduct my study.

4.5 Collaborative Action Research in a Case Study Setting

In this section, I present the specifics of the CAR that I conducted in the case study setting. I begin by introducing the benefits and limitations of adopting CAR in the context of this study. Then, I discuss the process of conducting CAR and outline the methods used for reflection. This research was grounded in the case study method, with an emphasis on observing, analysing, and interpreting a phenomenon or scenario. However, the CAR method was applied throughout the data collection, especially the observational data collection.

4.5.1 The Definition and Benefits of Collaborative Action Research

The rationale for choosing the case study approach has been illustrated in previous sections. The CAR approach developed organically from my initial collaborative

work with the nurseries. In this study, the CAR approach involved the author as external researcher collaborating with teachers to co-construct aspects of the research design, provide analytical and interpretive insights and inform their practice.

According to Capobianco (2007), a variation of CAR involves the teacher and researcher identifying a research problem and working together to solve it. The researcher refines the optimal research approach for the setting while the teacher develops academic abilities in data gathering, analysis, and interpretation. The researcher and teacher must engage in ongoing, personal, and critical reflections as part of the research process (Capobianco, 2007).

In the context of CAR, practitioners typically engage in action research, either individually or in collaboration with other educators. However, in my research, CAR took on a collaborative nature and involved an external participant (myself) who assumed the role of an external facilitator guiding the research process. My role entailed providing impartial and constructive insights and posing exploratory questions to the educators involved in the research. This added an additional layer of critical scrutiny and validation to the research process, benefiting both the educators' practical work and my research endeavours by furnishing valuable insights. Crucially, my CAR approach, while cooperative, offered a supportive perspective and professional knowledge as it involved an external facilitator.

CAR is a methodology aimed at narrowing the gap between pedagogy and research. According to Bennett and Brunner (2022), the concept of CAR encompasses the structure, approach, and forms of knowledge production. This development arises from reflective exchanges related to theory and practice, as well as ongoing evaluations of educational reality. CAR entails practitioners using evidence and a critical review of theoretical frameworks and their implementation by teachers and researchers to inform practice and improve learner outcomes.

Christianakis (2010) claims that without collaboration, academic scholars risk deriving ideas solely from data. One benefit of CAR is that researchers can enhance the analysis of classroom observation data through collaboration and discussion with practitioners. Moreover, Reason and Bradbury (2001) state, 'Creating new forms of understanding, since action without reflections and understanding is blinding just as theory without action is meaningless' (p. 2). The participatory nature of action

research makes it only possible with, for, and by people and communities, ideally involving all stakeholders both in the questioning and sense-making that inform the research and in the action, which is its focus. Meyer (2000) proposes another advantage to the approach: it makes the research process and findings, which are rooted in everyday practice, more meaningful to the practitioners (i.e., the teachers in the present study).

4.5.2 Benefits of Collaborating with Teachers

My reasons for choosing CAR with teachers were as follows: firstly, teachers must take responsibility for studying the students since they are the ones who know them best from each class, question, and conversation (Sargent, 2000), all of which makes them real 'teachers'. I, as a researcher, analysed students' engagement based on the teaching contents and assisted the teachers in preparing learning materials (including audio and video), while the teachers decomposed the materials into teaching contents for different classes based on students' learning conditions, as this research focussed on student engagement under the involvement of the TELT-M pedagogy. More crucially, by working with the teachers to construct lesson plans, they obtained a deeper understanding of their role in the research and the purpose of investigating students' engagement. Another crucial reason that led me to CAR was that it was important to have after-class discussions with the teachers based on their experiences of student engagement in the classroom. This provided an opportunity for me to better understand the teachers' perceptions, which enhanced my interpretation and analysis. Furthermore, a thorough understanding of students helped with the implementation of my lesson plans in the classroom. In this sense, the teachers contributed as both presenters and co-designers of the lesson plans.

Although I could interpret students' posture, facial expressions, or language based on observation tools and my past teaching experience, I still needed teachers to act as my colleagues and to help me interpret and reflect on these cues. Teachers, as participants, have not only extensive teaching experience and knowledge of all students but also their own understanding of students' behaviour. Thus, after I determined my own interpretation of students' posture and facial expression, the teachers were expected to assist my interpretation of students' behaviour in the classroom based on their understanding. Their feelings about the class and their

understanding and interpretation of students' behaviour were inseparable parts of my study.

4.5.3 Gap Between Researchers and Teachers

Some researchers have cautioned about the gap between teachers and researchers. For example, Huberman (1996) claims that teachers are not competent enough to conduct serious research and that the roles of teachers and researchers are different and conflicting. Bullough and Pinnegar (2001) similarly argue that research on teachers is too special, self-referential, and ungeneralised. One could argue that these opinions about roles and status are simplistic and obsolete and that they ignore the social backdrop and power relations (Christianakis, 2008). Some believe that teachers must adopt others' ideas, lessons, and approaches, which devalues their knowledge by calling it 'technology' (Apple, 1987; Kavanagh et al. 2020). Similarly, Harbour et al. (2015), stated that to be an effective teacher, one must conduct and engage in research. Other research has continued to stress this, seeing engagement with research -particularly collaboratively-as the key to effective professional learning and educational improvement (Elliott,2009). There is no doubt that teachers use the implicit knowledge and experience of employees and leadership to help with the CAR process. More importantly, these criticisms are made against teachers who have not received any training in conducting research. However, the teachers in this research were all experienced and had participated in CAR in different schools before. In other words, their teaching experience and research experience were considered potentially useful for analysing the class engagement of students, thus bridging the potential teacher-researcher gap.

Collaborative teacher research also has several limitations, as does any research (Castle, 1997). Pine (2009) claims that practice-based cooperation should focus on investigation and study rather than conversations and emotional support in everyday practice. He also indicates that researchers must be aware that cooperation might lead to 'group think', thereby limiting the opportunities for dissenting viewpoints or alternative narratives inside the collaborative group (Pine, 2009, p. 158).

Accordingly, I established a unified willingness to work early in the collaboration process through a conversation with the teachers. Crucially, when the teachers and I

had differing viewpoints or understandings or if there were any inconsistencies, the teachers needed to state them frankly, and I would likewise state them bluntly. The teachers' statements were added to my point of view as a supplement.

4.5.4 How I Planned, Did, and Reflected in the Collaborative Action Research

The process of this research built on the existing evidence of observation in class and teachers' personal feelings and beliefs; however, I attempted to move beyond strong feelings by introducing a reflexive, critical process so that the interpretations were robust in a qualitative sense. I could stress the dialogue with teachers, reflections on my own evidence, and coherence with the reflexive process, which are critical in qualitative research (Finlay, 1998). That is, CAR enhanced the reflective process in this research.

Hopkins (2002, p. 41) proposes that 'action research combines a substantive act with a research procedure, it is action disciplined by enquiry, a personal attempt at understanding while engaged in a process of improvement and reform'. The purpose of conducting CAR is to bring about change in a specific setting, which is informed by appropriate evidence collected by the practitioner. To achieve the purpose of their research, the researcher must plan precisely, observe and listen attentively, evaluate, and reflect critically during research activities (Parkin, 2009). Koshy (2010) notes that CAR is also intended to generate knowledge that is applicable to people's daily lives and thus strive to accomplish real results.

My research aimed to explore students' engagement in English class through a TELTM pedagogy. As such, I first constructed my own knowledge of the specific issues (by exploring the students' behavioural and emotional engagement in class taught through TELT-M) informed by relevant literature and my own experience as a teacher. I started by planning the procedure of research and teaching; then, I discussed with the teachers how to launch the research and teaching plans in the classes, reflecting on my own observations and investigating the teachers' feelings and opinions, before learning from the whole experience. For example, because I had not reviewed the lesson plans with the teachers in advance, I did not have a strong idea of the students' progress when I designed my own lesson plan for the first pilot;

therefore, I designed a lesson plan that included some content that the students had previously learned. Despite the students' passionate engagement, this plan stood in contrast to Well's concept of pedagogical scaffolding, which I was following. Moreover, I discovered that because the teachers were not participating in lesson plan development, the music and PPT presentations that I referenced throughout the lessons were unfamiliar to them, leading them to feel anxious during the class. This even made the teachers unable to follow my lesson plan fluently, forcing them to use methods that did not include music. That is, without collaboration with teachers, the class could not fully implement TELT-M.

As a result of my reflections on the process, I realised that I should include the teachers in the development of the lesson plans so that they could design the materials and steps of the lesson, while I could assist them in finding music videos, pictures, or animations. Another example is that when I used the observation form in the second pilot, I found that the original content form had many similar behavioural categories, such as 'stared' or 'dazed', which made it difficult for me to make specific observations based on the categories in the form after the classroom visit. After discussing this with the teacher in my second pilot, he suggested that I categorise the observations as positive or passive first; thus, I could have an idea of the students' state during the observation process and then take detailed notes on the specific observations, which could be put into the form after the lesson.

When I used the adapted form to make observations, I discovered that while not all students fit perfectly into all the categories, the categories covered almost all of the students' behaviour in the lesson in terms of their postures, expressions, and language. My observation notes added specific interpretations depending on the activity in which the students were engaged and their state of participation, making the observation much more useful.

Undoubtedly, collaboration was critical in this process. Meyer (2000) proposes that participation is the foundation of CAR and requires each participant to be willing to play an active role in research and change. This refers to the teachers who worked with me in this process, whom I could also refer to as 'my colleagues'. Fortunately, they both had experience using CAR methods and were relatively familiar with the methods, including the application of pedagogy, classroom observation, reflections, adjustment, and application again. For example, one teacher had participated in a

CAR study about strengthening students' reading comprehension skills and, through reflexive teaching, promoted the change in teaching picture books. After receiving systematic training, this teacher and his colleagues discussed how to effectively apply the methods of teaching picture book reading gained from the training in their classrooms. They then observed classes for each other and provided advice and comments, after which the teachers reflected on their own teaching, improved it, and put the improved methods into practice in the classroom again.

The following paragraphs explain the detailed process of collaborative CAR design.

The case study focussed on two nurseries in Beijing. Two teachers and 55 students were involved. During the research, the data were gathered from formal interviews with teachers, participant observation, and collaborative discussions with teachers. Before the research, I explored the issue of English teaching in Chinese (Beijing) nurseries, which led me to explore the efficiency of student engagement under the TELT-M pedagogy. During the research, I learned from them about the technologies and pedagogies already in use and interviewed them formally about their perspective on TELT-M; then, I introduced them to the TELT-M pedagogy and the teaching tools to be used in the research. Next, we created practical lesson plans collaboratively, before I investigated how students responded to the changes in class and sought teachers' perceptions a class. I subsequently conducted another formal interview with teachers to gain more knowledge about their opinions of the TELT-M pedagogy after implementing it in class. Finally, I reflected on and analysed the data I had collected. The detailed design is explained in the following sections: in total, the data collection lasted for 12 weeks (6 weeks at each nursery). Table 4.2 presents the data collection timeline:

Table 4. 2 Timeline of the Main Studies (Identical for the Two Nurseries)

Weeks	Data collection methods	Participant(s)		Duration
1	Interviews, lesson plan creation	Teacher	One teacher	120 min with the interview; 240 min to discuss with the lesson plans
	Classroom observation	Students	All students in the morning class	30 min each class
	Classroom observation	Students	All students in the afternoon	30 min each class
2-5	Collaborative discussion with teachers	Teacher	One teacher	120 min each week
	Classroom observation	Students	Five students each in the morning class/ five students each in the afternoon class	30 min each class

I collaborated with the teachers from the beginning of the research and explained its aim to them, which was to explore the efficiency of using the TELT-M pedagogy to enhance student engagement. The teachers then made their own lesson plans following samples that I had produced about The Very Hungry Caterpillar. For example, I wrote a step-by- step lesson plan and calculated the time required for each task during the first pilot with this picture book. Furthermore, I gathered audio and video from the internet regarding the lesson theme and created a PPT presentation for it. My aim was to follow the pedagogical scaffolding (Well, 1999) and include music and technology in each teaching session before observing students' engagement. Thus, before the teachers created lesson plans, I first explained the goal of my study; then, I showed them the lesson plans that I had created and supported them in finding appropriate videos, audio, or photographs.

The first week in each nursery was used to observe the students under the previous teaching method to obtain a rough idea of their engagement. In the first week, I collaborated with the teachers on making the lesson plans for the following weeks. The first interviews were also conducted with the teachers in the same week, acquiring their opinions and ideas about the TELT-M pedagogy. For example, in an interview in the first pilot study, the teacher expressed that many students were eager to hear the music, but many were simply mimicking other students. The teacher

suggested that it would be advisable to integrate the facial expressions of students rather than the students' language itself.

In the following weeks, a rotation of five different students was selected for observation until Friday (e.g., Week 1: Student A, Student B, Student C, Student D, and Student E; Week 2: Student F, Student G, Student H, Student I, and Student J). With the teachers, I discussed my observation diaries at the end of each week. I also provided my own interpretation of the facial expressions or postures that I had noticed with students and asked for the teachers' insights. In the last week in each nursery, I conducted a second interview, which was aimed at comprehending their opinions about the TELT-M pedagogy after launching the CAR in the fourth week. I subsequently analysed their viewpoints regarding the TELT-M pedagogy, thereby reflecting on the research methodology.

4.5.5 Generation and Interpretation of Collaborative Action Research Data

Following my reflection in the pilot study, the rationale for CAR as the method of choice gradually emerged. In the pilot study, without the observation, the students' behaviours were mostly recorded through the traditional 'pedagogical documentation' (Moran et al., 2007); however, this lacked the teachers' complement to my interpretation as a direct participant in the classroom.

In this study, teachers were not only interviewed before and after school but also collaborated more closely with me as we developed lesson plans and discussed the validity of my classroom observations of student engagement. Our initial discussions determined the nature of the collaboration-based primary data collection methods. Furthermore, the critical reflection discussions contributed to my interpretations and analyses and facilitated the teachers' professional development and practice.

When teachers had lessons, I observed the students' performance and behaviours, while making records of signals of behavioral and emotional engagement according to the forms. When I used the observation tools (considered in Sub-Section 4.6.2), learners' posture, facial expression, and actions could indicate that they did not feel at ease or quite engaged in the lesson; I thus needed to reflect on our interpretations of

these signs and to draw on other cues and evidence, including asking the teachers to check my observations. CAR was applied here, which seemed best suited to addressing concerns about behaviours observed in class, as well as the need for a close tie between research, theory, and practice.

Collaborative research in the process of gathering data is important in academic research due to its ability to bring teachers and researchers together, each of whom offers distinct and specialised perspectives. This collaborative approach proves particularly valuable when addressing complicated research inquiries, such as investigating whether the signals shown by students in a classroom setting align with specific engagement categories. Mauthner and Doucet (2008) argue, 'From the pluralistic stance of post-modern and post-foundational epistemologies, the bringing together of multiple researchers is seen to give team research an epistemological edge over solo research' (p. 976).

Regarding the specific steps of collaboration, I observed students in class from Monday to Friday (five different students each week). Here, I took notes on my observations, watched videos of classes, and held discussions with teachers each Friday about the engagement of the five students observed that week. During this end-of-week discussion, I showed the teachers the evidence of various facial expressions, body manifestations, or postures from students in class. Moreover, I discussed my on-site records of my own interpretations of detailed comments on students' performance with teachers. These clues were not inferred from introspection or the notes of others but rather by memorising what we had seen and listening to what we had heard.

The described research procedure assumed and created 'hierarchies of knowledge' (Reay, 2000, p.19), in which 'distance is equated with objectivity' and 'understanding is acquired through a detached positioning as superior to that gained through conducting fieldwork' (Reay, 2000, p.16). The contextual knowledge from the teachers was seen as more subjective than the textual knowledge from the theories. I attempted to treat the fieldwork, especially the student observations, as a knowledge-producing activity, regarding myself and the teachers as intellectual partners equally engaged in the production and construction of knowledge through interpreting the engagement of students. As researcher-participant relationships are reflexive and non-hierarchical (Creswell, 2007), I participated in this project in a dual role as both

facilitator and collaborator. As Bourdieu and Wacquant argues, a reflexive social science and research practice must concern itself not only with the individual scholar but also with ‘scientific practice’ more generally and the ‘epistemological unconscious’ and social organisation of the discipline and field (Bourdieu & Wacquant, 1992, p 41). It was thus helpful to have contextual information and insight from the teachers, who undoubtedly possessed personal perceptual experience from teaching in class, were more familiar with students, and knew more about them.

During the collaborative-based data collection, a challenge was discovered in the form of the availability of time for teachers to support discussions about students’ posture and facial signals during class. To reduce the amount of time required from the teachers, I marked the period in the recorded video that contained obvious signals of engagement by students. We then deliberated on all that I had found together.

Furthermore, I noted the moments in student videos that illustrated clear engagement signals or took screenshots for further analysis and discussion.

Illustrations 4.1 and 4.2 present screenshots from the videos of students recorded in class

Illustration 4.1 Screenshot of Video 1

05/04/2022, afternoon class, 15:20. The screenshot was taken at the 15 minute, 20 second mark during the afternoon class. I have used the notation 'afternoon 15:20' to refer to the time of the screenshot.

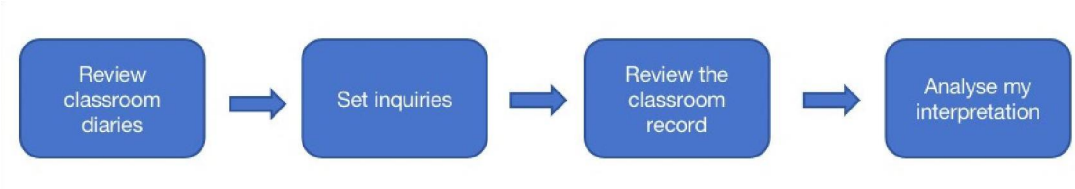
Illustration 4 .2 Screenshot of Video 2

15/04/2022, morning class, 05:10

My collaboration with the teacher throughout the analysis of my observation data was divided into the following four parts: firstly, in the classroom, while the teacher was in class, I observed the classroom and wrote a classroom observation diary about student engagement. Secondly, after the class, I presented my observation notebook

or observation form to the teacher, listened to their feedback, and added their comments to my notes if necessary. During this process, I also discussed my interpretations with each teacher to clarify the purpose of my data collection, and we then built relationships as a collaborative working group. Thirdly, I reviewed the videos with the teachers at moments where debatable points arose or where the teachers wished to add notes. Lastly, I combined the teacher's analysis with my own interpretation and composed a final interpretation, as illustrated in Figure 4.1:

Figure 4. 1 Outline of the Interpretation Phases



4.6 Specific Research Methods

Methods are the techniques or procedures used to gather and analyse data related to RQs or hypotheses (Crotty, 1998). Suitable research methods have the best chance of gaining useful and applicable answers to research queries (Gray, 2018). To obtain answers to the RQs, this study combined semi-structured interviews with classroom observation. The following sub-sections explain these methods in detail.

4.6.1 Semi-Structured Interviews

This research investigated not only the relationship between teaching pedagogies and student engagement but also teachers' opinions, which is consistent with Gray's statement that 'the interview may be considered the most logical research technique where the objective of the research is largely exploratory' (2018, p. 378). Interviews can reveal interviewees' thoughts, values, prejudices, feelings, and attitudes (Wellington & Szczerbinski, 2007). Interviews were thus used to qualitatively study the dissertation topic from the perspectives of teachers and students. Specifically, this research used one-on-one interviews, which allowed me to gather further qualitative information regarding the teachers' understanding of and attitudes towards TEL and music learning, as well as students' interest in and motivation for learning English.

The semi-structured interview method was chosen for this study because the themes and questions ensured the acquisition of key information while allowing the interviewees to express themselves freely. In addition, semi-structured interviews allow interviewers to not only weigh the content to be measured but also to discuss the problem in greater depth.

In total, at the two nurseries, two semi-structured interviews were conducted with each of the four teachers in the main study, one at the beginning and one at the end of the data collection. Thus, a total of eight interviews were conducted, each of which lasted 50 minutes. The first round of interviews was conducted with the intention of eliciting an understanding of and perspectives on TEL and music education, respectively, from the teachers. The second round was conducted with the same groups of teachers at the conclusion of the 8-week period of the TEL session to gain an understanding of their experiences and perspectives on the materials that were taught. The interviews were held in the teachers' offices, which were located close to the English-language classrooms they were responsible for teaching in. The interviews were conducted in English because the interviewees did not know Chinese. Furthermore, these teachers were selected as participants because they were the ones teaching the lessons. The interviews were recorded using digital technology, and the digital data was then transferred to a computer so that transcripts could be generated from the recordings. Field notes were also taken during each interview and reviewed prior to the next interview. Points of interest from the notes and recordings were raised as questions in the next scheduled interview. Each teacher was interviewed at least twice, depending on their schedule and availability.

Open-ended questions were used in the interviews. Krueger and Casey (2002) note that interviews provide an opportunity for each participant to cover a wide range of topics and also support the use of follow-up questions as a means of communication to allow the researcher to obtain more information on the topic of interest. I attempted to create a natural, free-flowing atmosphere for discussion within the interview time frame. Table 4.3 outlines the full interview schedule.

Table 4. 3 Interview Questions Per Interview Round

First Round of Interviews **(Conducted during the 4-week period when the original teachingmethod was used)**	**Second Round of Interviews** **(Conducted during the 4-week period when the new teachingmethod was used)**
1.1. Have you used technology-enhanced learning (TEL) as a teaching tool? If yes, what kind of technology have you used and at what frequency? If no, why not?	2.1 Did the students demonstrate more engagement in emotions and behaviours, such as being more happy and ready to comply with classroom norms, responding to requests, and being active in participating in classroom activities when they watched the video in class? 2.2 What do you think of the method of combining TEL with music?
1.2. Are there many opportunities to use music in English class? What kinds of activities do you use music for?	2.3 Did the students demonstrate more engagement in emotions and behaviours, such as being more happy and ready to comply with classroom norms, responding to requests, and being active in participating in classroom activities when they listened to audio or songs by themselves in class?
1.3. Are you interested in using in TEL and music? What do you think of this combination?	2.4 Did the students demonstrate more engagement in emotions and behaviours, such as being more happy and ready to comply with classroom norms, responding to requests, and being active in participating in classroom activities when they were singing the English songs in class? 2.5 Would you like to try to use this method in your future classes? Why or why not?
1.4 Under the methodology that you currently use, are the students demonstrating more engagement in emotions and behaviours, such as being more happy and ready to comply with classroom norms, responding to a requests, and being active in participating in classroom activities?	2.6 Did the students demonstrate more engagement in emotions and behaviours, such as being more happy and ready to comply with classroom norms, responding to requests, and being active in participating in classroom activities when they were doing interactive activities using TEL? 2.7 What problems do you think exist in the application process? 2.8 In what ways do you think you can solve those problems?
1.5 Is there anything you'd like to add that I may have missed in my questions?	2.9 What kinds of difficulties did you encounter in using this teaching strategy?
	2.10 Do you think the students adapted to this teaching method? If yes, what was the most impressive or striking aspect of their performance? If not, why? 2.11 Which parts of the class where you used TEL did the students seem to feel more interested? Alternatively, when did they prefer the combination of TEL and music? 2.12 Is there anything you'd like to add that I may have missed in my questions?

As this table shows, the first round of interviews aimed to understand the teachers' experiences of using music and TEL in their previous teaching. I also interviewed them about the frequency and familiarity of using music and TEL in their English class. This round of interviews also helped me gain insights into whether they attempted to combine music with TEL in their classes. Additionally, I asked for their perceptions of their students' behavioural and emotional engagement in class.

The second round of interviews focussed on exploring the teachers' opinions regarding students' behavioural and emotional engagement after they had used music and TEL during the teaching process. I was particularly interested in identifying any challenges they faced when using music and TEL, as well as any solutions they proposed. Furthermore, I sought to understand their perspectives on the effectiveness of using music and TEL for student engagement, both when used separately and in combination during teaching. During the interviews, alongside the planned questions, I engaged in discussions involving follow-up questions. Moreover, I investigated the teachers' experiences during the 2-month fieldwork period. This exploration involved gathering additional insights from them regarding the pros and cons of using a combined approach of music and TEL to promote student engagement. I also inquired into whether they intended to use this approach in their future classes and if they would recommend it to other educators.

The interview questions for the two rounds of interviews underwent a second pilot study, whose primary goal was to assess the clarity and comprehensibility of the interview questions for the participants. Then, minor adjustments were made to the wording of the questions based on feedback received from the pilot tests.

In this research, the teachers were presented with preliminary and indirectly phrased questions. This approach was chosen due to the teachers' in-depth understanding of the TELT-M pedagogy, which the interview duration allowed for. Probing questions were subsequently used to more deeply explore teachers' insights. The interviews commenced with a friendly greeting, followed by an explanation of confidentiality considerations and a request for permission to record our conversation. A concise overview of the interview topics was then provided. The interviews concluded by thanking participants for their involvement. For the sake of accuracy in information retrieval and to minimise diverting the interviewees' attention from the core matters, I opted for digital audio recording over note-taking.

4.6.2 Classroom Observation

In this section, I illustrate the rational for utilizing the Leuven Scale of Involvement and STTEW scale as the main observation framework. I also explain how I developed

observation tools to be used in the participating nurseries. My classroom observations involved both teachers and students, with the aim of verifying the data through sharing experiences and understanding classroom dynamics.

Classroom observation, an educational research method, involves collecting data directly or indirectly from classroom situations for focussed research (Wragg, 2013). I chose this approach because it can capture both obvious and subtle factors in the classroom. It provided direct insights into how the participants responded to the teaching approach, enabling a more comprehensive understanding. Moreover, observations can uncover new research directions that might otherwise be overlooked.

In this study, classroom observation was selected as the approach for exploring the impact of TEL and music on student engagement in English classes. The Leuven Scale of Involvement provided the observational framework for this research. As Laevers (2015, p. 8) notes, the scale's outcomes not only align with the intuitions of teachers but also confirm their existing knowledge scientifically.

Many scholars have noted that children's participation is a key gauge of the quality and effectiveness of educational programmes (Ridley et al., 2000; Laevers, 2015). Laevers (1997) identifies involvement as one of two process variables that measure learners' experiences, with the other being well-being. He concludes that higher levels of involvement are critical for producing quality outcomes and that active participation increases learning and development.

For behavioural engagement, I referred to The Leuven Scale of Involvement, presented in Figure 4.2, and created my own observation form based on his engagement indicators. I elaborate on how I incorporated this into the Leuven Scale for enhanced efficacy in the following paragraph.

Figure 4. 2 The Leuven Scale of Involvement

THE SCALE FOR INVOLVEMENT		
Level	**Involvement**	**Examples**
1	**Extremely low**	The child hardly shows any activity: • no concentration: staring, daydreaming; • an absent, passive attitude; • no goal-oriented activity, aimless actions, not producing anything; • no signs of exploration and interest; • not taking anything in, no mental activity.
2	**Low**	The child shows some degree of activity but which is often interrupted: • limited concentration: looks away during the activity, fiddles, dreams; • is easily distracted; • action only leads to limited results.
3	**Moderate**	The child is busy the whole time, but without real concentration: • routine actions, attention is superficial; • is not absorbed in the activity, activities are short lived; • limited motivation, no real dedication, does not feel challenged; • the child does not gain deep-level experiences; • does not use his/her capabilities to full extent; • the activity does not address the child's imagination.
4	**High**	There are clear signs of involvement, but these are not always present to their full extent: • the child is engaged in the activity without interruption; • most of the time there is real concentration, but during some brief moments the attention is more superficial; • the child feels challenged, there is a certain degree of motivation; • the child's capabilities and its imagination to a certain extent are addressed in the activity.
5	**Extremely high**	During the episode of observation the child is continuously engaged in the activity and completely absorbed in it: • is absolutely focussed, concentrated without interruption; • is highly motivated, feels strongly appealed by the activity, perseveres; • even strong stimuli cannot distract him/her; • is alert, has attention for details, shows precision; • its mental activity and experience are intense; • the child constantly addresses all its capabilities: imagination and mental capacity are in top gear; • obviously enjoys being engrossed in the activity.

https://www.kindengezin.be/img/sics-ziko-manual.pdf (Laevers, 2015)

In this research, the example descriptions in this template served as references for observation signals, which act as a tool through which observers record what they see. By noting children's genuine sentiments and empathising with their perspectives, observers can gauge their level of involvement. Children may express these signals in many ways, some of which require special attention and recognition. Interpreting these signals can be complex and requires consulting with additional evidence; nonetheless, these signals aid in recording student behaviour in the classroom.

Moreover, as students' engagement can fluctuate during a lesson and throughout the day, the Scale of Involvement was valuable for building a comprehensive overview over time.

This did not entail immediate judgement; instead, predictions were made based on notes of signs, cues, and evidence collected in class. My interpretations were shared and discussed with the teachers who instructed the classes, and I also considered contextual information. When using this multi-level observation of student engagement in class, it was crucial to emphasise their participation. I recorded the number of students present during the observed session, the observation time, a brief description of the observed time frame, and my chosen level of involvement for each 5-minute observation by selecting the corresponding box.

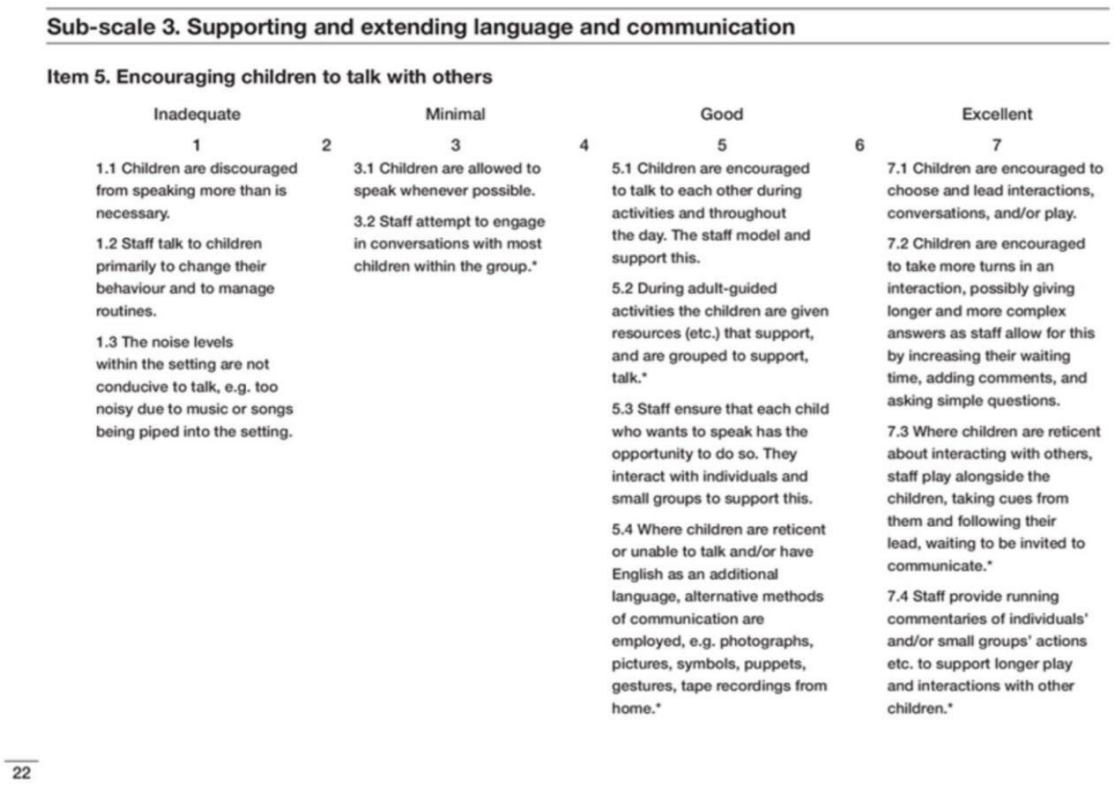
When it comes to the observation of emotional engagement, according to the review of literature in Section 2.2.4, the intricate relationship between language, communication, and emotion forms the cornerstone of educational interactions, especially when delving into emotional engagement within educational settings. Hiver (2021) underscores this connection, advocating for the utilisation of the SSTEW scale to observe emotional engagement. As elucidated by Siraj et al. (2015), the SSTEW scale is an observation-based quality rating tool that focuses on the process quality of children aged 2-5 years in teaching and interaction. They also note that SSTEW provides a structured approach to gauging emotional involvement in learning activities by considering the language, communication, and emotional responses of students.

To determine the relative success of SSTEW observations, Howard (2018) compared the effectiveness of SSTEW observations with established standardised ratings of the Early Childhood Environment Rating Scale-Extension, a well-recognised measure of quality in ECEC (Sylva et al., 2010). The results revealed that the SSTEW scale is valuable for evaluating process quality in early childhood care and education settings.

In practice, implementing the SSTEW scale involves keen observation and documentation of students' emotional responses to various stimuli. I observed verbal and nonverbal cues, noting changes in tone, facial expressions, and body language indicative of emotional engagement.

In my research, I drew from the principles of the SSTEW scale to guide my emotional engagement observations (Figure 4.3).

Figure 4. 3 Example Item from the Sustained Shared Thinking and Emotional Well-Being Scale



Sub-scale 3. Supporting and extending language and communication

Item 5. Encouraging children to talk with others

Inadequate		Minimal		Good		Excellent
1	2	3	4	5	6	7
1.1 Children are discouraged from speaking more than is necessary. 1.2 Staff talk to children primarily to change their behaviour and to manage routines. 1.3 The noise levels within the setting are not conducive to talk, e.g. too noisy due to music or songs being piped into the setting.		3.1 Children are allowed to speak whenever possible. 3.2 Staff attempt to engage in conversations with most children within the group.*		5.1 Children are encouraged to talk to each other during activities and throughout the day. The staff model and support this. 5.2 During adult-guided activities the children are given resources (etc.) that support, and are grouped to support, talk.* 5.3 Staff ensure that each child who wants to speak has the opportunity to do so. They interact with individuals and small groups to support this. 5.4 Where children are reticent or unable to talk and/or have English as an additional language, alternative methods of communication are employed, e.g. photographs, pictures, symbols, puppets, gestures, tape recordings from home.*		7.1 Children are encouraged to choose and lead interactions, conversations, and/or play. 7.2 Children are encouraged to take more turns in an interaction, possibly giving longer and more complex answers as staff allow for this by increasing their waiting time, adding comments, and asking simple questions. 7.3 Where children are reticent about interacting with others, staff play alongside the children, taking cues from them and following their lead, waiting to be invited to communicate.* 7.4 Staff provide running commentaries of individuals' and/or small groups' actions etc. to support longer play and interactions with other children.*

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Table 4.4 outlines specific student behavioural engagement practices that can be observed in the classroom. During the observation process, I provided detailed descriptions of students' behaviours. As noted above, each lesson encompassed five to six distinct activities, following the syllabi of the two nurseries under observation. While the specific activities within each class could vary, the following sequence remained consistent: warm-up activity, first activity, second activity, wrap-up activity, and closing game. I also documented the content of these activities using concise sentences.

