Strategies for Non-Option Special Education Needs Teacher Training at Private Early Intervention Center: The Fuzzy Delphi approach

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Abstract

In the past, studies have predominantly focused on approaches to training teachers in the special education field. However, the lack of specialized qualifications among non-option teachers at private early intervention centers need to be emphasized. Hence, this study develops tailored training approaches using the Fuzzy Delphi Method. Seven panel experts participated in this study to identify and prioritize essential training components for these educators. The findings highlight that observation, reflection, and co-teaching are critical strategies for enhancing the professional development of non-option teachers. By addressing the unique challenges faced by these educators, this study aims to improve educational outcomes for children with special needs and foster more effective teaching practices in private early intervention centers.

Keywords: non-options special education teacher; professional development; private early intervention center; Fuzzy Delphi Method

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1.0 Introduction

Preparing teachers for the unique challenges of teaching in early intervention program settings is a critical task that significantly influences the quality of education for young children with diverse needs. Special Education Needs Teachers (SENs) are essential in nurturing the development and learning of children with disabilities, requiring specialized skills, knowledge, and competencies (Gevarter et al., 2022). SENs must undergo specialized training to effectively address the various diagnoses, learning issues, and individual abilities of their students (Sidek & Abd. Wahab, 2023). While professional development training for teachers is not a new concept, it has evolved through multiple perspectives, reflecting the changing roles of educators (Stoeger et al., 2021; Weile, Sjaelland, & Nielsen, 2016; Xu & Liu, 2011). However, many SENs in early intervention programs lack formal qualifications in special education. The backgrounds of these teachers vary, with some holding degrees in special education or early childhood education, while others have degrees unrelated to these fields. As the demand for well-prepared special education teachers continues to grow, there is a pressing need to review current training practices for non-option SENs. Issues with existing training programs include unclear objectives, insufficient follow-up actions, a failure to meet teachers' specific needs, and a lack of locally relevant models for guidance (Kristen Merrill O'Brien, Nagro, Binkert, Szocik, & Gerry, 2023). Razalli et al. (2020) also further emphasize these concerns. Therefore, addressing these challenges is essential for improving teacher training programs and ensuring inclusive, high-quality education for all children. This research aims to identify the most effective approaches for training non-option SENs in private early intervention centers in Malaysia, based on expert consensus.

2.0 Literature Review

Training is the process of completing learning tasks or activities designed to enhance knowledge and develop new skills (Borosh, Newson, Mason, Richards, & Collins Crosley, 2023; Joyce & Showers, 2002). Effective training should integrate theoretical explanations and justifications of the skills being taught with experiential methods, such as coaching, modeling, active skill demonstrations, and practice in real-world or simulated environments, coupled with performance evaluations (Dunst et al., 2010; Parsons et al., 2012; Borosh, Newson, Mason, Richards, & Collins Crosley, 2023). Given the significant role that Special Education Needs Teachers (SENs) play in schools, it is crucial that they receive comprehensive training to implement high-fidelity, evidence-based practices for students with special education needs. However, SENs are not limited to school settings; many also teach in private early intervention centers. The teaching staff in these centers includes both option and non-option SENs, with educational backgrounds that span early childhood education, counseling, and psychology (Anisah et al., 2021).

2.1 The Significance of Customized In-Service Training and Mentorship for Special Education Teachers

Non-option Special Education Needs Teachers (SENs) struggle with effective teaching and learning practices, particularly in mastering the knowledge and skills required for special education classrooms. According to past studies by Strimel, Nagro, Pamela Hudson Baker, and Thoma (2023) also highlighted that. Abdullah (2020) further noted that teachers often lack training in the latest techniques for educating students with special education needs. Therefore, it is crucial for SENs to engage in in-service training to enhance their understanding of the latest special education initiatives, regulations, and procedures. Training is particularly needed in areas such as Individualized Education Plans (IEPs), effective learning strategies, social and communication skills, classroom management, behavior management for students with special needs, and the special education curriculum (Ithnain & Saidin, 2021).

In-service training significantly influences knowledge, allowing intervention professionals to learn and master advanced, student-appropriate teaching methods (Takala et al., 2023). Consequently, improvements driven by well-designed professional development programs and support from experienced mentors are likely to act as catalysts for transformative changes in the field of education (Shuib, 2020).

