

Assessing Preschool Teachers' Readiness for Inclusive Education of Children with Autism: Evidence from Knowledge, Attitudes, Self-Efficacy and Acceptance of Proposed Pedagogical Module Elements

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Abstract

Preschool teachers play a critical role in implementing inclusive education for autistic children. However, their readiness to provide appropriate educational support remains a concern. This study examined preschool teachers' knowledge of autism, attitudes and self-efficacy towards inclusive education, and acceptance of the proposed elements of a teacher-mediated Quran memorisation for autistic preschoolers (Q-MAP) pedagogical module. Quantitative surveys were conducted in both the pilot and main studies. The pilot study, involving 21 teachers, evaluated the questionnaire's preliminary construct structure. Exploratory factor analysis supported the retention of all 36 items, with factor loadings exceeding 0.60 and Cronbach's alpha coefficients ranging from 0.734 to 0.955, indicating satisfactory to excellent internal consistency. The main study involved 150 preschool teachers from two states in Malaysia. Findings indicated moderate levels of knowledge (41.5%) and self-efficacy ($M = 3.29$, $SD = 0.72$), but generally favourable attitudes towards inclusive education ($M = 3.55$, $SD = 0.79$) and a high level of acceptance of the proposed Q-MAP pedagogical elements ($M = 3.77$, $SD = 0.84$). The study concurrently assessed multiple dimensions of preschool teachers' readiness alongside their acceptance of the proposed Q-MAP pedagogical elements. These findings provide empirical evidence for the needs-analysis phase and a distinctive basis for informing the subsequent development of the teacher-mediated Q-MAP training module.

Keywords: Autism, Inclusive Education, Preschool Teachers' Readiness, Teacher-Mediated Pedagogy, Quran Memorisation

Introduction

Inclusive education increasingly emphasises the meaningful participation of children with diverse learning and developmental needs within shared educational environments. At the preschool level, inclusive education is particularly significant because early childhood represents a foundational period for cognitive, social, communicative, and adaptive development, with early experiences shaping children's subsequent learning and developmental trajectories (UNICEF, 2023).

In the Malaysian context, preschool inclusive education programmes provide opportunities for children with diverse developmental needs to learn alongside their typically developing peers in the same classroom on a full-inclusion or partial-inclusion basis and to participate in academic and co-curricular activities based on the national or modified national curriculum (Ministry of Education Malaysia Special Education Department, 2018). For children with autism, early childhood inclusive education can provide opportunities for participation and interaction with peers. However, meaningful inclusion depends not simply on physical placement in the same classroom but also on the availability of appropriate instructional and developmental support (Siller et al., 2021). This is particularly important because children with autism may have diverse developmental and learning characteristics that require teachers to provide appropriate and individualised pedagogical support.

Autism is a neurodevelopmental condition characterised by differences in social communication and social interaction, together with restricted or repetitive patterns of behaviour, interests or activities (American Psychiatric Association, 2013). These characteristics emerge during the early developmental period and may significantly affect an individual's functioning across social, educational and other contexts. The heterogeneity of autism means that children may demonstrate substantially different profiles of communication, sensory processing, attention, learning and adaptive functioning. Consequently, meaningful participation in inclusive preschool environments requires teachers to understand individual developmental characteristics, adapt instructional practices and provide appropriate pedagogical support according to children's learning needs (Woodcock et al., 2022). These demands place teachers at the centre of efforts to translate the principles of inclusive education into meaningful classroom participation.

Hence, in the Malaysian context, teachers' knowledge, attitudes and perceived competence are important in shaping their capacity to implement inclusive practices (Mah Tjun Lyn et al., 2020). Special education teachers' attitudes have been examined as part of their readiness to implement inclusive education, alongside knowledge and instructional strategies (Razalli et al., 2021). For the inclusion of autistic learners, positive teacher attitudes may support willingness to accommodate learners and implement inclusive practices (Russell et al., 2023). However, positive attitudes alone may not translate into effective classroom practice when teachers lack sufficient knowledge, pedagogical strategies or confidence. In addition, teacher self-efficacy is also important as teachers' beliefs in their capabilities to manage instructional and classroom demands can influence their willingness to implement inclusive practices and their persistence when confronted with challenging situations (Wray et al., 2022; Woodcock et al., 2022). Accordingly, being assigned to an inclusive classroom does not necessarily indicate that teachers are adequately prepared to educate autistic children. Therefore,

teacher readiness should be examined through multiple factors, including teachers' knowledge, attitudes and self-efficacy.

The Malaysian preschool context provides an important setting in which to examine these factors. The implementation of inclusive practices requires preschool teachers to accommodate children with diverse developmental profiles while maintaining meaningful participation in classroom learning. However, Malaysian studies have reported variability in teachers' preparation, autism-related knowledge, competencies and self-efficacy. For example, research involving pre-service special education teachers reported moderate levels of autism-related knowledge (Abdullah et al., 2022), whereas research involving preschool teachers found relatively low levels of knowledge regarding Autism Spectrum Disorder (Yahya & Mohamed, 2024). Recent evidence involving Malaysian in-service preschool teachers also reported average levels of knowledge, attitudes and self-efficacy in relation to the inclusion of autistic children (Tan & Abdullah, 2024). Other research involving Malaysian special education teachers has examined autism-related knowledge and societal attitudes in relation to teachers' perceptions of inclusive education (Low et al., 2020). Examining teachers' attitudes alongside their knowledge therefore provides a more comprehensive understanding of readiness for inclusive education than considering either construct in isolation. Taken together, these findings highlight the importance of examining knowledge, attitudes and self-efficacy concurrently to obtain a more comprehensive understanding of Malaysian preschool teachers' readiness for inclusive education of children with autism.

Beyond knowledge, attitudes, and self-efficacy, teachers also require practical pedagogical support to translate their knowledge and perceived capabilities into classroom practice. For autistic preschoolers, such support may need to address individual differences in communication, attention, behaviour, engagement, and learning through appropriate instructional adaptations (Dydia et al., 2020; Petersson-Bloom & Holmqvist, 2022). Teachers' acceptance of proposed pedagogical elements may therefore provide an additional perspective on readiness by indicating whether teachers perceive structured pedagogical support as relevant and acceptable for their inclusive teaching practice. Examining acceptance at the proposal stage is particularly relevant to needs analysis, as teachers' perceptions may help identify forms of context-appropriate support that are acceptable and feasible for subsequent professional training module development (Thomas et al., 2019).