These observation tools underwent piloting and discussion with the headmaster and teachers of one of the nurseries during the primary data collection phase. The behavioural and emotional indicators were further categorised into positive and passive behaviours. In this research, behavioural engagement was predominantly observed through body posture and verbal expressions (e.g., singing), whereas emotional engagement was assessed primarily through facial expressions. Table 4.4

presents this study's behavioural engagement observation form:

Table 4. 4 Behavioural Engagement Observation Form

Behavioural engagement	A. Raised hand to answer questions	B.Responded to the teachers properly	C. Was willing to join activities	D.Left their seat	E.Exhibited interferece behaviour	F.Refused to join activities
Under what activities?						
What was observed?						

Positive Indicators of Behavioural Engagement

A. **Raised hand to answer questions**: If the teacher asked a question, the student was able to raise their hand and volunteer to answer it, and their answer was related to the teacher's question (regardless of its correctness).

B. **Responded to the teacher properly**: The student could respond to the teacher's instructions or requests. For example, if the teacher asked the student to sing in an activity, the student was able to sing along with the teacher.

C. **Willingness to join activities**: After the game was explained by the teacher, the student positively participated in the game with their peers. For example, if the teacher asked the student to approach the screen and identify the words with their classmates, the student was willing to actively participate with their peers.

Passive Indicators of Behavioural Engagement

D. **Left seat without permission**: This applied if the student left their seat without permission for more than 3 seconds and the teaching assistant needed to help get the student back.

E. **Interference behaviour**: The student intentionally touched other students'

bodies without permission, or even hit them, or made noticeable sounds (e.g., monotonous and continuous yelling or crying unrelated to the teacher's class content).

F. Refusal to join activities: The student refused to interact with the teacher or play games with other students.

When I observed emotional engagement, I concentrated on the students' emotional states, such as their levels of interest, enthusiasm, and enjoyment in participating in classroom activities (Meyer and Turner, 2002). When fully participating, students exhibited surprise and astonishment, smiling and displaying other happy or sad expressions that corresponded to the emotional colour of the content. For example, when students watched the story of *The Very Hungry Caterpillar*, they exhibited expressions such as sympathy and joy. In each class, I observed and recorded five students and filled in the emotional engagement observation form immediately. If the in-class observations were incomplete, I watched the video to supplement them after class.

To facilitate the observation process, I compiled a list of potential behaviours related to emotional engagement that might occur in the classroom (Table 4.5), for which I drew from recent significant studies by Ladd et al. (2000) and Skinner, Furrer, Marchand et al.(2008). My plan was to record my observations when students displayed the outlined behaviours and to note the activities in progress at the time.

I proposed that the activities undertaken during lessons might encompass various games and practices. For instance, during the warm-up activity, the teacher might have employed a hello song or a song previously learned for a greeting. Similar to the approach employed for behavioural engagement, I observed five students in each class. Sub-Section 4.7.2.1 provides a comprehensive guide to the practical implementation of the observation form in this specific process, while Table 4.5 presents this study's emotional engagement observation form.

Table 4. 5 Emotional Engagement Observation Form

Emotional engagement	A. Paying attention to the class	B. Exhibiting a pleased facial expression	C. Gazing into space or staring at other students	D. Exhibiting an unhappy facial expression
Under what activities?				
What was observed?				

Positive Indicators of Emotional Engagement

A. **Pay attention to the class**: The student exhibited a body posture that indicated they were paying attention to the teacher and/or other students.

B. **Exhibiting a facial expression indicative of pleasure**: During the teacher's teaching process, the student demonstrated their engagement and delight in their facial expression.

Passive Indicators of Emotional Engagement

C. Gazing into space or staring at other students: During class, the student looked around or strayed from the teacher or from classmates who were speaking.

D. Exhibiting an unhappy facial expression: In the teacher's teaching process, thestudent exhibited a depressed, anxious, or unhappy facial expression.

In this study, I could directly observe teaching activities within the classroom during specific periods. To ensure that my data collection did not disrupt normal teaching proceedings, careful selection of observation points was essential. Given that students, the primary focus of observation, were seated in a U-shaped arrangement, I opted to observe from the central side of the classroom, adapting my location as required.

comprehensively capture both teacher and student behaviours during teaching

activities, the English classes were simultaneously recorded using an iPad that I

placed in the classroom. For a comprehensive view of students' movements and facial expressions, two cameras were positioned – one at the front and the other at the side of the classroom. Notably, introducing cameras into the classroom might potentially alter teachers' teaching methods and students' responses. However, teaching assistants recording videos or taking photos of classroom activities to send to parents is a common practice in China. Thus, students and teachers were accustomed to such recordings being made from the back of the classroom.

While I thoroughly briefed the teachers about the research and how the gathered data would be used, I also recognised the importance of maintaining normalcy in the teaching environment. As such, I encouraged the teachers to conduct their classes as they normally would. They were assured that all recorded videos and data would be treated with strict confidentiality.

Given the unique duration of teaching activities in the nursery (each activity section lasted 5-6 minutes), I determined that I could record observations at 5-minute intervals. Over the course of a week, I observed a group of five students. As there were 20 students in each class, this approach ensured that every student was observed twice within the group.

To observe the students' behavioural engagement, I reviewed video recordings of classroom sessions and took notes on their participation and performance in each activity following the class. I specifically focussed on their level of involvement, such as their active participation in activities and their willingness to raise their hands to respond to teachers' questions. Furthermore, I paid attention to students' posture during my observations, ensuring that it aligned with the specific context. I also observed whether students spontaneously used physical actions to convey relevant content based on the situation.

Moreover, when evaluating students' apparent mental state or engagement based on their external expressions, posture, and other cues, I used overarching categories and attributes from sources such as the Leuven Scale, the SSTEW scale, and the Student Engagement Walkthrough Checklist. For instance, if a student's posture, facial expression, or behaviour indicated discomfort, I critically assessed my own interpretations and sought additional clues and evidence. As this might involve consulting teachers to validate my judgements, contextual knowledge and insights

from others, particularly teachers, was pivotal in my comprehending the observed behaviours. This was especially relevant in the CAR process, where teachers' perspectives were included.

In summary, this section has introduced the observation tools I used to observe students' emotional and behavioural engagement. It has also discussed the observation forms and outlined how they were employed, including the information recorded on them. The following section discusses how I conducted the pilot studies.

4.7 Pilot Studies

I conducted two pilot studies, the first from March to May 2021 and the second from June to September 2021. The first pilot focussed on testing the materials used in class and the interview questions, while the second focussed on examining the efficiency of observations. The two pilots are briefly outlined in the following two sub-sections.

4.7.1 First Pilot Study

The pilot fieldwork nursery was an advanced private nursery located in Beijing, with a floor area of approximately 700 square metres and a total of 40 teachers. Originally, there were five full-time foreign teachers; however, because of COVID-19, four of them were prohibited from entering China after their winter holiday in March 2020. Only one foreign teacher was left who had not gone back to his country. The foreign teacher who participated in the research was from the Philippines. His mother tongue was Filipino, and English is Philippines official language. The teacher had 3 years of teaching experience with young learners, both in nurseries and home-schooling.

The average age of the students involved in this research was 5 years old. In this nursery, the students in this age group were not taught with fixed English teaching materials. Instead, the headmaster provided four topics to the foreign teacher each month and asked him to prepare his own teaching materials. Their teaching content was relatively flexible. The class size was 20 to 23 students, and there were one or two teaching assistants in each class.

In this phase of the pilot study, consent forms were given to students at the start of the week. As they were not of legal age, the paperwork needed to be taken home to be signed by their parents or legal guardians. Every child expressed a desire to participate in the research. The data collection could start as soon as all of the necessary consent forms had been submitted and received. Specifically, I communicated with the headmaster and teachers of the nursery before choosing the textbooks to be used in the research. They all agreed to use picture books as textbooks for more than 2 months. The nursery in the pilot study used more flexible textbooks for students aged 4-5 years. Although the nursery had fixed textbooks, the headmaster and teachers agreed to suspend the use of their own textbooks after communicating with the parents. The topics and difficulty levels of the picture books that were used were determined after I discussed the issue with the teachers from the three nurseries, and the decisions were based on how many words and sentences the students knew.

Once all of the necessary consent forms had been obtained, the data collection began. The data for this pilot study were collected from November 2020 to January 2021, with the course lasting 10 weeks. Using picture books as teaching materials, the course was designed to investigate the respective impacts of using music and TEL within a game-based pedagogy.

There were two different classes (Groups A and B) with students of the same age. Group A had English class in the morning, while Group B had it in the afternoon. Both had 4 days of English class, which lasted 30 minutes each day. In the research, Group A used a projector in class, while Group B did not. The pilot and control groups were switched after 2 weeks. The picture books and lesson plans were the same. In Group A, the teacher used a projector as the main teaching tool, while in Group B, the teacher printed out PPT flashcards to use as the main tool.

Before the course began, I established classroom management rules with the students. At this stage, their English vocabulary and proficiency were pre-tested for the purpose of comparing learning outcomes. After the course began, I planned how to follow the course timetables to ensure that the same teaching pedagogies were used for different groups of students, and I decided to assign different classes to the same teacher to reduce the impact of uncertainties. Hence, although the students were divided into two groups under two teaching pedagogies according to the research

purpose, the two groups shared the same learning content.

4.7.1.1 Pilot Interviews

Three formal teacher interviews were conducted within a week for the pilot study, and there were brief exchanges with teachers every day after school. Following each interview, the person who was interviewed was prompted to provide feedback on the questions that were asked, provide their opinion on whether the questions were appropriate, and indicate whether any information was omitted from the interview. In addition to daily classroom observations, I kept a teaching diary.

The common theme reflected in the pilot study was that teachers were not clear about the concepts of emotional and behavioural engagement. As such, to make the interview questions clearer, I replaced the terms of emotional and behavioural engagement with some concrete examples. For example, after the pilot study, the question ‘Did the students show more emotional and behavioural engagement when they watched the video in class?’ was rephrased to ‘Did the students show more engagement in emotions and behaviours, such as being more happy and ready to comply with classroom norms, responding to a request, and actively participating in classroom activities when they watched the video in class?’

In addition, I mentioned in the pilot interview that the teacher could say whatever he preferred in response to my questions, and I did not interrupt him while he was speaking. This made him feel at ease and encouraged him to speak informally; however, some of the things he said were repetitive and unrelated. To prevent such tangents from occurring during the primary interviews, I determined that the interview questions would be presented in order. I provided a list of interview questions; however, if the interviewees could provide sufficient information to answer the RQs, not all queries would be necessary.

4.7.1.2 Pilot Observation

The observation method was piloted to check the feasibility and proper conduct of observation. Two classes were observed in the pilot study. In the process of observation, several major problems were observed in the class. Firstly, according to my observation, the consistency of learning was undermined by the absence of a

review of previous courses, as each lesson was designed with new content, activities, and games. Students could not understand old knowledge when prompted the following day. For example, at the beginning, students were told that the hungry caterpillar eats different food every day and were taught a song. However, since the teacher did not lead the students in reviewing vocabulary, they could not follow the lyrics when singing along with the video the next day. The teacher also agreed that if appropriate review activities could be added to each class, students would be happier with the teaching content and it would be easier for them to understand the class.

Secondly, when *The Very Hungry Caterpillar* was taught, different songs had different effects in class. In the first week, the song from the singer Miss Nina (a relevant song used as a material in class) was used, and the students actively imitated and interacted with the teacher. Some students even said, 'I love Miss Nina'. However, when playing the song by another singer, Miss Bri, the students were unwilling to sing along with the music or to imitate the teacher. According to my observations and communication with the teacher after class, if the music was cheerful and rhythmic and the melody was relatively slow, the students would be willing to imitate and interact with the teacher. Although they liked the rhythm of Miss Bri, they thought the lyrics and the melody were too fast. The students used Chinese to tell the teacher that 'the song is too difficult to understand', and they became less enthusiastic in the class.

Thirdly, the two nurseries differed greatly in their English levels. The students in the intervention group could concentrate and interact with teachers better than the students in the comparative group. By communicating with the teacher, I learned that, with the help of the projector, the comparative group demonstrated better performance in terms of their understanding of the teaching content and interaction. The pilot group, with stronger learning abilities, maintained excellent interaction and understanding without a projector in the first 2 weeks.

Fourthly, I the teacher had rarely used PPT before the research. After learning that PPT was required in the research, he expressed his worries about not knowing how to use PPT, and he was concerned that the effects of the class would be influenced by any mistakes.

Finally, the teacher, with insufficient preparation, did not have enough time for the

assessment. Since the assessment was to be conducted one-on-one, the teacher needed to take each student into the classroom individually. It was thus critical to organise other students to conduct a writing activity at the beginning of the class. However, with little experience of performing assessments in these conditions, the teacher assigned the writing task to the students after the class had begun, and it was close to the end of the class when he finally succeeded in telling the students to sit down. This situation left limited time for the students to do the assessment. It was supposed to take 3-4 days, but it ultimately took over a week.

Based on these problems, the following adjustments were suggested to the teachers: firstly, a review part was added to each class, beginning with the third. The pace of the class was slowed, and more practice opportunities were offered for each activity. For example, the students would previously have been divided into three groups, with each group doing the exercise only once. After adjustment, all activities were done by each of the groups three times, offering students the opportunity to practise the things they had learned with other peers.

Secondly, when preparing the teaching content for Walking Through the Jungle, I chose four pieces of different music with lyrics that were clear and slow. Furthermore, I selected music videos with animations to attract the students' attention.

Thirdly, despite differences in learning ability, the pilot and control groups both reacted positively to the music. In this regard, the foreign teacher and I, after communicating, decided to continue to teach the pilot group according to the teaching plan. As for the control group, which had a lower learning ability, although the learning content remained the same, we decided that a greater focus would be given to songs, with reduced time allocated for other activities.

Fourthly, I encouraged the teachers to use PPT before the study began. I told him that I had prepared PPT presentations that could be used directly for the class, and he was required to learn how to play them. I also prepared a comprehensive teaching plan and offered the teacher simple training in PPT during his lunch break every day, covering several simple operation methods and skills.

Finally, I decided that before the assessment, I would send the writing activities to the teachers to communicate with the teaching assistant in advance. Before the

assessment, the foreign teacher would tell the teaching assistant to print the materials and assign the writing activities to the students as soon as the class began. Thus, the teacher would have enough time to perform one-on-one assessments with each student while the other students were doing writing activities. Moreover, some explanations would also be offered before the class began to help the students understand the content of the activities.

4.7.1.3 Changes Made After First Pilot Study

The teacher in the pilot study found it difficult to teach two classes with two different pedagogies during the same period. Thus, the design for the main study was changed. In the first 2 weeks, the teacher used the original teaching method, and then in the next 6 weeks, the teacher used the TELT-M method for both classes. In this process, observations were made of the learning process in classes, and interviews were also conducted to understand how the teachers viewed the pedagogies and how they felt about using them.

Another change in the main study was in the facilities. Since the purpose of the research was to explore the engagement of students when applying TEL combined with music, there were no definite restrictions on what kind of tools could be used. However, as Chapter 2 discussed, using an IWB system and/or projector to play video and/or audio is common and feasible for nursery students; moreover, projecting onto the wall rather than using a screen reduces the harm to students' vision. After I spoke with both headmasters, they agreed to use projectors to present pictures, videos, and/or audio. Moreover, PPT presentations could be replaced with any other new media player, depending on the teachers' preferences.

Finally, in the formal data collection process, I focussed more on the passive engagement (disengagement) behaviours exemplified by the students. This was because some of the passive engagement (disengagement) behaviours in class were observed in the pilot study, such as 'staring blankly', 'showing no reaction to the target object', 'reeling right and left', 'staggering forward and backward', and 'playing with their clothes'. Another behaviour I found in the pilot study was students whispering things to other students that were irrelevant to the teaching content. Furthermore, students sometimes used emotional language, such as 'really boring' and 'not fun', to express negative emotions.

4.7.2 Second Pilot Study

The second pilot study involved classroom practice, as well as the implementation and modification of the observation form. I chose one teacher who would not be participating in the main study at one of the nurseries. I used the observation form that I created as a tool for observing the lessons.

I experienced the following difficulties during the process:

1. During classroom observation, I noticed that some of the signs for observing students' engagement mentioned from the previously designed signs were repetitive, suchas the sub-categories of 'stared' and 'dazed', which could be combined after my refinement. That is, their substance was so similar that it was challenging for me to tell them apart when taking notes.

2. I did not classify the students' language, postures, and facial expressions in the previous observation tool at the beginning, which made it difficult for me to capture students' engagement in the classroom. It was also time consuming and disorganised.

3. During the pilot, even if I observed five students simultaneously, it was reasonable because the students' seats did not rotate or change. This made discussion with the teacherevery evening about student engagement in class quite challenging, as discussing all five students in each 30-minute period involved a high workload (10 students in two classes for a whole day).

These issues were resolved using the following strategies:

Firstly, for exploring behavioural engagement, during my observations, I decided to pay more attention to students' physical and verbal signals, especially where emotional engagement was involved with facial expressions. The distinct categories allowed me to investigate the distinctions between behavioural and emotional engagement. More details are presented in Tables 4.4 and 4.5.

Secondly, the components were divided into negative and positive observational data after I categorised the behavioural and affective engagement components. The initial awareness of students' behaviour assisted me in better encoding and interpreting their

engagement.

Thirdly, because there were some students whose behaviour I was not quite sure about and about whom I needed to communicate with their teachers, I decided that each Friday evening, the teachers and I would have a discussion about the week's class recording. During the observation, I tracked the time invested by students who exhibited remarkable signals (which needed to be discussed) and the activities in which they were participating; thus, when the teacher and I had a specific discussion, we could watch the video at the appropriate time for the discussion. For example, if my class diaries indicated that one student smiled after hearing the teacher's video song in the 20th minute of the class and began to actively sing along with the music, we skipped to the 20th minute and watched the recording together.

Finally, regarding the use of the observation form (paper forms in class), I believed that the best way to use this was to first write down what the students did during the classroom observation according to the form; then, after the class (after the morning class, I did this during lunch time, and after the afternoon class, I did this at home), I transcribed the specific language, postures, and facial expressions of the students during my observation in the table for each day. This is because during the classroom observation, I found that I needed to record a large number of messages and personal statements, which made it difficult to complete the forms one after the other.

During the classroom observations, I made notes of the postures, facial expressions, and language of the observed students during the different activities. At the end of each lesson, I transcribed the notes into the observation form listed earlier. The observation form, as explained in Sub-Section 4.6.2, was based on the Leuven Scale of Involvement and SSTEW scale. On this scale, the engagement levels of students are determined by different signals, which are graded in five levels from extremely low to extremely high to analyse the engagement of students through language, postures, and facial expressions. I used the classroom observation form, which was based on the Leuven Scale and intended to assist me in analysing signals and levels of student engagement.

4.7.2.1 Changes Made After Second Pilot Study

In this sub-section, I provide a brief overview of the modifications and adjustments

made to the observation form and transcripts following the second pilot study.

Observation Form

By comparing the Leuven Scale with the SSTEW scale and the Student Engagement Walkthrough Checklist, I discovered that the signals stated in the Leuven Scale contained similar information to negative and active engagement signals. In other words, negative and active engagement corresponded to the range of positive to negative student engagement on a scale of 0-5. To make the final analysis of student behaviour easier, I classified low and extremely low engagement on the Leuven Scale as somewhat negative engagement, moderate engagement as a mix of active and negative engagement, and high or extremely high engagement as positive engagement. Thus, after transcribing my classroom notes into the observational form of signals for students, I not only analysed the grading of engagement but also considered positive or negative student participation. Moreover, I discussed the signals displayed by the students in class that confused me or that I could not determine with the teachers after class. Obviously, not all signals were included in the observation table; I also added the postures, facial expressions, and language not displayed in the observation as a supplement to the form.

For example, after transcribing my notes taken in class, my observation form revealed that when the teacher had used the projector for a greeting activity, Student B had looked intently at the board, his facial expression had been joyful, and he had sung the song happily and loudly. Most of these signals correlated to levels on the Leuven Scale at grades 4-5, which ranged from highly involved to extremely involved in the activity. In my reflection analysis of student engagement, I exemplified that this student was highly or extremely highly involved as well as actively participating in these teaching processes.

In another example, when I was observing an English singing activity, I noticed that Student C stared at the teacher, but her attention was obviously not focussed on the activity; thus, according to the Leuven Scale, her involvement level was more moderate. However, she opened her mouth to sing the whole time, which showed that she was highly engaged in the activity according to the Leuven Scale. Therefore, due to the conflicting behaviours of the student, I decided to talk to her teacher after class about the state of her engagement. When we replayed the video, the teacher told me

that although the student was opening her mouth, it was not in the right shape. The teacher told me that the student was opening her mouth mechanically and was not really engaged. Thus, after transcribing signals from my class notes into the observation form regarding this student, I graded her engagement from extremely low to low, which was also classified as passive involvement (i.e., disengagement).

Transcript of the Observation Form

In my research, I ensured that I had sufficient time to critically reflect on students' emotional and behavioural engagement through careful transcription from my notes to the observation form, before moving on to analyse the data.

More crucially, based on what I had noted in the classroom, the transcription of the forms from my classroom notes to the observation form allowed me to provide a more detailed description of student engagement, separated into emotional and behavioural engagement. Furthermore, behavioural and emotional engagement were divided into more precise descriptions, including 'occurred during music-related activities', 'TELrelated activities', and 'activities that included both musical content and TEL as teaching pedagogies'. In the transcription process, however, I first marked students' individual behaviour within the form (serial number) and then compared it with the Leuven Scale, writing the relevant grade on the scale.

Tables 4.6, 4.7, and 4.8 present an example of the transcription process. Table 4.6 is the notes I took in class on five students (Students A–E); Table 4.7 is the transcription from notes to the emotional engagement observation form of Student A; and Table 4.8 is the transcription from notes to the form of Student A.

Table 4. 6 Observation Notes for Five Students in the Same Classroom (09/05/2022)

What activities in class (if they included TEL or music)? What time?	**Student A**	**Student B**	**Student C**	**Student D**	**Student E**
Greeting (songs, video) 9:00–9:05	Happy face Sang along Highly focused	Happy face Sang along Sat well Highly focused	Happy face Stood up waved body music and with	Singing with music Looked at the floor	Unhappy Not singing Looked at the student close to him
Activity 1 (Use a projector or interactive whiteboard [IWB] to present a PowerPoint presentation) 9:05–9:15	Happy face Raised hand in every T–S question Read words loudly	Happy face Did not raise hand In every T–S question but in some Read words loudly	Happy face Did not raise hand in any T–S questions Read words loudly	Happy face Raised hand in every T–S question Read words loudly	Happy face Did not raise hand in any T–S questions Read words loudly
Activity 2 Sing-along of the music related to the topic of the day (with or without music) 9:15–9:25	Happy face Sang aloud and moved body with melody (with video and without video)	Happy face Sang and moved body with melody (with video and without video)	Opened mouth Maybe singing? (with video) No singing without video	Sometimes open mouth (with video) No singing and even looked at other students without video	Happy face Sang happily (with and without video)
Wrap-up (Use a projector/IWB to play a board game) 9:25–9:30	Happy face Hands up answered all questions 9:25–9:30	Happy face Hands up answered all questions	Stared at the board without any facial expression	Happy face Hands up answered all questions	Happy face Hands up and answered all the questions

Thus, I meticulously recorded each student's responses, expressions, participation in various classroom activities, singing reactions, gestures, and body language. This observational endeavour enabled me to acquire insights into the students' individualised engagement and interactions throughout diverse segments of the lesson.

During distinct classroom activities, each student's facial expressions were also

meticulously noted, offering valuable clues about their emotional states and levels of interest. These expressions provided essential cues for gauging their degree of connection with the learning material and the classroom environment.

Furthermore, their involvement and participation in the activities, as well as their responses to singing exercises, were meticulously documented. This encompassed observing whether they eagerly participated, maintained a more reserved demeanour, or exhibited varying degrees of engagement based on the nature of the activity. These observations presented a nuanced perspective on each student's comfort level with classroom dynamics and their receptiveness to different modes of engagement.

A notable aspect of the observation focused on capturing the students' physical actions and gestures during the activities. This included not only their overt actions but also subtler non-verbal cues that conveyed their attitudes and inclinations. Such non-verbal cues encompassed body posture, fidgeting, hand movements, and eye contact, all of which provided supplementary insights into their levels of comfort and engagement.

Table 4. 7 Emotional Engagement Observation Form (Student A; 09/05/2022)

Emotional Engagement Signals	**1. Paid attentionto the class/ focus on the task**	**2. Facial expression indicative of pleasure**	**3. Gazed or stared into spaceor did not concentrate on teacher/ task**	**4. Unhappy facial expression (bored/sad)**
What was observedduring music activities?	Signals discovered in activity: 1 Detailed note: Really paid attention to listening to the songs sung by other students and teachers, then sang the songs by himself with confidence. Grade based on Leuven Scale: High to extremely high			
What was observedduring TEL activities?	Signals discovered in activity: 1 and 2 Detailed note: The student actively engaged in the activities displayed on the IWB. He wore a smile on his face and showed great enthusiasm throughout the game experience. Grade based on Leuven Scale: High to extremely high			
What was observedduring music combined with TEL activities?	Signals discovered in activity: 1 and 2 Detailed note: The student remained fully focused on the video content, captivated by its presentation. His expressions ranged from smiles to laughter, reflecting his genuine engagement and enjoyment. Grade based on Leuven Scale: High to extremely high			

I carefully observed the emotional engagement of each student across the following three distinct categories of activities: music activities, TEL activities, and activities that integrated both music and TEL. The detailed recording of these extensive notes was conducted using the emotional engagement observation form.

In the context of musical activities, I adeptly noticed the complicated nature of individual students' emotional reactions. This encompassed their facial expressions, bodily gestures, and apparent responses during engagement in music-related activities. With careful attention to detail, I recorded and analysed the subjects' emotional responses, including indicators such as smiles, focused gazes, and instances of excitement. My objective was to extract valuable observations regarding their degree of engagement and emotional resonance with the musical material.

Likewise, the investigation of emotional engagement during activities involving TEL was expressed using the form 4.5. This document presented an analysis of the students' responses, facial expressions, and general behaviour upon being introduced to TEL tools. The objective of this study was to investigate whether the integration of technology elicits unique emotional reactions from students.

Moreover, the document provided a comprehensive overview of the emotional involvement exhibited by individual students during activities that incorporated both music and advanced technology. This entailed documenting the diverse range of responses exhibited by individuals, encompassing their expressions of curiosity while engaging with technology as well as their emotional reactions when music was integrated with technological components.

Table 4. 8 Behavioural Engagement Observation Form (Student A; 09/05/2022)

Behavioural Engagement	**1. Raised hand to answer questions**	**2. Respond to teachers properly**	**3. Willing to join the activities**	**4. Left theirseat**	**5. Challenging and/or disruptive behaviour**	**6. Refused to join the activities**
What was observed under the music activity?	2.3. Sang along following the teacher and video properly; concentrated with music activities; looked like he obviously enjoyed music activities. Grade based on Leuven Scale: High to extremely high					
What was observed under TEL activities?	1.2.3. Put hands up several times and answered questions correspondingly; paid attention to the content on the board; really willing to join the activities. Grade based on Leuven Scale: High to extremely high					
What was observed under music combined with TEL activities?	1.2.3. The same as above: student spontaneously sang along and actively engaged in watching music videos or participated in sing-along activities. Grade based on Leuven Scale: High to extremely high					

Similarly, the teacher and I carefully observed the behavioural engagement of each student across three distinct categories of activities: activities related to music,

activities involving TEL, and activities comprising both music and TEL. These comprehensive records were thoroughly recorded in the behavioural engagement observation form.

This form encompassed each student's observable behaviours during their participation in musical activities, including their level of active participation, attention span, and interaction with the musical content. Through diligently recording their behavioural cues, such as enthusiastic participation, focussed attention, and moments of active engagement, I hoped to gain insights into their likelihood to engage in music-related behaviour. I then recorded the students' interactions with TEL tools, responses to prompts, and overall responsiveness to the digital learning environment.

In addition, the form provided a detailed description of each student's behaviour during activities that combined music and TEL. This required capturing their complex responses, ranging from their interactive behaviours during technology-assisted tasks to their level of active engagement when music was integrated with technological components.

4.8 Data Analysis

This study included two qualitative data collection and analysis components interviews and classroom observations. I chose reflective thematic analysis (RTA) as the method for analysing my interview and observational data. In this section, I first describe the RTA process and then explain how I applied it to the statements from the interviews.

According to the research design, there were two main datasets available for analysis in this study: (1) transcripts of four semi-structured interviews about teachers' understandings and perceptions of the impact of augmentative technology and music on student engagement in classrooms where English was taught and (2) my classroom observation notes, which comprised 44 pages of transcripts with field observations. I therefore chose to interpret the analysis by combining these two types of data.

4.8.1 Reflective Thematic Analysis

I adopted an RTA methodology not only to preserve a complex and multifaceted picture of the data but also because of its adaptability. Braun and Clarke (2006) outline that the key purpose of RTA is to recognise similar themes and patterns in data. This procedure involves the reflection of the researcher; hence, Braun and Clarke renamed thematic analysis to RTA to underline 'the researcher's subjectivity as an analytic resource and their reflexive engagement with theory, data, and interpretation' (2021, p. 30).

Although the structure and description of the data are essential components of RTA, their function extends beyond that of a straightforward summary and instead makes it possible to comprehend the data. RTA is compatible with constructivism, which holds that participants and researchers should be viewed as co-producers of data about their respective worlds (Braun & Clarke, 2006). Thus, I conducted my RTA using a constructivist worldview (discussed in Section 4.3). I selected RTA because of its user friendliness and versatility, both of which allowed me to gain an overall perspective on the data. As such, I was able to develop knowledge and understand it in a way that was automatically connected with the facts (Braun & Clarke, 2019, 2021).

4.8.2 Application of Reflective Thematic Analysis

Consistency between theory, methodology, and the RQs is crucial in RTA, as is reflexively engaging with the data throughout the analysis (Braun & Clarke, 2019) to discover significant elements or patterns of interest to address the RQs.

Additionally, RTA enables researchers to study different types of data separately. This can be accomplished deductively, using theory as a guide, or inductively, by identifying themes in the data. I focussed on using the inductive approach. I initially classified the transcribed data based on the interview questions to identify research-relevant content. The use of inductive analysis (drawing out emerging patterns) then enabled more specific coding and themes to emerge from the data without the requirement for predetermined coding frameworks (Braun & Clarke, 2006).

RTA can use interview questions as a framework for coding to generate early codes, but these questions are not themes. I also struggled with validity, or researchers' reliance on self-assessments, flexibility, and rigour (Clarke & Braun, 2013). Fereday and Muir- Cochrane (2006) have raised concerns about rigour and adequacy. To achieve rigour, it is necessary to emphasise coherence, clarity of theory, and research techniques, as well as the interpretation of the meaning of participants in light of the data. To meet requirements for sufficiency, the narrative of the study's findings, as well as the sample, must be understandable and consistent.

In this research, I used Braun and Clarke's (2006, p. 87) six-point RTA checklist to prevent inconsistencies and fallacies:

> *1)Familiarisation-transcribing, reading the transcripts, and making notes of initial ideas;*
> *2)Coding-generating initial codes for interesting features of the data for the entire dataset;*
> *3)Identification of themes-collating codes and coded data into potential themes;*
> *4)Reviewing themes-checking the themes against the coded data and the whole dataset;*
> *5)Defining themes-refining the content of the themes and assigning them names;*
> *6)Reporting-conducting the final analysis in the selection of 'vivid, compelling extract examples' (Braun & Clarke, 2006, p. 87)* and putting these in context.

Following the six stages, the coding process in RTA takes on a dual nature, incorporating both deductive and inductive elements to ensure a comprehensive exploration of the data.

In this research initial stages of RTA involved deductive coding, where I employed existing theories and research questions as a guide. In my research, I used the interview questions as a framework for generating initial codes. This deductive approach in the research provided a structured starting point, aligning the analysis with the initial research objectives. However, it is important to note that these codes derived from the interview questions are not the final themes. Instead, they served as stepping stones for deeper exploration.

As the coding process advances, the inductive approach takes center stage. This involves allowing themes to emerge organically from the data itself. Inductive analysis is a more flexible and open-ended method. In my study, this approach proved invaluable as it allowed for the discovery of new and unexpected themes that

enriched the analysis.

However, the process of RTA was not without its challenges. One such challenge was ensuring the validity and rigor of the analysis. I often grapple with questions of validity, which can be influenced by our reliance on self-assessments and interpretations. Maintaining rigor, as highlighted by Clarke and Braun (2013), requires careful attention.

The further consideration of how RTA guide and be applied in my interview and observation analysis will be discussed in the next section.

4.8.3 Interview and Observation Analysis Method

I now explain how I followed Braun and Clarke's (2020; 2006) six-step guide and applied the steps in my interview transcription.

According to Braun and Clarke (2006), the first phase of RTA involves becoming familiar with the generated data. Since none of the teachers were Chinese, and English was their second language or the official language of their home countries, the interviews were conducted in English. This eliminated the need for translation. In the initial stage of transcription, it was sometimes difficult to hear the teacher's voice against the background noise, as was the case of my interview with the teacher in a nursery, whose office was close to the students' physical activity area. I therefore chose to transcribe the interviews using XunFei, a Chinese translation software programme. Nevertheless, despite the software I used having already transcribed the entirety of the dialogue, I checked and, where necessary, corrected each sentence by continually comparing the transcribed text with the recording, which I considered to be an interpretative process in and of itself. This aligns with Braun and Clarke's (2006) advice to listen to the recordings to ensure correctness and to correct any mistakes made by the software in the initial transcription (Braun & Clarke, 2006). In my case, I adjusted some of the homophone conflation that had occurred in the soft transcriptions after repeatedly comparing my transcriptions and recordings, such as the confusion of the words 'kids' and 'kits'.

Furthermore, I transcribed verbatim but de-naturalised (Halcomb & Davidson, 2006).

A de-naturalised transcript (‘full verbatim’) includes all utterances, faults, repetitions, and grammatical flaws (Bucholtz, 2000). In de-naturalised transcriptions, transcribers choose which norms to use (Oliver et al., 2005). I retained all pauses, laughter, stutters, ‘you know’, ‘like’, and unfinished words. I added these functions where the transcription software had not.

According to Allen and Wiles (2016), participants should either be given the opportunity to choose their own pseudonyms or, at the very least, be included in the decision-making process. As I believed this to be a reasonable suggestion, I provided my participants with a range of possible pseudonyms, which I had found through a search of Biying (an online search engine) for commonly used English names, making it easier for me and the reader to recall these pseudonyms when they appear in the text. Because the teachers are all from nations in the Middle East or Southeast Asia, I avoided pseudonyms that had some association with the participants, such as pseudonyms containing the names of family members, mentors, departments with university-specific names, or local regions or places. Only ‘composite stories’ (i.e., stories not directly linked to anyone in real life) were used; for example, interview segments that could be pieced together to identify participants were not used (Creswell, 2007, p. 57). I then asked the teachers themselves to choose their preferred pseudonyms from these names, and they chose Tom and Jack, respectively.