A study by Ramli et al. (2023) found that training for non-option SEN must be customized to address the specific needs of the teachers (Knight, 2018). The study also emphasized the importance of guides and their guidance methods in applying and enhancing adult learning principles through their personal experiences working with teachers.

Research by Gary et al. (2021) at a special education school for individuals with physical disabilities revealed that training was tailored to the specific needs of the teachers. The primary focus of the study was to explore how teacher preparation could facilitate the development of Individualized Education Plans (IEPs) for children with physical disabilities within the Japanese national curriculum. The study's findings highlighted the emphasis of the teacher preparation program on the process of creating IEPs for each student. As a result, teacher collaboration improved, and the alignment of students with similar characteristics was enhanced, which positively impacted the teaching and learning process. Teachers who underwent this training gained a better understanding of each student's unique circumstances and were able to create customized lesson plans accordingly.

In Europe, this program functions as a mentorship session for new teachers who lack prior teaching experience, particularly for non-option teachers (Lee et al., 2020). In China, mentoring involves a collaborative process between inexperienced instructors and seasoned teachers. The less experienced teachers observe the techniques of their senior counterparts after initial discussions. They also receive formal training and guidance (Lee et al., 2020), followed by reflection on the session's outcomes (Rafiquddin et al., 2025)

2.2 Reflective Approaches and Key Elements for Training Non-Option Teachers in Special Education

In collaboration with senior SENs, SENs implement the suggestions that emerge from these reflective discussions and debates. Adult learners strive for continuous improvement by reflecting on their professional practices, setting goals, and engaging in coaching conversations to refine their methods and approaches (van der Linden et al., 2023). The facilitator's coaching techniques are part of Knight's Impact Cycle, a school-based instructional coaching model. This model consists of three key phases: identify, learn, and improve.

Knight (2018) emphasizes three critical elements in the "identify" component: understanding the current reality, setting goals, and selecting teaching strategies. In the initial meeting, the senior SEN will engage in dialogue with the SEN to gain a clear understanding of the current situation, establish goals, select appropriate teaching and learning strategies to achieve these goals, monitor progress, and address any challenges until the goals are successfully met.

Secondly, concerning the issue of current reality, the senior SEN observed that not all students were able to complete the task. Consequently, initial assessments will be conducted, and the senior SET will receive coaching on how to develop Individualized Education Plans (IEPs) based on these assessments and tailored to the cognitive development needs of the students.

The third component is improvement. As outlined by Knight (2018), this involves confirming the direction, reviewing progress, planning enhancements, and determining next steps. The SEN will present their IEPs and the activities conducted with students with special needs. During the reflection session, the senior SET will pose questions to the SET. If the SEN provides satisfactory answers, it demonstrates their understanding of the students' needs and indicates that the session is proceeding effectively. Issues and problems encountered during the session can be resolved through reflection and open dialogue. In the subsequent learning component, the SEN and senior SEN will review the teaching conducted in the second meeting. The SEN will present the prepared IEPs and the activities carried out with their students.

2.3 Integrating Therapeutic Approaches and Collaborative Practices in Training Non-Option Special Education Teachers

Additionally, collaboration with therapists, such as occupational therapists, speech therapists, and physiotherapists, also plays a role. One collaborative approach that can be implemented is conducting Continuing Medical Education (CME).The concept of CME encompasses any activity designed to maintain, develop, or enhance knowledge, skills, and professional performance, and relationships used by doctors to provide services to clients. CME ensures that healthcare professionals stay current with the latest knowledge and skills and promotes the efficient use of healthcare resources. CME has been shown to improve knowledge, skills, attitudes, and clinical outcomes in the health field. The field of health sciences places a strong emphasis on continuous learning or CME (Spence &

Santos, 2019). CME occurs when a group of professionals, either within the same field or multi-professional, listens to presentations from peers about new knowledge related to the latest intervention methods. The content of CME includes new developments and advancements in the medical field, interventions for children with special needs, professional theories, treatment and management of common diseases, health policies and laws, new skills and practices, as well as research capabilities. However, CME also requires teachers to step away from teaching sessions to focus on training or sharing sessions led by facilitators. This situation means that teachers' time, which should be spent teaching, is not utilized effectively (Spence and Santos, 2019).On the positive side, CME can also be conducted during working hours, where teachers and parents participate in sessions led by senior teachers or therapists. Knowledge sharing related to managing intervention sessions can help improve the understanding of teachers and parents regarding the handling and continuity of intervention sessions (Spence and Santos, 2019).