This need for context-appropriate pedagogical support is especially relevant when culturally and religiously meaningful learning activities, such as Quran memorisation, are incorporated into preschool inclusive education. Quran memorisation is an important component of Islamic preschool education, yet autistic learners may require adapted approaches that respond to their individual learning characteristics and educational needs. Recent Malaysian research on Quran learning for autistic learners highlighted challenges related to communication, sensory sensitivities, learning differences and access to educators familiar with special education strategies, and explored the potential of innovative approaches such as visual aids, interactive digital platforms, individualised education plans and technology-assisted learning (Wan Nik et al., 2025). Earlier research similarly highlighted the importance of structured, well-designed, scaffolded and multisensory techniques for Quran memorisation among autistic learners (Abdullah et al., 2018; Syar Meeze, 2020). Thus, examining teachers' existing readiness together with their acceptance of proposed pedagogical support provides a

context-specific basis for identifying the types of support that may be appropriate for Quran memorisation among autistic preschoolers.

Against this background, the present study examines preschool teachers' readiness for inclusive education of children with autism through three established teacher-related constructs: knowledge of autism, attitudes towards inclusive education, and self-efficacy in educating children with special educational needs. In addition, the study examines teachers' acceptance of proposed pedagogical module elements designed to support Quran memorisation among autistic preschoolers in inclusive education. These proposed elements provide the pedagogical context for the subsequent development of the teacher-mediated Quran Memorisation of Autistic Preschoolers (Q-MAP) training module.

The acceptance construct is examined at the proposal stage rather than as an evaluation of a completed intervention. Specifically, teachers' acceptance reflects their perceptions of the relevance and acceptability of proposed teacher-mediated pedagogical elements that may subsequently inform structured training. As this study constitutes the needs analysis phase preceding the development of the teacher-mediated Q-MAP training module, examining these four constructs concurrently provides an empirical basis for understanding teachers' existing readiness and identifying appropriate areas of pedagogical support.

The novelty of the study lies in examining teachers' knowledge, attitudes and self-efficacy concurrently with their acceptance of context-specific proposed pedagogical support for Quran memorisation among autistic preschoolers in inclusive education. By bringing these constructs together within a Malaysian preschool context, the study contributes to social-science research by providing an empirically grounded account of teacher readiness that connects established teacher-related factors with teachers' receptiveness to proposed pedagogical module elements. The findings provide a needs-analysis basis for informing the subsequent development of context-responsive professional training for preschool teachers working with autistic children in inclusive education.

Research Gap and Rationale for the Present Study

The literature indicates that teacher readiness is central to the implementation of inclusive education for autistic preschoolers. However, there remains limited evidence assessing these readiness dimensions alongside teachers' acceptance for the elements of a proposed teacher-mediated pedagogical support, particularly within the context of supporting autistic preschoolers' Quran memorisation.

This gap is significant because professional development should be informed by teachers' actual needs rather than based solely on predetermined training content. A needs analysis can identify areas in which teachers demonstrate sufficient readiness as well as areas requiring further development. Such evidence can subsequently guide the selection and organisation of pedagogical content for a targeted training module.

Purpose of the Study

The purpose of the study is to examine preschool teachers' readiness to educate children with special educational needs, particularly autistic preschoolers, in inclusive education and their

acceptance to the elements of proposed teacher-mediated Q-MAP pedagogical module. Specifically, the study seeks to:

1. establish preliminary evidence of the factor structure and internal consistency of the questionnaire through a pilot study;
2. determine the level of preschool teachers' knowledge concerning autistic children;
3. determine the level of preschool teachers' attitudes towards inclusive education;
4. determine the level of preschool teachers' self-efficacy in educating children with special educational needs in inclusive education; and
5. determine the level of preschool teachers' acceptance to the elements of a proposed teacher-mediated Q-MAP pedagogical training module.

Research Questions

The study addressed the following research questions:

RQ1: Does the questionnaire demonstrate acceptable preliminary factor structure and internal consistency for measuring preschool teachers' knowledge, attitudes, self-efficacy and acceptance of the elements of the proposed Q-MAP pedagogical training module?

RQ2: What is the level of preschool teachers' knowledge about autism?

RQ3: What is the level of preschool teachers' attitudes towards inclusive education?

RQ4: What is the level of preschool teachers' self-efficacy in educating children with special educational needs in inclusive education?

RQ5: What is the level of preschool teachers' acceptance of the elements of the proposed Q-MAP pedagogical module?

Literature Review

Inclusive education in early childhood seeks to ensure that children with diverse abilities can participate meaningfully in shared learning environments and experience belonging, social interaction, and appropriate developmental support. For children with autism, however, meaningful inclusion requires more than physical placement in mainstream classrooms. Teachers need to understand individual differences in communication, attention, social interaction, sensory processing, and learning, and to adapt classroom practices accordingly. The increasing participation of autistic children in Malaysian preschool Inclusive Education Programmes therefore places greater demands on teachers' preparedness to provide appropriate pedagogical support (Malaysia Education Blueprint, 2013–2025).

Earlier Malaysian studies have reported gaps in teachers' preparation, autism-related knowledge, and competency in implementing appropriate instructional approaches for autistic learners (Toran et al., 2016; Majin et al., 2017). In addition, research among Malaysian special education teachers has highlighted gaps in autism-related training and competency, particularly in the use of evidence-based teaching approaches for autistic children (Loi & Yasin, 2017). More recent evidence continues to indicate variability in teachers' readiness for inclusion. A Malaysian study involving 152 in-service mainstream preschool teachers found moderate levels of knowledge, attitudes, and self-efficacy towards the inclusion of autistic children, with knowledge significantly related to attitudes (Tan & Abdullah, 2024). These findings suggest that teacher preparation remains an important consideration in strengthening preschool inclusive practice.