Moreover, I did not change any words or rearrange the sentences to improve the clarity of meaning, because I did not want to lose the flavour of how each participant had expressed themselves. Appendix 1 presents the collated version of all transcripts.

According to Braun and Clarke (2006), coding is a type of analysis that it involves categorising and organising interviews into meaningful units. The initial coding was primarily driven by the RQs around student engagement and teacher perceptions of it in the context of a pedagogy that combined TEL and music.

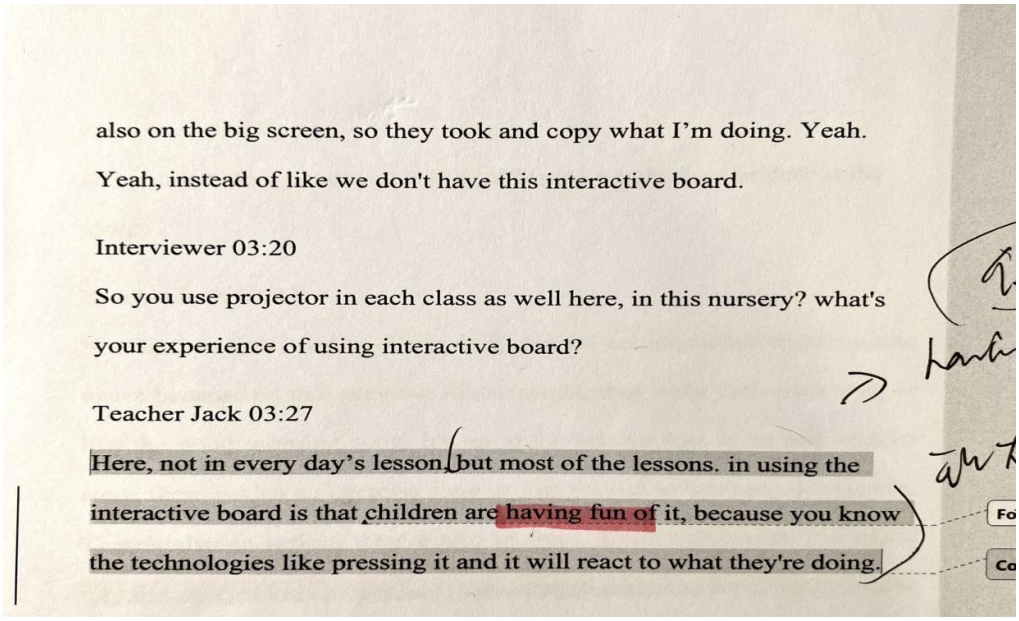
Notably, since I divided the teacher interviews into two sections (i.e., before and after CAR), I also divided the teacher interviews into two separate parts for coding. I created coding tables, which I checked before and during my coding of the relevant data, thus ensuring consistency of meaning in the data and improving reliability (Cohen et al., 2007; Ryan & Bernard, 2003). Due to the manageable amount of data (75 double spaced pages of transcripts), I chose to code the data manually rather than

using software such as Nvivo, which allowed me to comprehend the data more deeply.

This inductive approach allowed me to immerse myself in the data, identify and code all patterns that were potentially or obviously relevant to my RQs (Braun & Clarke, 2006), and select key moments and events (Fereday & Muir-Cochrane, 2006). While some codes were directly related to the RQs, others were generated entirely by the data. As with deductive codes, defining inductive codes increased the reliability of consistent applications (Cohen et al., 2007).

I started by labelling information fragments from one of the first teacher interviews, which were labelled as quotes from the interviewee or text written by the researcher based on their descriptions. Some definitions or explanatory texts were marked next to these codes for further analysis (see Figure 4.4) after regularly reading and familiarising myself with various interview transcripts. For instance, one teacher said that 'although TEL has increased student engagement in the classroom to some extent, [they] must spend more time preparing materials for the class'. This was initially coded as the teacher thinking they needed to spend more time preparing materials.

Figure 4. 4 Notation and Identification of Information Fragments



As this figure shows, I highlighted the text in the transcript that was relevant to the research topic, and similar coding was indicated by the same colour. For instance, if the teacher mentioned the code of having fun in the transcript above, I marked all

repetitions of this code in red.

The remaining interview transcripts were analysed similarly to generate additional text fragments. After this step was completed, 33 initial codes were produced or extracted from the interview transcripts when data saturation was reached (i.e., when no additional information could be added to form new themes). Table 4.9 presents the 33 initial codes:

Table 4. 9 The 33 Initial Codes from the Interview Transcripts

1. Relevant topic
2. Multi-sensory experience (IWB and projector)
3. Spend more time on preparing materials
4. Flash cards
5. Lyrics (new words/vocabulary)
6. Video (animation)
7. The difficulties of using technology
8. Visual learning (multi-sensory experience)
9. Limitation of technology-enhanced learning equipment
10. Audio (technology with music)
11. Language learning in class
12. Mix technology-enhanced learning and physical games
13. Appropriate song/music
14. PowerPoint (teaching materials, easy preparation)
15. Total physical response (mimic actions)
16. learning
17. Memory aid
18. Adapt for available resources (CD player, laptop, or TV)
19. Physical games
20. Class efficiency
21. Fun to learn
22. Promote engagement
23. Scaffolding
24. Teacher creativity
25. Peer corrections in class
26. Interaction (T–S, S–S)
27. Language learning
28. Classroom management
29. Projector use in class
30. Collocative action research
31. Relaxed atmosphere
32. Feeling of boredom with technology-enhanced learning
33. Technology causes distractions

During the ongoing refining of codes to make them more accurately reflect the data and relate to the other codes, labels for the themes were also developed from my words and those of the participants based on my comprehension of the text fragments. In addition, the observation data were used as a supplement to the interview and for a multi-positional interpretation.

The analysis of the observation form (44 pages of observation notes, 65 pages of transcripts from the behavioural engagement observation form, and 65 pages of transcripts from the emotional engagement observation form) totalled 174 pages and used a similar analysis method to the interviews (i.e., RTA). The first step was to familiarise myself with the data. As I transcribed the detailed observation notes recorded in each lesson into the observation form, I read through my classroom observation notes and familiarised myself with my data. Observations of occurrences, gestures, mimicry, and actions were included on the form, as data loss from intonation, visuals, and gestures could not be neglected (Cohen et al., 2007). Video taken by the camera and iPad in the classroom helped me add the students' language to the table when I was transcribing. One key advantage of using video for classroom observation is the ability to review and analyse specific moments in detail. Unlike live observations, videos allowed for post-session reviews, where I could pause, rewind, and replay segments, ensuring a comprehensive examination of key teaching moments. This heightened level of scrutiny enables educators to identify subtle nuances, non-verbal cues, and student interactions that may be overlooked during live observations. Additionally, video observation facilitates collaborative research amongst educators. I was able to share recorded videos of their teaching sessions with colleagues, and we could engage in reflective discussions together.

Whereas the initial codes in the observation were developed before I collected the observation data, these theory-related materials included signals of positive and negative behavioral engagement responses (Finn,1993; Lam et al., 2014), as well as positive and negative emotional responses (Froiland, 2015; Cekaite & Ekström, 2019). These signals assisted me in determining the level of involvement that the students had in the various activities, as well as whether their engagement was positive or passive (i.e., disengagement).

After I combined the Leuven Scale (Figure 4.2) and SSTEW tables (Figure 4.3), the classroom engagement signals were categorised into facial expression, posture, and language in class. I thus added three codes-facial expression, sing-along/language in class (the language used in class added by watching the recording back), and body posture which resulted in 36 revised codes, presented in Table 4.10:

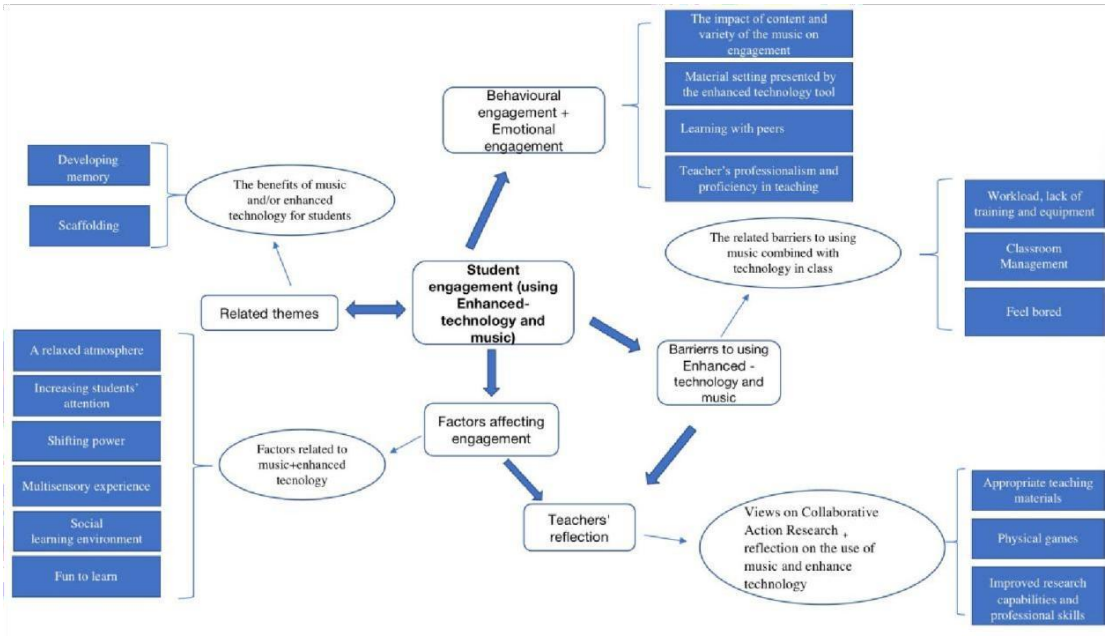
Table 4. 10 Interview and Observation – 36 Revised Codes

1. Relevant topic
2. Multi-sensory experience (IWB and projector)
3. Spend more time on preparing materials
4. Flash cards
5. Lyrics (new words/vocabulary)
6. Video (animation)
7. Difficulties of using technology
8. Visual learning (multi-sensory experience)
9. Limitation of technology-enhanced learning equipment
10. Audio (technology with music)
11. Language learning in class
12. Mix technology-enhanced learning and physical games
13. PowerPoint (teaching materials, easy preparation)
14. TPR (mimic actions)
15. Appropriate song/music
16. ZPD learning
17. Memory aid
18. Adapting for available resources (CD player, laptop, or TV)
19. Physical games
20. Class efficiency
21. Fun to learn
22. Promote engagement
23. Scaffolding
24. Teacher creativity
25. Peer corrections in class
26. Interaction (T–S, S–S)
27. Language learning
28. Classroom management
29. Projector use in class
30. Collocative action research
31. Relaxed atmosphere
32. Feeling of boredom with technology-enhanced learning
33. Technology causes distractions
34. Sing along
35. Body language
36. Facial expression

Assigning the collected codes to themes led to revised coding. Here, I conceptualised and generated themes that related to the data and RQs in this ‘creative and active

process' (Braun & Clarke, 2021, p. 16). Making a mind map of the codes, displayed in Figure 4.5, helped me to integrate the codes, organise them into themes, and link them to the RQs.

Figure 4. 5 Mind Maps for Generating Themes



The development and review of the themes were completed in Step 4. To conduct this reflective activity, I studied the themes that arose from the interview transcripts and began to eliminate the overlap and repetition between these initial ideas. In this process, some of the initial themes were further divided, reorganised, adapted, or rearranged as necessary, thus reducing overlap and redundancy. After this step, all initial themes were structured into a few key themes.

As mentioned above, I took one teacher's views as the code *spend more time on preparing materials (TEL tools)*, while another teacher said in an interview, 'TEL in the classroom really made my sequences flow, as long as there are no problems with the software in the classroom'. This was coded as the *difficulties of using TEL*. These two codes were then collated into a potential theme, namely *barriers to using music combined with technology in class relate to teachers or school*.

For example, during this process, I coded these problems encountered by teachers and students in the TELT-M classroom, including the excessive workload mentioned by the teacher, a lack of TEL training and equipment, and students using TEL that needed additional classroom management due to being overstimulated by visual and

auditory stimuli, and so on. I used curly brackets to indicate that these codes were subsumed into the sub-theme *barriers to using TEL and music in the English classroom.* These two sub-themes (barriers to using TEL and music related to (1) teachers or school or (2) students) could be merged into a single theme, namely *barriers to applying TEL and music in the English classroom*. I used a single arrow in the mind map to highlight that this theme was prevalent in the classroom through TELT-M.

When devising categories, I observed that the themes and their constituent categories that emerged from the data often exhibited significant interplay and interrelationships. As depicted in Figure 4.5, the category of *teacher's professionalism and proficiency in teaching consisted of the broader theme of student engagement in class*. However, it can also be classified or encoded as part of the category of *factors that affect combined music and TEL to promote student engagement* within Theme B. Another example was the category of *shifting power*, entailing a shift in the dynamic between students and teachers when employing TEL in the classroom, leading to an increase in student autonomy and a certain level of power transition. Students were no longer solely recipients of instruction from teachers. This was subsumed within the sub-theme of *factors related to music and TEL*, while it could also be further categorised within the *advantages of music combined with TEL for students* under Theme E. This intricacy highlights the multifaceted nature of the themes, which often necessitates nuanced categorisation to effectively capture the interrelated elements and relationships present within the dataset.

When I produced coding schemes, some were difficult to categorise into any sub-theme or theme that was directly related to the RQs, such as the code of *songs that can develop memory*, which was observed through both observations and interviews, or the *significance of different types of scaffolding*. Furthermore, after analysing the data, I discovered that both codes could be ascribed to the sub-theme of *benefits of music and/or TEL for students*, which was subsequently summarised as themes related to student engagement. Moreover, through my research, I found that student engagement not only impacted students' memory in classrooms that combined both TEL and music but also facilitated the use of multiple scaffolds. In turn, memory improvement or appropriate scaffolding strengthened students' engagement. Therefore, I placed two arrows between the related themes and student participation in the mind map (using TELT-M).

Another crucial point is that I did not include facial expressions, sing-along language, or body posture as separate codes for any sub-theme but rather grouped them together in *student engagement in class*. This is because, when I analysed the data, I found that the codes included within each theme or sub-theme needed to be supplemented and discussed through my observational notes or the content of the observation forms that I completed. For example, when I encountered the code *felt bored* during interviews, I supplemented it based on the records in my classroom observation form. These additional records primarily came from the indicators of behavioural engagement mentioned in Sub-Section 4.6.2. After identifying passive indicators that suggested students were feeling bored, such as *refused to join activities, gazed into space or stared at other students*, or displayed an *unhappy facial expression*, I summarised and categorised these observations under the code of *felt bored*.

Furthermore, both the notes and content of the observation forms predominantly revolved around students' facial expressions, singing/language, and body posture. As such, these classroom records greatly assisted me in supplementing the coding. The themes were all discussed based on interviews with the teachers and my own observations of student engagement in the classroom, their engagement in music, or TEL activities, amongst others.

In the fifth step, it was vital to find the 'central concept' (Braun & Clarke, 2021, p. 13) of the themes. Based on a careful reading of all the initial themes, I developed a core theme to incorporate the findings (see Table 5.1). Each core theme consisted of at least one sub-themes with differentiates codes.

The RTA process was completed by writing the analysis report. The detailed data story in this study needed to be compelling, non-repetitive, logical, coherent, and cohesive. I used captivating and vivid data extracts as examples in my data analysis writing that were pertinent to the literature, subject, and RQs, as well as the themes I was discussing and reporting on.

Then, each topic was evaluated and refined in connection with the complete dataset. I verified that the themes and sub-themes that arose from my inductive analysis appropriately reflected the meaning of the dataset. I reviewed all the data multiple times, making notes, comments, and connections. Thus, my data analysis and

interpretation involved developing relationships within the data and correlating data from diverse contexts to develop various perspectives (Graue & Walsh, 1998).

Finally, to apply the interview topics to the analysis, each issue and the theme set as a whole had to be identified and developed. I thoroughly examined each theme's data extraction to establish its content. To guarantee relevance and support, I checked the entire dataset numerous times. I arranged the themes and sub-themes into structurally logical and cohesive patterns to suit the narrative. I also renamed the themes and subthemes at the start of the analysis to make them stronger, more concise, and clearer, and integrated them with the interview topic. Finally, Table 4.11 was produced:

Table 4. 11 Themes, Sub-Themes, and Categories

Core Themes	Sub-Themes	Categories
a. Student engagement in class	a1. Emotional and behavioural engagement	*Content and variety of the musicitself affect engagement* *Material setting presented by theTEL tool* *Learning with peers* *Teacherprofessionalism and proficiency in teaching*
b. Facilitating factors for promoting studentengagement	b1. Factors related to music	*Classroom atmosphere created bymusic and songs* *Music as a means of increasing students' attention*
	b2. Factors related to technology	*Shifting power in the classroomMulti-sensory experience(IWB, projector)* *Social collaborative learning* *Fun to learn*
c. Potential barriers to using music combinedwith technology in learning	c1. Barriers related to teachers or school	
	c2. Potential challenges related to students	
d. Teachers' reflection on student engagement and collaborative action research	d1. Teachers' reflection on student engagement	*Importance of physical gamesBenefit of modern technologies*
	d2. Reflection on collaborative action research	*School support* *Improvement of research capabilities and professional skillsEngagement of teachers in social practice*
e. Related themes: Vocabulary retention and multi-level scaffolding	e1. Developing memory as advantage of TELT-M students	
	e2. Positive aspects of scaffolding	*Importance of scaffolding* *Technology as a scaffold for learning* *Peers as a scaffold for learning* *Teachers as a scaffold for learning*

4.8.4 Reliability and Validity

When discussing issues of reliability and validity, my understanding is that the meanings of these terms differ when dealing with human and social environments compared to the natural sciences. Some researchers (e.g. Caelli et al., 2003; Goulding, 2001) argue that qualitative methods must be rigorous. Thomas (2006), an early proponent of the generalised inductive approach, also emphasises the importance of trustworthiness.

However, Zina (2010) argues that in social research, obtaining reliable results is challenging because the nature of the projects may not allow for replication. Therefore, she advocates for 'dependability' – ensuring that methods are carefully designed and thoughtfully implemented to minimise flaws.

In this study, I minimised the pitfalls by carefully designing the research steps. After completing the transcription of the data and RTA of the participants, I held a reflective discussion with the teachers about the interview material. Additionally, I consulted two qualitative researchers who reviewed a transcript with codes and emerging themes. For example, one colleague helped me include 'developing memory with music', which I overlooked, as a sub-theme by arguing its importance.

As elucidated by Wilson (2009), validity determines whether a study genuinely measures what it intends to measure. To address the issue of validity in my research, I provide readers with a detailed account of the research and analysis methodologies and discuss where and when my reflections and interpretations contribute to the study.

4.9 Ethical Considerations

Ethics is a crucial component of the research procedure. Social research is about humans, not only since it includes humans directly but also because researchers as humans will influence the participants (Matthews & Ross, 2010). When resolving conflicts between the law, individual rights, and research design, ethical considerations are crucial, particularly when dealing with individuals unfamiliar with written consent. In this section, I discuss cultural factors and ethical concerns, as well as potential enhancements or solutions to the problems.

4.9.1 Ethical Issues

The current research followed the requirements of the guidelines adopted by the School of Education from the British Ethical Guidelines for Educational Research, fourth edition (2018). A detailed ethics protocol was discussed with my supervisors, based on which the relevant statement of research ethics was obtained from the Research Ethics Committee of the School of Education.

Before the start of each class (i.e., before implementing the proposed teaching pedagogies for the students), I spent some time ensuring that the students were familiar with me to prevent them from feeling tense or nervous due to a lack of acquaintance. I inquired with the head teacher about the specific conditions of each student and became aware of their different characteristics during teaching to ensure that each student was treated equally by the teachers. Before the fieldwork, all participants were informed of the training, interview, and observation, as well as the steps involved and the duration of the classes that I delivered. The purpose of the research was imparted in detail to the people involved, and it was specified that their performance throughout the entire fieldwork would not be judged. For the class video recording, I did not make any judgements but only examined the reactions of the children. I informed the teachers in advance about the usage of the classroom video, the authorised personnel who would have access to this video, and the conceivable forms and methods of storage. Before starting with the research, I let head masters teachers and parents know as much as possible about the purpose of this fieldwork and told them that the interviews were to be conducted on a voluntary basis; thus, they were free to quit and had the right to refuse to participate at any time in the fieldwork without an explanation. The aim of the observation and interview was not to judge the teachers' use of TELT-M for teaching English, nor to evaluate their teaching content; rather, it was to collect the teachers' reflective opinions on the research topic, objectively compare the changes in students' engagement in class and establish mutual trust as well as with the teachers during CAR. In addition, pseudonyms for students and teachers were adopted for confidentiality purposes.

The research predicted a dependent relationship between schoolchildren and their teachers. The potential participants were involved on an entirely voluntary basis. In addition, the potential participants were informed that their decisions concerning

whether to participate would in no way affect their relationship, progress, or general experience of school.

4.9.2 Insider-Outsider Stance

Chinese researchers have an advantage in China. However, ignoring ‘insider’ issues is unfair. Explicitly discussing cultural and language issues helps the reader better understand how potential losses in meaning have been minimised (Squires, 2009). Regarding cultural diversity, China’s Confucian philosophy has shaped the country’s cultural values (Ma & Tsui, 2015) since the Han Dynasty (206 BC to 220 AD). It lies at the core of interpersonal communication in China.

Confucianism emphasises harmony, hierarchy, moral development, and kinship, which provide the basis for human relations in Chinese society (Carless & Lam, 2014). This type of relationship is called guanxi in Chinese, which means ‘relationship’ (Chen and Chen, 2004). Thus, while analysing participants’ replies, I also examined student–teacher–researcher interactions. Chinese philosophical ideas, such as maintaining harmony in relationships and respecting elders in this hierarchical society, may influence research outcomes (Matthews & Ross, 2010). This was in fact not a problem in this research because it was exploratory in essence and not an evaluation; teachers were asked related questions based on their own experiences, and the researcher was not interested in evaluating their perceptions. In addition, as the teachers were not local Chinese, the influence of Chinese philosophical beliefs was likely less influential on them. In addition, I ensured that all questions in the semi-structured interviews were non-leading, so that the teachers naturally provided information from their own experiences.

Kinship also helped me. I started the fieldwork by recruiting research volunteers, and my parents’ friends introduced me to various nursery principals. After explaining my research design and ethical concerns, they supported me. As the headmaster mentioned, this CAR was not only fieldwork for me as a researcher but also an opportunity for the teachers to learn and engage in research. As such, the headmaster also stated that she hoped teachers would learn something that would help them in their future teaching by participating in this study, so that they could be more inspired and progress as educators.

During the research process, I was both an ‘insider’, a Chinese person who conducted research and worked with them; and an ‘outsider’, a person sent by the teachers’ principal and immediate superior. I stressed to the teachers that I wanted to work as a team within a professionally collaborative approach and that we would operate as a team; therefore, I hoped for them to regard me as an intern teacher and to let me help them with their everyday work. To some degree, I was an outsider to the teachers: I am not a foreigner in China like them, but being a team member in the CAR helped me become an insider to them. This was because I not only interviewed the teachers and discussed student engagement and performance with them but also reviewed and reflected on the lesson recordings with them after class. Although the headmaster helped me communicate with the teachers before we began the research, I developed a good rapport with them and even had dinner with them during the fieldwork, which enabled them to express themselves in a natural and relaxed way when I interviewed them.

4.9.3 Conducting Research with Children

My participants had free choice, received no bodily or non-physical injury, were aware of the risks and rewards, and were treated fairly and equitably. This research never violated human rights.

Children are not immature adults. They are distinct from adults and require sensitive social researchers (Larcher, 2017). They are unique and subject to external stimuli. Thus, external elements must be considered as much as possible. As a researcher in early childhood education, I was well equipped to deal with children.

Over the past 8 years, I have gained copious practical experience working with children during my intermittent teaching and learning process, both in China and the UK. Young learners are, according to my professional experience, a group that requires extra attention and respect. In my classes with 4 to 6-year-olds, I have frequently observed students silently crying or even bawling. When I spoke to them or their parents after class, I realised that this was sometimes because I had not paid attention to them when they raised their hands to participate, or I had not given them immediate positive feedback when they offered the correct response. In summary, it

was critical for me to consider the characteristics of Chinese participants and the different roles of the participants-children, adults, humans, and members of Confucian culture and how those roles may have affected my interaction with the participants.

4.10 Chapter Summary

In this chapter, I have offered the basic principles and operational steps of the technique used in this research. The chapter started with an introduction, then moved on to discuss the study purpose, and finally moved on to discuss the RQs. After introducing the interpretative paradigm, the next step was to provide an overview of qualitative research methods and then choose instances for the case study research. Following that, a description of the procedure for selecting participants and the results of that selection were provided. I discussed the benefits of doing CAR in the context of a case study, its design and application, and the formulation of the research methodologies (semi structured interviews and classroom observation) for the purpose of data collection. I focussed on the creation of the classroom observation form as well as its application in the classroom and subsequently discussed the pilot studies, as well as the modifications made to the research design as a result of them. The thematic analyses used in this study, which included both inductive and deductive methodologies, were discussed.

Following this, ethical considerations were discussed, and my insider–outsider perspective was dissected from the point of view of generating more reliable and trustworthy results.

The next chapter presents the findings.

Chapter 5 Findings

5.1 Introduction

Based on the data collected from participants' responses in the semi-structured interviews and classroom observations, this chapter presents an exploration of the impact of music and TEL on student engagement. In this chapter, I examine the themes revealed through data analysis. As considered in Sub-Section 4.8.3, my data analysis encompassed 75 pages of double-spaced interview transcripts and 130 pages of on records, as well as 44 pages of classroom notes.

In this chapter, for the sake of clarity, I use the precise identifiers introduced in Chapter 4, including the main themes, sub-themes, and categories. The categories are indicated using italics throughout the chapter, which begins by discussing children's behavioural and affective engagement (Section 5.2). The impact factors of combining music and TEL in promoting student engagement are subsequently analysed (Section 5.3). Next, the disadvantages of using music and technology in the classroom are examined, including drawbacks for teachers, schools, and students (Section 5.4). Then, reflections from teachers regarding student classroom engagement and CAR are presented (Section 5.5). Lastly, two additional themes are introduced, the benefits of applying music combined with TEL in terms of enhancing students' memory and the advantages of scaffolding (Section 5.6).

Overall, this chapter provides initial findings regarding the impact of music and TEL on student engagement, which are then further elaborated and contrasted with the literature in chapters six and seven. To provide clarity, Table 5.1 presents the corresponding numbered section in brackets next to each theme and sub-theme.

Table 5. 1 Themes, Sub-Themes, and Categories with corresponding numbered sections

Core Themes	Sub-Themes	Categories
a. Student engagement in class (5.2)	a1. Emotional and behavioural engagement(5.2.1)	*Content and variety of the music itself affect engagement* *Material setting presented by the TEL tool* *Learning with peers* *Teacher Professionalism and proficiency in teaching*
b. Facilitating factors for promoting student engagement (5.3)	b1. Factors related to music (5.3.1)	*Classroom atmosphere created by music and songs* *Music as a means of increasing students' attention*
	b2. Factors related to technology(5.3.2)	*Shifting power in the classroom* *Multi-sensory experience (IWB, projector)* *Social collaborative learning* *Fun to learn*
c. Potential barriers to using music combined with technology in learning (5.4)	c1. Barriers related to teachers or school (5.4.1)	
	c2. Potential challenges related to students (5.4.2)	
d. Teachers' reflection on student engagement and collaborative action research (5.5)	d1.Teachers' reflection on student engagement (5.5.1)	*Importance of physical gamesBenefit of modern technologies*
	d2. Reflection on collaborative action research (5.5.2)	*School support* *Improvement of research capabilities and professional skills* *Engagement of teachers in social practice*
e. Related themes: Vocabulary retention and multi-level scaffolding	e1. Developing memory as advantage of TELT-M for students (5.6.1)	
	e2. Positive aspects of scaffolding (5.6.2)	*Importance of scaffoldingTechnology as a scaffold for learning* *Peers as a scaffold for learning* *Teachers as a scaffold for learning*

5.2 Student Engagement in Class (a)

Under the main theme of student engagement, there was one sub-theme, behavioural engagement and emotional involvement with four corresponding categories. To address this sub-theme in the pages that follow I discus students' engagement in classrooms where the instructor employed music and TEL to teach English from my own and the teachers' perspective, obtained through interviews and classroom

observations. One purpose of the classroom observations was to obtain a broader view of the behavioural and emotional expressions of student engagement. I discovered that students were highly engaged behaviourally and emotionally in the classroom with music and TEL, as I illustrate below. During fieldwork, in addition to interviewing the teachers, I conducted observations twice a day, once in the morning and once in the afternoon, for each of the two different classes. In total, I observed each class in both nurseries 40 times.

5.2.1 Emotional and Behavioural Engagement (a1)

Emotional and behavioural engagement are two closely related and frequently associated aspects of the learning experience that emerge in a dynamic interaction. The boundary between the two dimensions is frequently unclear, making it difficult to separate the results. This degree of complexity stems from the complex relationships between emotions and behaviours, in which an individual's emotional state can significantly impact how they engage in behaviour, and vice versa.

Through my fieldwork, I noticed that the connection between emotional and behavioural engagement was multifaceted and complementary. Emotions can be a driving force behind certain behaviours; for example, a student's interest in a particular topic may motivate them to enthusiastically participate in lessons. By contrast, active behavioural engagement in learning activities can generate emotions; for example, effectively completing a difficult assignment may elicit feelings of happiness and satisfaction. Positive emotional experiences can increase behavioural engagement, whereas active participation can cultivate a sense of accomplishment and emotional fulfilment. In this analysis, I focussed on emotional and behavioural engagement together rather than as independent sub-themes.

According to Noorhidawati et al. (2015), the concept of emotional engagement (discussed in section 2.2.3) is connected to the feelings and attitudes that students exhibit when they are in the classroom. Children's responses to their teachers and peers are also considered part of their engagement. In fact, this kind of involvement is significant in the learning process; when young learners are involved, they are actively engaged in the process of learning, particularly when the activities attract them and provide them with joy. Throughout the lessons, they displayed a range of

feelings, some favourable and others slightly negative. I explicitly inferred these signals using the combined Leuven Engagement and SSTEW scales (as described in section 4.6.2).

I inferred these emotions by observing students' behaviour in the music classroom combined with TEL; they appeared primarily to be joyful, as seen by their laughter, smiles, amusement, and positive behaviour. According to the Leuven Engagement and SSTEW scales, I compared the students' classroom expressions and inferred that the students were in a state of positive engagement. According to Niemi et al. (2012), most children demonstrate both curiosity and positive feelings such as enthusiasm, motivation, and enjoyment. For instance, when I observed the students, I knew they were engaged when they displayed a particularly happy expression, moved their bodies with the music, smiled happily, or answered the teacher with relevant responses. By contrast, those who exhibited wandering gazes, stared blankly into space, were distracted during an activity, or stood up and ran around the classroom during the lesson were considered less or passively engaged (i.e., disengagement), according to the Leuven Engagement and SSTEW scales.

The performance of the students' emotional engagement that I witnessed also indicated that the learning experience generated by TEL can raise engagement, satisfy curiosity, convey required information, and increase motivation. Moreover, the performance of the students' emotional engagement that I observed also proved that TEL can increase engagement.

Behavioural engagement (defined in Chapter 3) primarily related to how the students engaged with language in the classroom and whether they participated in activities (including singing and speaking in class). Similarly, the behaviour they displayed during the lessons was somewhat positive and somewhat negative.

In my findings, I noted the following four categories under children's behavioural and emotional engagement in the classroom: *Content and variety of the music itself affect engagement, Material settings presented by TEL tools, Learning with peers*, and *Teacher professionalism and proficiency in teaching*. I elaborate on these four factors in the following sub-sections.

The Content and Variety of the Music Itself Affect Engagement

The first factor related to the content and variety of the music itself. What seemed to motivate students' tolerance affected their engagement, including the difficulty of the song's vocabulary in class and whether the songs are entertaining or encouraged imagination. This indicates that the content of the song itself also influenced students' engagement.

For instance, a teacher selected three distinct videos with the theme of 'Walking Through the Jungle'. Although the songs concerned the same topic, the vocabulary, speed, and melodies all varied, as did the animations. As the videos were played for the first time, the students' focus and posture centred attentively on their animation, with nearly no one unable to engage. The following discussion focusses on how students behaved after viewing the film a second or subsequent time.

One of the songs, 'Walking Through the Jungle Barefoot Books Sing along' (by Barefoot Books), offers a vibrant animation that, based on my observations, appealed to the students. As soon as the video began playing, most students sat up straight and watched it intently. Although there was unknown vocabulary in the song, such as 'floating', 'chasing', and 'climbing', the cartoon figure performed exaggerated actions whenever these words appeared, and almost all the students in the class laughed aloud at the humorous gestures. Several even enthusiastically replicated the moves along with the video.

Another song, 'Walking in The Jungle' (by Super Simple Songs), also contained terms that the students did not know, such as 'stomping', 'jumping', 'skipping', 'stepping forward', and 'stepping back', similar to the aforementioned video. The characters in the cartoon made the corresponding movements for these words, which the students found very interesting; some even imitated them. When the phrase 'I'm not afraid' was sung, the characters just smiled and shook their heads. There were no special actions or facial expressions to illustrate the word 'afraid'. As the students in the classroom had not learned the word before, it was clear from their expressions that some did not understand its meaning; some displayed expressions of confusion, while some even frowned slightly and asked the question, 'What are they doing?' The students were therefore not fully engaged with the video content.

The third song was 'Walking Through the Jungle Singalong Nursery Rhyme' (by My

Little World of Song). The design of the video was immediately attractive to the students because it began with recognisable images of animals. However, as the students began to interact with the video in earnest, I noted that the video seemed to have a very fast speed, and although the music was cheerful, many words were pronounced in succession that the students could not understand. When the video was shown more than twice, the performance of the students was notably different from the other two songs, as several of the students began to look around or became unable to focus on the video. Only when the image of animals appeared again with a cup of tea did the students exhibit signs of interest, sit up straight, and look at the video; nonetheless, only a few of them sang along with the song.

I interviewed teachers about whether they thought the music, tone, or graphic content of the videos impacted the levels of engagement exhibited by the students. Jack stated,

> *If I play some bitty music, for example, like something about pop music, yeah, because I think these pop music-style songs are quite fast or too difficult for the students… I can see the students feeling bored. They are enjoying the children's songmore. So the songs for children and students can be more engaged… and I can see they show more interest in this type of song.* (Jack, first interview, 28:02)

Tom also raised a very similar argument:

> *I would say when the students join some physical games or when they listen to funny songs, it helps them to show their faces, they can really obey the norms, and they give me a really good interaction.* (Tom, first interview, 27:50)

Students were evidently attracted to music with a rhythm, while slow, clear lyrics were also important. Thus, I concluded that students would be more interested if animations are used to help them comprehend the text in a video. They are likely to engage with a colourful, easy to understand, and entertaining music video.