Hence, according to past studies, training non-option Special Education Needs (SEN) teachers requires a well-considered approach tailored to their specific needs. These teachers often lack formal training in special education, making it essential to provide customized in-service training and mentorship. The training should emphasize practical skills such as developing Individualized Education Plans (IEPs), managing behavior, and enhancing social and communication abilities. Reflective approaches, including continuous professional development and coaching cycles, are critical in helping non-option SEN teachers refine their teaching strategies based on real-world feedback. Additionally, integrating therapeutic and collaborative practices, such as CME, can significantly enhance their training by promoting multidisciplinary knowledge sharing. However, CME programs must be carefully structured to ensure they do not interfere with essential teaching time. Therefore, this study seeks to assess expert opinions and suggestions to produce solutions based on expert consensus and determine the best approaches for training according to professional expert' consensus and viewpoints for non-option SEN teachers in private early intervention centers.

3.0 Research Aims

The purpose of this research is to provide specific recommendations for improving non-option SET training at private early intervention centers. There are two primary goals for this study:

- To assess expert opinions and suggestions to produce solutions based on expert consensus.
- To determine the best approaches for training according to professional experts' consensus and viewpoints.

4.0 Methodology

The Fuzzy Delphi approach involves a process of validation or approval from selected experts to achieve consensus among the chosen experts. This method was introduced by Kaufman and Gupta (1988). Nine specialists in educational management and special education participated in the study. The panel experts consist of 2 from educational management background which are supervisor for Special Education Department at Private Early Intervention Center , 4 from special education background which is senior SEN and 3 non- option senior special education needs teacher from private early intervention center . All of this panel expert are chosen because they have experience in this field more than 5 years and practicing in this field and have knowledge on this field (Creswell and Creswell, 2017).

4.1 Sampling

Jones and Twiss (1978) state that the number of experts involved should range between ten and fifty. Adler and Ziglio (1996) specify that for the Delphi technique, the number of experts should be between ten and fifteen to achieve a high level of consensus. However, Rosnaini (2006) suggests that involving just five experts is sufficient. For this phase of the study, nine experts were involved, a number that falls within the recommended range of five to fifty. Fifteen experts were selected because they possess the necessary expertise for the study. Adler and Ziglio (1996) indicate that having ten to fifteen experts is ideal when high consensus and uniformity among experts are desired, particularly those with more than five years of consistent experience in the field (Cresswell and Cresswell, 2017).

4.2 Step of Fuzzy Delphi

Before the instrument was provided to the expert panel, an appointment letter was issued, and the experts confirmed their consent to be appointed as panel members for the study. The instrument was sent to the experts via email, and they were given two weeks to return the completed instrument. The questions on the instrument were based on literature reviews and the results of focus group discussions during the design phase.

The Fuzzy Delphi Method is utilized to achieve expert consensus on specific topics through a structured approach involving the creation and validation of questionnaires. Introduced by Kaufman and Gupta (1988), this method employs triangular fuzzy numbers and defuzzification to process expert opinions. The development of the questionnaire begins with sending appointment letters to experts, who confirm their participation. Once agreed, the questionnaire was distributed via email, allowing two weeks for completion. The questions were based on literature reviews and focus group discussions conducted during the design phase.

The selection of the expert panel is crucial for ensuring a broad range of expertise. While Jones and Twiss (1978) suggest involving ten to fifty experts and Adler and Ziglio (1996) recommend ten to fifteen for high consensus, this study opted for fifteen experts to balance breadth and depth of knowledge. The questionnaire employed a Likert scale to measure responses, which were then converted into triangular fuzzy numbers for analysis.

This conversion process is essential for translating subjective responses into quantifiable data.