Knowledge is a fundamental component of teacher readiness because teachers require an accurate understanding of autism to interpret learners' behaviours and make appropriate pedagogical decisions. Limited knowledge may contribute to teachers' uncertainty about how autistic children communicate, engage in learning activities, respond to classroom demands, and regulate their behaviour. Recent Malaysian evidence indicates moderate levels of autism-related knowledge among pre-service special education teachers (Abdullah et al., 2022), while mainstream preschool teachers have been reported to demonstrate relatively lower levels of autism knowledge (Yahya & Mohamed, 2024). These findings suggest that knowledge gaps may remain an important barrier to teachers' preparedness for inclusive practice. However, knowledge alone may not be sufficient to support effective inclusion. Teachers also need to develop attitudes that value the participation of autistic children and demonstrate a willingness to recognise and accommodate individual differences in learning, communication, and behaviour.

Teacher attitudes therefore represent another important dimension of readiness for inclusive education. Positive attitudes towards inclusion may support teachers' willingness to accommodate autistic children and implement inclusive practices that facilitate their participation in mainstream classrooms (Russell et al., 2023). However, evidence on teachers' attitudes towards the inclusion of autistic learners is not entirely consistent, with studies reporting positive, neutral, and negative attitudes across different contexts (Gómez-Marí et al., 2022).

Another important dimension of teacher readiness for inclusive education is teachers' self-efficacy. According to Bandura's (1997) Social Cognitive Theory, self-efficacy refers to individuals' beliefs in their capability to organise and execute the actions required to achieve desired outcomes. Within the context of inclusive education, teacher self-efficacy concerns teachers' confidence in their ability to teach diverse learners, manage classroom challenges, and implement appropriate pedagogical practices. Research indicates that teachers' self-efficacy may be influenced by factors such as professional learning, teaching experience, contextual conditions, and opportunities to interact with persons with disabilities (Wray et al., 2022). A systematic review focusing specifically on autistic learners further suggests that teachers' self-efficacy may be constrained by limited autism-specific professional development, structural barriers, and insufficient professional support. Conversely, sustained, practice-oriented professional development and supportive leadership may strengthen teachers' confidence and perceived capability to support autistic learners effectively (Petersson-Bloom & Hansson, 2025).

Importantly, knowledge, attitudes, and self-efficacy represent related but distinct dimensions of readiness. A teacher may possess knowledge about autism but lack confidence in applying that knowledge in classroom situations. Similarly, a teacher may express positive attitudes towards inclusion while experiencing uncertainty about how to provide effective pedagogical support. Examining these dimensions together therefore provides a more comprehensive assessment of teachers' readiness for inclusive education. Evidence from meta-analytic research also indicates a positive relationship between teacher self-efficacy and attitudes towards inclusive education, reinforcing the importance of considering these constructs collectively (Yada et al., 2022).

Teachers' knowledge, attitudes, and self-efficacy provide complementary dimensions for understanding readiness for inclusive education. Knowledge provides a foundation for understanding autistic learners and their educational needs, attitudes influence teachers' willingness to support meaningful participation and accommodate individual differences, while self-efficacy reflects their perceived capability to implement appropriate teaching practices.

However, identifying teachers' levels of readiness alone may not be sufficient when the purpose of research extends towards the development of pedagogical support. It is also important to examine whether teachers recognise the relevance and acceptability of the proposed elements intended to support their inclusive teaching practices. Teachers' acceptance of such elements may provide important evidence regarding the perceived relevance and practical suitability of a proposed teacher-mediated pedagogical module.

Teacher readiness also involves teachers' willingness to engage with pedagogical approaches that can translate knowledge, attitudes, and self-efficacy into classroom practice. For autistic preschoolers, effective inclusive practice requires teachers to provide individualised instructional support and classroom adaptations that respond to differences in communication, engagement, learning, and behavioural needs (Siller et al., 2021). This perspective positions the teacher not merely as a curriculum implementer but as an active mediator who intentionally structures and adapts learning experiences in response to individual learner needs (Feuerstein et al., 2002). Such teacher-mediated pedagogical considerations highlight the importance of examining whether teachers accept proposed elements that may provide practical support for implementing inclusive practices with autistic preschoolers.

This teacher-mediated perspective is particularly relevant to the development of pedagogical support for Quran memorisation among autistic preschoolers (Q-MAP). Quran memorisation involves sustained attention, repetition, recall, sequencing, and engagement with verbal information (Syar Meeze et al., 2020). These demands may require teachers to provide structured and responsive support, particularly for children whose communication, attention, sensory processing, or working memory characteristics affect participation. Thus, teachers' readiness was assessed not only through their existing knowledge, attitudes and self-efficacy, but also through their acceptance of theoretically informed pedagogical elements, with Feuerstein's Mediated Learning Experience providing the specific theoretical basis for the teacher-mediated components. These teacher-mediated pedagogical module elements were proposed to address the instructional needs of autistic preschoolers in inclusive education.

Feuerstein's theory of Mediated Learning Experience (MLE) provides one theoretical foundation for the teacher-mediated components of the proposed pedagogical approach. MLE emphasises the role of a human mediator in intentionally organising and interpreting learning experiences for the learner. Among its central strategies are intentionality and reciprocity, mediation of meaning, and transcendence, through which the mediator directs the learner's attention and encourages reciprocal engagement, helps establish the significance of learning, and connects immediate learning experiences with broader contexts beyond the task itself (Feuerstein et al., 2002).

In the proposed Q-MAP pedagogical training module, these principles are reflected in the proposed pedagogical elements assessed in the needs analysis: communicating the intention of learning activities and eliciting children's responses, using visual supports to facilitate understanding of the meaning of memorised Quranic verses, and connecting memorised Quranic content with children's real-life experiences. The proposed pedagogical elements also incorporate complementary supports relevant to the learning characteristics of autistic preschoolers, including memory strengthening, usage of digital technology as behavioural support and reinforcement, individualised teacher–child interaction, and a short and session format.

However, the potential implementation of any proposed pedagogical approach depends partly on teachers' willingness to understand, accept, and apply its elements within their existing classroom practices. Therefore, assessing teachers' acceptance of proposed teacher-mediated pedagogical training module elements provides an important complement to measuring knowledge, attitudes, and self-efficacy.