Material Setting Presented by the Technology-Enhanced Learning Tool

In this study, technology was not just used to play audio or video songs to students; it was also integrated into several gaming sessions, such as classroom games created with PPT (see section 3.2). Through the classroom games with TEL tools, learners could observe, compare, and analyse information. The students could gain immediate feedback through the rudimentary version of the classroom game after the teacher

played it out (in some games, the PPT game would receive applause after the students chosen the correct answer). I saw that, in particular, the interactivity seemed to motivate them. They reacted differently to this feedback, displaying emotions through facial expressions, for instance. I made the following notes on the observation form:

> *Amanda seemed excited about the game's response, and a smile appeared on her facewhen the PowerPoint made an applause sound after she clicked on all the puzzle pieces and dragged them to the correct position.* (Observation form, Forest Nursery,Lesson 10)

> *Ray played the game of matching animals and words and completed it in the correctway, after which she smiled and applauded herself.* (Observation form, Villa Nursery, Lesson 8)

It was obvious from the smiles on the students' faces that most were enjoying themselves after realising that the game had responded appropriately to the answers they had given. Even after they had completed the task and returned to their seats, specific students immediately began to actively raise their hands to show the teacher they wanted to participate again. Based on the comparison using the SSTEW scale, this represents the level of engagement as 'excellent'.

When I interviewed the teacher Jack, he stated,

> *… can see they are really interested in all of this stuff, like… the PowerPoint, with the enhanced technology. And after a few weeks, I… I can still see that thestudents are very interested in playing games in this way.* (Jack, second interview, 11:46)

Tom shared a similar opinion:

> *[I] tried to make more IWB games within the PowerPoint. I will teach them by playing games, which could make them really engaged in the class.* (Tom, second interview, 14:04)

These statements revealed that the young learners seemed to like the way that music is combined with TEL. They were also emotionally engaged in these activities. My classroom notes indicated that several students expressed a willingness to finish the class, which I recorded because it did not appear on my initial classroom observation form, but I felt it was an expression of positive emotional engagement; as such, while

transcribing the observation form, I watched the classroom video and recorded specific student behaviours. More specifically, engagement appeared to come from positive emotions, and my classroom notes indicated several students' expressions of willingness to finish the class.

In Lesson 12 at the Forest Nursery, when the teacher was about to close the software at the end of the last picture matching game, the students seemed sad. One even said, 'Let's play again'.

Learning With Peers

The third factor was a surprising finding for me. In his interview, Tom mentioned that if students learned the content of the song in class, other students were easily influenced by the student who sang. As soon as one or two students started to sing the lyrics, they led the other students and sometimes even corrected them.

Learning alongside classmates in a classroom setting and completing assignments in pairs or small groups was yet another element that contributed to the students' increased emotional engagement. Their level of autonomy in learning was improved as a result of such learning, which offered them the freedom to converse with one another and the sense that they could choose and finish a task jointly. Conversely, during class time, the children were not permitted to communicate with one another in any way. They consequently valued the adaptability and laid-back nature of this activity, and thus, they were deeply emotionally engaged in the procedure, as Jack indicated in his interview:

> *I played the board games through the PowerPoint, and they were just watching the screen. And I can see they're very happy, but that it's quite individual, or, I would say, isolated, after I realised that I tried to pick up two to three students and let them stand in front of all the other classmates… interact with each other… So, I ask for two to three students to come in front of the class, and… They study in a group. And I encourage them to speak English when they communicate with each other or discuss each other. (Jack, second interview, 31:48)*

As indicated above, students' positive emotions led to their engaging in class topics. However, they also felt boredom and bewilderment. These feelings were frequently induced by a lack of interest in the music or its and an inappropriate level of difficulty. An example from my observation form demonstrates this:

> *Rita looks confused when the teacher calls her up to complete the game because shehas not been able to find the correct answer.* (Observation form, Villa Nursery, Lesson 2)

After explaining and demonstrating the children's engagement in the lesson, one teacher responded to her observations,

> *... I think they are very enjoying and happy watching these videos and listen… listen to this music. When they watch the video, I can see they are really engaged in these videos and music. And I can see it from their expressions, body language, and postures. They are really happy and engaged in the class.* (Jack, second interview, 00:37/01:31)

Jack's interview illustrates how these group activities unfold in practice. He describes how he transformed individual games into group- or team-based activities, promoting peer interaction and English-language use amongst students during discussions. These instances resemble peer-led study sessions, showcasing the potential for peer-to-peer learning to enhance emotional engagement in the classroom.

Teachers' Professionalism and Proficiency in Teaching

Lastly, the fourth factor was the effect of the teachers' professional teaching skills on students' behavioural engagement.

An early impression that I had during the study was that the two teachers were very well prepared and professional. I found from my observations and interviews that they were well prepared for their lessons, which were habitual practices of both teachers. As mentioned in the previous chapter (Sub-Section 4.4.1: Case Selection), I initially chose these two teachers in these two nurseries because of their expertise. This display of professionalism was evidenced by the teachers' proactive engagement in various preparatory activities prior to the commencement of the lesson. Specifically, they conscientiously entered the classroom in advance to make necessary arrangements, ensuring a conducive learning environment. Additionally, they dedicated considerable efforts to prepare themselves for the instructional delivery as well as meticulously organising all the essential components of the lesson. Moreover, the teachers astutely anticipated potential challenges or students' needs for support during the lesson, thus demonstrating their proactive approach to facilitating

a successful learning experience.

In his first interview, in reference to preparing for the lesson, Jack stated,

> *[P]ersonally, I don't like it like, for example, the picture, I don't like this picture formyself, so I think you have to choose some other pictures. Here in Google andthen bring myself.* (Jack, first interview, 19:34)

When asked a similar question, Tom replied,

> *I will prepare two or three songs in advance before starting the topic… First, I play the song in the book; if they don't like it, then I will bring the other song. Because in this project I must prepare the lessons before going to the class, I have to keep in mind that they are kids, and the kids are like, very frank to tell you that Idon't like this song, I don't want to say no… like this. They can do this. So I have to be prepared in advance.* (Tom, second interview, 04:57)

The teachers' level of preparation seemed to set the tone for the class and result in high expectations, which additionally increased motivation and deeper engagement with the learning process. These extremely high standards included how the teachers communicated with students about the larger aims of their particular tasks and how the abilities and information they acquired were applicable outside of the classroom setting. During my classroom observation periods, I discovered that the teachers paid attention to ensuring that students had proper pronunciation.

One interviewee illustrated this:

> *Sometimes kids there, especially Chinese kids there, some of the letters and pronunciation… They don't speak it like, for example, this to clean up, clean up… And it sounds 'cleaner'. So there's no up. Yeah, I always say that it is 'clean up', two words, something like that. The melody does help the students recall the words,but there is also a need to correct them.* (Jack, first interview, 33:20)

To a reader who is not familiar with the classroom setting, it may not come as a surprise that arriving on time, being well prepared, and maintaining a professional demeanour are required of students. However, in my experience, nursery school teachers are not always permitted to approach their pupils in such a manner. I concluded that the teachers in both classrooms were applying both their professional skills and attitudes (teacher characteristics) to create an environment in the classroom that fostered investment in learning activities (environmental characteristics). This, in

turn, contributed to the success of the students in both classes. In other words, this assisted students in moving from a state of inspiration to one of engagement.

Considering the teaching techniques of both Jack and Tom in terms of offering scaffolding or help allowed me to accurately forecast the amount of learner support required. It was clear from his interview that Jack had anticipated vocabulary or expressions that might be challenging for some students and had prepared slides or pictures to explain or illustrate some of them. Sometimes, the teacher would choose visual pictures so that students could understand the song or specific vocabulary in the target language more visually. Jack had anticipated these potential challenges and had prepared slides or pictures to explain or illustrate some of them.

> *You are right; they may feel confused [cartoon pictures]. So, this is why I just choose to use some real-life pictures and show them to the students to help them learn new words or new things.* (Jack, second interview, 17:24)

Another crucial aspect of teachers' skills is their approachability. In every classroom, I observed examples of informal interactions between the teacher and students. These interactions appeared to contribute to an encouraging environment in the classroom, as well as engagement for the students. Most of these unstructured conversations occurred as the pupils arrived at class, before the school bell rang, and frequently involved small talk about the weather, the date, or the breakfast planned for the day. The teachers responded promptly to anything that the students could communicate in simple English, sometimes even asking the teaching assistant (who spoke Chinese) to help with the communication through translation. An example is provided as follows:

> *Yes, I do not like to use like much. I can find the kids who want to speak more…Specifically, one kid, Summer, is very nice, even though his English is not good. Butwhenever he answered, he answered right, even with a one-word answer. He's notlike other kids like you ask A and he will answer B, he's like, if you're asking A, he'sgoing to answer you… on the point.* (Tom, first interview, 20:53)

Thus, according to the evidence presented above, approachability is another teacher quality that appears to affect the degree of student engagement. This could be because it satisfies a psychological demand for both competence and relationships. Approachability lowers the barriers between context and self, and the resulting motivation increases learner engagement and translates into action (participation).

Humour is another aspect of the teachers' personalities that contributed to the overall down-to-earth atmosphere:

> *Because I really want to make my class fun and interesting for the students, especially these young learners, I need to make them feel they enjoy it, and then they can learn the new language. They can learn the new words happily. As I said, this is not only good for me, but it's eventually it's very, very good for the students.So, I mean, when I tried to play music with other technology in class, the students were very involved in this class. They really focus on the class, and they reallyenjoy the class.* (Jack, second interview, 22:36)

This example demonstrates that the teachers, through the establishment of a relaxed and enjoyable learning atmosphere, effectively reduced the psychological barriers between students and instructors. This consequently fostered increased motivation and participation amongst learners.

5.3 Facilitating Factors for Promoting Student Engagement (b)

In this section, I discuss the factors that I discovered to influence the effectiveness of combining music with TEL in promoting student engagement, which is Core Theme b in Table 5.1. Firstly, I discuss the music-related factors (Sub-Theme b1), which include how music can create a conducive classroom atmosphere and how music can enhance students' attention. Next, I elaborate on the factors related to TEL (Sub-Theme b1). These factors encompass how TEL can empower students to become active participants in the classroom by providing them with multi-sensory experiences, fostering social collaborative learning, and facilitating joyful learning experiences.

5.3.1 Factors Related to Music (b1)

In this sub-section, I elucidate sub-theme (b1), which focuses on the factors associated with music that can enhance student engagement in the TELT-M pedagogy. This subtheme includes two categories: Classroom atmosphere created by music and songs and Music as a means of increasing students' attention.

Classroom Atmosphere Created by Music and Songs

The relaxed atmosphere created by music and songs came up frequently in the interviews and observations. In the interviews with the teachers, the word ‘relaxation’ was mentioned many times. For instance, when Jack outlined playing a video or music to his students during the lesson, he said he felt that ‘the students were more relaxed in this moment’.

Even though there is little pressure on teachers to teach knowledge in nursery schools, most teachers have teaching goals for their tasks or activities. However, not all activities can be completed easily. For instance, I observed that a knowledge-related activity such as ‘memorising ancient poems’ in Chinese class could be challenging for children, but listening to music could make the process relatively simple and facilitate the completion of the assignment. In my observations, I found that the students’ facial expressions and body movements revealed uncontrollable engagement and pleasure, whether they were watching a video or listening to songs. Moreover, when they were asked to sing along with a video or song in class, they did so without questioning whether they could sing it correctly. They were not required to assess whether there was a correct response.

In my classroom observations, I found that the students demonstrated more positive emotional states and attitudes when music was playing in the classroom. As a result, they could pay closer attention to the material being discussed and were more likely to actively participate in the learning process.

My research led me to discover that in the English class where there was no music (or TEL), even though only a small number of children displayed impatience, it resulted in poor performance in the class because the children occasionally exhibited reluctance to participate in class activities. After the songs were played, it was apparent that the students’ enthusiasm for participating in class activities, as well as their general feelings of interest and enjoyment, improved significantly.

Furthermore, it appeared as though the children enjoyed the music that was played in the classroom, and, as my research continued, the connection between the songs and increased engagement became apparent to me. During my classroom observations, I gathered data on students’ positive emotions with the emotional engagement observation forms (as outlined in Chapter 4, Table 4.5). For instance, the teacher in

the Villa nursery played the song ‘Walking Through the Jungle’ during the second week of my observations, and several students displayed joy the first time they listened to the song. Furthermore, after listening to the song more than once, almost all the students looked more comfortable and relaxed. As the activity was enjoyable, the students were more willing to participate in it. Through my observations, I found that in the Villa nursery, most students displayed very happy or excited expressions when they participated in the music activity, and in the 10th lesson, when the teacher began to turn on the video, a student named Amie said, ‘I like singing the most!’

During the lesson, the students appeared engaged – smiling, nodding, and even singing along with the music. The students in the Forest nursery were not quite as enthusiastic about the music as their counterparts in the Villa nursery, but most looked carefully at the screen as soon as the music began and were quite engaged in the song. Most of the time, they appeared to be paying careful attention to the song or video.

However, some students displayed negative engagement at first when they discovered that they were unable to fully comprehend the songs’ challenging language. For instance, before Tom played ‘Where Are You Going?’, he taught the class some essential vocabulary, such as the names of several locations, including a shop, park, zoo, pool, beach, and bank. The advantage of teaching some core words was that the students realised they did not need to understand every word but could understand the song once they had mastered the key words. I observed that after this step, the students became more engaged when they heard the song. Tom stated,

> *You know that sometimes we have songs because songs are all about music and the lyrics, right? So, there are so many different vocabularies in it, not just the targeted one. Well, our aim is to teach them the target vocabulary first. So, Ithink choosing songs that are relevant to the topic is important, helpful, and an important reason to pick the song to teach. Because when they listen to the song, even for the first time, when they listen to the targeted words, they recognise and say, ‘This is a word’.*
> (Tom, second interview, 1:15)

Thus, when a teacher selected key words to explain, this technical language objective (vocabulary) served as the focal point that assists students in listening to the song. Once the students could comprehend the song, they were more ready to sing along.

Upon exposure to the songs, the students conveyed favourable impressions, manifesting in contentment with the pleasurable listening experience and a sense of gratification and excitement upon recognising the integration of grammar or vocabulary they had acquired into the song lyrics they were actively singing. Throughout the lessons, most of the observed students exhibited enthusiasm, active involvement, and a strong drive for learning. Nevertheless, certain adverse emotions emerged, which stemmed from uncertainties and moments of frustration, as evidenced by the display of unhappy facial expressions, such as frowning. Notably, when the teacher increased the music's tempo, a decline in student engagement was discernible, leading to observable signs of anxiety or boredom. Jack mentioned this problem:

> *If I play some sort of quick music… it can be too fast or too difficult for the students.After I did some experiments, I could see that the young learners felt anxious or bored. They were enjoying the children's songs more. So the songs should be for children, and students can be more engaged…* (Jack, second interview, 28:02)

This problem was improved and resolved by the teacher's selection of alternative music, which gave the students more of a chance to choose the music they enjoyed.

In addition, I observed that the students' active participation in singing, as well as their willingness and overall positive attitude, were apparent in how they gave answers by raising their hands or by singing the song directly, as opposed to the typical passive (disengagement) response of remaining seated and repeating after the teacher. Students seemed to gain confidence in their behaviour when they answered questions or sang songs from memory. For instance, Yan displayed a high level of confidence and remained engaged and inspired during the whole class, which was particularly essential given that she was a student who was typically disinterested in English classes (as mentioned to me by the teacher before the study began).

Although, in some instances, students who were previously unwilling to participate did not remain interested throughout the entire course, my observation of Yan indicated that she gradually grew engaged. Yan was an introverted student. Observing her closely throughout the lecture, I could tell by her posture and facial expressions that she became more eager to engage in class. She raised her hand and expressed an interest in speaking, which indicated that she was excited. She radiated

happiness and self-assurance as she prepared to ask the questions she had identified after listening to the song.

My preliminary investigation brought to light the presence of two distinctive cases within the investigated class. Firstly, one student with significant learning difficulties exhibited a recurring pattern of non-compliance, often opting for self-directed actions. Secondly, there was a particularly gifted student in the class who, despite his talents, displayed a general disinterest in participating in regular learning activities due to perceiving them as too simplistic. Remarkably, both students experienced noteworthy changes in their behaviour following the integration of songs into the instructional process. The incorporation of songs sparked a newfound enthusiasm in both students, leading them to actively engage in all learning activities centred around the musical elements. This positive transformation in their conduct suggested the potential efficacy of using songs as a teaching approach.

However, it was imperative to engage in further discussions and conduct in-depth analyses to ascertain whether the use of songs possesses the capacity to engender interest and active participation amongst all students, surpassing other conventional teaching methods. Emphasis may be placed on scrutinising the responses and reactions of gifted students, as well as those facing challenges in their learning journeys. Such an investigation can provide a more comprehensive understanding of the broader impact of integrating songs as an instructional tool.

The necessity of limiting students' conversations and preventing them from creating unnecessary distractions was a disadvantage of employing music in the classroom that I observed throughout my research. It was often difficult for the teacher to control the noise level and constant chat, which distracted the students and hindered their engagement. The music roused and energised them, resulting in a relaxed and enjoyable environment; however, it also caused some problems. The greatest obstacle was the students (predominantly boys) with significant discipline or learning problems. After singing the song, they became extremely excited and could no longer engage with or listen to the teacher.

In certain instances, a sub-set of students did not display an apparent enjoyment of the learning experience, indicating a preference for more conventional teaching methods. Notably, these students exhibited heightened levels of frustration and disappointment,

which were primarily attributable to their inability to maintain pace with their peers or comprehend the meaning of the songs, even after the teacher had explained the key vocabulary. Additionally, there were occasions when the incorporation of songs appeared to have a demotivating effect on some students, leading to reduced engagement in the learning process. Nevertheless, these instances were relatively infrequent, and most students responded positively to the song and music activities.

Music as a Means of Increasing Students' Attention

Music was found to increase students' attention in the class. Jack said that when the students heard a familiar piece of music, they became highly attentive and could immediately memorise the lyrics. When he mentioned that the students had begun to focus on the music, he stated,

> *For example, if I just sing along with the music, the students will sing with me, as you can see, because they are familiar with the song.* (Jack, first interview, 40:13; this sentence appeared at 40:13 in the interview, the annotations represent the same meaning in the following text)

The students' attention was most noticeable in their song recognition and interest, as well as in changes in their responsiveness to the music and whether they engaged in cooperative participation in musical activities. Through my observations, I found varying levels of attention, from participating with a clear awareness and recognition of music in the environment, taking pleasure in the experience and seeking their own preferences, to rejecting the music outright. For those students in the emerging music developmental stage, this was outlined by a change in initial engagement – from an apparent lack of awareness to initial recognition and sensitivity and the beginning of demonstrating greater interest in musical stimuli.

Once the students had focussed their attention on the music, they began to make further choices. Thus, when students were highly engaged in music, they began to express their own preferences for music. They indicated, through words, whether they enjoyed the songs they heard, or even said in advance what music they liked in prior lessons. Jack stated,

> *And students like the music with a strong beat or some familiar content, like a slow and repeated sentence. (Jack, first interview, 25:35)*

My observations also revealed that students had distinct musical preferences and were beginning to make independent musical decisions. The awareness and management of musical stimuli demonstrated how children began to grow more competent in their auditory environments, both in terms of seeking and gaining enjoyment from music as well as detecting when music is unwanted. This increasing awareness of music's function and existence could also be detected in the students' behaviour in class. These shifts were usually minor, with engagement patterns emerging over a longer period.

I discovered this through classroom observations. During the first and second weeks of class in the Villa nursery, the teacher played a variety of songs about The Very Hungry Caterpillar. I watched the students transition from simply participating in the music to beginning to develop their own musical awareness and preferences. After the teacher had played the song, some students would respond, 'I don't want to listen to this', while others might say, 'I'd rather listen to another piece of music since it's more interesting'.

The students' enhanced interest was indicated by their effective response to the activity. Changes in the types of music they participated in were also observed amongst those who had previously demonstrated engagement in music. I also observed that students interacted with various musical genres in various ways. Specifically, I observed changes in attention and how these influenced their emotional engagement in the classroom.

In my notes, I recorded some examples, such as Classes 8, 9, and 12 in the Villa nursery and Classes 9, 16, and 20 in the second nursery, when students conversed with the teacher about their preferences for songs, and the teacher agreed to play the music that the students asked for. The students could clearly focus better after the teacher agreed to play the music they had requested, since it was their own decision or the choice of their peers. When the teacher played a piece that the students were not particularly interested in, a few students began to show signs of resistance or unhappiness. This further illustrates that students' engagement transformed or evolved to a higher level of interest and sophistication, with a heightened awareness of the distinctions in engagement elicited by the varying degrees of attention they gave to various types of music.

My observations suggested that students were more drawn to and sensitive to children's songs. In the Villa nursery, the teacher played hungry caterpillar songs with the same themes but different rhythms and rhymes throughout the first and second weeks. During the lessons, I observed the students' joyful expressions and movements in response to the slow, repetitive, easy-to-learn songs. For instance, they sang along with the teacher attentively, their faces displayed attention, and they swayed or danced when they heard their favourite music. Most students paid less attention to the music when they heard it sung by an adult, whereas they paid greater attention after they learned the beat of such simple, rhythmically obvious tunes.

If the teacher chose music that the students enjoyed, they were highly engaged and attentive during the music session. Tom emphasised this point:

> *I found that even if I use more music, it's not a waste of time. Because the students are watching it and learning from it. It's really important to choose a suitable video to let them learn the target vocabulary… I mean, if the students really, really like the song you choose, it will be good material and a good assistant to help you grasp their attention. (Tom, second interview, 31:14)*

As students began to focus on the songs and choose their favourites, the teacher's ability to play their favourites made them more engaged in the songs.

5.3.2. Factors Related to Technology (b2)

In this sub-section, I elucidate the sub-theme (b2) linked to technology that can enhance student engagement within the pedagogical framework of combining music with TEL. These factors were categorised into four categories: Shifting power in the classroom, Multi-sensory experience (IWB/projector), Social collaborative learning, and Fun to learn, as outlined in Table 5.1.

Shifting Power in the Classroom

The section highlights how TEL, particularly the use of IWBs, can empower students to take control of their learning, fostering increased engagement and enhancing the language-learning experience. It also emphasises the changing role of the teacher from an authoritative figure to a guiding presence in such interactive learning settings.

As Tarmo (2016) notes, in traditional classrooms, the teacher is ‘omniscient’ and controls instruction. Students often ask closed-ended questions to the teacher to confirm understanding or correctness, which rarely requires critical thinking or active involvement. Thus, pupils respond positively or negatively based on prior beliefs, without actively generating information. Due to the teacher’s power, students are excluded from knowledge creation in the traditional classroom.

This dynamic was not evident in the English classes, as I observed that the foreign teachers could be less authority conscious than Chinese teachers. However, as students were used to being taught under the traditional classroom model, I observed that when the teacher asked a yes-or-no question, the students made judgements based on the answer the teacher came up with. This changed when the students were completing TEL games, when, in addition to their increased enthusiasm, the balance of power in the classroom changed, and the power shifted to the students.

For example, when the IWB displayed images of different objects, the teacher prompted the students to identify and name the objects in English. Instead of the teacher providing the answers, the students actively interacted with the IWB, using their fingers or the stylus to touch the correct objects on the screen and articulate the corresponding English words. The IWB provided immediate feedback, reinforcing the correct responses and offering guidance for any errors. The students could thus actively participate in the learning process, exercise their decision-making skills, and improve their language abilities through this interactive experience. The teacher assumed a facilitative role, observing and providing support as required, while the students took control of their learning, thereby experiencing a shift in the power dynamic. They became active participants, engaging in hands-on exploration and developing language skills through collaborative and interactive approaches. This fostered increased student engagement and enhanced their language-learning experience.

Furthermore, when the students played games individually or in small groups in front of the IWB, they were required to independently find solutions to complete tasks. At this point, the teachers were not entirely excluded from the process, but their role transformed from being an authoritative figure to a guiding presence in the background.

Multi-Sensory Experience (Interactive Whiteboards/Projectors)

In this section I discus how TEL devices, such as IWBs, can engage students through multi-sensory experiences, particularly by stimulating their visual, auditory, and tactile senses.

TEL devices can activate various sensory modalities, including visual, auditory, and physical pathways (Wood & Hedges, 2016). The use of audio, video, and IWB systems, as well as projectors, provides students with a diverse array of multi-media materials, thereby stimulating their senses and enhancing their engagement with the content. Taljaard (2016) proposes that the success of multi-sensory pedagogical approaches in facilitating learning is attributed to their alignment with the natural environment, rendering the learning process enjoyable and enabling children to establish connections with real-world contexts. Indeed, my research findings indicated that employing a variety of instructional methods is crucial, given that children of similar ages do not necessarily possess uniform levels of psychological readiness. Different TEL approaches can be employed to present learning concepts in various manners, thus enabling children to acquire proficiency in using preferred styles aligned with their specific needs.

According to my observations, the children displayed different levels of engagement with different types of activities through TEL, but when the students could interact with the IWB system, they displayed the highest levels of engagement, due to the higher level of sensory stimulation. For example, they were closely engaged in the IWB game, which had a multi-dimensional design that combined pictures and sounds with animations and games. Their expressions and body movements indicated to me that they were interested in the videos, pictures, and games, but what they liked most was the feature of having interactive touchable features (e.g., games on the IWB or projected by projector, where they could touch the wall, and the teacher would help them by performing the actual clicking).

In his interview, Jack noted that the students enjoyed playing interactive games that allowed them to touch the screen. He consequently created many games that allowed students to interact with the screen.

> *We do have an interactive board, so we can ask the kids to go to the front,*

> *and they can point to the pictures or whichever object they want to choose. And it will pop up something… Something like that (Jack, first interview, 00:23)*

The students' sense of touch was aroused as a result of such activities, and their engagement with the TEL content was increased as a result. In addition, for the children in the Forest nursery, having the ability to touch the items and objects displayed on the IWB made them feel happier and more engaged. This was reflected in the performance of a student named Jason, who was called to the front of the classroom to participate in a game using the IWB. During the lesson, he had a particularly exuberant laugh and a happy, joyful expression. I recorded these facial expressions in my notes, as well as his language when he was watching the video. As soon as Jason was finished, he said,

> *I think it is fine, because, for example, if I'm going in the next semester, if I'm going to teach them the other group of students. (Tom, second interview, 06:43)*

This instance illustrates the interactivity of touch displays, a feature of IWB systems that enables children to interact with digital items and receive instant feedback. In addition, because their fine motor skills are not fully developed, preschoolers cannot operate traditional computers, which require the use of a keyboard and mouse. IWB devices can thus be highly convenient for helping young children engage in class, as they can operate the device directly with their fingers; by contrast, using a projector, although also possible, means that teachers cannot see where students are tapping, thus giving the students no immediate interactive experience. In other words, the IWB system allowed students to experience the stimulation and interaction of multiple senses, and although the teacher could attempt to imitate it by using the mouse when the students were using the projector, I found that the experience of allowing students to participate was less effective and engaging than when they were allowed to use an IWB that actually responded to their touch. An IWB system allowed children to touch the graphic icons directly with their fingers. This direct manipulation appealed to children and excited them. It also permitted them to interact with the digital environment through tapping, dragging, swiping, pinching, and sliding (Ai-Chu, 2023).

Through contact and interaction with an IWB, students may develop cognitive and motor skills that may impact their thinking and finger coordination. Most of the

children used touch gestures such as swiping, tapping, and dragging throughout the programme, and they required IWB interaction to complete assignments. The instantaneous response to each contact and selection gave the children a sense of being in charge and helped them maintain their focus and interaction. In addition, I found that children's immediate use of the IWB increased their engagement as they could control the digital objects displayed on the screen. This direct participation enhanced their motivation and confidence. Moreover, in a similar way to how music increases students' focus (as considered in Sub-Section 5.3.2), tactile technology increased the children's focus and provided an interactive experience.

Although the IWB system was more convenient for the teacher than the projector, the slightly more limited experience of the projector did not affect the students' active engagement in the class. This could be seen in the interview with the teacher Jack:

> *Which means this: the young learners or students really enjoy and concentrate on these games.* (Jack, first interview, 31:03)

While the IWB system or projector could give students a multi-sensory experience, Tom raised another concern:

> *If the whole class is about visual learning, some games in the IWB do not engage students enough; they are just watching. They are just sitting there, and they mightfeel sleepy sometimes… They are paying less attention to the class. If the game is very short it's not time consuming, then it's okay.* (Tom, second interview, 05:18)

Nevertheless, selecting the game to be played with the IWB is a highly significant decision, similar to choosing the song to be played in a music activity. Students can enjoy the multi-sensory experience and become more engaged in the subject being taught in the classroom if the games they play are either shorter or allow numerous students to participate together.

Social Collaborative Learning

This category emphasised that communication and cooperation amongst students in smaller groups or pairs promote active participation, idea sharing, problem-solving, and a deeper understanding of the material. It was also suggested that TEL can facilitate and support these social interactions, creating a conducive environment for

students to freely communicate, share ideas, and collaborate with their peers, ultimately increasing motivation and enthusiasm for learning.

According to DeWitt et al. (2013), social contact is one of the most essential components of cooperative learning. According to Vygotsky (1978), one of the most influential factors in human development is social interaction. I discovered that educating children in collaborative contexts, such as smaller groups or collaborative classrooms, is an effective method for enhancing their engagement and learning. Communication amongst students is essential to the learning process because it enables students to collaborate on ideas, make plans, find solutions to problems, and make connections between new and previous information. The participation of students in cooperative activities in smaller groups not only inspires and motivates them to learn but also helps them to remember more; thus, they develop a more profound comprehension of the material (DeWitt et al., 2013). My research findings were consistent with eychav and Wu (2015), who note that children are provided with greater opportunity to construct meaning and digest knowledge when they are taught in small groups.

In this investigation, most of the social interactions between students occurred in small groups or pairs. This did not imply that they were not interacting as a group; rather, peer interaction was more prevalent. As mentioned above, higher levels of classroom engagement are the result of pleasant interactions between students and their participation with their classmates. According to socio-cultural theory, learning occurs whenever interaction occurs between children, as this leads to the formation of collective knowledge. In this model, students are supported in their educational endeavours by a combination of their peers, teachers, and technology.

Throughout the study, peer interaction manifested in a variety of ways, such as students talking about ideas, participating in games, and listening. I found that students smiled or laughed more frequently during peer or group-based games. In reality, the interactions of students are contingent upon their development, the play environment, and the relationships between play partners (Lawrence et al., 2019).

One example impressed me. In the third week of Tom’s class, two students were called together to the front of the room to complete a connect-the-dots game. The game required the students to connect the picture on the left with the word on the

right. The two students exhibited happy facial expressions throughout this process and carefully discussed what was shown on the IWB. Moreover, as mentioned in Sub-Section 5.3.4, if the teacher asked one person to complete the activity on the screen, the other students sat quietly and watched without getting more engaged. My observations revealed that when two students were collaborating on an exercise, the other students began to look more carefully at them, and some were smiling and more involved since they could hear the two students communicating.

Jack expressed a similar view:

> *… I mean, the students are more likely to watch another group of students do the games. It looks more interesting than one pupil. And sometimes, even when they are not asked to join in the game at that time, they will still get involved by watching another group of students. (Jack, second interview, 33:55)*

I discovered that when students collaborated with their peers, they did so in several ways, including sharing ideas, discoveries, prior knowledge, and experiences; debating; negotiating; and providing advice or technical assistance (scaffolding). This is illustrated by the following example.

The teacher asked a group of students to come to the front of the classroom to complete and select pictures of the different stages of a caterpillar's transformation from caterpillar to butterfly. When Filora saw the picture of the caterpillar, the following dialogue occurred:

> *Filora: The butterfly was a caterpillar when she was a baby.*
> *Linda: That egg was the beginning.*
> *Filora: It began with an egg, and then the caterpillar… she was a little green caterpillar, and then she… ate a lot of leaves, and then she turned into a beautiful butterfly.*
> *Linda: Butterflies are big butterflies. (Villa Nursery, Lesson 10, video recording)*

This example illustrates the types of interactions that occurred when students used PPT presented classroom activities. For instance, children instructed their companions on how to finish a task and discussed their options. In addition, viewing images assisted them in recalling some of the information and previous experiences that they had shared with their colleagues or group. These actions involved speaking with, explaining to, or assisting students in developing their social and cooperative

abilities.

In Section 5.2.1, I mentioned hearing similar viewpoints from teachers. In addition to their perspectives, my observations indicated that the application of TEL can serve as a key factor in enhancing freedom of discourse and peer interaction to a certain extent. Within activities involving TEL, students enjoyed the relaxed atmosphere of group settings, which allowed them to engage in conversations freely and share their thoughts and discoveries with peers. The emotional satisfaction derived from the freedom of discussion in the classroom contributed to their increased motivation to actively participate. Furthermore, it also enhanced students' enthusiasm for learning and their overall attitude.

Fun to Learn

This category focusses on incorporating enjoyment and entertainment into classroom activities involving advanced technology to enhance children's learning experiences and engagement. It discusses how educational content designed to be playful and entertaining appeared to capture children's attention and motivated them to learn.

During the interviews, the teachers stated that there was no doubt that their students enjoyed classes that used TEL because they provided a sense of fun. Tom said,

> *I will use this method in the future because I applied it, and to be honest, I found ituseful for students' engagement. And it helps me, like, make the class more interesting and fun… I need to make them feel they enjoy this, and then they can learn the new language.* (Tom, second interview, 21:40 and 22:36)

Tom said that he would continue to use TEL as a tool afterwards because it makes the classroom more interesting and fun for the children. Similarly, the other teacher, Jack, stated the following benefit: '[A benefit of] using the interactive board is that children are having fun with it' (Jack, first interview, 03:27).

When students had fun, their engagement increased. In other words, having fun in the classroom is a strategy for increasing students' engagement. However, during his interview, Jack mentioned another crucial point. Although the use of TEL is fun and entertaining, it sometimes distracts children from the learning process:

> *But disadvantages also exist [with online games]. The students can easily be distracted by the videos. And I think the students are really engaged in these, and they enjoyed watching them. But if I play the video for quite a while during the class, I think the students, because they are young learners, may find it difficult to come back and concentrate on me or the class immediately… (Jack, second interview, 14:54)*

In other words, when Jack used TEL as a teaching tool, he found that the animations were interesting and attracted the students' attention, allowing them to concentrate; however, when the video ended, they could not immediately redirect their attention to him.

In addition, both teachers mentioned the importance and irreplaceability of physical games in reference to TEL. Physical games can also be fun for students. Tom stated,

> *I would say when the students join in some physical games or when they listen to funny songs, it helps them to show their face, and they can really obey the norms, and they give me a really good interaction. Even sometimes, I have to say that playing games physically is good…is better. Because I can make the groups look like four kids together… (Tom, second interview, 27:50)*

Here, he highlighted that he felt that physical games were irreplaceable and sometimes even more fun than TEL games because he could easily get students to do group activities.