Defuzzification, the process of converting fuzzy numbers into crisp values, involves three formulas to determine the consensus. The study calculates the distance between fuzzy numbers using specific methods (Cheng & Lin, 2002). If the distance between the average ratings and expert data falls below a predefined threshold (e.g., 0.2), it indicates that consensus has been achieved. If not, a second round of the Fuzzy Delphi Method needs to be conducted to refine the results (Mustapha et al., 2022). The results of this study will provide the researcher with expert consensus values regarding the usability of the developed model (Cheng & Lin, 2002).

Table 1: Five-Point Linguistic Variable Scale

Linguistic Variable	Fuzzy Scale
Strongly Disagree	(0.0, 0.1, 0.2)
Disagree	(0.1, 0.2, 0.4)
Neutral	(0.2, 0.4, 0.6)
Agree	(0.4, 0.6, 0.8)
Strongly Agree	(0.6, 0.8, 1.0)

(Source: Asra et al., 2014)

5.0 Findings

The findings from the analysis indicate that all construct concentrations within the training model achieve an optimal range, with over 70% expert consensus, confirming the model's robustness and applicability. This strong consensus is supported by studies such as Deslandes, Mendes, Pires, and Campos (2010) and Mustapha et al. (2022).

In the context of the study on Strategies For Non-Option Special Education Needs Teacher Training at Private Early Intervention Center, defuzzification plays a crucial role in transforming the fuzzy data gathered from expert opinions into clear, actionable insights. This process involves translating the triangular fuzzy numbers into crisp values, making it possible to assess the level of agreement among experts and the effectiveness of the proposed strategies.

The results of the defuzzification in this study show a consistent and strong agreement among experts regarding the strategies proposed for training non-option Special Education Needs Teachers (SENs) in a private early intervention center. Each element in the training strategy, including activities such as creating lesson plans through coaching, classroom observations by and of senior SENs, co-teaching with senior SENs, and reviewing lesson plans with senior SENs, achieved a threshold value \(d \) of 0.03992. This threshold value indicates that the deviation among expert opinions is minimal, reflecting a high level of consensus.

Moreover, all these strategies achieved a 100% agreement rate among the expert group, highlighting the collective confidence in their effectiveness. The fuzzy scores for these strategies, consistently at 0.75556, further affirm their strong acceptance. This

suggests that experts believe these methods are highly effective for the professional development of non-option SENs. The status of "Accept" for each strategy indicates that they meet the necessary criteria to be considered reliable and effective components of the training program.

Interestingly, the strategies involving the examination of the lesson plan with the senior SEN and Continuing Medical Education (CME) sessions showed slightly higher threshold values of 0.05132, indicating a slightly broader range of expert opinions. However, these strategies also garnered a 100% agreement rate, with fuzzy scores of 0.73333 and 0.66667, respectively. Although these scores are slightly lower than those for other strategies, they still fall within the acceptable range, and their inclusion in the training model is endorsed by the experts.

The implications of these findings are significant. The high level of consensus and acceptance among experts suggests that the proposed strategies are not only viable but also critical for enhancing the skills and effectiveness of non-option SENs. This consistency across various training activities underscores the robustness of the Fuzzy Delphi Method in identifying and validating essential strategies for specialized teacher training. As a result, these strategies can be confidently implemented in private early intervention centers to ensure that non-option SENs are well-equipped to meet the unique needs of their students.

Table 2: Finding Defuzzication

Element	Triangular Fuzzy Numbers		Expert Group Agreement	Status
	Threshold Value, d	Percentage of Expert Group Agreement, %	Fuzzy Score *(A)*	
Creating a lesson plan through coaching with SEN	0.03992	100%	0.75556	Accept
SEN observe Senior SEN in the Classroom	0.03992	100%	0.75556	Accept
Senior SEN observes SEN in the classroom.	0.03992	100%	0.75556	Accept
Co-teaching with a senior SEN	0.03992	100%	0.75556	Accept
Examining the Lesson Plan with the Senior SEN	0.05132	100%	0.73333	Accept
CME	0.05132	100%	0.66667	Accept

These realizations have prompted the creation of a prototype training approach for non-option SENs that places a strong emphasis on mentoring and working together with more seasoned SENs. Structured coaching sessions, classroom observations, cooperative teaching methods, and reflective practices are all part of the concept. In addition to offering non-option SENs the urgent training they require, this organized framework offers a long-term strategy for their continued professional development. In the end, combining these

components guarantees that inexperienced teachers are prepared to handle the variety of demands of their pupils, improving the standard of special education.