Methodology

Research Design

The present study represents Phase One of Needs Analysis which forms part of a broader multiphase mixed-methods research undertaken to develop a teacher-mediated Quran memorisation training module (Q-MAP) for preschool teachers working with autistic preschoolers in inclusive education. The needs analysis represented the initial empirical stage of this process. Rather than assuming that teachers required a particular form of module, the study first examined their existing knowledge, attitudes, self-efficacy and receptiveness to the proposed elements of a teacher-mediated pedagogical support. This approach enabled the subsequent module development to be grounded in the characteristics and needs of the intended users.

This article focuses specifically on the quantitative needs analysis. Two quantitative stages were undertaken. First, a pilot study was conducted to examine the preliminary measurement properties of the questionnaire. Second, the validated questionnaire was administered to a larger sample of preschool teachers to determine the levels of knowledge, attitudes, self-efficacy and pedagogical module acceptance. The pilot and main studies therefore served complementary purposes: the pilot study examined the preliminary suitability of the measurement instrument, while the main study established the empirical profile of the target population.

Ethical Considerations

This study was conducted for a period of about thirty days. Beginning with asking permission from the Malaysian Ministry of Education (e-RAS 2.0), as the sample involved government preschool teachers, to getting assistance from the State Education Departments of two states in distributing the Google Form questionnaires to the targeted preschool teachers. Google Form self-administered questionnaire is an online process.

Ethical approval was obtained from the Human Research Ethics Committee of Universiti Sains Malaysia (JEPeM-USM) prior to data collection (JEPeM Code: USM/JEPeM/PP/25121123). The approval covered the designated study sites in Selangor and Kelantan. The research

procedures and instruments used in the study were reviewed and approved as part of the ethics application. Participation was voluntary, and participants were informed of the purpose and procedures of the study before providing informed consent. Participant confidentiality was protected throughout the study. Individual responses were kept confidential, and the findings were reported without identifying individual participants.

Instrument Development and Translation Procedure

The questionnaire was developed by adapting items from existing instruments to address the objectives and context of the present study. As the original questionnaire (Liu et al., 2016) was in English, a translation procedure was undertaken to prepare the instrument for use with Malaysian preschool teachers. Forward and backward translation procedures were carried out in accordance with the test adaptation principles proposed by Hambleton (1993). The accuracy of the translated questionnaire was reviewed by two university lecturers. One lecturer had expertise in Teaching English as a Second Language (TESL), while the other had expertise in Design and Development Research (DDR) methodology. Their review focused on the accuracy and clarity of the translated items and the extent to which the intended meaning of the original items was retained in the Bahasa Melayu version.

Following the translation review, the translated questionnaire was pre-tested with three preschool teachers from different educational and professional backgrounds. The first teacher held a degree in Early Childhood Care and Education (ECCE) and had four years of experience teaching both typically developing children and children with special educational needs in an inclusive education setting. The second teacher held a degree in Special Education and had experience teaching children with special educational needs at a therapy centre. The third teacher held a degree in Montessori education and had ten years of preschool teaching experience. The pre-testing was conducted to examine the clarity, comprehensibility, and appropriateness of the translated items from the perspective of preschool teachers.

The adapted Bahasa Melayu questionnaire was subsequently subjected to pilot testing to obtain preliminary evidence regarding its measurement properties before administration in the main study. The pilot study examined the preliminary factorability and internal consistency of the four constructs.

A 36-item questionnaire was developed to assess four constructs of preschool teachers' readiness for inclusive education of children with autism: knowledge of autism, attitudes towards inclusive education, self-efficacy, and acceptance of proposed teacher-mediated pedagogical module elements. Table 1 shows the constructs and the number of items for each construct.

Table 1

The Constructs and the Number of Items

Construct	Items	Number of Items
Knowledge of autism	1–8	8
Attitudes towards inclusive education	9–18	10
Self-efficacy	19–26	8
Pedagogical Module Acceptance	27–36	10
Total	1–36	36

The knowledge construct comprised eight items assessing teachers' understanding of autism. Responses were measured using a three-category response format: True, False, and Don't Know. The remaining three constructs were measured using a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

The pedagogical module acceptance construct was included to assess teachers' acceptance of the proposed teacher-mediated pedagogical elements that could subsequently inform the development of a training module, as the present study represented the needs analysis phase preceding module development.

Pilot Study: Sampling, Data Collection and Data Analysis

A non-probability sampling method was employed for the pilot study conducted with 21 preschool teachers who possessed characteristics comparable to those of the target population but were not included in the main study. The use of a separate pilot sample was intended to reduce potential contamination between pilot testing and the main survey.

The questionnaire was administered through Google Forms with the help of the State Education Departments of the two states of Selangor and Kelantan. All 21 responses were obtained within a one week period. The pilot study was conducted to identify potentially problematic items and to obtain preliminary evidence concerning the reliability and factor structure of the instrument.

The 21 responses received were analysed using IBM SPSS AMOS Statistics version 28.0. Exploratory factor analysis (EFA) was conducted using Principal Component Analysis (PCA) with Varimax rotation. Sampling adequacy was assessed using the Kaiser-Meyer-Olkin (KMO) measure, while Bartlett's Test of Sphericity was used to determine whether the correlation matrix was suitable for factor analysis. Items with factor loadings above 0.60 were retained according to the criteria adopted in the original analysis. Internal consistency was subsequently examined using Cronbach's alpha.

Main Study: Sampling, Data Collection and Data Analysis

The main study was conducted among preschool teachers in Selangor and Kelantan, Malaysia. The two states were selected to obtain representation from different geographical contexts and from both government and private preschool sectors.

A non-probability sampling approach was used to recruit participants who met the established inclusion criteria. Recruitment was facilitated through accessible educational networks with assistance from the State Education Departments of Selangor and Kelantan. Due to the use of electronic data collection, the questionnaire was distributed through Google Forms to eligible preschool teachers. Participation was voluntary, and respondents were provided with information about the purpose of the study and the voluntary nature of their participation before completing the questionnaire. Respondents who agreed to participate proceeded to complete the questionnaire electronically.