The other teacher, Jack, also expressed,

> *It depends on the content, but the technology and music really help. But the games with lots of interaction without technology or music are great too. (Jack, first interview, 42:35)*

Although Jack felt that the games presented using TEL tools were fun, he said that offline games would allow more student–teacher and student–student interactions.

Children love playing games. Through TEL, they could discover and solve problems in a new academic environment. When using TEL as an educational tool, students generally had fun and enjoyed the games, animations, and sounds of the games, but they were also engaged in traditional physical games if they were properly set up to let them have fun.

5.4 Potential Barriers to Using Music Combined with Technology in Learning (c)

Within this theme, there are two sub-themes divided into two areas: barriers related to teachers or school, and potential challenges related to students.

5.4.1 Barriers related to teachers or school (c1)

My interviews with the teachers revealed that although both had positive attitudes towards TEL, they were still anxious before and during the research process about whether they could successfully apply TEL, due to their lack of relevant experience and training. It took much time for the teachers to investigate how they could make the most of the technological resources available within the classroom, as well as produce multisensory lessons. Moreover, both Jack and Tom felt that they may not be spending time on their work after they had finished in the nursery. Before conducting the research, I asked both teachers about the obstacles they had encountered while using computers to prepare classes. Jack responded,

> *The students love music and technology, but sometimes I do not have time to prepare the technology and music in advance. (Jack, first interview, 41:40)*

Jack believed that introducing TEL into the classroom increased his workload due to the necessary preparation involved, which increased his responsibility. Teachers already devote much time to crafting lesson plans to engage students, and modifying these plans to include multi-media equipment for delivery requires extra work; in addition to preparing lesson plans, they must assign homework, assess children's understanding of the curriculum, observe them in the classroom, and arrange communication with teaching assistants.

After the research, Jack had a new perspective on using computers for lesson planning:

> *So it's like, for example, on Monday after I finish my lunch and I still have some spare time, I use that, um, 20 or 25 minutes to do the preparation. And I do it every day; I would say it took me 5 days, but I only use my spare time in school, and I can prepare the lesson plan for the next 2 to 3 weeks. So use the time in school, and it is quite helpful for me to save my after-school time to do this. (Jack, second interview 27:07)*

Jack would still need to find time to prepare for his classes, but he would no longer have to sacrifice his day off or personal time after work. When Tom was asked a similar question, he responded,

> *I will do that, as I said, though it takes time to prepare the PowerPoint, and you're familiar with that. But if you are familiar with how to make the animations and all that in the PowerPoint, it is really because the kids enjoy the animations in the PowerPoint. They really, really, really love their animations. (Tom, second interview, 09:29)*

Tom believed that multi-media courseware takes time to prepare, design, and produce, but once the teacher starts to become familiar with the process, the production time becomes shorter, and he or she will find that the students are really engaged in the class that the teacher has prepared.

> *I think it is fine, because, for example, if I'm going in the next semester, if I'm going to teach them the other group of students. (Tom, second interview, 06:43)*

In addition, Tom stated that although it takes additional time to prepare the lessons and music, once they are complete, they can be employed in multiple sessions. When the same lesson can be taught in multiple classes, the teacher's preparation time is greatly reduced.

It was evident from the interviews that the teachers possessed technological skills; however, integrating TEL skills into the classroom takes more than the basic technological skills that they possessed. Teachers are required to acquire knowledge about the pedagogical role of technology. They must not only properly incorporate educational software into the curriculum but also embrace a child-centred mentality to maximise the equipment's potential. Teachers require periodic training to learn how technology can assist them in meeting curricular requirements and how it can be utilised to assist weak students, foster creativity, and improve students' learning. In addition, they ought to have knowledge of the technologies and multi-media devices accessible to support their practices.

In addition, working with technology may involve unforeseen challenges, such as technical problems, poor internet availability, and bugs that must be fixed, which can impact the use and dissemination of multi-media by teachers. Changing technology is

perpetually increasing the professional development that teachers require, requiring them to maintain pace with the latest technological developments, particularly those that benefit their work.

Indeed, the adoption of new pedagogies and the trend towards TEL required teachers to change their teaching pedagogies and design more accessible lessons for learning environments that involve TEL. To cope with the possible changes in activities, such as differences in student engagement processes and levels of engagement was redesigned to accommodate this type of learning.

In addition, the development of acceptable classroom teaching materials and the location of content that is suitable for the curriculum can be challenging for instructors. Although lessons can be made with very simple mini-games, the sorts of games played and the locations in which they are played are also significant. The games may also be structured to inspire students to solve issues, foster creativity, and increase curiosity. Students will thus have a better overall learning experience, which will lead to higher engagement on their part, if the classroom is equipped with content-rich media that includes animation, still images, moving images, and audio. Notably, to keep children engaged, supply appropriate teaching pedagogies, meet their requirements, correspond to their level of ability, enable them to acquire knowledge at their own rate, correct their misunderstandings, offer culturally appropriate data, align tasks with real-life situations, and provide scaffolding, elements such as rewards and prizes are also essential.

Beyond the problems that teachers may have when preparing their classes, the accessibility of TEL devices is another concern. In China, many private nurseries have the infrastructure for advanced technology, but its use is still in the exploration stages in terms of management, culture, assessment, design, and pedagogy (as discussed in Chapter 2). Private nurseries are committed to providing their students with a high-quality learning environment; however, there is little support for systematic teacher training and equipment training. This lack of support can cause teachers to consider the negative aspects of TEL and stop them from using such devices to successfully enhance students' engagement and learning.

In his second interview, Tom stated,

> *I mean, just in my case, the music in the PowerPoint is not working well because the songs in the PowerPoint never played. (Tom, second interview, 07:33)*

After speaking with the teaching assistants, I discovered that this problem could have been easily avoided if Tom had obtained the proper instructions to select the suitable audio player. Thus, this was a case in which some training could have efficiently resolved a technical issue.

In terms of discovering materials, the teachers stated that when they searched for videos, they were frequently required to use alternative software to download the appropriate videos because they could not access websites such as Google and YouTube in China.

The uncertainty around such software increased the teachers' preparation time.

> *I can use my iPad instead of the school computer because there's a VPN, so I can use Google. Yeah, I can find more on Google than Baidu or Bing. I know there are a lot more, but it's more convenient than for me. (Jack, first interview, 23:07)*

Here, Jack stated that he prefers to use Google to find images or relevant lesson content when preparing for a class because he has always used this site in his native country. An information security and censorship technology programme called the Great Firewall has been widely used in China since 2008 (Chandel, 2019), which prevents internet users in China from visiting many foreign websites. While it is currently difficult for teachers in China to access certain foreign websites, the teachers overcame these obstacles through their creativity.

5.4.2 Potential challenges related to students (c2)

In this sub-theme (c2), I analyse the challenges associated with using music and technology in the classroom, specifically regarding their impact on students. The primary focus is on potential requirements for teachers to allocate additional time to classroom management when implementing activities combining music with technology.

Soon after I began my research, both the interviews and classroom observations

revealed an essential classroom issue. When the teachers began showing videos to the students, they would sometimes quickly lose control of the class, because some students became engrossed in the video's content and extremely excited, which caused them to speak loudly and even run around the classroom. Jack stated,

> *But if I play the video for quite a while during the class, I think the students, because they are young learners, may find it difficult to come… (Jack, second interview, 14:54)*

Students can be highly interested when watching a video, and this engagement might impact their participation in class after the video has finished. After the teacher had turned off the video, some students may be too excited to continue to engage in the activities that follow. Thus, Tom chose to reduce the frequency of the videos and replace them with audio or his own chants to keep the students engaged in classroom activities and focussed on their tasks. He stated that the audio and songs were complemented with physical gestures to attract the students' interest.

> *So I try to play the audio, and I sing as well. I sing with the song, and I do some actions to make them focus on me. So instead of making them distracted, I make them look at my actions and follow them because they really like to do so.* (Tom,first interview, 18:50)

By contrast, Jack's strategy was to simply pause the video and request that the students imitate his body movements to recapture their attention:

> *Yes, it is distracting if I show the video and stand in front of the class. So I will stop the music and take action. (Jack, first interview, 51:50)*

In addition, I observed that the teaching assistants helped the teachers regain control of the classroom by reminding the students of the rules and the consequences for breaking them (e.g., not being shown a video in the next lesson). I observed that it took at least 3 weeks for the students to adjust to the use of TEL in the classroom.

In my observations, watching videos in the classroom was just one source of disruption to students' learning. Disruptions were sometimes also caused by noise made by certain students while others were engaging in a singing activity, or by their singing too loudly, which led other students to become distracted and less able to engage in typical classroom activities. After a singing activity had ended, there were also times when students would willingly continue to hum the songs that were taught

to them by the teacher. Although students can learn in a more relaxed environment when music is provided, the fact that this can make the process of learning more chaotic can make it more difficult to establish authority over children. Ultimately, this can impact how well they are educated.

5.5 Teachers' Reflection on Student Engagement and CAR (d)

This section explains the teachers' reflections on student engagement and CAR in the context of the combination of music and TEL. This theme has two sub-themes, one of which concentrates on reflections on the application of TEL and music as teaching pedagogies and tools; the other emphasises teachers' perspectives on the collaborative action process, including achievements and experiences.

5.5.1 Teachers' Reflection on Student Engagement (d1)

In this section, I expound upon the reflections of the teachers regarding students' engagement in my research. The primary focus encompasses teachers' perspectives on the inclusion of music combined with TEL. Specifically, I discuss their recognition of the significance of physical games as an indispensable aspect and delve into the perceived benefits of TEL as acknowledged by the teachers. I use two distinct categories to consider the first sub-theme (d1) – The importance of physical games and Benefits of modern technologies.

Importance of Physical Games

In their interviews, the teachers repeatedly asserted that despite the many benefits of TEL, physical games cannot be completely replaced, as they allow students to be more active through kinaesthetic learning. The physical games played regularly in these two nurseries included 'passing the ball and saying the words', 'finding the cards', and 'grabbing the chair'. Games in practical classrooms give students the chance to interact with a range of things, learn about the world, interact interactively with their teacher and peers, and improve their observational skills.

Tom mentioned the advantages of physical games a few times, as in the following:

> *To be honest, the kids of that age really love to play physical games, getting involved more. And like, it's up to you how you are going to put that. Your vocabulary, which you're teaching into the game, can mix and match.* (Tom, second interview, 14:05)

According to his observations, as students in this age group are motivated to engage in physical games, he designs a range of physical games for them to play in the classroom each day. The games enable more students to be involved in class simultaneously and to comprehend the vocabulary or grammar being taught.

> *Playing physical games is… How do I say that they can be more engaging, right? The focus is much better. I can tell from their behaviour and response in class. Their mobility is much better because they know where they are going and what they are supposed to get.* (Tom, second interview, 25:21)

Tom also mentioned that there were even classroom activities during which he felt that physical games would engage the students more than TEL and music, because their behaviour and reactions made him feel that the activities were more motivating. On such occasions, physical games made students more aware of the activities they were doing and allowed for more interaction.

Furthermore, the experience offered by multi-media, whether audio, video, images, or animation, was full of details that were not easily observed in physical games. They could enable students to visualise and comprehend complex concepts through games and videos; however, during classic games, the teacher could bring in real-world objects so that students can experience smells and tastes elements that TELT-M cannot offer. Using the IWB or projector enabled children to investigate and learn using only their hearing, touch, and sight; while this system could stimulate certain senses in students, it lacked the element of touching actual objects. As such, the other two senses, namely taste and smell, were not involved. Learning English requires students to use all five senses to acquire knowledge and make discoveries, and TEL does not create a learning environment that stimulates all five senses.

When I was conducting observations at the Villa nursery, I saw an instance in which a real-world object enhanced the children's learning experience immensely. Jack talked about the hungry caterpillar in the classroom, and one of the foods that the caterpillar eats is salami. Salami is not a popular food in China, but Jack did not want to skip the word and leave the students without understanding; he thus talked to the

headmaster and bought a piece of salami from the nearby imported food supermarket. Before the lunchtime meal, he let the students play a game that involved grabbing chairs, and by the end of the game, everyone had tasted the salami, and the children were happy to compare it with more familiar sausage; moreover, most of them could repeat the word salami with ease (Villa Nursery, class notes, Lesson 10).

Benefits of Modern Technologies

An additional major finding of this study was that technology (e.g., messaging and video chats) mediated the collaborative process between me and the teachers, involving relationships of support, reciprocal participation, and trust. We investigated the consequences of many of their activities and the effect of these actions on their professional development, interacting in a reasonably collaborative and supportive environment throughout.

I consider the video conversations to have served as a collaborative trust-building and negotiation exercise for the development of mutual understanding between the teachers and me. In this instance, the teachers' respectful attitude of talking through the phone, their genuine interest in the research, and their appreciation for the information I presented served as catalysts for the continuation of our relationship. In reality, the face-to-face communicative element of Tom and Jack's meetings fostered trust and laid the groundwork for our collaboration. However, when we still needed to contact or interact after they had finished their schoolwork, we used technology that allowed for more relaxed and natural communication, and I could send them recommendations, documents, and questions in a natural discussion. My questions primarily encouraged the teachers to share their perspectives and foster their ability to think critically.

Moreover, this study revealed that Jack's level of reflection was stimulated by narrative activities and reflective questions, which prompted him to adopt a more empathic and introspective attitude. Crucially, I believe that reflection in professional development programmes (both online and face-to-face) must be approached naturally through continuous inquiry into what one is doing and why.

Notably, the findings also indicated that contextual factors in online and face-to-face situations both facilitated and restricted opportunities for communication that

reflected emotional and personal beliefs and thoughts. As mentioned above, internet communication enables a comprehensive discussion of the teacher's previously critical thoughts (more time for reflection online). During the face-to-face narrative session, however, I noticed that both teachers expressed their emotions and feelings about the teaching profession more, whereas the interview was more formal because I was recording and we were unable to communicate with the same level of emotion.

Face-to-face communication may permit teachers to engage in a more personal, introspective, and emotional way; however, online communication and interview formats may prevent teachers from expressing their voices more.

5.5.2 Reflection on the Collaborative Action Research (d2)

This sub-theme primarily highlights the significance of school support and the benefits of CAR in improving research capabilities and professional skills, as well as in promoting the engagement of teachers in social practice. These ideas were coded under three categories, namely School support, Improving research capabilities and Professional skills, and Engaging teachers in social practice, discussed below.

School Support

The findings of this study indicated that the socio-cultural setting of the nurseries in which the teachers worked influenced their professional development by defining their attitudes and opportunities about the use of technology for professionalisation. The teachers' positive opinions towards the use of technology for professional development and their experiences throughout the study is explored A variety of opportunities provided by the school, including technology resources, the school's willingness to allow them to participate in the project, and additional support from colleagues, assisted the participants in realising their personal development path more thoroughly in a relationship of mutual growth that repeatedly influenced their intentions and attitudes towards professional development. Schools that encourage teachers to explore the technological potential and engage in collaborative action activities might be beneficial to their professional development.

In summary, my findings suggested that both Jack and Tom reflected through

negotiating ideas, using resources relevant to their development in this research.

Improving Research Capabilities and Professional Skills

Overall, the findings demonstrated that CAR can help teachers address problems in their professional practice. This research study combined TEL and music to explore student engagement and provided opportunities and challenges for involving students in collaborative and reflective processes, while the influence of the environment (e.g., whether the school supported the teacher), my partnerships with the teachers, and their personal attitudes towards collaboration and technology use influenced the teachers' professional development.

Engagement of Teachers in Social Practice

My research revealed that action research and various professional development activities engaged the teachers in action and doing in the engagement process, and that this action and doing in social practice allowed them to articulate the value of their mentoring and support for students or colleagues. During the implementation phase, I supported Jack's and Tom's professional ideas, while leaving them the opportunity to determine and propose professional measures that were respectful. I believe that these ideals arose naturally when the teachers satisfied their unrealised professional needs through CAR's social practices. This finding is especially important in terms of the impact of CAR on teachers' professional development. I argue that teaching is an ethical profession whose manifestation is a commitment to the education of other human beings; teachers' intrinsic desire to regularly meet their neglected needs can consequently be met through action and adaptation to the local professional environment. CAR and professional development activities provide an excellent foundation for contextualising the values of teachers.

5.6 Related Themes: Vocabulary Retention and Multi-Level Scaffolding (e)

This core theme consists of two sub-themes: *advantages of TELT-M for students* (e1) and*positive aspects of scaffolding* (e2). Although these benefits may not have appeared to bedirectly related to student engagement, they did contribute to student engagement. Under this theme, there are two sub-themes: developing memory as

advantage of TELT-M for students and positive aspects of scaffolding. In this study, scaffolding included peer, teacher, and technology scaffolding.

5.6.1 Developing memory as advantage of TELT-M for students (e1)

This sub-theme presents my findings regarding the beneficial effects of music combined with TEL on students' memory.

Although the effect of TEL combined with music on students' vocabulary acquisition and learning was not the focus of my research, it should not be neglected. This insight is based more on the teachers' feedback and observation than on a formal assessment of learner memory and recall. Students also uttered words or entire sentences when they heard the music of the songs they were taught, which is evidence that the use of songs has a positive effect on memory retention and vocabulary acquisition. Jack stated,

> *The last music that I played in the class sometimes makes students sing even when they get out of the classroom.* (Jack, first interview, 31:20)

My observations also indicated that students frequently involuntarily repeated the songs that they had been taught by the teacher during the lesson, even after the class.

In Tom's interview, he also emphasised the need for strong memory abilities to comprehend the language-learning process. He believed that the students were aware that the use of songs assisted them in learning vocabulary. He stated,

> *Because sometimes the kids, usually the kids who are enjoying the songs andthe music, it's very easy to teach them the vocabulary with the music. Sometimes the student doesn't want to just see the pictures; they want to listen.* (Tom, second interview, 20:08)

My findings highlighted the positive impact of using songs as an enjoyable and meaningful approach for English as a foreign language (EFL) learners. The incorporation of songs into the learning process was observed to enhance engagement and foster a deeper understanding of grammar and vocabulary, as corroborated through both observations and discussions with the teachers.

While the overall response from students was favourable, certain factors were identified that limited or hindered the full potential of the songs as learning tools, including the songs' rapid tempos, the presence of unfamiliar words, and potential noise disruptions during playback. Such impediments may have deterred some students from perceiving the songs as advantageous for their learning endeavours. However, the gathered evidence demonstrated that employing songs in a thoughtfully effective, suitable, and creative manner through engaging activities yielded more favourable outcomes for students. Hence, teachers are encouraged to leverage songs strategically in the EFL classroom to optimise their educational impact. Furthermore, music's memory- enhancing effect was notable in reinforcing students' retention of vocabulary and target language; thus, it fostered a renewed sense of active participation in the learning process.

In light of these findings, songs are a valuable pedagogical tool that merits attention and familiarity in the context of the EFL classroom. Their potential for engaging students and bolstering language acquisition underscores their importance as an effective teaching resource. As such, educators may explore and use songs with thoughtful consideration of their pedagogical applications to facilitate enhanced learning experiences for their students. Tom stated,

> *Well, I think if they already know the music, they interact very well because there are kids… So as I can see from their behaviour in class, the best thing is that they learn the words…* (Tom, Second interview, 00:15)

Because the students were fascinated by the lyrics and content of the music, they were more eager to participate when the teacher played the song again or discussed the relevant terminology that they could remember. This was the case with a student named Linda. The first activity in the lesson in question involved the teacher playing a song called 'Where are you going, my dear friend?' Linda sang it with great enthusiasm and had a happy, satisfied expression on her face. Immediately following the song, the teacher asked the pupils to look at photos and say the words. Linda was the first student to raise her hand when each card appeared (Forest Nursery, class notes and recording, Lesson 8).

A notable occurrence that originated from my thoroughly recorded observations and served as an anticipated theme and insight was the markable acquisition of English

vocabulary and expressions by students through their active engagement in song practice.

This spontaneous repetition of newly acquired vocabulary demonstrated a commendable level of internalisation, leading to enhanced confidence and familiarity with the language. As a result, the students exhibited a notable willingness to experiment with the new language in diverse class activities, reflecting their heightened self-assurance in language usage. This newfound confidence in employing the language facilitated an enjoyable and participatory classroom atmosphere where students derived pleasure from the learning process.

5.6.2 Positive Aspects of Scaffolding (e2)

This sub-theme elucidates the importance of scaffolding, I divided it into four categories as shown in Table 5.1 *Importance of Scaffolding, Technology as a scaffold for learning*, *Peers as a scaffold for learning*, and *Teachers as a scaffold for learning*.

Even though the primary focus of my research was on the effect of combining TEL and music on student engagement, I must highlight the importance of teacher and peer scaffolding for various reasons. Firstly, in a setting that combines music and TEL, students received scaffolding from both peers and teachers. Thus, it is essential for the reader to have a complete understanding of scaffolding when I highlight specific examples. Secondly, both types of scaffolding affected students' abilities to learn English, as well as their level of engagement. Thirdly, social constructivist theory emphasises that learning occurs within a rich social context characterised by interaction, collaboration, articulation, and negotiation. Scaffolding was used efficiently as a result of the absence of support from teachers in the combined multi-media and musical environment. Scaffolding based solely on the incorporation of multi-media and music did not guarantee an increase in the engagement of students as an educational tool and concentrated only on the entertaining aspects.

Importance of Scaffolding

One of the most notable conclusions that emerged from the data concerned scaffolding. My observational data revealed three types of scaffolding that assisted

students' English- language acquisition in the TELT-M setting: scaffolding based on technology, scaffolding based on English teachers, and scaffolding based on peers, each of which is considered below.

Providing children with the proper scaffolding enables them to achieve their objectives, complete their work efficiently, and overcome difficulties. In fact, cognitive assistance in the form of technology, teachers, and peers brings children closer to an independent level of competence.

In any classroom setting, the availability of scaffolding in a variety of forms and levels allows for the accommodation of several students' developmental areas. In turn, this ensures that all children have access to help and guidance.

Technology as a Scaffold for Learning

Learners are given the opportunity to construct their own knowledge and explore appropriate pedagogies in a variety of contexts using TEL, which provides a variety of learning experiences and scaffolding activities. This enables the technology to fulfil the requirements of learners. Technology-based scaffolding includes games based on technology that provide students with instructions and advice. These games are designed to assist children in comprehending the objectives of the activities and performing them accurately. In addition, such scaffolding makes difficult activities accessible and achievable, which simplifies the process of education and makes it more enjoyable. During his interview, Tom commented that the material was 'extremely engaging' and 'quite easy to follow' (Tom, Second interview, 7:47).

In fact, TEL offers students aid in the form of feedback, prompts, and prizes, which assist them in learning and enable them to become self-reliant. Even when the activities are challenging or difficult to understand, students' engagement can be increased using technology-based scaffolding. This kind of support can simplify complicated words for students by directing their attention to the most critical concepts. The purpose of technology scaffolding is to help students bridge the gap between the abilities required to successfully accomplish a task and the skills they already possess.

The content included in multi-media presented a variety of scaffolding features that,

to promote learning and engagement in the activities, matched the difficulty levels of the learning activities to the abilities of the children. For instance, highlighting mistakes is an example of a sort of scaffolding that helps students see errors as soon as they commit them; this can be part of guiding them through the process and providing instructions. In addition, when students are unable to find a solution to a problem on their own, it is helpful to provide them with suggestions so that they might discover ways to complete the task. In other words, these prompts offer children some suggestions or insights that can assist them in moving forward.

For example, in Lesson 16 in the Villa nursery, there was an activity where a rabbit on the screen ate carrots, but only if the proper word was placed in the basket. If the wrong word was placed, the accompanying sound effect was a shattering jar rather than a rabbit munching on a carrot (Villa Nursery, class notes, Lesson 16). Learners were given the ability to deduce the game's rules with the assistance of the embedded scaffolding, which also enabled them to access the information more easily. After the rules of the game were introduced by the teacher, some students were discovered to have not immediately understood them. However, when the students drew the appropriate words by themselves or with their group members and heard the rabbit eating a carrot, most understood the game. In reaction to this, they began searching for a solution, which consisted of selecting the appropriate phrases to place in the basket.

These findings suggest that when TEL games were presented along with instructions, children could grasp the learning objectives of the activity, the resources available, where and how to find them, and what outcomes they would achieve when they completed each activity. This was further reflected in the following observations.

In one instance, a student named Shawn was able to finish a game that required him to match pictures and text on his own, but when he got to the podium, he was confused about what he should do. Shawn looked at the example that had been correctly matched, then raised his hand to begin the link himself. He asked the instructor how to finish the link, and the instructor advised him to tap on the screen. This caused an example to appear that had been correctly matched (Villa Nursery, class notes, Lesson 18).

Thus, Shawn was able to learn from the instructions because he came up with a

question to aid his comprehension of the topic. This interaction between the scaffolding provided by the teacher (in the form of feedback, simplification and questioning) and the scaffolding provided by the technology (in the form of animation, instructions and feedback) allowed the student to acquire the pertinent substantive knowledge necessary to make the connection between the picture and the text.

Furthermore, the engagement of students in activities was positively influenced using rewards and scaffolding in play, which in turn positively impacted their ability to learn. For example, clapping and cheering occurred in Jack's class during a PPT game that he had designed, and if the students clicked on the appropriate picture after hearing the word, the game continued. This proved effective when a student named Cherry played the game; the moment that she realised she had made the right choice and heard the applause, she burst out laughing and became more motivated to finish the remaining words. Once Cherry had finished the game, the other students also heard the applause, which caused everyone to sit up straight and raise their hands in the hope that the teacher would call on them to participate (First Nursery, class notes and recording, Lesson 19). Thus, the use of such feedback as scaffolding had an essential impact on students' learning.

Peers as a Scaffold for Learning

Students were guided through the process of knowledge integration by a strategic framework provided by scaffolding. Different types of scaffolding facilitated meaningful learning and assisted young learners in making connections between new information, prior information, and experience. To create opportunities for weaker students to learn from stronger classmates and to promote social contact amongst students, both Jack and Tom divided their classes into groups to play games. In the interviews and observations, I indicated that social engagement and peer-to-peer talks about mobile learning activities assist students in constructing their own knowledge and scaffolding their learning. For instance, in one game, Tom asked students to divide themselves into groups, go up to the IWB, and circle the places the characters in the song had visited. Amie looked at the picture of the location and then said the following to a student named Peng Peng: 'This word I knows, the red cross is hospital, it's hospital' (Forest Nursery, class notes and recording, Lesson 14).

Thanks to the technological elements, the students had a variety of options to animate and visualise what they were learning in class. Images of post offices, police stations, and hospitals allowed them to compare what they had learned to situations they had encountered in real life. However, some children tended to engage in discussions and interact more with their classmates than with the teacher, which could lead them to misinterpret information. Indeed, any learning technique that includes peer scaffolding has both advantages and disadvantages. A negative effect of this type of scaffolding was that students may receive incorrect information from their classmates. During my observations, I saw this occur amongst some students while the teacher was occupied with other groups. For instance, Linda told Mike that 'all the post offices in the world are green'. Moreover, in the same lesson, Lily said the following to the classmate next to her: 'There are no police officers in the police office, the "police uncles" are catching the bad guys on the road' (Forest Nursery, class notes and recording, Lesson 19).

Nevertheless, these limitations do not negate the benefits of peer-based scaffolding, whose adoption leads to information exchange, social engagement, resource sharing, discussion, and debate. This was illustrated by Chelsea's remark after Linda told Mike that all post offices are green. Chelsea stated that when she was travelling with her mother in New Zealand, they went into the post office to send food home, and she remembered the post office being red and emblazoned with the words 'Post Office'.

Chelsea was thus able to recall and apply what she had learned on her previous travels to this scenario. This helped Linda gain a new understanding of not only the target language but also the cultures of other nations.

Teachers as a Scaffold for Learning

Scaffolding, led by teachers, extends students beyond their capabilities. This guidance aided students in using scaffolding techniques to complete tasks and projects.

In this study, teachers consistently incorporated games and songs, briefly explaining activities to boost engagement through demonstrations and presentations. The teacher's primary role was to facilitate and enhance learning, though the effectiveness of scaffolding methods varies among students.

Differences in teacher-student interaction influenced teaching approaches. Jack, with more interaction time, understood student abilities better, while Tom relied more on teaching assistants due to limited interaction.

Supportive scaffolding empowered students, fostering self-regulation, independence, and reduced reliance on teachers. Teachers utilized various scaffolding techniques, such as questioning, modeling, leading, and activating prior knowledge, integrating technology and teacher guidance for effective learning. The integration of technology and teacher scaffolding was exemplified in the following case: After Jason viewed a photograph of grass, his teacher Jack inquired about it. The grass in the image was green, but Jason, after saying 'green', added in Chinese that 'it is sometimes yellow'. Even though Jason said this in Chinese, Jack stated in English that the grass was sometimes green and sometimes other colours (Villa Nursery, class notes and recording, Lesson 20). This example indicated that when a student's comprehension is reinforced by the teacher, they engage with the activity and tie their formal learning to their everyday experiences, which can allow them to discover that English can also be used as a tool to understand the world around them. The combination of TEL and teacher scaffolding allowed Jason to learn the English word 'grass' as well as recall earlier knowledge.

Throughout the duration of the project, the teachers employed several scaffolding techniques. For instance, they chose appropriate moments to pose questions that would provoke students to respond. A typical example of this occurred when Tom considered what the hungry caterpillar ate each day, and both he and the students repeated the sentences for the days of the week. Tom then asked the students the following question: 'On what day of the week did the hungry caterpillar eat the leaves?' The students began to answer, and, based on my observations, their responses were diverse. The teacher then turned on the hungry caterpillar song, sang it with the students once, and then asked the following question: 'What day of the week does the caterpillar eat leaves?' Almost all the students who responded to the question at this point could provide the correct response (First Nursery, class notes and recording, Lesson 6).

The interaction between this teacher's scaffolding (i.e., participation and inquiry) and the technological scaffolding (i.e., the song) focussed on remembering the days of the week and their corresponding foods. The video enhanced his teaching tools and his

capacity to scaffold the students' learning. The teacher's scaffolding aided the students in focusing on the big picture as well as highlighting critical elements.

Language acquisition often involved complex and abstract concepts, necessitating teacher support. Teachers played a essential role in directing students' attention to differences and similarities through questioning. Illustration 5.1 presents a photograph of a teacher showing his students an image.

Illustration 5. 1 Example of an Image Presented by a Teacher in the Classroom

During this activity, the teacher used PPT to display images of a tiger and a mouse on the screen, prompting students to identify the differences between the two animals. Upon observing the images on the screen, the students engaged in active discussions. After guiding the students through gestures to differentiate the size and form of the two animals, Linda made the following remark: 'Tigers are large, and mice are small'.

The teacher then pointed to the tiger's head and asked the students, 'What can be found on the tiger's head?' According to Rachal, 'The tiger has a 王[crown] on its head'.

Next, the teacher asked, 'But what are they both?' Several students responded, 'They are both animals'. Then, some students began to imitate how tigers and mice appear and behave. The teacher then played a video with the song 'Walking Through the Jungle' and encouraged the students to make comparisons with other animals in the jungle (Villa Nursery, class notes and recording, Lesson 19).

This example highlighted technology's indirect support for teachers in enhancing their teaching practices, emphasizing the potential of technology in education to facilitate communication and interactive learning.

5.7 Chapter Summary

This chapter has considered the vital role of integrating music and TEL in education, highlighting the profound impact of music's content and diversity on student engagement. When music was combined with teaching practices, with TEL tools used to present instructional materials, student participation was further enhanced. These tools encompassed devices such as IWBs and projectors, which offered students diverse learning approaches that stimulated their interest and curiosity. Concurrently, collaborative learning with peers and the professionalism and pedagogical proficiency of teachers were also critical in fostering student engagement. In an interactive and supportive learning environment, students were more inclined to actively participate and express their viewpoints and ideas.

Moreover, music not only improved students' attention but also fostered a positive classroom atmosphere. When teachers skillfully employed music and songs to guide students, the classroom ambiance became more relaxed and enjoyable, thereby increasing students' focus and involvement. Additionally, the application of TEL provided students with greater autonomy and opportunities for involvement in decision-making processes, facilitating cooperative learning and encouraging proactive engagement in classroom activities. Moreover, multi-sensory experiences catered to students' diverse learning styles and perceptual preferences, providing a comprehensive and holistic learning experience.

However, to achieve effective student engagement and learning outcomes, several challenges must be addressed, including heavy teacher workloads, a lack of training and equipment for TEL, and the need to strengthen classroom management. Teachers required additional support and resources to effectively use TEL and manage their classrooms. Additionally, the significance of physical games, the benefits of modern technologies, school support, and the importance of enhancing research capabilities and professional skills must be widely acknowledged. Teachers' involvement in social practices, such as collaborating with educational professional organisations and

communities, can provide them with additional opportunities for professional development and practical experiences.

Simultaneously, it is essential to recognise the positive impact of music on students' memory abilities and the significance of scaffolding in teaching. Music can evoke students' emotions and enhance their memory and comprehension of learning content. Scaffolding instruction represents an effective pedagogical strategy for assisting students in gradually mastering complex learning tasks through support and guidance. Technology can serve as scaffolding for learning, providing a wider range of learning resources and personalised support. Additionally, peers and teachers can also act as scaffolds, offering assistance and guidance for helping students to overcome learning challenges.

In the following chapter I consolidate the research findings and further discuss and elaborate seven key finding in light of the existing literature.

Chapter 6 Discussion

This chapter provides a critical discussion of the KFs while also reviewing the relationships between the main results of the study and the scholarly literature reviewed in Chapters 2, 3, and 4. This chapter discusses the seven KFs about student engagement in English classrooms in nurseries in China when TEL and music were applied, with reference to the relevant literature. Sections 6.1 and 6.2 explore the integration of TEL with music to increase student engagement. The emphasis in Section 6.1 is on the advantages related to TEL (KF1), while Section 6.2 discusses the contribution of music to promoting student engagement in the TELT-M pedagogy (KF2). Then, Section 6.3 addresses questions about how practical experience and training in TEL can affect a teacher's ability to successfully apply TELT-M pedagogies (KF3). Section 6.4 considers that teachers' failing to pay attention to their teaching style, emotional state, or even tone (language) and content in the classroom may lead to passive student participation (KF4). Next, Section 6.5 reveals that teachers who have a good comprehension of student engagement and a clear understanding of core teaching values and beliefs can positively impact student engagement (KF5). In Section 6.6, I consider how the teachers' reflections, as well as my own (in CAR), on teachers' identity, teaching autonomy, and teaching skills may positively impact student engagement, as well as teacher professional development (KF6). Section 6.7 highlights the importance of multi-level scaffolding (technology, peers, and teachers) in enhancing student engagement (KF7). Finally, Section 6.8 summarises the chapter's main content and arguments.