Data Collection Procedure

Data were collected over a two-week period using the electronic questionnaire administered through Google Forms. Following the data collection period, the responses were screened according to the established inclusion criteria before being included in the final dataset for analysis. The electronic survey approach enabled the collection of responses from preschool teachers across the two selected states and from both government and private preschool sectors.

A total of 157 responses were received. Seven responses were excluded as they did not meet the inclusion criterion of returning complete responses and usable. Consequently, 150 valid responses were retained for analysis. The final sample comprised 75 preschool teachers from government settings and 75 from private preschool settings across Selangor and Kelantan.

Data Analysis

Data from the main study of Phase One Needs Analysis Survey Questionnaire were analysed using IBM SPSS Statistics version 28.0. Descriptive statistical analyses were conducted to assess the four dimensions of preschool teachers' readiness for inclusive education of children with autism.

Frequencies and percentages were used to describe the levels of teachers' knowledge of autism. Descriptive statistics, including means and standard deviations, were used to determine attitudes as well as self-efficacy towards inclusive education, and acceptance of proposed teacher-mediated pedagogical module elements.

The analyses addressed the four research questions of the study (RQ2–RQ5) by identifying patterns and levels across the four dimensions of teacher readiness. The findings from the needs analysis were subsequently used to identify areas requiring further professional support and to provide the empirical basis for the subsequent development of the teacher-mediated Q-MAP training module.

Results

Pilot Study: Results for the Preliminary Validation of the Questionnaire

Table 2 displays the overall results of KMO and Bartlett's Test for the Four Constructs. EFA was conducted separately for each of the four constructs. Overall, the findings indicated that all four constructs demonstrated acceptable factorability, with KMO values exceeding 0.60 and statistically significant Bartlett's Tests of Sphericity. A single component emerged for each construct, and all items demonstrated factor loadings above 0.60.

Table 2

KMO and Bartlett's Test for the Four Constructs

Construct	KMO	Bartlett's χ^2	df	p
Knowledge	0.642	33.593	28	< .001
Attitudes	0.791	195.305	45	< .001
Self-efficacy	0.845	171.808	28	< .001
Pedagogical Module Acceptance	0.795	194.015	45	< .001

The KMO values ranged from 0.642 to 0.845, indicating acceptable sampling adequacy for the pilot analysis. Bartlett's Tests of Sphericity were statistically significant for all four constructs ($p < .001$), indicating that the item correlation matrices were not identity matrices and were suitable for factor analysis. Table 3 shows the summary of the EFA and Reliability results.

Table 3

Summary of Exploratory Factor Analysis and Reliability Results

Construct	Items	Components	Variance Explained	Loading Range	Cronbach's α
Knowledge	8	1	67.141%	0.611–0.855	0.734
Attitudes	10	1	74.950%	0.720–0.917	0.932
Self-efficacy	8	1	73.349%	0.645–0.963	0.939
Pedagogical Module Acceptance	10	1	85.549%	0.620–0.949	0.955

The factor loadings for all 36 items exceeded 0.60. Consequently, no items were removed following the pilot EFA. The internal consistency coefficients (Cronbach's alpha) ranged from 0.734 to 0.955, indicating acceptable to excellent internal consistency across the four constructs. The overall Cronbach's alpha across the 36-item instrument was 0.942. The pilot findings therefore supported the retention of all 36 questionnaire items for administration in the main study shown in Table 4.

Table 4
Final Questionnaire Structure Following Pilot EFA

No.	Construct	Items Retained	Total
1	Knowledge	Knowledge1–Knowledge8	8
2	Attitudes	Attitudes1–Attitudes10	10
3	Self-efficacy	Self-efficacy1–Self-efficacy8	8
4	Pedagogical Module Acceptance	PMA1–PMA10	10
Total items =			36

Main Study: Levels of the Four Constructs

The main study involved 150 preschool teachers. Teachers' knowledge of autism was assessed using eight knowledge items, with each correct response receiving one point. The total knowledge score was converted into a percentage of correct responses, ranging from 0% to 100%.

To facilitate interpretation, the percentage-score range was divided into five equal intervals of 20 percentage points, resulting in five levels: Very Low, Low, Moderate, High, and Very High as shown in Table 5. This interval-based classification followed the score-range approach illustrated by Ismail et al. (2020, pp. 86–87), whereby the difference between the highest and lowest possible scores is divided by the intended number of score levels.

Table 5
Score level for Knowledge Construct

No.	Construct of Knowledge. Mean Percentage score (Range score=100-0/5=20.00%)	Score Level
1	0.00 % to 20.00%	Very Low
2	20.01% to 40.00%	Low
3	40.01% to 60.00%	Moderate
4	60.01% to 80.00%	High
5	80.01% to 100.00%	Very High

For the five-point Likert-scale constructs of attitudes, self-efficacy, and acceptance of the proposed pedagogical module elements, the same interval-width principle was applied. The interval was calculated as $(5-1)/5 = 0.80$, resulting in five categories: Very Low (1.00–1.80), Low (1.81–2.60), Moderate (2.61–3.40), High (3.41–4.20), and Very High (4.21–5.00) (Table 6).

Table 6

Score level for Likert Scale 5

Adapted from Ismail et al. (2020).		
No.	Likert Scale 5 Mean Score	Score Level
1	1.00 to 1.80	Very Low
2	1.81 to 2.60	Low
3	2.61 to 3.40	Moderate
4	3.41 to 4.20	High
5	4.21 to 5.00	Very high

From both score levels, the summary of the mean score levels for the four constructs are displayed in Table 7.

Table 7

Summary of mean score levels of the Four Constructs

Construct	M	SD	Level
Knowledge	41.5%	-	Moderate
Attitudes	3.55	0.79	High
Self-efficacy	3.29	0.72	Moderate
Pedagogical Module Acceptance	3.77	0.84	High

Knowledge of Autism

The autism knowledge construct comprised eight statements covering selected characteristics, misconceptions, and general understandings related to autism. Responses were scored according to the criteria established in the adapted questionnaire. Overall, preschool teachers obtained a mean percentage of correct responses of 41.5%, which was below the passing criterion of 50% or more correct responses used in the original study.

Item-level responses showed considerable variation across the eight statements. The highest proportions of responses consistent with the original scoring criteria were observed for Item 1.1, concerning the use of visual input in learning (76.7%), and Item 1.2, concerning the misconception that children with autism would usually develop mental illness in adulthood (76.0%). In contrast, Items 1.6 and 1.8 recorded the lowest proportions of responses consistent with the original scoring criteria, at 11.3% and 13.3%, respectively. Item 1.3, concerning dietary changes and autism characteristics, also recorded a relatively low proportion of correct responses (23.3%). Other items showed intermediate levels of correct responses, including Item 1.4. about social attachments (45.3%), Item 1.5 concerning occurrence in the population (38.7%), and Item 1.7 about autism as a psychological problem (47.3%).

Attitudes Towards Inclusive Education

Teachers' attitudes towards inclusive education were examined using ten Likert-scale items concerning the inclusion of children with special educational needs, teacher preparation,

service provision, parental responsibility, and government support. Overall, preschool teachers demonstrated a high level of attitudes towards educating children with special educational needs in inclusive education ($M = 3.55$, $SD = 0.79$).

Nevertheless, item-level findings showed variation across the areas assessed. The highest mean was observed for the statement that government assistance should be established to facilitate the recruitment of preschool staff to meet the needs of children with special educational needs ($M = 4.01$, $SD = 1.11$). This was followed by the view that the Malaysian government should allocate more resources for services for children with special educational needs ($M = 4.00$, $SD = 1.13$). Teachers also expressed relatively high agreement that preschools should have therapists to support children with special educational needs ($M = 3.89$, $SD = 1.03$) and that parents are responsible for services for their children with special educational needs ($M = 3.89$, $SD = 1.18$).

In contrast, responses concerning the integration of children with special educational needs into mainstream preschool settings were less pronounced ($M = 2.86$, $SD = 1.25$). Similarly, the statement that only special education teachers can teach children with special educational needs recorded a mean of 3.13 ($SD = 1.36$), while the adequacy of existing services in Malaysia received a mean of 3.35 ($SD = 1.12$). These findings indicate that teachers' responses were not uniformly positive across all aspects of inclusive education.

Self-Efficacy

Teachers' self-efficacy towards inclusive education was examined using eight items addressing their perceived readiness, willingness to undertake professional learning, acceptance of children with special educational needs, perceived capability to support children in the classroom, and willingness to make changes to inclusive practice. Responses were recorded using a five-point Likert scale, and the mean scores were interpreted according to the classification adopted for the study.

Generally, preschool teachers demonstrated a moderate level of self-efficacy towards inclusive education ($M = 3.29$, $SD = 0.72$). However, item-level findings showed variation across the aspects examined. The highest mean was recorded for the statement that teachers would be ready to accept children with special educational needs in their classes if they were well trained ($M = 3.65$, $SD = 0.88$). This was followed by teachers' interest in attending training related to developmental and behavioural disorders ($M = 3.60$, $SD = 0.93$) and their willingness to help children with special educational needs with their daily needs in the classroom ($M = 3.51$, $SD = 0.89$). Teachers also indicated a relatively high level of willingness to make a difference in the education of children with special educational needs ($M = 3.41$, $SD = 0.90$).

In contrast, the lowest mean was observed for teachers' comfort with parents being present in the classroom as assistants ($M = 2.53$, $SD = 1.14$), which fell within the low category. Teachers' perceived readiness to handle children with special educational needs also recorded a moderate mean ($M = 2.96$, $SD = 0.89$). Similarly, their perceived ability to make a difference in the education of children with special educational needs was moderate ($M = 3.24$, $SD = 0.89$), as was their recognition of the need to implement classroom changes to accommodate children with special educational needs ($M = 3.20$, $SD = 1.02$).

Acceptance of Proposed Pedagogical Module Elements

Teachers' acceptance of the proposed pedagogical module elements was examined using ten items addressing the perceived usefulness, practicality, and relevance of the proposed Q-MAP pedagogical module for supporting inclusive education and Quran memorisation among children with special educational needs. Responses were recorded using a five-point Likert scale, and the mean scores were interpreted according to the classification adopted for the study.

The findings indicate a consistently high level of acceptance across the proposed pedagogical elements ($M = 3.77$, $SD = 0.84$), with no individual item falling below the high category. Additionally, item-level findings showed a consistently high level of acceptance across all ten proposed elements. The highest mean was recorded for the statement that teachers need a pedagogical module that is easy to use in inclusive education ($M = 3.93$, $SD = 0.90$). This was followed by the perception that the Q-MAP pedagogical module would help strengthen children's memory ($M = 3.82$, $SD = 0.82$) and help teachers communicate the intention of activities to obtain children's responses ($M = 3.79$, $SD = 0.81$). Teachers also expressed high acceptance of the proposed use of digital technology as a reward ($M = 3.77$, $SD = 0.82$), visual assistance during the learning process ($M = 3.77$, $SD = 0.83$), evidence-based interventions to support behaviour management ($M = 3.76$, $SD = 0.86$), and visual aids to connect memorised Quranic verses with the real world ($M = 3.76$, $SD = 0.85$).

The remaining items also received high mean scores, including the use of visual assistance to explain the meaning of memorised Quranic verses ($M = 3.73$, $SD = 0.82$), the use of Q-MAP for individual teacher-child sessions ($M = 3.71$, $SD = 0.86$), and the proposed maximum session duration of ten minutes ($M = 3.62$, $SD = 0.86$). Although the ten-minute session item recorded the lowest mean, its score remained within the high category.

Discussion

This study examined key dimensions of preschool teachers' readiness for inclusive education of children with autism. They are knowledge of autism, attitudes towards inclusive education, and self-efficacy towards educating children with special educational needs in inclusive education along with assessing teachers' acceptance of proposed pedagogical module elements. Taken together, the findings illustrate variations in teacher readiness across the different dimensions examined, rather than suggesting a uniform pattern of readiness.