Table 6.1 presents the seven KFs along with their corresponding key ideas:

Table 6.1 Seven Key Findings and Their Key Ideas

Key Finding (KF)	Key Idea in the KF
KF-1: Applying technology and music can enhance students' engagement in technology-enhanced learning (TEL)	KF1 discusses the increase in student engagement in the classroom through the combination of TEL and music, with a focus on the following three main aspects: the influence of immediate feedback provided by new media, the promotion of classroom engagement through enjoyable and interesting learning experiences, and the impact of multi-sensory stimulation on students' sensory engagement
KF-2: Contribution of music to promoting student engagement in TEL	KF2 highlights the role of music in a pedagogy, which reinforces the combination of technology and music, demonstrating how music can effectively increase student engagement in nursery settings through its positive impact and the importance of selecting music that aligns with students' tastes and preferences
KF-3: Practical experience of and training in TEL affect a teacher's ability to apply it	KF3 emphasises the significance of teachers' experience and training in successful TEL, underlining the need for them to acquire pedagogical knowledge of technology, adopt child-centred philosophies, and continuously update their skills to overcome challenges in technology use in education
KF-4: Inattention to teaching style, emotional state, tone of voice, and content by teachers may lead to passive student engagement in the classroom	KF4 analyses how passive engagement is affected by teaching style, emotional state, tone of voice, and teaching content in class, characterised by students disengaging from learning and exhibiting behaviours such as distraction and experiencing negative emotions, with the subsequent discussion exploring the impact of teachers and course content on student engagement
KF-5: The perceptions and values of teachers positively influence student engagement	KF5 examines teachers' perceptions of student engagement, revealing individual variance in technology and music usage; teachers' attributions of success and failure varied based on internal and external factors, suggesting a potential influence on their efforts to enhance student engagement
KF-6: The importance of working collaboratively to promote teacher autonomy, critical reflection, and skills	KF6 highlights the significance of teacher reflection on identity, autonomy, and teaching skills for impacting students' engagement and professional development in collaborative action research, while also discussing the enhancement of teachers' self-reflection and agency through participatory cooperation and the influence of teacher characteristics, readiness, investment in students, and preparedness on learners' engagement
KF-7: The significance of multi-level scaffolding (TEL combined with music, peers and teachers) in enhancing student engagement	KF7 discusses the enhancing effect of various scaffolding types on student engagement and emphasises the importance of providing appropriate scaffolding within the students' zone of proximal development to support learning, self-regulation, and independent learning in a nursery setting with TELT-M

6.1 Key Finding (KF) 1 – Applying Technology and Music Can EnhanceStudent Engagement

My research showed that TELT-M enhanced student engagement in the classroom. This section provides ideas in three specific domains: firstly, students were more willing to participate in classroom activities due to the immediate feedback that occurs when new media are combined; secondly, making learning fun and interesting promoted classroom engagement; and finally, multi-sensory stimulation evoked sensory engagement in students.

Immediate Feedback Makes Students Willing to Engage in Classroom Activities

In Chapter 5, I stated that enhanced technology can provide students with timely feedback, which encourages active student participation. In the classroom, timely feedback primarily consisted of aural or visual input (Dirksen, 2009). Students could remedy their errors, evaluate their work, and immediately alter their thinking when they received timely feedback. This is consistent with Downie et al. (2021) statement that the use of TEL can enable the provision of quick feedback to students, allowing them to continue their duties without compromising classroom engagement by waiting for feedback from the teacher. Positive feedback (e.g., the clapping considered in Chapter 4) tended to keep students actively involved in the activities and assisted them in staying on target and keeping their focus.

Moreover, timely feedback was crucial in assisting students in identifying their areas of inadequacy, thereby fostering greater autonomy and self-directed learning, reducing their reliance on teachers, and enhancing their learning autonomy (Van Nuland et al., 2015). This finding aligns with the observations of Sha et al. (2012), who note that lessons that incorporate TEL often prioritise feedback mechanisms, which contribute to students' autonomy and engagement in the learning process. Specifically, the provision of appropriate challenges and tasks followed by prompt positive feedback was interpreted to boost students' sense of achievement, competence, and motivation to learn (Sha et al., 2012).

Furthermore, this study found positive feedback to significantly increase self-

efficacy in certain children, encouraging their active participation in classroom learning, enhancing their willingness to take on more challenging tasks, and increasing their dedication to successfully completing assignments. This positive impact on self-efficacy also aligns with the results of another study that investigated the use of technology to support feedback strategies in improving students' confidence (Achterkamp et al., 2015).

In addition, supporting students in using enhanced technology during class contributed to a more enjoyable learning experience, which led to increased engagement in classroom activities. Boredom and the absence of enjoyable activities can lead to reduced interest in studies and academic under performance (Baek & Touati, 2017). Because knowledge, entertainment, and enjoyment are fundamental aspects of children's well- being, addressing their need for entertainment is as crucial as addressing their learning and other needs (Shaw & Tan, 2015).

Moreover, educational content designed to offer both learning and entertainment elements captures students' attention through playful design (Israel et al., 2016; Noorhidawati et al., 2015). Games have been specifically shown to be enjoyable and popular amongst children. The incorporation of enjoyable elements in education can lead to increased motivation and engagement with the learning material (Atwood Blaine & Huffman, 2017). In various extracurricular activities, children actively seek opportunities for fun and enjoyment to enhance their sense of well-being (Shafer, 2013). When they appreciate and enjoy the activities they are engaged in, they tend to exhibit higher levels of motivation and persistence (Lumby, 2011).

Making Learning Fun and Interesting Promotes Classroom Engagement

Both teachers employed TEL to present a wide range of games to the class, offering them an enjoyable experience. After such technology was integrated into the classroom, we found that the students had a greater interest in learning, such as when Jack displayed a slide containing various animals on the projectors and then challenged the students to match the pictures with the corresponding words by clicking on them, activating animations and sounds. The teachers thus believed that the classroom had become more interesting and richer in content because of the implementation of such devices, as I summarised in Section 5.3. This aligns with many previous studies noting the motivational effect of IWBs or projector on

students, such as the large screen, multi- media features, and fun elements enhancing the presentation of the course (Glover & Miller, 2001; Levy, 2002). In essence, the use of IWBs can enhance whole-class engagement in teaching and learning, if teaching practices are adapted and transformed and the unique features offered by TEL are leveraged.

In general, the students enjoyed the games, animations, and music supplied through TEL methods, which led to high levels of participation. Multi-media offers a variety of stimuli (including text, graphics, sound, spoken language, animation, video, audio, and music). The aural and visual components of the learning environment influence students' feelings and dispositions; hence, multi-media components affect engagement by stimulating their senses (Byun & Loh, 2015). The use of interactive multi-media can produce an engaging learning environment and ward off boredom (Raditya et al., 2017). According to Ciampa (2014) and Pellerin (2014), the use of many types of multi-media (e.g., video, photos, and audio) can stimulate children's interest and arouse their desire to explore their senses.

Students were offered a variety of learning activities to engage in, including matching, doing crossword puzzles, sketching, colouring, and viewing animations. These activities, enhanced with technologies such as IWBs, enabled each child to experience their preferred way of learning (i.e., visual or aural). In conclusion, active participation is essential for optimising the effectiveness of the learning process. Technology provides better opportunities for active participation, which stimulates student's visual, auditory, and tactile senses and sparks their curiosity for learning.

6.2 KF2 – Using Music Increases Student Engagement in Technology-Enhanced Learning

This section discusses the second KF, which concerns the role of music in the TELTM pedagogy and how it can increase student engagement. I discuss how music promotes the engagement of nursery students from two perspectives –the positive impact of music on enhancing student engagement and the significance of selecting music that suits students' tastes and preferences.

Importance of Appling Music in in Technology-Enhanced Learning

My initial research revealed that when a teacher played audio or video songs in the classroom, they created a delightful and calming learning environment, which led to greater student engagement. The use of audio or video inside the class has been proven an efficient method for fostering a playful and enjoyable atmosphere. As the lessons proceeded, it became increasingly clear that the students greatly enjoyed the musical components and content, as evidenced by their delighted expressions and movements whenever the teacher played the video or audio and by the fact that at the end of each lesson, they were asked to express which songs they preferred. Most students liked happy, rhythmic music. Their positive body language, laughter, and enthusiasm when singing or watching the videos supported this. Students are engaged when they are highly focussed and interested and appreciate the musical content of an exercise (Shernoff et al., 2003).

Students' positive emotional states and attitudes were visible throughout the lessons and contributed to their heightened levels of attentiveness. Indeed, the students' positive disposition not only created a more focussed learning environment but was also pivotal in increasing their eagerness to actively engage in class activities. This observation suggests that the learners' emotional responses were influenced by specific topics and experiences encountered during the lesson. Certain subjects or learning experiences appeared to evoke positive emotional reactions in the students, thereby contributing to their increased enthusiasm and willingness to participate in the educational process (Garrett & Young, 2009).

During my classroom observations, most students performed more confidently and enthusiastically when music and songs were played. Thus, students might be continuously engaged in class if the teacher plays music. Both the video recordings and my personal observation notes attest to this. The students were engaged while involved in musical activities, and while they were attempting and completing their tasks, they were occasionally not concerned with how they performed in front of their classmates. However, a small number of students still expressed discontent or did not completely engage in musical activities because the tempo was too fast or the subject did not attract them. Furthermore, my research revealed that rhythmically strong or catchy music can stimulate students' enthusiasm and engagement.

Csikszentmihalyi (1990) proposes an idea connected to 'flow'. In the context of the

English classroom and the use of music, students acquire target vocabulary through music, which gives them a sense of flow: a state of effortless absorption and high awareness, a task in which one can be completely and seamlessly engaged (Byrne & Sheridan, 2000). As a result, they are more engaged and participate more actively. As evidenced by their involuntary shaking of their bodies and uncontrollable singing, the students' levels of immersion and engagement were exemplified by their flow. This suggests that music in the English classroom provides a learning environment and enhances students' classroom experiences.

Flow is a critical concept in education: it contributes to the creation of a pleasant and engaging learning environment, which can increase student engagement and enhance the overall educational experience. Although this was not explicitly discussed in the teacher interviews or in my observations, the immersion that the students exhibited when they heard music resembled Csikszentmihalyi's descriptions. The use of music in the English classroom provides students with a 'flow' sensation. The process of students learning target vocabulary through music helps them sense that the work they are performing is neither too difficult nor too easy according to their abilities. In addition, the work must have clear goals and provide opportunities for feedback on progress.

I typically observed that students were eager to participate in chants. I also observed that while they were singing along with the audio, video, or teacher's voice, they were actively engaged and corrected themselves without hesitation. The overwhelming majority exhibited a high level of motivation in the classroom, demonstrating a willingness to engage in song as a component of their educational experience.

Simultaneously, the teachers enhanced student participation by combining songs with other playful TEL activities, which encouraged engagement in a positive learning environment. This aligns with Shernoff et al.'s (2003) findings that participatory and challenging activities produce better engagement in the classroom. My findings indicated that the students could focus better when they were actively engaged in multitasking, namely singing while clicking pictures on the IWB or projector. I observed that this made the children concentrate harder. This is consistent with Csikszentmihalyi's (2009) description of the state of action–consciousness integration, in which a participant's attention is highly focussed, their actions become

spontaneous and automatic, and they are fully engaged in the classroom, experiencing a sense of becoming ‘one’ with their actions.

Moreover, practically all students could participate in musical activities. Both teachers indicated prior to the study that they had introverted or shy students who rarely responded to them or initiated conversation. During the class, however, I carefully noted that once the teachers began to play the audio or video, and after playing the same song multiple times so that the students were relatively familiar with its content, virtually all of them seemed delighted and confident to start singing. At this point, I was concentrating on the students considered introverted or nervous by the teacher, and I did not notice much resistance or unhappiness in their performances. The students listened to the music and sang together, which to some extent aligns with the concept that ‘creating a joy noise’ helps with inclusion and acceptance of those who are different (Bailey & Davidson, 2005). I discovered that students who were introverted or who otherwise did not feel they were highly included in group activities could participate in classroom activities when music was present. For example, in the Forest Nursery, I observed two students, named Lily and Max, who exhibited introverted tendencies and hesitated to actively participate in group activities. They often lacked confidence in joining their peers during interactive games and language exercises. However, a remarkable transformation occurred when the teacher incorporated cheerful and melodious songs as part of the learning experience. With the background music playing, Lily and Max appeared to gain more self-assurance and enthusiasm. They began to sing along, repeat English words, and even interact with their peers during the activities.

Choosing Music that Suits Students’ Tastes and Preferences is Important

By contrast, I also observed that some overly enthusiastic or engaged students had trouble staying calm when singing, which could occasionally distract other students and hinder their capacity to respond appropriately to the music they were hearing. As such, when integrating music into the classroom for nursery students, it is necessary for the teachers to carefully select music that suits the whole class.

Furthermore, when incorporating music into the nursery classroom setting, it is important to carefully select music that meets the needs of students and supports the learning objectives of the curriculum. I found that this requires the following key

factors to be considered: age appropriateness, learning outcomes, engagement, familiarity, and diversity. These are elaborated below.

Firstly, the music must be age appropriate for young children and have appropriate lyrics and content to ensure no negative impacts on children's mental, emotional, or psychological development. Secondly, the music should align with the learning goals of the curriculum. Such music can be an effective tool for teaching vocabulary if it has clear, simple lyrics and includes the target vocabulary; thus, students will not only enjoy it but also learn from it. Thirdly, the music may be engaging, with a beat that encourages moving and singing along. Enjoyable and upbeat music will make students more likely to engage with the lesson and retain the information taught, as well as create a positive and energetic atmosphere. Fourthly, the music have a strong rhythm and melody and can include elements of familiar nursery rhymes. Familiar melodies can increase students' engagement and enjoyment. When the teachers used English songs adapted from the melodies of familiar Chinese songs, I observed students' enjoyment and engagement increase because they were familiar with the music. Lastly, it is crucial to include a variety of musical styles and genres to maintain students' interest. Such musical diversity will help to keep students interested and engaged, catering to their different tastes and preferences and keeping them motivated, as supported by other studies (Bautista et al.,2018).

6.3 KF3 – Practical Experience and Training in Technology-Enhanced Learning Affect Teachers' Ability to Apply It

This section discusses the KF that teachers' experience and training are key to successful TEL. My research outlined that the instructors had an optimistic outlook on the potential for TEL to enhance children's educational development; however, due to a lack of experience and training, they felt apprehensive about the successful implementation of TEL in their classrooms. However, to some degree, the pedagogical knowledge of teachers decides the efficiency of applying technology and technological tools in classroom. The discussion is divided into two subsections. The first centres on the challenges and solutions related to class management and control faced by teachers, while the second examines the influence of IWBs or projectors on students' interaction and collaboration, with an emphasis on the pivotal role of teachers' knowledge and comprehension in the effective implementation of this

technology.

Class Management and Control

From my research, I found that in the field of educational technology, the instructional knowledge of teachers plays a crucial role in effectively utilising technological tools and ultimately shaping students' learning experiences.

This is in line with the findings by Haleem et al. (2022). While educational practitioners generally acknowledge the potential of TEL to yield rich educational outcomes, the successful implementation of these tools depends on teachers' experience, training, and understanding of pedagogical principles. One of the primary challenges encountered when integrating electronic learning tools such as IWBs or projectors into classroom instruction is maintaining classroom management and control. For example, I noticed that students would run in the classroom after completing an activity on the IWB or click on the IWB repeatedly in a short time. Jack and Tom commonly reminded the students of the rules of the classroom and the consequences of violating them. Jack sometimes also alerted them that the IWB is used to learn in class and that repeated clicks could damage the device, such as by cracking the screen, and that the cost of replacing it would be high. Jack and Tom had to remind students of the consequences of improper use of technology and violations of classroom norms in order to regain control of the classroom. Such rules assist educators in regaining control and also benefit from the teaching experience of teachers. In other classes, Tom used the IWB exclusively to play videos. It consequently took children more than a week to adapt to the new mode of instruction, as the instructor attempted to shift the learning environment from a traditional classroom to a smart classroom, which negatively impacted classroom management and control (Terras & Ramsay, 2012).

However, transitioning from traditional teaching methods to incorporating technology requires an adaptation period for both teachers and students, often resulting in the disruption of established classroom routines. In Tom's classroom, the IWB was initially used solely for playing videos. However, this limited usage failed to fully harness the potential of the IWB in enhancing student engagement and learning outcomes. To address this challenge, Tom mentioned in an interview that he utilised his pedagogical knowledge to effectively guide the transition to a technology-

integrated learning environment. After gaining a deeper understanding of how technology can support diverse learning needs, he fostered a more conducive environment for active student participation and collaborative learning. This involved not only utilising the IWB for viewing videos but also incorporating more group activities to encourage student engagement.

Teachers' Understanding and Knowledge of Interactive Whiteboard affect Student Participation and Interaction

This has research discussed the potential of IWBs or projectors to provide students with increased opportunities for teamwork and enhance classroom engagement. Rogers and Lindley (2004) indicate that students tend to interact individually when working in groups using IWBs or projectors, while my interviews with Jack and Tom supported the belief that IWBs or projectors might reduce group collaboration during assignments. However, my observations revealed a different perspective, as the use of IWBs or projectors did not necessarily diminish student interaction and collaboration.

Unlike the traditional teacher-led question-and-answer format, where student participation is controlled, classrooms equipped with IWBs or projectors allow the teachers to engage the entire class in a collaborative effort towards a common goal. Gillen et al. (2007) express a similar view, suggesting that IWBs or projectors appear particularly effective for promoting whole-class interaction – thus, they are an ideal technology for collaborative learning.

Moreover, the effective use of IWBs or projectors in the classroom poses a notable consideration. Deploying IWBs or projectors as teaching tools empowers students with greater autonomy, which aligns with Herrington and Standen's (2000) view that educational processes associated with IWBs or projectors shift from teacher- to student-centred as schools progress from the initial pedagogical phase to the transitional phase. Nonetheless, as with many other ICT tools, the effectiveness of IWBs is closely tied to teachers' pedagogical knowledge rather than the quality or features of the tools employed in the classroom.

Based on my research, the successful integration of IWBs or projectors in the classroom evidently relies on teachers' knowledge and understanding. This view is supported by De Vita et al. (2018), who suggest that teachers must be proficient in

the technical aspects of using IWBs or projectors and possess a comprehensive understanding of pedagogical principles that support student learning. Without this knowledge, teachers may not fully recognise the potential advantages of IWBs or projectors, which would impede student learning.

In other words, the effective integration of an IWB or projector into the classroom depends on teachers' pedagogical knowledge and professional skills. While technical proficiency is important, solely relying on it is insufficient to ensure successful utilisation of IWBs in promoting student learning. This includes understanding how to utilise them to optimise student participation, collaboration, and cooperation in the classroom.

Without this pedagogical knowledge, teachers may struggle to fully harness the potential of IWBs, thus limiting their impact on students' learning experiences. For example, merely using the boards as digital whiteboards or presentation tools may neglect their interactive and collaborative learning functionalities. Teachers lacking pedagogical understanding may struggle to design activities that effectively utilise the interactive features of IWBs or projectors, thereby affecting student engagement and learning outcomes.

I found that both Tom and Jack underwent changes during the fieldwork process through practical experience, reflection, and collaboration with me in my research. Throughout this process, they not only improved their technical skills, such as fluency in using an IWB or projector and the speed of creating PowerPoint (PPT) presentations, but also deepened their understanding of how to integrate an IWB or projector into teaching practices in alignment with effective pedagogical approaches.

6.4 KF4 – Teachers' Inattentive Teaching Style, Emotional State,Tone of Voice and Content May Lead to Passive Student Engagement

KF4 revolves around the analysis of how students' passive engagement is influenced by their teacher's teaching style, emotional state, tone of voice, and even the content of their classroom instruction. I consider this discovery crucial, as it substantiates that passive engagement can be profoundly shaped by teachers. Thus, this exploration holds inherent significance for teacher education, underscoring potential implications

for the realm of pedagogical training itself. The following discussion is divided into two subsections, which focus on the impacts of teachers and course content on student engagement.

Role of Teachers' Teaching Style, Emotional State, and Tone of Voice

Through my observations, I found that the teachers played a role in preventing their students from investing in learning. Their teaching pedagogies, emotional state, intonation, and speech intelligibility affected students' engagement. For instance, while Tom displayed slides to students and let them play PPT games, I observed that when he spoke in a lower and toneless voice, many students did not pay attention to the tasks he proposed. This finding is supported by Servilha and Da Costa (2015), who state that when the teacher speaks in a monotonous or weak voice, students cannot maintain attention and engagement, indicating that the quality of teachers' speech affects their students' learning engagement. According to relevant studies, students' attention and effort decrease when they are bored in class, which reflects a negative correlation between boredom and behavioural engagement (Dettmers et al., 2011).

Engagement encompasses students' learning efforts, interests, and self-regulation (Sharp et al., 2018; Tanaka & Murayama, 2014), as well as the relationship between their boredom and disengagement. Sharp et al. (2018) concur that the incidence and effects of scholastic boredom are far from trivial and may not be minimised. Sometimes, teachers link their teaching quality with their enthusiasm and willingness to communicate with students. For example, Tom talked with his students in some classes. Although their linguistic competence was not sufficient to allow them to fully express themselves in English, this interactive communication made them excited and happy to engage.

Moreover, teachers may be sensitive, approachable, and willing to express concern and encouragement to create a safe and encouraging environment for students to meet their needs (Stephen & Plowman, 2008), which may affect students' learning interests and engagement. Such disengagement suggests that students' academic engagement is unstable and non-static, while their engagement is dynamic, situational, and environment dependent (Finn & Zimmer, 2012; Fredricks et al., 2004). In addition, teachers may be concerned about the difficulty of the lesson, which also

greatly affects student engagement.

Lesson Content Impacts Student Engagement

When the content of the song used by the teacher was more difficult than the target language or when its tempo was too fast, students exhibited incomprehensible expressions, and their interest waned. This demonstrates how academic boredom is positively correlated with difficulty levels but negatively correlated with the expected value and perceived utility of the subject (Tanaka & Murayama, 2014). When students listened to songs with many new words, they immediately showed no interest or motivation. Students experience negative emotions in class, such as depression, boredom, and anxiety, especially when they think they lack the ability to understand the subject (Fredricks et al., 2016).

My observations revealed that when the teacher played songs repeatedly to promote active engagement, the students could not help humming along while listening to the familiar music and content. However, if the teacher played repeated content too many times in the same class, the students' interest in learning seemed to obviously fade. This finding is supported by research emphasising how students disengage (Murray et al., 2004), which suggests that students' engagement is affected by their views on the difficulty of curriculum materials.

In addition, the results of previous research indicate that students' passive engagement is affected by emotional factors, such as the roles of teachers and of students' interest. This strengthens the key role of the emotional dimension of learning in influencing students' learning engagement. In fact, the observation of most passive engagement indicated that students emotionally disengaged from learning due to a lack of interest. As they could not enjoy learning and did not have the expected encounters with teachers, they felt frustrated and discouraged. To conclude, I examined respondents' passive engagement, alienation from class activities, and reduced effort. These experiences add empirical evidence to the complexity of academic engagement, which is a continuum with varied levels (Bozpolat, 2016), such as high or low academic engagement.

Although no students quit their classes, certain learners' experiences indicated a degree of detachment and alienation from learning. The finding supports the idea that

disengagement is more than just a lack of engagement (Chipchase et al., 2017) and instead includes negative emotions such as boredom, depression, and discouragement.

In addition, background factors such as a lack of interest in the topic and teachers' unenthusiastic response to students affect their disengagement, which supports the idea that learning weariness is multi-dimensional and environment dependent (Finn & Zimmer, 2012; Fredricks et al., 2004). This finding reveals that it is equally important to understand the factors that lead to students' disengagement (i.e., inhibiting factors) as those that promote engagement (i.e., promoting factors).

6.5 KF5 – Teachers' Perceptions and Values Positively Influence Student Engagement

This KF applies primarily to the positive impact of teachers' beliefs and values on student engagement. The interviews indicated the presence of important individual variation in students' use of technology and engagement with music. This discovery contributes a level of specificity to prior scholarly investigations, which have indicated that teachers occasionally perceive their students as a collective entity and thus overlook the distinct needs and capabilities of individual students. Furthermore, the teachers highlighted the complex nature of students' engagement in music and technology interactions. The methods through which they engaged with these teaching resources were evidently diverse, as they were shaped by their unique characteristics and aptitudes. The presence of diverse student populations presented challenges to the establishment of similar teaching pedagogies, meaning that teachers must demonstrate flexibility and adaptability in their approaches to TEL.

The following sub-section discusses the impact of teachers' fundamental pedagogical values and beliefs on student engagement.

Teachers' Core Pedagogical Values and Beliefs Influence Students' Engagement

Depending on whether people think a behaviour is personal or situational, they form internal or external attributions (Heider, 1958). Success and failure are attributed to effort (motivation), ability, task complexity, and chance. This approach examines instructors' attributional views on students' engagement and disengagement. High

achievers typically attribute their triumphs to internal causes and their failures to external factors. Low achievers are the opposite. Thus, when applied to others from a third-person perspective, the external attribution of failure (disengagement) may seem preferable, since it reflects high achievers' mindsets.

When teachers use the framework, internal and external attributions may boost student involvement. Teachers can impact outwardly stable variables such as task difficulty, internally stable components such as student talents, and internally unstable elements such as student attitudes and effort. Jack believed that he could affect the external stabilising factors in question, whereas Tom believed that the effect was non-significant. Because Jack thought he had some control over his students' internally unstable beliefs, he was more effective at engaging them. Thus, differences in teachers' attributions of factors that influence student engagement affect the corresponding adjustments they make when increasing student engagement.

My research aimed to investigate the many different facets of student participation. I believe that the key is to assist students in being as actively engaged in the here and now as they possibly can be, regardless of the objectives for the longer term.

Undoubtedly, the ultimate instrumental purpose of classroom involvement, namely the acquisition of English-language skills, is essential. However, I am less concerned with achieving this aim than I am with ensuring that students continue to be involved in the current activity and remain focussed on it.

My perspective takes on a new significance as pupils are faced with growing competition for their attention from TEL and other digital diversions. Motivation cannot exist in the absence of attention. According to Harris, 'There is now little question that how one uses one's attention, moment to moment, largely determines what kind of person one becomes. How we put our ideas and our lives to use is the primary factor in determining who we become' (2014, p. 31). I argue that the capacity to truly engage in a topic, above and beyond what is required for participation in the classroom, is a major contributor to one's overall well-being and ought to be the goal of teaching and learning in any field. Thus, the how educators maintain control over the use of TEL has become a primary priority.

Regarding the influence of combining TEL with music on the degree of student

involvement, I wholeheartedly concur with Tom that the benefits far outweigh the downsides. Furthermore, I believe that the provision of suitable scaffolding and assistance can boost students' focus.

During this stage of the research, it became clear that the fundamental pedagogical principles and beliefs held by instructors acted as a foundation for their perceptions of the benefits of enhancements using digitally integrated music. My interpretation of the phrase 'teaching values and beliefs' is very similar to that of Gao and Zhang (2015); it refers to the guiding principles, assumptions, and attitudes that teachers use in their classrooms. The individual experiences and cultural background of each instructor may contribute to the formation of these attitudes and ideas.

The incorporation of technological elements into musical instruction is referred to as 'technology-integrated music'. Examples of such technological elements include digital instruments, software, and internet resources. This suggests that the underlying beliefs that educators have about the nature of education and the processes of teaching and learning relate directly to how they approach the use of technology in music classrooms. For instance, a teacher who places a high priority on student-centred learning may view technology as a tool that can support and encourage higher engagement on the part of students in music classes. Conversely, if a music educator strongly emphasises more conventional methods of teaching music, they may consider technology a diversion from these methods.

Understanding how teachers' pedagogical values and beliefs influence their perceptions of technology in music education is critical for implementing effective technology integration strategies. Teachers who believe that technology enhances their core pedagogical values and beliefs are more likely to embrace technology and use it in meaningful ways in their teaching practices.

While it is true that all perceptions are supported by a set of values and beliefs, the interviews notably highlighted the connections between the two concepts. It was useful that both teachers had more than 4 years of teaching experience. They also engaged in conversation with me in a straightforward, self-aware manner. Although Jack acknowledged the value and efficacy of augmentative technology, he insisted that it could not replace the role of actual games. His opinions could have been influenced by his reservations regarding the widespread implementation of

technological tools in educational settings.

6.6 KF6 – Importance of Working Collaboratively for Promoting Teachers' Autonomy, Critical Reflection, and Skills

This KF concerns the importance of reflection on collaboration, especially classroom observation, concerning teacher identity, autonomy, and teaching skills, which may impact both students' engagement and teachers' professional development in CAR.

The following sub-sections discuss the inter-relationship between the views of teachers and those of others, with reference to relevant literature, to explore how these factors affect teachers' professional identity, a concept integral to teacher professionalism (Day, 2011). The three sub-sections each cover a different aspect: teachers' professional identity, autonomy, and professional development (e.g., skills).

Reflections on Teachers' Professional Identity and its Influences

Teachers' ever-growing workload is the first factor that influences their professional identity (i.e., professionalism). As the nature of teaching has changed, teachers are increasingly required to use modern technology; thus, they face ever-heavier workloads. With this increasing workload, the meaning of being a 'good' teacher-one who is expected to fully grasp what they may do and how to do it properly (Day, 2011; Johnson, 2009) is redefined. In this study, I found that when teachers began to integrate new technologies into their teaching, their beliefs about teaching and learning were also gradually enhanced in the process of exploring student participation. As Li Li. (2020) notes, how teachers position themselves significantly impacts the positioning of students and influences the content and effectiveness of their learning experiences, which also exerts pressure on them to change.

At the beginning of the study, Jack felt that he had limited influence on students in terms of using modern technology, which also seemed to challenge his 'moral purpose' in teaching (Smethem, 2007). This moral purpose may necessitate him to consistently polish his knowledge and skills to meet the needs of his students (Fullan, 1993) and to maintain pace with the rapid changes in teaching and learning. However, he struggled to expand his knowledge and abilities (the impact of professional

development) to meet the evolving demands placed on teachers. In our daily conversations, he also mentioned that because of his age and excessive workload, he felt that he was unable to do as well as he wished or to change overnight.

In other studies, examining the work and lives of teachers, considerable evidence has suggested that an intensified workload negatively impacts teachers' professional identity, moral purpose, and willingness to continue pursuing their career (Hargreaves,1994; Smethem, 2007). However, I found some transformational changes; that is, when I started acting as their 'critical partner', by constantly encouraging them, communicating with them, and helping them to reflect on and summarise their progress, remarkable changes started to emerge. The most apparent change was in Jack.

Initially, Jack was not inclined to use projector in his classes. His lack of familiarity with creating PPT presentations and a reluctance to use this technology made him feel somewhat inadequate in its application. However, upon assuming the role of his critical partner, I consistently provided encouragement, engaged in open communication, and assisted him in reflecting on and summarising his progress in creating PPT presentations or using TEL. Jack gradually began to develop a self-awareness of the need for transformation and improvement. This confirms Hargreaves' (1994) notion that the reinforcement of self-awareness was not solely influenced by external pressures, demands, or expectations. Instead, it became an objective that Jack actively pursued with an open and pro-active mindset, which highlighted the importance of critical friend facilitators in a CAR context.

During this process, classroom observations conducted within the context of Collaborative Action Research (CAR) offered valuable insights into understanding teachers' professional practices and perceptions, particularly their professional identity, autonomy, and professional development. For example, in my research, teachers and I conducted CAR to explore the utilisation of TELT-M in classroom settings. When teachers have a specific objective, they optimise their teaching strategies through constant reflection and summarisation and focus not only on their own development but also on the improvement of their students' engagement. However, I discovered that by exploring the interrelationships between teachers' perspectives and my own viewpoints, it becomes more conducive to comprehensively understanding how these factors influence teachers' efficiency and engagement.

Reflections on the Influence of this Research on Teacher Autonomy

Numerous studies examining the effect of educational control, particularly when prompted by reform initiatives, on the professional lives of teachers have consistently revealed a negative impact on their professional identity. These negative effects include the restriction of their autonomy and an increase in their anxiety, resulting in a decline in their morale and possibly affecting their overall health and well-being (Moss, 2004; Wilkins, 2011). As interpreted in this and the preceding chapters, the findings of this study are consistent with those of prior research. Specifically, the teachers reported that educational control negatively impacted their independence, autonomy, dedication, satisfaction with work, self-worth, and mental well-being. I hope that the findings of this study create space for an in-depth discussion on how the balance between control and autonomy can bring unexplored values out of the teachers' professionalism rather than treating them with conventional and regulated approaches (Cribb & Gewirtz, 2007).

I chose CAR to enable the teachers to participate as partners in the research to enhance their professional learning and contribute to research design and analysis. In the pilot phase, I found that if I interfered with teachers' pre-class preparation or excessively supervised them in the classroom and asked them to implement certain teaching strategies, they felt limited in their autonomy. Jack and Tom repeatedly expressed that I helped them greatly, for which they expressed their genuine appreciation. Furthermore, they felt that such a practice of cooperative equality was extremely fruitful and mentioned that our talks and exchanges after class and after work were all autonomous and voluntary.

In addition, they revealed that several teachers in their previous CAR experiences had acted the way the headmasters wanted when the latter audited their classes and reverted to their usual selves once they left the classroom. The 'assessment relationship' reported by the teachers seems to encourage 'fabrication' and 'deception' (Bullough, 2011, p. 16). It seems that their previous experiences with action research were not truly collaborative in nature and had negative functions and impacts. These negative effects occurred despite the researchers' well-intentioned desire to improve teacher effectiveness.

Indeed, it is worth noting that classroom observations conducted within the framework of CAR are undertaken against the backdrop of addressing the negative impacts of educational control and promoting educators' autonomy, collaboration, and reflection. Classroom observations enable me to provide immediate feedback to teachers on issues I identify, which we can then discuss and reflect upon together after class. This collaborative approach between teachers and researchers not only facilitates teachers' professional learning but also contributes to improving classroom teaching practices and teachers' sense of well-being. CAR involves teachers and researchers working together to identify and solve problems in their classrooms or schools and could involve a cyclical process of problem-solving, data collection, analysis, and reflection. During the implementation phase, teachers would work collaboratively with researchers, provide feedback and support, share resources, and engage in professional dialogue, as supported elsewhere in the literature (Mills, 2011; Mertler, 2016).

Through this process, teachers can develop their knowledge and skills and build a culture of collaboration and reflection. More importantly, a CAR project between researchers and teachers would focus on clear communication, effective data collection and analysis, and a shared ownership of the process. This view aligns with those of Borko (2004) and Mertler (2016).

In conclusion, CAR with teachers is a valuable method for providing professional development and improving classroom practice. By collaborating to identify and solve problems in their classrooms or schools, teachers can develop their knowledge and skills and build a culture of collaboration and reflection. The effective implementation of CAR requires a supportive school culture, well-structured processes, and a focus on communication, data collection, and shared ownership.

Reflection on Teaching Skills

In my research, I explored how conducting classroom observations within the CAR framework helps to gain a deeper understanding of teachers' professional practices and perceptions, particularly in addressing the challenges and requirements associated with integrating TEL into teaching methods.

I found that although Jack mentioned that the preparation of PPT presentations is time

consuming, even when they are familiar with the operation method, he provided feedback that there were no special difficulties in preparing them and that reusing the presentations after getting used to the process can save time when preparing lessons.

Teachers work harder in preparation since they have more duties if they spend several hours planning classes according to specified criteria to engage students and build their expertise. These programmes would have extra, tiresome work if they were updated to use TEL (Alenezi, 2017). This would require them to create lesson plans, teach them, assign homework, evaluate students' grasp of class content, prepare assignments and assessments, and supervise students in class (Alwraikat, 2017). New teaching pedagogies demand that teachers use TEL-friendly instructions (Asiimwe & Hatakka, 2017).

TEL with suitable material can foster problem-solving, creativity, and curiosity. Animations, graphics, video, and music make content-rich media more engaging and boost children's learning (Webster, 2017). The following are also important: offering rewards and awards for participation, providing appropriate teaching strategies, meeting children's needs, tailoring them to their skill level, allowing them to learn at their own pace, correcting misconceptions, providing culturally appropriate information, aligning tasks with the real world, and scaffolding (Baran et al., 2017).

Related to workload, some teachers must also cultivate their technical skills and gain relevant information because they lack experience, may feel the burden of the implementation process, and also need more time, as noted by Asabere (2013). For example, it takes time for teachers to study a new operating system and its functions and become familiar with them. This involves acquiring hands-on knowledge of how to insert video and audio and of the file formats. Unsurprisingly, the most common barrier to the use of TEL is the time constraints faced by teachers, as they must meet various requirements and needs, as echoed by Alenezi (2017). Unlike traditional classroom teaching, mobile learning has changed the role of teachers, requiring them to design teaching pedagogies and materials suitable for mobile learning formats, which aligns with Asiimwe and Hatakka (2017).

However, once the teacher has mastered this skill, they can implement and make the most of it using these practices. Thus, the courseware they create can help them achieve the purpose of teaching and make the classroom more diverse. In this study,

through classroom observations, both the teachers and I engaged in mutual learning experiences during subsequent meetings, utilising collective professional knowledge to foster teachers' professional development. With collaborative engagement and peer support, educators can address the challenges associated with integrating TEL into teaching practices. As the teacher's 'critical partner', I often shared my experience in the production of PPT presentations and provided advice. In the absence of guidance from their school, teachers can access information on the internet and discuss it with each other so they can quickly master the methods. When I was not in one of the nurseries, I learned that other teachers helped Jack and Tom, which enabled them to become more familiar with producing lessons on TEL devices.

6.7 KF7 – Significance of Multi-Level Scaffolding (Enhanced Technology Combined with Music, Peers, and Teachers) in Enhancing Student Engagement

In this section, it is crucial to emphasise the importance of multiple dimensions that have an outstanding impact on student engagement. They include various scaffolding approaches, the incorporation of modern technology as well as music, the involvement of peers, and the contributions of teachers. Together, these factors exert a notable influence on the level of student engagement. By providing further details about and explanations for these elements, one can acquire a thorough comprehension of how diverse educational strategies come together to establish an ideal learning setting that enhances students' engagement and commitment to educational outcomes.

An appropriate level of challenge in the classroom, when accompanied by supportive scaffolding, can maintain students' engagement, thus facilitating their learning process. This approach engages children who may feel overwhelmed or bored by traditional pedagogies and stimulates them to participate more actively (Hamari et al., 2016). According to Wells (1999), scaffolding can support two types of learning – selfregulated and independent learning. Providing appropriate scaffolding for children enables them to achieve their goals, perform tasks effectively, and solve problems (as discussed in Sections 3.4 and 3.5).

Several studies, including those of Hirsh-Pasek et al. (2015) and Palincsar et al. (2018), have illustrated that the absence of scaffolding and guidance can have detrimental impacts on children's discoveries that may not help their learning.

Technology-Enhanced Learning Combined with Music as a Scaffold for Learning

TEL provides learners with various scaffolding activities that enable them to use appropriate methods to construct their knowledge and explore in various contexts to meet their needs, such as PPT animations and small games. Scaffolding based on TEL provides instructions and guidance to help children understand the purpose of tasks. In addition, this type of scaffolding makes complex tasks easier to accept and manage, making learning simpler and more engaging. Moreover, TEL provides appropriate support to children in the form of feedback, prompts, or rewards, fostering their learning and self-reliance (Melero et al., 2011). According to Kao et al. (2017), enhanced technological scaffolding helps bridge the gap between the abilities that children currently possess and the skills that are necessary to successfully complete a task. This view corresponds with the findings of the literature.

According to my findings, improved technological capabilities offer many functions that can be used as scaffolding to facilitate learning by matching the difficulty of learning activities with children's capabilities. For instance, highlighting errors is a form of scaffolding that enables children to immediately detect errors after making mistakes by offering instructions. According to Yin et al. (2013), this type of scaffolding assists children in successfully completing activities. They are also given the ability to deduce game rules through the embedded scaffolds, which makes it easier for them to comprehend the information.

In the same class, TEL can help them understand some content that they may not have fully understood in class pedagogical scaffolding; understanding the content will make students more involved in the learning process. For example, a crucial difference exists in students' understanding and participation in a song when the teacher leads them in singing without animation assistance compared with singing along with animation assistance in a video. Students who participate with the help of TEL are clearly more engaged.

Direct instruction boosts learning performance, unlike unstructured play. Technological scaffolding reduces children's frustration, helping them overcome challenges. Problembased activities with scaffolding can help students solve problems. Game scaffolding helps them overcome game barriers, increasing

engagement and enjoyment. According to Yuriev (2017), scaffolding can help children think strategically and solve challenges, motivating them to play when they get stuck. Mobile games can assist and challenge players, keeping them engaged. Moreover, technological scaffolding can provide summary feedback, making up for the inadequate scaffolding provided by teachers and providing much positive feedback, which can make students more engaged. This has been supported by Kim and Bae (2020).

When considering the scaffolding of students' learning, it is evident that music naturally encompasses a sense of musical rhythm. Within game-based educational environments, music consequently assumes a prominent role. Campbell (2002) notes that music is not just an aesthetic experience; rather, it guides children to actively engage and share perspectives, as well as fosters their communication skills.

Music are so common in social game interactions shows its communicative function and the power of musical materials in unrestricted ‘dialogues’ of communication and creation. (Marsh & Young, 2015). My research revealed how processes of imitation and shared emotions became particularly heightened through playful music interactions, whether in peer interactions, in spontaneous, child-directed contexts, or as ‘play partners’ with adults. This sentiment is supported by Koutsoupidou (2020), who posits that music can provide scaffolding for children’s development and interaction.

Peers as a Scaffold for Learning

In current research, children receive technological scaffolding through TEL. These scaffolds mainly guide children in the correct direction through visual and auditory cues, such as video and audio, as well as PPT games and other forms. The prominent feature of technological scaffolding is that it allows students to participate more actively in the classroom in a fun environment.

Learning can also be supported and facilitated by one’s peers. Children are given a strategic framework using scaffolding, which assists them in completing the process of integrating their acquired knowledge. According to Chen et al. (2014), various types of scaffolding facilitate meaningful learning and assist children in making connections between newly acquired information, previously held information, and

personal experience. According to Well (1999), children who receive scaffolding from their peers are better able to remain in their Zone of Proximal Development, which in turn allows them to actively participate in the learning process. This project included several activities conducted by the teacher, who divided the class into several small groups and then completed activities such as singing performances and interactive games played on an IWB or projector. The goals of these activities were to give less capable children the opportunity to benefit from their more capable peers and to strengthen social interaction amongst children.

Unsurprisingly, this kind of scaffolding encourages student participation. According to Yu et al. (2013), scaffolding is a teaching approach that is believed to be effective and have a favourable influence on children's learning. When children engage in negotiation and debate, the more knowledgeable children in the group contribute to the establishment of knowledge by providing clarification, posing important questions, and drawing attention to resources. In fact, even learners with less prior knowledge can contribute to the learning process by inquiring about things that are unclear to them and asking questions.

Conversely, as discussed in Chapter 5, some students tend to join in conversations and interact more with their classmates than with the instructor, which might result in incorrect knowledge as a result of misunderstandings. A trade-off exists between the benefits and drawbacks associated with using this kind of scaffolding in any learning technique. Inaccurate information being passed on to children by their peers when they are being scaffolded is one of its negative impacts that must be considered to prevent children from gaining inaccurate knowledge. The positive features of peer-based scaffolding, which can lead to knowledge exchange, social contact, resource sharing, discussion, and debate, are not negated these negative aspects. Rahmani et al. (2013) provide support for these positive aspects.

Teachers as a Scaffold for Learning

Teachers also provide learning scaffolding. In accordance with the viewpoints of Dominguez and Svihla (2023), during the scaffolding process, instructors assist students by providing support, which allows them to develop learning tasks that they could not establish on their own. Vygotsky (1978) believed that temporary assistance could advance children's learning and regarded scaffolding as a teaching method and

a means of student engagement. Children who are supported can complete tasks; scaffolding simplifies tasks by explaining the structure of tasks or encouraging children to begin with simpler activities. In fact, the presence of scaffolding provided by a teacher during difficult activities can alleviate the discomfort that children may feel due to irritation or confusion. The development of positive self-efficacy enhances their emotional state (Craig, 2017). This optimistic disposition is also crucial in students' participation.

According to Yu et al. (2013), when teachers provide guidance in the form of scaffolding prior to beginning a learning task, this type of instructional scaffolding may help students overcome potential difficulties that contribute to initial failure. The literature provides examples of teachers employing a variety of scaffolding strategies, and studies have determined that some strategies are effective for some pupils, while others may not be. This demonstrates that certain types of scaffolding are not beneficial for all students.

Through monitoring and observing students, both Jack and Tom acquired an understanding of their students. According to Jong and Tsai (2016), this enables teachers to comprehend the learning-related issues faced by their students and then provide suitable scaffolding strategies that assist them in addressing these problems. This aids teachers in assisting and directing students who cannot complete their tasks.

In this study, both Jack's and Tom's instructions responded to students' comprehension, and their responses helped students realise the significance of their participation through observation. When the scaffolding of the teacher (participation and inquiry) and of TEL (different images) interact, they direct students' attention to actively engage with the classroom content. TEL expands the teacher's teaching resources and ability to scaffold student learning. The teacher's scaffolding helps students concentrate on the big picture and emphasises critical points.

When students use an IWB to complete tasks, the teacher's function changes from instructing to guiding (Knight & Davies, 2016), which can stimulate children and generate effective learning outcomes. In my research, when the two teachers planned class content in advance, they provided children with opportunities for independent experience and participation by enhancing classroom technology and consequently experienced a sense of accomplishment (Ward et al., 2013).

Students' confidence can be established and bolstered using scaffolds that provide support for various learning aspects. It is clearly unfeasible for a teacher to offer scaffolding for every student in the learning environment within 30 minutes. Kim and Bae(2020) support the notion that technological and peer scaffolds can help students engage more effectively in classroom activities and demonstrate greater behavioural and affective involvement. Although my research concentrated on the combination of TEL and music, I have highlighted the scaffolding provided by teachers and peers in this section for several reasons. Firstly, children receive scaffolding from peers and teachers within the context of TEL, so it is essential that readers have a thorough understanding of scaffolding; secondly, these two types of scaffolding affect the engagement of children; and thirdly, the social constructivist theory emphasises that learning occurs in a complex social context characterised by communication, cooperation, alignment, and negotiation.

However, relying solely on technological scaffolds cannot guarantee that children's learning will be bolstered, as some children may disregard TEL as an educational aid and focus only on its entertainment aspects. In addition, this type of scaffold cannot prevent young students from engaging in erroneous reasoning because their prior knowledge levels, as well as their skills and abilities.

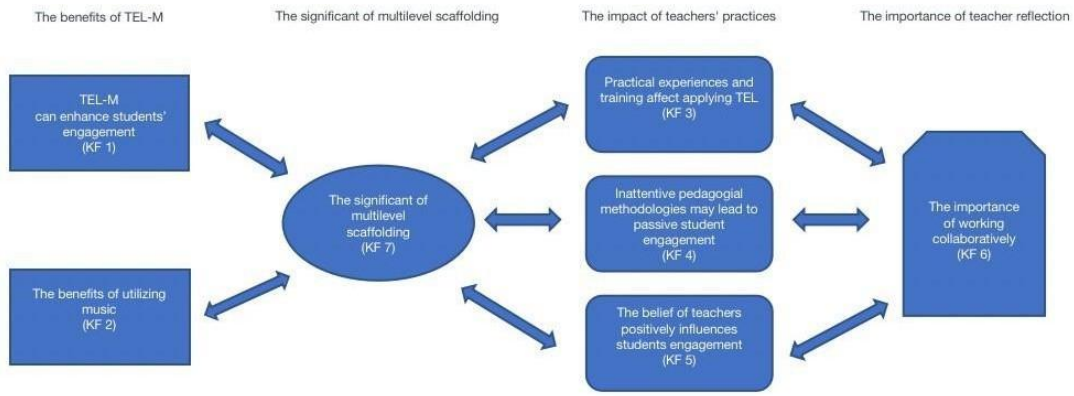
When faced with adversity, students seek the assistance of instructors. Without their assistance, students cannot construct their knowledge correctly or avoid erroneous ideas. Implementing various types of scaffolding ensures that every type of learning is optimally supported. As such, it is necessary to describe and illustrate the support provided by instructors and peers. Without coherent and complex curricula, peer interactions, and teacher mediation, these scaffolds cannot reach their full potential (Palincsar et al., 2018).

In summary, incorporating TEL devices into English education can positively influence children's learning and increase their engagement, when combined with appropriate teaching scaffolds. A lack of scaffolding may discourage learners from repeating incorrectly completed activities and negatively impact children's engagement in exploratory activities (Dominguez & Svihla,2023). Different forms of scaffolding can enhance children's learning experiences.

6.8 Relationships Amongst the Key Findings

The KFs exhibit certain interconnections, which can be categorised into the following four groups: (1) KF1–2 focus on the contributions of music and technology, respectively, in TEL to promote student engagement; (2) KF3–5 involve various factors related to teachers' experiences, training participation, teaching styles, emotional states, language tone, instructional content, and application of TEL, thus impacting student engagement; (3) KF6 reflects the significance of teacher self-reflection for both teacher professional development and the subsequent enhancement of student engagement; and (4) KF7 elucidates the benefits of multi- level scaffolding (technology and music, peers, and teachers) in fostering increased student engagement. These relationships are visually represented in Figure 6.1:

Figure 6. 1 Relationships Amongst the Seven Key Findings



My analysis has indicated that TEL has a positive effect on student engagement, primarily attributed to the characteristics of music and technology (KF1–2). However, to fully leverage this instructional approach, apart from capitalising on these characteristics, teachers also play a critical role (KF3–5). These factors all belong to different levels of support for students (technology and music, peers, and teachers) (KF7), and it is the variation in these supportive elements that results in varying impacts on student engagement.

Lastly, the figure demonstrates the reciprocal influence between teacher self-reflection in CAR (KF6) and how teachers apply TEL (KF3–5). For instance,

engaging in self-reflection (KF6) prompts teachers to improve their teaching pedagogies, thereby enhancing their experiences (KF3). Conversely, teachers' participation in training and acquisition of extensive experience in the classroom (KF3) foster more comprehensive self-reflection (KF6).

6.9 Chapter Summary

This chapter has outlined the seven KFs that emerged from a second analysis of the identified categories and sub-categories and a further review of the literature. In short, he integration of augmentative technology with music is known to increase student engagement (KF1–2), but the teacher plays a key role in this process.

A teacher's lack of practical experience and training in the use of TEL combined with the application of music may affect their ability to successfully apply the TELT- M pedagogy (KF3). Teachers who do not pay attention to their teaching style, emotional state, tone (language), or classroom content may even cause students to exhibit passive participation (KF4). Conversely, once teachers have a good understanding of student engagement and a clear understanding of core teaching values and beliefs, they can positively impact student engagement when applying pedagogy (KF5). In the case of this study, teachers and researchers' reflections on teacher identity, pedagogical autonomy, and pedagogical skills may also positively impact student engagement and teacher professional development and be enhanced by adopting a CAR approach in their practice (KF6).

Finally, in addition to the importance of teachers, the impact of multi-level scaffolding in increasing student engagement cannot be overlooked. Teachers, pedagogy, and peers are all critical factors in promoting student engagement (KF7).

The following chapter ends the thesis by presenting the conclusions of this study, as well as my recommendations for future research.

Chapter 7 Conclusions and Recommendations

7.1 Chapter Overview

This chapter consolidates the diverse themes expounded on in Chapter 5 and further distilled around seven KFs in Chapter 6 to address the RQs and simultaneously consider implications, limitations, and potential pathways for further investigation. The outcomes of this research are closely associated with the influence of TEL and music on student engagement, as discussed in Chapter 6. This chapter comprises seven sections, the remainder of which are organised as follows: the second section presents a comprehensive examination of the KFs that directly address the RQs. The third section explores the implications arising from the KFs. In the fourth section, an analysis of the limitations is provided, while the fifth section discusses the recommendations for the future research. Then the sixth section outlines the original contributions made by this study. Finally, the seventh section provides some concluding remarks and reflective thoughts.

Though this study, I aimed to understand and explore the impact of TEL combined with music on the engagement of nursery students in the context of English nursery classrooms in China. I examined the behavioural and emotional engagement of students when teachers applied TELT-M as the main pedagogical approach and explored teachers' perspectives, understandings, and articulations of this pedagogy. Following an interpretive approach, classroom observation and interview methods were used to examine student engagement. After two pilots, I used CAR to co-design the lesson plans and reflect on their implementation with two teachers weekly over a 3-month period. The findings suggest that the use of a combination of TEL and music as teaching tools and methods in English classes at private nurseries in Beijing positively impacted the students' classroom participation. In addition, the use of TEL as a teaching tool promoted collaborative learning, enabling the children to enjoy being part of a group and share their findings and information. This tool may facilitate the adoption of learner-centred teaching pedagogies by teachers and help overcome the dominance of the current teacher-centred approach in the classroom. These findings build upon Lu et al. 's (2022) research, which notes that teachers often struggle to recognise the inherent contradiction between teacher- and student- centred

approaches in the classroom setting.

The negative aspects of using music combined with TEL as a primary teaching method have likewise been discussed in this thesis. One key challenge was found to be teachers' lack of experience and training in using TEL, which can lead to anxiety and difficulties in effectively applying it. This thesis has argued that teachers may encounter unexpected challenges when using technology, such as technical problems, network availability, and bugs that must be fixed. Teachers therefore need regular training to be prepared for unexpected obstacles and to keep pace with the latest innovations in technology. Moreover, while some teachers may have the technical skills, incorporating TEL into teaching requires more; specifically, teachers must acquire knowledge about the pedagogical role of technology and adopt a child-centred philosophy to take advantage of TEL devices.

Another key challenge for teachers lies in classroom management and control. As Walters and Frei (2007) mention, student behaviour may affect teachers' effectiveness in using TEL; it is the teacher who establishes and reinforces classroom rules that will help them regain control. In this study, I noted that students would run around the classroom after completing activities on the IWB or projector. Only when teachers reminded students of the classroom rules and the consequences of breaking them, such as damaging the equipment or causing harm to themselves or other students, were they likely to be effective at avoiding such problems.

The next section focusses on the findings that best address my two RQs and their sub-questions.

7.2 Key Findings Addressing the Research Questions

This study was guided by two overarching RQs. While the previous chapter provided a discussion of each of the KFs, this section synthesises the findings to directly address the two RQs and their sub-questions.

RQ 1: What emotional and behavioural engagement responses do students have in nurseries in Beijing when experiencing TELT-M?

This question is addressed by KF1, KF2 and KF7.

After the teachers used TELT-M in the classroom, most of the children who participated in the study exhibited interest as well as positive emotions, such as increased verbal responses, expressions of delight, and movement during the lessons. There seemed to be two primary contributors to the children's experience of positive emotional engagement. The first factor was related to utilizing instant feedback, amusement, play, promotion of imagination, and IWB or projector that motivated children. The second aspect was the combination of TEL and music, which could positively influence both the emotional and behavioural engagement of students while they were in the classroom. My research found that this typically involved the following aspects:

Increasing concentration: Listening to music could help students focus and concentrate on their work. This engagement was more effectively enhanced when the music chosen matched the students' preferences. For example, melodies that were familiar to students and had an upbeat but relatively slow tempo appeared to be more appropriate for the students in the two nurseries. These findings are supported by Shernoff et al. (2003). Furthermore, although I was not consciously aware of the concept of 'flow' during the data collection phase, when organising the data, I found that my observations of students closely mirrored Csikszentmihalyi's (2009) notion of flow. When students heard tones they liked, it facilitated a state of flow where they felt completely absorbed and engaged in the activity.

Improving mood and increasing motivation: During the research, I became aware that music has been demonstrated to positively impact mood and that students were more actively engaged in the classroom when they were relaxed and feel at ease. Music that had a strong beat or was catchy can motivate students. This aligns with the findings of Thoma et al. (2013), Bidelman and Alain (2015), and De Witte et al. (2020).

In general, integrating TEL with music could be a potent tool for improving students' emotional and behavioural engagement in the classroom. However, to select the appropriate music and technology for each activity and ensure that these resources are employed in a manner that contributes to the learning process rather than one that detracts from it.

RQ 2: What factors influence the effectiveness of TELT-M in promoting learner engagement?

In this research question, there are two sub-questions, I will provide discussion for each of them individually. I identified several factors in my findings that may influence the effects of TEL and music on the promotion of learner engagement. These factors encompass positive perceptions amongst participating teachers in the fieldwork regarding the impact of audio-visual technology in supporting student learning, as well as such technology's potential influence on enhancing student participation when combined with music.

RQ 2.1: What and how much impact do teachers perceive TELT-M to have as a teaching tool on student engagement?

KF3, KF5 and KF6 are drawn on when addressing this research questions.

Teachers' perceptions of the impact of teaching English with enhanced technology combined with music depend on several factors, including their teaching experiences, comfort with technology, and their personal beliefs about the role of music and technology in education. Additionally, these educators noted that technology and music not only enhance engagement but also provide a variety of learning opportunities for their students. They recognized that technology enables them to incorporate multimedia elements, virtual field trips, and interactive quizzes, while music could add a rhythmic and emotional dimension to language learning.

Enhanced Engagement: The teachers in this research perceived that using technology and music in the English language classroom could enhance student engagement. They believed that multimedia resources, interactive software, and music could make lessons more appealing and relatable to students, thereby increasing their motivation to participate actively in the learning process.

Variety in Learning: Teachers viewed technology and music as tools that offer diverse instructional methods. They recognized that technology enables them to incorporate multimedia elements, virtual field trips, and interactive quizzes, while music could add a rhythmic and emotional dimension to language learning.

However, teachers also felt anxious about applying TEL successfully due to a lack of experience and training. To cope with unexpected barriers, teachers required regular training. Another key challenge for teachers lied in classroom management and control.

In addition, my research revealed that teacher readiness, engagement, and attitudes supportive of student learning would all affect student engagement and that teachers' characteristics could act as amplifiers or barriers. Teachers' workload could also influence their professional identity and their ability to adopt new technological teaching pedagogies, which mirrors the findings of Day (2011) and Sung et al. (2016), as mentioned in Section 6.6.

At the same time, the conclusions drawn in my research differ somewhat from those of Tamana et al. (2019). Their findings suggest that constant exposure to highly stimulating and rapidly changing visual stimuli on digital devices may hinder children's ability to sustain attention during other activities. In contrast, my study revealed that the combination of enhanced technology and music in the classroom, providing multisensory stimulation, to some extent, positively contributes to students' attention and classroom engagement.

RQ 2.2: What roles do teachers' skills and perceptions play in the effective use of TELT-M?

This research question is addressed by drawing on ideas from KF3, KF4, KF5 and KF6. Teachers' skills, attitudes, and awareness played pivotal roles in the effective use of teaching English with enhanced technology combined with music. From the data I analysed that the teachers' proficiency in utilizing technology and music, coupled with their positive perceptions and informed choices, would create dynamic and engaging language learning environments.

Attitude and preparation of the teacher: While TEL could improve students' learning outcomes, its successful integration into the classroom was highly dependent on the attitude and preparation of the teacher. This study further found that the teacher's level of preparation set the tone for the classroom and that students were more engaged when the teacher was well prepared.

Contextual features: Contextual features appeard to influence learner engagement in many ways, primarily as a enviornment for teaching practices and teacher characteristics, but also in more direct or powerful ways, such as when conversation partners were particularly engaging (or not) or when lesson content was interesting and relevant (or not). I found that the classroom atmosphere, interlocutor, and course and task influenced engagement.

Teachers' reflection: A crucial point that arose from the study was that teachers' reflections were enhanced by collaboratively engaging with me as a researcher and 'critical partner'. Reflection helped teachers identify strengths and weaknesses to improve teaching techniques and create effective lesson plans; enabled them to better understand their students' needs and perspectives, which in turn enabled them to adapt teaching pedagogies for improved classroom engagement and helped them to incorporate feedback to improve their own pedagogy. Reflection encouraged a more holistic approach to education, with teachers recognising the importance of multiple forms of scaffolding and adopting more student-centred activities. Through their participation in my study, the teachers were given the time and opportunity to engage in reflection.

Firstly, reflection helped the teachers become more self-aware of their own teaching practices. By reflecting on their experiences in the classroom, they could identify their strengths and weaknesses as educators and use this knowledge to improve their teaching techniques, adapt their teaching pedagogies to better suit their students, and create more effective lesson plans. For example, the teachers reflected on and identified areas where they could have included more engagement within PPT through observations of student engagement in the classroom or analysed which type of music would better enhance students' engagement based on their responses to the different music being played. These reflections could lead to changes in teachers' pedagogies, such as adjustments to music type and increased preparation for lessons.

Secondly, reflection noticeably enabled the teachers in this research to better understand the needs and perspectives of their students. By reflecting on students' behavioural and emotional engagement in the classroom, teachers could adapt their teaching pedagogies to engage students more in the classroom. For example, a teacher could reflect on a music activity in which some students participate at a high

level but disrupt the participation of others by being too loud, which could make the teacher aware of the need for more effective classroom management during singing.

The CAR in this research led to productive self-reflection from the teachers, and the increased student participation in the classroom speaks to the usefulness of such collaboration.

The next section discusses the implications derived from the findings of the research.

7.3 Implications of the Research Findings

This study found that music and technology boosted student engagement in the classroom by facilitating quick feedback, role-playing, and collaborative learning. Students liked conversing, joking, playing, and giving guidance during TEL. Music also helped the students relax and enjoy class. Through TEL, the teachers and students scaffolded student engagement, enabling the learners to perform activities independently and to simplify complex ones. In addition to these positive findings, I identified some negative aspects such as students losing interest in music or not adhering to rules during video play and the lack of necessary equipment, which would need consideration when developing implications from the research.

These findings have implications for national and regional policymakers, practitioners, and the academic community. I address each of these types of implications in the following three sub-sections.

7.3.1 Implications for Policymakers at the Regional and National Levels

I have explained how educational policies could encourage the integration of music and technology in classrooms to boost student engagement. Policymakers could invest in resources to support technology integration and music programmes in schools to help students relax and enjoy their classes.

The findings of the current study provide suggestions and insights for nursery school

headmasters. Firstly, schools would benefit from investing in technology, such as tablets, IWBs, projectors and educational software, and ensure that teachers use it effectively in the classroom. Notably, by 2019 (Liu & Chen, 2019), teachers were reporting higher rates of infrastructure provision, including TVs and DVDs (97.4%), computers (95.5%), projectors (82.8%), internet access (77.4%) digital cameras (73.2%), educational software (70.4%), telephones (73.9%), IWBs (61.2%) and laptops (52.9%). Devices that are commonly used China-wide, such as TVs, computers, and interactive media, had gained popularity by 2019; however, according to the data, many cities still suffer from a lack of digital resources that limit the daily use of technology, which has been supported by Liu (2018) and Jing Li (2019).

In addition to investments in technology, the professional training of teachers in schools is also crucial. Many teachers have not received such training (Weng & Li, 2018; Liu, 2018; Chen, 2019). Increasing the quantity and quality of training available to teachers would greatly improve their ability to integrate technology into their practices. Another important issue is that the training for teachers is particularly technology centred, with little focus on pedagogy; for in-service teachers, training is focussed on the use of hardware and software, with few training sessions on its integration into teaching activities. Training in China focusses more on technical skills, such as learning to use Flash, making animations, and building web pages for educational programmers, than on using technology in teaching. As such, these training programmes fail to meet teachers' demands for the development of advanced skills, a point corroborated Dong's (2018) study involving interviews with four preschool teachers. He notes that the lack of effective ICT training and professional development presents significant obstacles when integrating ICT into teaching practices.

Prior to completing my dissertation, I found the 'Quality Evaluation Indicators for Nursery Care and Education' (Ministry of Education of China, 2022), which states that 'adequate and diverse teaching tools and picture books' should not 'emphasise hardware over substance'. This is a national policy, but it is also understood and executed by both public and private nursery heads in the nurseries they administer. Alternatively, the national policy message could be interpreted as ensuring that the substance of pedagogy is not overlooked by the uninformed adoption of technological hardware. In either case, teachers and heads of nurseries could benefit from guidance on this issue.

Indeed, my research is compatible with this policy, which suggests that nursery education has become the responsibility of the Ministry of Education China. As mentioned in my findings, based on my observations and interviews with teachers, they evidently require more guidance on how to integrate knowledge and skills; otherwise, their TEL skills may improve while their teaching skills do not. While training could focus on integrating the use of TEL devices and teaching activities, care may also be taken to avoid using such technology or music as a simple tool to show children what is being taught and to guide learning. The use of technology in learning and teaching would be informed by sound pedagogical theory rather than merely passive information transmission approaches. In my study, for example, one teacher was using TEL combined with music as a tool for outputting content and interaction, and this approach increased students' engagement to some extent. However, the use of TELT-M would not be especially effective in Chinese nurseries if the teacher just played a piece of music, showed an animated video, or used the technology to play relaxing music to help calm children down after an outdoor activity or induce them to sleep, which is a view supported by Dong and Mertala (2021).

As stated in the policy mentioned above, if the focus is placed merely on hardware, such as the use of IWBs or projectors to display language, a traditional blackboard's functions are simply replaced by those of a digital resource, meaning that the technology-centred strategy is ineffective; IWBs or projectors simply replace, instead of improving upon, blackboards. By contrast, according to my research, the teachers used games to achieve teaching objectives and enhance student engagement, with the IWB or projector used as a tool to achieve such objectives. Students were shown videos on the IWB or projector and performed activities to increase their engagement.

While a lack of equipment will remain a barrier to incorporating technology into teaching practice, from both a Beijing and a national perspective, it is no longer the only, or arguably the most important, barrier. Instead, a lack of time and training is the primary obstacle, which aligns with the findings of Liu and Chen (2019) and Dong (2018). This suggests that future teacher training programmes could place a greater emphasis on the integration of technology and the distribution of information. The findings also suggest that it is important to increase collaboration between existing teachers and other schools or professional researchers, in addition to

providing training for teachers in quality technology integration.

Nursery heads may wish to collaborate with other schools that have successfully implemented music and technology in the classroom to learn best practices and strategies. It may even be possible to collaborate with music professionals, such as composers or music therapists, to develop a music curriculum that incorporates technology. This approach, enhanced by a collaborative practitioner inquiry, can help ensure that technology is used in a way consistent with best practices in music education and appropriate for the developmental stage of nursery students.

In addition, given the centrality of technology in the early childhood classroom, some nurseries in a position to do so may ask one or two teachers to adopt the role of IT administrator to help colleagues use technology and solve related problems. This support is necessary, as most Chinese teachers lack a clear, basic digital knowledge base, as supported by Jing Li (2019). This also mirrors how Scottish Education has tackled promoting primary education teachers' STEM skills, with specially trained mentor teachers working in their schools to promote skills and professional learning (Lowden et al., 2019).

Through reading the literature by Chen (2019), I learned that some nursery directors measure teachers by their use of PPT or even fully conceptualise TEL as screen-based digital resources, such as IWBs and computers. In my research, I found that designing PPT slides easily becomes a teacher-valued issue, as teachers most often apply PPT related devices during lessons, which usually involves a type of passive teacher-centred learning that conflicts with a child-centred approach.

When principals assess, they may collect data on student participation, as well as seek feedback from students and teachers. A dialogue must also occur between teachers and headmasters to build a shared understanding of TEL's implementation and professional learning; thus, this information can be used to make informed decisions and ensure that it positively impacts student learning.

That is, policymakers might first provide funding to nursery heads to enable them to purchase and implement more effective technologies for teacher training. This may involve educational software, online learning platforms, and digital resources. Then, policymakers can design policies that support the incorporation of TEL in teacher

education. These could include norms and standards for the use of technology, as well as incentives for principals who prioritise technology in their training programmes. Headmasters and teachers could also receive training on how to incorporate technology into their lesson plans and use TEL effectively in the classroom. Furthermore, policymakers may support collaborations between nursery heads and technology firms to create new training programmes that combine enhanced technologies. This may involve partnering to build new tools and materials that are specifically geared to the needs of nursery schoolteachers. Finally, policymakers could analyse the efficacy of technology integration in teacher training programmes to determine its impact on student learning results. This could aid in informing future policy decisions and ensuring that resources are spent effectively.

7.3.2 Implications for Teachers

This section presents the implications of my findings for teachers, including several recommendations for teachers in the application of TEL and music as a pedagogy. Teachers might consider student diversity and obtain reliable information about each child's skills, interests, and requirements; teachers themselves may need to adjust their emotional state and language; and teachers may need to explore continuous professional development.

Teachers could use technology and music to provide quick feedback, role-playing, and collaborative learning experiences to students. However, TELT-M is not a magic tool that engages young learners and promotes their participation in the classroom. Instead, teachers would be prepared to guide and manage the classroom correctly in terms of methodology and technology.

The potential of combining enhanced technology and music as teaching pedagogies in early childhood education settings requires careful consideration. Conversely, the process of implementation calls for new, often convoluted, business procedures that must be carefully evaluated. I provide recommendations for possible future practices based on the results of this study as follows.

According to the findings of this research, for educators to make the most of the powerful resources at their disposal, they must consider the unique characteristics of

each of their students. In addition, they must collect precise information regarding the abilities, interests, and requirements of each child in their classrooms.

Firstly, the material in the classroom that is intended for use with children could be coordinated with relevant educational goals. Secondly, it needs to be considered, teachers structure the curriculum of their classes so that it considers varying levels of student proficiency. Thirdly, classroom management could be ignored, and the requirements of the children, including their interests, should be considered, since this can boost their motivation and engagement. Fourthly, children would be provided with opportunities for collaborative learning through teachers assigning tasks using enhanced technologies, which may facilitate scaffolding and peer-to-peer teaching, the sharing of discoveries and learning experiences, and the exchange of newly acquired information with peers. These opportunities could be made available to children through TEL. Teachers in China today still largely use teacher-centred forms of delivery, and their use of PPT is mostly for passive learning with teacher- centred teaching and group learning, as reported by Luo et al. (2021). By modifying their use of improved technology, teachers can move away from a teacher-centred format. The teachers have to see positive aspect of using TEL may increase engagement and ultimately facilitate the adoption of a more student-centred pedagogy.