Knowledge of Autism

Even though, a moderate level of autism-related knowledge was portrayed by the preschool teachers, however, their responses across individual knowledge items revealed variations in their understanding of different aspects of autism. This variation suggests that teachers demonstrated greater familiarity with some general characteristics and misconceptions about autism but showed less consistent responses to other statements included in the adapted knowledge measure.

However, the item-level findings should be interpreted with caution because the questionnaire was adapted from an earlier instrument and reflects the wording and scoring framework of the original measure. Some understandings and terminology relating to autism

have continued to develop, and certain statements may therefore not fully reflect contemporary conceptualisations of autism.

The finding is consistent with previous research indicating that teachers may have insufficient or uneven knowledge of autism despite working with children in early childhood inclusive education settings. Malaysian evidence has reported moderate autism-related knowledge among pre-service special education teachers (Abdullah et al., 2022; Razalli et al., 2021), while research involving preschool teachers highlighted low level autism knowledge (Yahya & Mohamed, 2024).

Despite this limitation, the findings provide an important indication of a professional learning need. Teachers require accessible and contextually relevant opportunities to strengthen their understanding of autism and to connect this knowledge with practical classroom responses. These variations need to be addressed as teachers' understanding of autism can influence how they interpret children's communication, behaviour, engagement, and learning needs within inclusive classrooms.

Attitudes Towards Inclusive Education

In contrast to the knowledge findings, teachers demonstrated an overall high mean score for attitudes towards educating children with special educational needs in inclusive education ($M = 3.55$, $SD = 0.79$). However, the item-level findings demonstrate that these attitudes were not uniformly favourable across all aspects of inclusion. This pattern suggests that teachers may support the principle of providing services and resources for children with special educational needs while experiencing greater uncertainty regarding how inclusion should be implemented within mainstream preschool classrooms.

The findings are broadly consistent with Liu et al. (2016), whose study of preschool teachers in China examined attitudes towards autism and inclusive education through issue-specific items concerning mainstream integration, professional support, service provision, parental responsibility, and government assistance. Their findings similarly demonstrated variation across different aspects of inclusion rather than a uniformly positive or negative attitude. The present findings therefore suggest that teachers' attitudes towards inclusive education may be better understood as multidimensional and context-dependent.

For teacher preparation, this distinction is significant. Positive or favourable attitudes provide an important foundation for inclusion, but favourable attitudes alone may not ensure teachers' confidence or capability to implement appropriate practices. Teachers may support inclusion in principle while remaining uncertain about how to respond effectively to the diverse educational needs of autistic children. Thus, the attitude findings should be considered together with the self-efficacy and knowledge findings rather than interpreted independently.

Self-Efficacy Towards Inclusive Education

The findings showed that preschool teachers demonstrated a moderate overall level of self-efficacy towards inclusive education. More importantly, the item-level findings reveal an interesting distinction between teachers' willingness to engage in inclusive education and their perceived capability to implement it.

This pattern suggests that teachers may be willing and motivated to support children with special educational needs while simultaneously recognising limitations in their own preparedness and capability. In other words, willingness does not necessarily translate into confidence in practice. This distinction is particularly relevant to inclusive preschool education, where teachers may be expected to adapt instruction, manage classroom behaviour, respond to communication differences, and provide meaningful participation for children with diverse developmental needs.

The finding is consistent with research suggesting that teacher self-efficacy may be influenced by professional learning, teaching experience, contextual conditions, and opportunities for relevant support (Wray et al., 2022). A systematic review focusing on teachers working with autistic learners further identified limited autism-specific professional development, structural barriers, and insufficient professional support as factors that may constrain teacher self-efficacy (Petersson-Bloom & Hansson, 2025). These findings reinforce the importance of professional development that goes beyond the transmission of information and provides teachers with practical strategies that can be applied within their actual classroom contexts. The self-efficacy construct in the present study was derived from an adapted instrument and included items addressing readiness, willingness, interest, and perceived capability. The findings should therefore be interpreted within the operational definition adopted in this study rather than assumed to represent the full theoretical scope of Bandura's self-efficacy construct. Nevertheless, the overall moderate score provides useful needs-analysis evidence that teachers may require further support to strengthen their perceived capability for inclusive practice.

Acceptance of Proposed Pedagogical Module Elements

The most consistent finding across the needs analysis was the high level of teachers' acceptance of the proposed pedagogical module elements ($M = 3.77$, $SD = 0.84$). Importantly, all ten proposed elements received mean scores within the high category, ranging from 3.62 to 3.93.

Altogether, teachers particularly valued the need for a module that is easy to use in inclusive classroom settings. Teachers also expressed high acceptance of elements intended to strengthen children's memory, support teachers in communicating activity intentions, use digital technology as reinforcement, provide visual assistance during learning, support behaviour management, and connect memorised Quranic verses with meaningful contexts. The consistently high scores suggest that teachers perceived the proposed elements as relevant to their classroom needs and potentially useful for supporting their teaching practices.

This finding is particularly important when considered alongside the moderate self-efficacy and limited knowledge findings. Teachers appear to recognise the need for additional pedagogical support and, at the same time, demonstrate willingness to engage with proposed strategies that may help translate inclusive principles into classroom practice. At this stage, teachers were expressing their perceptions of the proposed elements.

These findings provide important needs-analysis evidence for the subsequent development of the Q-MAP pedagogical module. The high level of acceptance indicates that teachers not

only require support for inclusive practice but also perceive the proposed pedagogical elements as relevant to their classroom needs.

Integrating the Findings

Collectively, the four sets of findings provide a more comprehensive picture of preschool teachers' readiness for inclusive education. The results do not indicate a simple condition in which teachers are either ready or unready. Rather, the findings reveal different levels across different components of readiness. Teachers demonstrated a moderate level of autism-related knowledge, with variations across specific areas of understanding, moderate self-efficacy, generally favourable attitudes towards inclusive education, and high acceptance of the proposed pedagogical module elements.

This combination is particularly meaningful for the development of teacher-mediated pedagogical support. Teachers may recognise the value of inclusion and express willingness to support children with special educational needs, yet still require greater knowledge and confidence to translate these intentions into effective classroom practices. The high acceptance of the proposed pedagogical elements further suggests that teachers perceive structured, practical support as relevant to addressing their professional needs.