More crucially, teachers' emotional states and speech intelligibility can affect students' engagement and participation, with monotonous or weak voices negatively impacting attention and engagement. Teachers who are nervous, apprehensive, or angry may unintentionally alter their students' disposition and engagement. It is thus crucial to support teachers' emotional health and well-being, including relevant skills. If teachers remain approachable and create a safe and encouraging environment for meeting their students' needs, it may affect their interest levels and subsequent engagement. Student engagement is dynamic, situational, and vulnerable to the environment. Teachers would consider the difficulty level of their lessons, which also greatly affects student engagement.

Simplicity of voice is another crucial element in student engagement. Teachers whose voices are weak or monotonous may struggle to maintain their pupils' attention. Hence, it is important to train teachers on how to communicate clearly and effectively and employ a variety of vocal styles to maintain interest. In addition, trainers could use feedback and observation to provide constructive criticism and highlight areas for

development to help teachers enhance their engagement abilities. This could be accomplished through classroom observations, video recordings, and consistent feedback sessions.

Furthermore, based on the analysis of the fieldwork in two nursery schools, this study's findings suggest that continuing professional development for teachers is essential for ensuring increased student engagement; however, this is currently lacking for in-service teachers. The nurseries in my study provided teachers with TEL equipment, and both teachers were expatriates with undergraduate degrees; both the hardware and the teachers' level of competence may have been sufficient for them to use TELT-M, but they had not tried it before the study began. Thus, teachers are still far from being able to use and explore these devices, which means that they need to learn not only how to use them but also how to use them effectively in conjunction with teaching. This aligns with the findings of Ranieri and Bruni (2018), who state that teacher preparation programmes focus on the use of technology skills rather than teaching competencies.

In addition, it is evident from my study that CAR can be useful for teachers' continuous professional development. The results demonstrate that CAR is an effective approach for helping teachers achieve professional development, by allowing them to ask questions and use their own or secondary evidence in their reflective processes. I found that CAR allows teams of educators or researchers to work together to investigate and improve methods of educational practice. Through this approach, teachers and researchers can identify areas of concern in teaching practice, design and implement interventions, collect and analyse data, and reflect on their findings. By working with researchers, teachers can identify areas of their practice that may need support or guidance. They can also explore new teaching pedagogies and strategies, experiment with different techniques, and reflect on the results. I chose CAR because it allowed the teachers to adapt and explore the songs they chose based on students' responses. They reflected and then discussed their thoughts with me (the researcher), which allowed them to develop a deeper understanding of the pedagogical potential of the songs and to improve their teaching practices accordingly, resulting in increased student engagement. This type of research can help teachers gain practical knowledge about the potential pedagogical role of technology and learn how to effectively integrate pedagogical approaches into their lessons. Through interviewing and collaborating with teachers and, I determined

that professional development activities, such as workshops and training courses, that demonstrate how to effectively use IWBs and other ICT tools in classroom instruction can aid teachers' self-development. Moreover, continual support and resources can aid teachers in effectively integrating IWBs or projectors into their teaching practices, allowing them to refine their instructional methods over time.

7.3.3 Implications for the Academic Community

Based on my experience, I now offer suggestions to researchers who use the CAR method to study teaching pedagogies in Chinese nurseries.

It is extremely helpful to prepare and communicate with teachers before conducting field investigations. Before starting my research in the nurseries, I communicated with the teachers for at least a week, which included learning about their personalities, understandings of education, knowledge of students, and views on CAR. Understanding the teachers and communicating clearly helped me to cooperate with them in the most suitable way, such as with the teacher Jack. During the communication process before the research, I learned that Jack had a part-time job in the evenings, so he needed to leave immediately after school. However, he was willing to discuss research problems and reflect on the content of the class with me after all work had been completed. As such, I also adjusted my schedule so that we had more time to communicate and discuss. Thus, communicating and exchanging ideas with teachers as much as possible before starting a CAR project will help researchers prepare for the work.

Next, I offer suggestions for researchers who focus on Chinese nurseries. In research, it is crucial to ensure compliance with ethical principles, especially in studies that involve children. Researchers must obtain the consent of parents or guardians and protect the privacy and dignity of young children during the research process. As I was collecting data during the outbreak of COVID-19 in China, I was extremely concerned about the ethical implications and practicality of contacting children, as I was aware that in China, the protection of children in schools is critical. After returning to China and completing my quarantine, I underwent bi-weekly nucleic acid testing to assure my safety in the nursery. In addition, the schools' principals, instructors, and security guards were extremely helpful and understanding during my

research. After I explained my research objectives, methodology, and ethical considerations, all participants displayed a high level of interest and support. This allowed me to visit the nurseries daily to acquire initial data on the young children through classroom observation.

In conclusion, for researchers focusing on Chinese nurseries, it is imperative to prioritize ethical considerations, particularly when working with children. This entails obtaining informed consent from parents or guardians and upholding the privacy and dignity of young participants. My experience during the COVID-19 outbreak underscored the importance of adhering to ethical standards and maintaining safety measures while conducting research in this context. Building strong rapport and transparent communication with nursery staff and stakeholders can facilitate a productive and ethical research process in Chinese nurseries.

7.4 Limitations

This study has some limitations. Firstly, it only focussed on student engagement and not on more in-depth changes in students' language skills or knowledge. Student engagement is inextricably linked to students' language-learning gains but after discussing this with supervisors and peers in the first year of the study, we felt assessing knowledge would fall beyond the scope of the investigation. Secondly, this study focussed on behavioural and affective engagement but did not explore cognitive engagement, due to the limitations of the students' age, as mentioned in the Literature Review chapter (section 2.2.1). Thirdly, there were resource and time constraints, as I was the only researcher. While perfection is impossible, researchers must be creative and efficient with their time and available resources to achieve their desired goals.

A fourth limitation is the lack of 'learner voices' in the information that I gathered, which primarily relied on teacher interviews and observations. Although the methods were effective in addressing my RQs, the more holistic design would entail leading focus group discussions with students. This approach would enable an exploration of their preferences regarding the integration of technology and music within the classroom setting. This is a topic that I consider worthy of additional research.

Fifthly, I did not compare the combination of TEL with music to comparable evaluations of student engagement in traditional or non-musical classroom environments. In the context of this study, I observed that both teachers had prior pedagogical expertise and had used traditional or non-musical teaching approaches, which resulted in the addition of personal perspectives and experiences during the interview process. Nevertheless, it would be helpful to further investigate analyses of the integration of TEL and music compared to traditional or non-musical practices.

7.5 Directions for Future Research

In this section, I present research recommendations and directions for future research.

The findings of this study shed light on several areas that require further investigation and exploration. This interpretive study involved only two nursery English classrooms and focussed on the impact of the integration of TEL and music on student engagement. Areas that require further research in this process include the relationship of student engagement with learning outcomes and achievement; further research in this area could provide a broader perspective on this topic and aim to analyse qualitative and quantitative data, for example students' vocabulary scores across a number of nurseries. Further research is also required on the differences in engagement across diverse groups of students who are taught with similar pedagogies, such as different age groups and other private nurseries.

Additionally, to examine this topic in greater depth, researchers could extend their efforts to include the views of headmasters and parents to obtain a fuller picture of engagement factors. Future research on the combination of TEL and music to help increase student engagement would also include further longitudinal research to determine whether young learners' engagement with TELT-M changes over time, as well as to examine the reasons for any changes.

In addition, a general trend exists in Asia and beyond towards the prevalence of TEL in early childhood education, as has been outlined by Zuhri and Akhmad (2022) in Indonesia. McDonald and Fotakopoulou (2022) have also described this trend in England, Norway, and Greece. Furthermore, Lee et al. (2021) identified considerable positive effects on children's attention, preference, and willingness to participate

when they were learning under an innovative curriculum that combined music and pictorial technology with physical activity in a Taiwanese preschool. They suggest that when music is combined with physical activity, it facilitates improved attitudes and feelings about learning amongst children. Notably, during my research, the COVID-19 pandemic brought to my attention the increasing use of online virtual tools to help teachers with distance learning lessons.

A study by Hu et al. (2021) during this period notes that in Hong Kong, despite the increased use of technology in education and everyday life, students and teachers seemed to be simply moving lessons from the traditional classroom to the web. Thus, despite the widespread adoption of TEL environments during the COVID-19 pandemic, true digital learning remained elusive; traditional pedagogical approaches were simply being transferred to a digital platform. Given that my fieldwork was conducted in Beijing, it would be interesting to conduct research similar to that of Hu et al. in nurseries in Beijing.

As the education system in Hong Kong differs from that on the mainland to some degree, the findings may vary. It is worth exploring how virtual tools can be used to teach online in a sensible and effective way, when lockdowns force online learning, or in other urgent emergencies.

Finally, a suggestion for future research is that researchers could build upon my study's RQs but directly gather data concerning the voices and perspectives of learners.

7.6 Original Contributions of the Study

The original contribution of the study is threefold: (1) I offer research-based insights for practitioners and researchers in China on the integration of TELT-M pedagogies; (2) I provide original insights and practical guidance for teachers to enhance their classroom practices, particularly in the context of TEL supported by CAR; and (3) I put forward recommendations for nursery headmasters, addressing technology integration barriers and emphasising training, collaboration, that also have relevance to educational policy.

Contribution to pedagogical thinking

I have provided illuminative insights for nursery teachers in China regarding the teaching pedagogies of TELT-M and the CAR approach. The integration of technology and music in early childhood English classrooms can increase student engagement and facilitate the development of new teaching strategies and tools. This original contribution builds on recent research on Chinese nurseries by Dong and Mertala (2019) who focus on the support for digitization in early childhood education, the attitudes, and capabilities of Chinese teachers in integrating technology into their teaching practices.

Meanwhile the research by Luo et al. (2021) who discussed the topic with the perspectives of pre-service early childhood teachers in China on information and communication technology and their adaptability. My research shares similarities with theirs in exploring enhanced technology. However, I expanded this field of research by combining TELT-M and the CAR approach to generate new data and related analyses. By integrating technology and music into language learning, teachers can create more interactive, personalised, and effective learning experiences that help students stay motivated and engaged in the learning process. I have suggested how teachers would benefit from exploring the various ways in which technology and language learning can be integrated to enhance student learning and engagement.

Contribution to the practical application of TEL supported by CAR

I have highlighted the value of adopting a greater use of CAR by practitioners, which has already been used in UK (e.g. Rojas-Bustos & Panniello, 2022) and Chile (Paula & Ignacio, 2018), in preschool provision in China. Other studies have focussed on Chinese nurseries (e.g. Liu, Toki, & Pange , 2014, Weng & Li, 2018) but none have considered CAR in their research design. In this study, teachers were encouraged and guided to use multiple scaffolds to make their classrooms richer supported by a CAR process that also involved myself as an external researcher. Many Chinese teachers want to use TEL devices for teaching, yet are unaware that a reflective collaborative action research approach could facilitate an effective adoption of TEL in their classrooms and schools. I have offered an original analysis of evidence from the case study Chinese nurseries and made suggestions that can

inform other teachers' professional learning.

Contribution to policy

I provide recommendations and insights for nursery headmasters to inform the effective implementation of TEL that are not limited to private nurseries or English-language subjects. A lack of time and training was identified as a major barrier to the integration of technology into teaching practice. This mirrors Nikolopoulou et al.'s (2023) study regarding Greek teachers' perceptions of barriers to the use of mobile technology in the classroom. They identified a similar order of importance of barrier factors for users and non-users in the classroom ('lack of resources', 'support', and 'classroom conditions'), independent of the type of mobile device used in the classroom (Nikolopoulou, 2023). Chinese early childhood teachers receive very little systematic training in technology integration; the training they do receive focusses on the use of hardware and software, with few sessions focussed on integrating technology into teaching and learning activities. As Li Li. (2018) mentioned, teachers could learn how to understand the role of technology and make it fit within their budget and instructional needs. After conducting an original analysis of fieldwork from Chinese nurseries, several recommendations for headmasters and policymakers have emerged from my research. These include to emphasize integrating equipment with instruction; and to promote collaborative training to merge knowledge and skills for effective technology use and encourage cooperation with teachers, schools, and experts to co-develop best practices. These recommendations are also highly relevant to the Ministry of Education of China's (2022) latest policy that stresses that teachers should not 'emphasise hardware over substance'. My study is among the first to provide recommendations that inform the implementation of this new policy.

My research has also highlighted for policy, the usefulness of adopting a CAR approach in educational settings to enhance teachers' professional learning and practice. In this case, the focus was on TEL, but the CAR approach also has potential for other aspects of teachers' professional learning.

7.7 Conclusions and Final Thoughts

This thesis presents the qualitative research that I conducted to investigate the influence of teachers' technology-enhanced and music-based pedagogy on students, along with teachers' perceptions and application of this pedagogical approach in two Beijing nurseries. The study reveals disparities in student engagement resulting from the implementation of the TELT-M pedagogy. Moreover, it makes an original contribution to the use of enhanced technology and music in Chinese nurseries, offering crucial implications for future policy, practice, and research in this domain.

As a researcher, the years that I dedicated to my doctoral research have endowed me with the expertise to systematically and critically comprehend and analyse diverse forms of evidence and data. Furthermore, I have developed an understanding of the importance of situating my own research within the existing literature, enabling a broader perspective on the issues, and acknowledging the potential to validate or expand upon existing knowledge. The use of qualitative methods has provided me with invaluable skills and insights into individuals' perspectives and the multifaceted realities of real-life contexts.

The genesis of this inquiry lay in my personal teaching experiences in early childhood English education and professional work. My conviction has always been that every educator aspires to witness the fruits of their students' endeavours. During my fieldwork, I observed the curiosity and exploratory nature of Chinese nursery teachers and headmasters. Despite the challenges faced with TEL in China, it has been heartening to witness the concerted efforts of Chinese educators to enhance education through the assimilation of novel educational models, ideas, and methodologies. I believe that TEL and music, when integrated effectively, can open new avenues for the early childhood education sector in China and beyond. Recognising that this is an enduring journey built on the cumulative efforts of educators and researchers, I hope that my research will inspire others who intend to contribute to technology-integrated education in China and globally, thereby enhancing student engagement in classrooms.

Looking ahead, I am determined to continue exploring the evolution of a future that seamlessly integrates technology and music, enriching educational practices and enhancing the learning experiences of students.

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Appendix A: Plain Language Statement

University of Glasgow

College of Social Sciences

Plain Language Statement for Children

Title of project and researcher details:

Implementing Technology-enhanced English Language Teaching with music at private Nursery in China: Students' Experience, Engagement andPerformance

Researcher: Miss Sicong Li

Supervisors: Dr. Oscar Odena and Prof. Victor Lally

It is better to read with your parents. They can explain the text to you if you have any questions.

You are being invited to take part in a research project into exploring music and enhanced technology to teach English in Chinese nurseries. You are being asked to take part because teaching English with enhanced technology in Chinese nurseries is still at a rudimentary stage,needing further research.

My project involves me working with you for the English classes in this month. You will attend the English class as usual expect I will be your English teachers. Also, the research will last for 12 weeks in total, 4-week course run in three timesin three different school, so that means the research in your school will last 4 weeks.

Before you decide if you want to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read this page with your parents/carers and ask me if you would like more information. Take time to decide whether or not you wish to take part.

What will happen if you take part?

The purpose of this study is to explore the efficiency of applying music and enhanced-technology in teaching English in Nurseries in China. By offering original insights on the analysis of children's psychological and cognitive characteristics, and the theory of modern English teaching and linguistics as the instruction, I will explore the course thinking and teaching strategies of English teaching for children.

You do not have to answer any questions that you don't want to. I will teach in your class as an English teacher and will be finished gathering information by the end of the month.

You do not have to take part in this study, and if you decide to, your participation will still be totally voluntary. If, after you have started to take part, you change your mind, just let meknow and I will not use any information you have given me.

Keeping information confidential

I will keep the information in a locked cabinet or in a locked file on my computer. When I write about what I have found out, your name will not be mentioned. If you like you can choose another name for me to use when I am writing about what you said. No-one else will know which name you have chosen. However, confidentiality may be impossible to guarantee due to small size of the sample or location, which means the people from neighborhoods or yourfriends may conjecture the participants in the research.

However, if during our class I hear anything which makes me worried that you might be in danger of harm, I might have to tell other people who need to know about this.

The results of this study

When I have gathered all of the information from everyone who is taking part I will writeabout what I have learned in a thesis, which is a long essay, which I have to complete for the course I am studying on. This will be read and marked by my teachers at university. I will tell you and the other children who have taken part what I have found out about. I will destroy all of my original notes and recordings when the project is finished.

Review of the study

This study has been reviewed and agreed by the College of Social Sciences Research Ethics Committee, University of Glasgow, United Kingdom.

Contact for further Information

If you have any questions about this study, you can ask me (xxxxxxxx@student.gla.ac.uk) or the Ethics officer for the College of Social Sciences. Muir.Houston@glasgow.ac.uk

Thank you for reading this!

University of Glasgow

College of Social Sciences

Plain Language Statement for Parents

Implementing Technology-enhanced English Language Teaching with music at private Nursery in China: Students' Experience, Engagement and Performance

Researcher: Miss Sicong Li

Supervisors: Dr. Oscar Odena and Prof. Victor Lally

Programme: PhD in Education

You are being invited to take part in a research project into Implementing Technology-enhanced English Language Teaching with music at private Nursery in China: Students' Experience, Engagement and Performance. Because teaching English with enhanced technology in Chinese nurseries is still at a rudimentary stage, needing further research. Liu (2014) suggests that Chinese nurseries are adopting technology in their education but that they still face challenges and problems. So, this is an attempt to use advanced technology to teach English for Chinese children's English teaching methods. This research can explore the effect of enhanced technology, serving as a booster for drawing the attention of domestic nursery teachers to enhanced technology. In addition, few researches have been focused on exploring music combined with enhanced technology in teaching English. Regardless of the research results, the exploration of children's English teaching methods through this research may bring more researchers to focus on this field, so that related issues would receive more publicity.

The research will last for 12 weeks in total, 4-week course run in three times in three different school, the school which your children involved is one of the three.

Before you decide if you want to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the information on this page carefully. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What will happen if you take part?

The purpose of this study is to seek the efficiency of using enhanced-technology and music in teaching English in Chinese nurseries. If you decide to take part I will wish you can take part into two questionnaire. These two questionnaires will be released to you before and after the research.

During the research I will teach one class as the comparative group, and the other one or two classes which have English class with their own teacher (using the teaching methods as usual) will be the controlled groups.

By offering original insights on the analysis of children's psychological and cognitive characteristics, and the theory of modern English teaching and linguistics as the instruction,

I will explore thecourse thinking and teaching strategies of English teaching for children.

You do not have to take part in this study, and if you decide to, your engagement will still be totallyvoluntary. If, after you have started to take part, you change your mind, just let me know and I will not use any information you have given me.

Keeping information confidential

I will keep the information in a locked cabinet or in a locked file on my computer. When I write about what I have found out, your name will not be mentioned. If you like you can choose another name for me to use when I am writing about what you said. No-one else will know which name youhave chosen. However, confidentiality may be impossible to guarantee due to small size of the sample or location, which means the people from neighborhoods or your friends may conjecture the participants in the research.

The resultsof thisstudy

The data will use for my research dissertation only. I assure that the confidentiality of data will be stored in Storage at University of Glasgow or the computer files which can to be available bypassword only.

I intend to destroy the personal data the research data which I collected after I analysed them,

Review of the study

This study has been reviewed and agreed by the College of Social Sciences Research Ethics Committee, University of Glasgow, UK.

Contact for further Information

If you have any questions about this study, you can ask me (xxxxxxxx@student.gla.ac.uk) or the Ethicsofficer for the College of Social Sciences. Muir.Houston@glasgow.ac.uk

Thank you for reading this!

University of Glasgow

College of Social Sciences

Plain Language Statement for teachers

Implementing Technology-enhanced English Language Teaching with music at private Nursery in China: Students' Experience, Engagement and Performance

Researcher: Miss Sicong Li

Supervisors: Dr. Oscar Odena and Prof. Victor Lally

Programme: PhD in Education

You are being invited to take part in a research project into Implementing Technology-enhanced English Language Teaching with music at private Nursery in China: Students' Experience, Engagement and Performance. Because teaching English with enhanced technology in Chinese nurseries is still at a rudimentary stage, needing further research. Liu (2014) suggests that Chinese nurseries are adopting technology in their education but that they still face challenges and problems. So, this is an attempt to use advanced technology to teach English for Chinese children's English teaching methods. This research can explore the effect of enhanced technology, serving as a booster for drawing the attention of domestic nursery teachers to enhanced technology. In addition, few researches have been focused on exploring music combined with enhanced technology in teaching English. Regardless of the research results, the exploration of children's English teaching methods through this research may bring more researchers to focus on this field, so that related issues would receive more publicity.

The research will last for 12 weeks, 4-week course run in three times in three different school, your school is one of the three.

Before you decide if you want to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the information on this page carefully. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What will happen if you take part?

The purpose of this study is to seek the efficiency of using enhanced-technology and music in teaching English in Chinese nurseries. If you decide to take part, I will wish you can take part into the two interviews. These two interviews will proceed before and after the research. During the research I will teach one class as the comparative group, and the other one or two classes which will be taught as their own teacher (using the teaching methods as usual) will be the controlled groups.

By offering original insights on the analysis of children's psychological and cognitive characteristics, and the theory of modern English teaching and linguistics as the instruction, I will explore the course thinking and teaching strategies of English teaching for children.

You do not have to take part in this study, and if you decide to, your engagement will still be totallyvoluntary. If, after you have started to take part, you change your mind, just let me know and I will not use any information you have given me.

Keeping information confidential

I will keep the information in a locked cabinet or in a locked file on my computer. When I write about what I have found out, your name will not be mentioned. If you like you can choose another name for me to use when I am writing about what you said. No-one else will know which name youhave chosen. However, confidentiality may be impossible to guarantee due to small size of the sample or location, which means the people from neighborhoods or your friends may conjecture the participants in the research.

However, if during our conversation I hear anything which makes me worried that you might be indanger of harm, I might have to tell other people who need to know about this.

The resultsof thisstudy

The data will use for my research dissertation only. I assure that the confidentiality of data will be stored in Storage at University of Glasgow or the computer files which can to be available bypassword only.

I intend to destroy the personal data the research data which I collected after I analysed them,

Review of thestudy

This study has been reviewed and agreed by the College of Social Sciences Research Ethics Committee, University of Glasgow, UK.

Contact for further Information

If you have any questions about this study, you can ask me (xxxxxxxx@student.gla.ac.uk) or theEthicsofficer for the College of Social Sciences. Muir.Houston@glasgow.ac.uk

Thank you for reading this!

_____End of Participant Information Sheet_____

Appendix B: Consent Form

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Consent Form (teachers)

Title of Project: *Implementing Technology-enhanced English Language Teaching with musicat private Nursery in China: Students' Experience, Engagement and Performance*
Name of Researcher: Sicong Li

Name of Supervisor: *Dr. Oscar Odena and Prof. Victor Lally*

I confirm that I have read and understood the Plain Language Statement for the above study and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. I consent to interviews being audio-recorded.

I acknowledge that copies of transcripts will be returned to participants for verification. I acknowledge that participants will be referred to by pseudonym.

I acknowledge that there will be no effect on employment arising from my participation or non-participation in this research.

I understand that other authenticated researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.

I understand that other authenticated researchers may use my words in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form

- All names and other material likely to identify individuals will be anonymised.
- The material will always be treated as confidential and kept in secure storage.
- The material will be destroyed once the project is complete.
- The material will be retained in secure storage for use in future academic research
- The material may be used in future publications, both print and online.

I agree to take part in this research study ☐

I do not agree to take part in this research study ☐

OR

I agree/ I do not agree to take part in the above study.

Name of Participant ……

Signature …… Date……

Name of Researcher ……

Signature …… Date……

……End of consent form ……

University of Glasgow | School of Education

Consent Form (children)

Title of Project: *Implementing Technology-enhanced English Language Teaching with musicat private Nursery in China: Students' Experience, Engagement and Performance*
Name of Researcher: Sicong Li

Name of Supervisor: *Dr. Oscar Odena and Prof. Victor Lally*

I confirm that I have read and understood the Plain Language Statement for the above study and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. I acknowledge that participants will be referred to by pseudonym.

I acknowledge that there will be no effect on my grades arising from my participation or non-participation in this research.

I understand that other authenticated researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.

I understand that other authenticated researchers may use my words in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form

- All names and other material likely to identify individuals will be anonymised.
- The material will always be treated as confidential and kept in secure storage.
- The material will be destroyed once the project is complete.
- The material will be retained in secure storage for use in future academic research

- The material may be used in future publications, both print and online.

I agree to take part in this research study ☐

I do not agree to take part in this research study ☐

OR

I agree/ I do not agree to take part in the above study.

Name of Participant ……

Signature …… Date……

Name of Parent/carer **(if participant is under 16)** ……

Signature …… Date……

Name of Researcher ……

Signature …… Date……

……End of consent form ……

University of Glasgow | School of Education

Consent Form (parents)

Title of Project: *Implementing Technology-enhanced English Language Teaching with musicat private Nursery in China: Students' Experience, Engagement and Performance*
Name of Researcher: Sicong Li

Name of Supervisor: *Dr. Oscar Odena and Prof. Victor Lally*

I confirm that I have read and understood the Plain Language Statement for the above study and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. I consent to participant the questionnaires.

I acknowledge that participants will be referred to by pseudonym.

I acknowledge that there will be no effect on grades of my children arising from my participation or non-participation in this research.

I understand that other authenticated researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.

I understand that other authenticated researchers may use my words in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form

- All names and other material likely to identify individuals will be anonymised.
- The material will always be treated as confidential and kept in secure storage.
- The material will be destroyed once the project is complete.
- The material will be retained in secure storage for use in future academic research
- The material may be used in future publications, both print and online.

I agree to take part in this research study ☐

I do not agree to take part in this research study ☐

OR

I agree/ I do not agree to take part in the above study.

Name of Participant ……

Signature …… Date……

Name of Researcher ……

Signature …… Date……

……End of consent form ……

Appendix C: Letter of Ethical Approval

Letter of Ethical Approval removed due to confidentiality issues.

Appendix D: A sample interview transcript of one participant

Interview (round 1) with Teacher Jack in the first

nurseryInterviewer 00:01

Have you used enhanced technology as teaching tools before?

Teacher Jack 00:12

Yeah. I have used technology in my previous teaching.

Interviewer 00:16

So what kind of technology have you used? I mean not only in this nursery, but also in your previous

teachingplaces.

Teacher Jack 00:23

Oh, the whole teaching life. We do have interactive board, which we can ask the kids to go to the front and they canpoint the pictures or which object they want to choose. And it will going to pop up something like same with the one way they have when we do the PowerPoint. Something like that.

Interviewer 00:54

So you can interact directly with the students by using the supports. How often did you use the IWB in your class?

Teacher Jack 00:59

Yes,yes,yes.We use the IWB system nearly in each

class.Interviewer 01:20

So, when you used IWB in the previous school, did you show some video or show some games? Or they

have akind of system that already made for you to apply?

Teacher Jack 01:46

You mean, you're asking, what materials I use another nursery.

Interviewer 01:57

Yeah, what are these materials in IWB? Is there only some video to show within IWB or the teaching content showin the IWB as well?

Teacher Jack 02:10

In the previous school we have the IWB system which include all the materials and content that need to be used in class. It is not necessary for me to prepare the materials in the IWB by myself.

But here we don't have that, but we have this projector. so, what I did is I take a photo, some of the page that important aside from they have their own books. I have to take a photo so that it will be bigger in front and I am showing them what I'm doing is what I also want to imply to them is that they will do the same like, for example, by reading instead of having a book of my hand. Yeah, but I do that also pointing the word. I do that also on the bigscreen, so they took and copy what I'm doing. Yeah. Yeah, instead of like we don't have this interactive board.

Interviewer 03:20

So you use projector in each class as well here, in this nursery? what's your experience of using interactive board?

Teacher Jack 03:27

Here, not in every day's lesson, but most of the lessons. in using the interactive board is that children are havingfun of it, because you know the technologies like pressing it and it will react to what they're doing.

So, they will be excited by doing that even if you have this iPad. And if they can press and they will really, how doyou call that? interested? It's like playing, but playing at the same time, they are also learning. For example, the present this one is, for example, a ball, say ball. sometimes when they press know the word, the board, the picture ball, it will also have given the voice same thing as that. So, since we don't have that one, I let them go to the front and press the picture or in the projector. And they can say the word ball, something like that.

Appendix E: Extended Extract of Sample Lesson Plan

1st lesson (30')

STAGE OF LESSON	TEACHER PARTICIPATION			STUDENT PARTICIPATION	
	Time	Types of Interaction	Teacher Activities/Action	Activities L/S/R/W	Student Activities and Languages (function/form)
Greetings	3'	T-Ss Ss-T	• Say hello to the Ss and sing a hello song.	L&S	• Say hello to the T and sing a hello song.
Warming up	2'	T-Ss Ss-T	• Play a 'follow me' warm up activities 'follow follow follow me (clap the hands four times), hands up/ hands down/stand up/sit down/let's turn around' the teacher could give any command to the students and ask them to follow your gesture.	L&S	• Play the follow me activity with the teacher.
Activity 1	**10'**		• Show the hungry caterpillar video to student (first 4 minutes) • Show students the real object or pictures on IWB and ask them share their own exprience of these food (if they had tried them).	L&S	• Play the video (story video) • Elicit the words • Play hide and seek game with the words showed before
			• Play **hide and seek** game. Hide the words : **apple, pear, plum, strawberry, orange, chocolate cake, ice cream cone, in classroom, encourage students find them and pronounce the words.** If necessary, T models to read the words for the Ss.		
Activity 2	10'	T-Ss Ss-T	• Guide the Ss to watch the video of the song 'the hungry caterpillar's food' by Miss Nina. • Show the words of Monday to Sunday in power-point as well as all the food appears in the song. Teacher sing the song by themselves as well drag the picture under the corresponding day. • Let the Ss sing with teacher with body movement (the gesture of eating).	L&R&S	
					• Sing the song by Miss Nina.
Closing	3'	T-Ss Ss-T	• Sing goodbye song. • Reflect themselves behavior in class.	L&S	• Sing goodbye song. • Reflect themselves.

1st lesson home work: Listen and sing with the song 'the hungry caterpillar's food' by Miss Nina.

3rd lesson (30')

STAGE OF LESSON	TEACHER PARTICIPATION			STUDENT PARTICIPATION	
	Time	Types of Interaction	Teacher Activities/Action	Activities L/S/R/W	Student Activities and Languages (function/form)
Greetings	3'	T-Ss Ss-T	• Say hello to the Ss and sing a hello song.	L&S	• Say hello to the T and sing a hello song.
Warming up	4'	T-Ss Ss-T	• Play video and take Ss sing the song 'the hungry caterpillar's food' by Miss Nina. • Encourage the Ss to sound out the words with body movement: **apple, pear, plum, strawberry, orange.** • Introduce the game for scoring: The Ss may have a chance to sing the song in group. If they can sing loudly and completely, they may get a star for their team.	L&S	• Read the words. • Sing the songby Miss Nina. • Listen to the T and try to understand the game rules. Ask questions if needed.
Activity 1	10'	T-Ss S-Ss	• Show the hungry caterpillar video to student (the fianl 3 minutes) • Show the students the food that caterpillar ate on Saturday with powerpoint. (**chocolate cake, ice cream cone, pickle, cheese, lollipop, cherry pie, sausage, cupcake, watermelon, leaf**)	L&R&S	• Let Ss learn about the food that hugery caterpillar had on Saturday and Sunday.
Activity 2	10'	T-Ss S-Ss	• Play a 'ninja fruit' game with PowerPoint (the food will appear from the bottom and if the students speak out it correctly, next food will come out)	R&S	• Help students get to know the the words with game.
Closing	3'	T-Ss Ss-T	• Sing goodbye song. • Reflect themselves behavior in class.	L&S	• Sing goodbye song. • Reflect themselves.

6th lesson (30')

STAGE OF LESSON	TEACHER PARTICIPATION			STUDENT PARTICIPATION	
	Time	Types of Interaction	Teacher Activities/Action	Activities L/S/R/W	Student Activities and Languages (function/form)
Greetings	3'	T-Ss Ss-T	• Say hello to the Ss and sing a hello song.	L&S	• Say hello to the T and sing a hello song.
Activity 1	5'	T-Ss S-Ss	• Play reveal game on IWB one by one.	R&S	• Speak out the words as soon as possible after tapping the hidden square on IWB .
Activity 2	12'	T-Ss Ss-Ss	• Let the Ss write first letter of **apple, pear, plum, strawberry, orange, chocolate cake, ice cream cone, pickle, salami, cheese, lollipop, cherry pie, sausage, cupcake, watermelon** on IWB one by one. Let the Ss speak out the phonic after write. • Let the Ss watch the whole animation of the story.	R&S&W	• Write the letter and speak the phonic • Watch the video
Activity 3	7'	T-Ss Ss-T	• Listen and sing the song 'What will the caterpillar eat next?' by Bri. (video) • Follow with the teacher without video, teach children the chorus first, then sing phase one by one with body movement (slap the belly and wave the hand)	L&S	• Sing the song with body movement • Act and describe the words with simple color words. • Sound out the phonic.
Closing	3'	T-Ss Ss-T	• Sing goodbye song. • Reflect themselves behavior in class.	L&S	• Sing goodbye song. • Reflect themselves.

9th lesson (30')

STAGE OF LESSON	TEACHER PARTICIPATION			STUDENT PARTICIPATION	
	Time	Types of Interaction	Teacher Activities/Action	Activities L/S/R/W	Student Activities and Languages (function/form)
Greetings	3'	T-Ss Ss-T	● Say hello to the Ss and sing a hello song.	L&S	● Say hello to the T and sing a hello song.
Activity 1	12'	T-Ss Ss-Ss	● Show them food pictures and let the Ss to speak the words. ● Use IWB to let students play maze game, put the different food in the way to exit. So if the student can memorize what food did the caterpillar have and what order it have, they can go out the exit. Divide students in groups and come to the front to finish the maze. (see below)	S&R	● Speak the words ● Drag the picture with sequence
Activity 2	12'	Ss	● Print out the pictures with all food the name. Ask students stick the name of the food underneath of the food, then color the food.	R&S	● Figure out the food name on writing version. ● Color the food pictures.
Closing	3'	T-Ss Ss-T	● Sing goodbye song. ● Reflect themselves behavior in class.	L&S	● Sing goodbye song. ● Reflect themselves.

Appendix F: A Screenshot of PowerPoint Game

Appendix G: A Screenshot of PowerPoint Used in Class