The findings therefore support the rationale for developing a pedagogical module that does not focus solely on increasing teachers' factual knowledge. Instead, pedagogical support should connect knowledge with practical strategies that teachers can mediate and apply during interactions with autistic preschoolers. Such support is particularly relevant where teachers need to adapt learning experiences, provide visual and contextual support, manage behaviour, strengthen children's engagement and memory, and structure brief individualised learning interactions.

In this respect, the needs-analysis findings provide the empirical foundation for the subsequent development of the Q-MAP pedagogical module. The module development phase can therefore be understood as a response to an identified pattern of need: teachers showed a willingness to engage with inclusive education, but their knowledge and perceived capability indicated areas requiring further support, while their high acceptance of the proposed pedagogical elements indicated that such support was viewed as relevant and accepted.

Conclusion

This study examined three dimensions of preschool teachers' readiness for inclusive education: autism-related knowledge, attitudes towards inclusive education, self-efficacy, and one domain of acceptance of the proposed elements of a teacher-mediated Quran memorisation (Q-MAP) pedagogical module.

The pilot study provided preliminary evidence of the reliability of the questionnaire across the four constructs. The items demonstrated satisfactory psychometric properties, with factor loadings above 0.60, while Cronbach's alpha coefficients indicated acceptable to excellent internal consistency across the constructs. These findings supported the use of the instrument in the main study.

The main study revealed a multidimensional pattern of teacher readiness. Teachers demonstrated a moderate level of autism-related knowledge and self-efficacy, alongside highly favourable attitudes towards inclusive education and high acceptance of the proposed elements of the teacher-mediated Q-MAP pedagogical module. Importantly, analysis of individual items revealed variations within the constructs, indicating that teacher readiness should not be viewed as a uniform condition. In particular, the variations identified in teachers' autism-related knowledge, attitudes and self-efficacy need to be addressed when designing professional development and pedagogical support.

Implications

The findings of this Phase One needs analysis provide an empirical foundation for the subsequent Phase Two of the multiphase development of teacher-mediated Q-MAP training module. Rather than indicating a uniform level of readiness, the findings revealed variations across the dimensions examined. These findings therefore identify specific areas that need to be addressed in the development of the proposed training module.

First, the moderate level of autism-related knowledge and the variations identified across individual knowledge items suggest that the module should incorporate targeted content addressing teachers' understanding of autism and its implications for teaching and learning in inclusive preschool classrooms. The purpose should not simply be to increase general awareness of autism, but to strengthen knowledge that can support teachers' pedagogical decision-making and classroom practices.

Second, the moderate level of self-efficacy indicates the need for module components that strengthen teachers' confidence in applying appropriate teaching strategies when supporting autistic children. The proposed training should therefore provide opportunities for teachers to develop practical competencies and apply pedagogical strategies relevant to Quran memorisation within inclusive classroom contexts.

Third, teachers' highly favourable attitudes towards inclusion suggest a supportive foundation for the proposed intervention. Since teachers generally demonstrated a willingness to support inclusive education, the subsequent module development can focus on strengthening this positive orientation into pedagogical competence and confidence. In this regard, the module should bridge the gap between teachers' willingness to include autistic children and their perceived capability to implement appropriate teaching practices.

Finally, the high level of acceptance of the proposed elements of the teacher-mediated Q-MAP pedagogical module provides empirical support for proceeding to the next phase of the study. The needs analysis findings can therefore serve as a basis for determining the content and pedagogical components of the module, ensuring that its development is responsive to the identified needs of preschool teachers. In this way, Phase One findings directly inform Phase Two of the multiphase study, in which the teacher-mediated Q-MAP pedagogical module is developed and subsequently validated.

Research Limitations

Several limitations should be considered when interpreting the findings. First, data collection was conducted through an electronic Google Forms questionnaire, with recruitment

facilitated by the State Education Departments of Selangor and Kelantan. Although this approach enabled access to preschool teachers when conventional face-to-face recruitment was constrained, participation was based on a non-probability recruitment approach and voluntary response. Consequently, the sample may not fully represent the broader population of preschool teachers in Malaysia, and the findings should therefore be interpreted within the context of the selected states and participating respondents.

Second, the autism knowledge construct warrants cautious interpretation at the item level. The questionnaire was developed and adapted during an earlier stage of the doctoral research based on the literature and conceptual understandings available at that time. As contemporary research on autism and neurodevelopment continues to evolve, some individual statements may now require greater conceptual nuance. Accordingly, the overall knowledge finding is reported according to the original scoring framework of the adapted instrument, while individual item responses should not be interpreted as a definitive representation of contemporary scientific knowledge about autism. Future studies should consider updating and revalidating the knowledge construct against current evidence-informed conceptualisations of autism.

Thirdly, the study focused on self-reported teacher readiness and acceptance. Such measures reflect teachers' perceptions and reported responses rather than direct observations of classroom practice. Future research could therefore complement self-report measures with classroom observations, interviews, or other behavioural indicators to examine how teacher readiness translates into actual inclusive pedagogical practice.

Finally, the study focused on preschool teachers within the Malaysian context for two states only, which may limit the generalisability of the findings to other educational and cultural settings.

Future Research

Future research should examine preschool teachers' readiness to support autistic learners in inclusive education using larger and more diverse samples across different geographical and educational contexts. Longitudinal and observational approaches could also examine how teachers' autism-related knowledge, attitudes and self-efficacy develop over time and whether these dimensions are reflected in observable pedagogical practices.

Furthermore, future research should examine whether the developed Teacher-Mediated Q-MAP pedagogical module based on the high level of teachers' perceived acceptance of the proposed elements identified in this needs analysis, effectively addresses the needs in improving teachers' autism-related knowledge, attitudes, self-efficacy and pedagogical competence. Implementation studies involving teacher training and classroom practice could further determine whether these pedagogical elements can be effectively translated into practice and whether such improvements are associated with observable changes in teachers' pedagogical practices and autistic children's learning engagement.

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