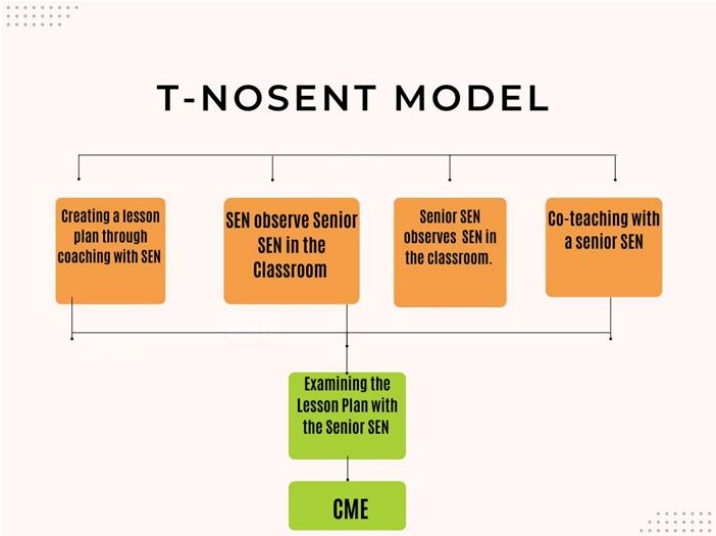

Figure 1: T-NOSENT MODEL (Training Non-Option Special Education Needs Teacher Model)
(Source: Author)

6.0 Discussion, Recommendations and Conclusion

The defuzzification results from this study indicate a strong consensus among experts on the essential elements for training non-option special education needs teacher in a private early intervention center. The elements analyzed, such as creating lesson plans through coaching, observation, and co-teaching with senior special education needs teachers (SENs), all show high levels of expert agreement. This consensus highlights the importance of collaborative and practical approaches in teacher training, where novice SENs benefit from the guidance, experience, and feedback of more seasoned professionals.

The results also emphasize the reciprocal nature of observational learning, where both junior and senior SENs engage in a process of mutual reflection and improvement. By observing each other in the classroom and co-teaching, novice SENs gain valuable hands-on experience, while senior SENs provide constructive feedback that is crucial for professional growth. This process ensures that training is grounded in real-world practices, fostering the development of competent and confident educators who can effectively meet the diverse needs of special education students. This finding is agreed to the past studies by Lee et al.,(2020)

While past studies by Spence and Santos (2019) highlighted that CME may detract from teaching time, my findings indicate that, despite its slightly lower importance, CME is

still a crucial part of the training strategy. It keeps SEN teachers current with the latest special education advancements, thereby complementing the practical training elements. The defuzzification process reinforces this by providing a strong basis for developing comprehensive training programs that can significantly improve the quality of education in early intervention centers.

The limitations of this study, particularly related to the use of the Fuzzy Delphi Method (FDM), should be considered when interpreting the results. FDM relies heavily on the subjective judgments of selected experts, which can introduce biases and affect the consistency of the findings. The selection and diversity of the expert panel are crucial, as a small or homogeneous group may limit the generalizability of the results. Additionally, while FDM is designed to reach a consensus, this focus may inadvertently marginalize minority opinions or innovative ideas that do not align with the majority view.

Another limitation is the time-consuming nature of the FDM process, which involves multiple rounds of surveys to achieve consensus. This can lead to reduced participation rates, especially among busy experts, potentially impacting the quality and reliability of the results. Furthermore, the consensus-driven approach might overlook valuable divergent perspectives that could enhance the training strategies identified. Overall, while FDM is a valuable tool for expert consensus, these methodological limitations suggest that the findings should be interpreted with caution and supplemented with additional research methods to provide a more comprehensive understanding of the training needs for non-option special education teachers (Gengatharan et al., 2023)

For future research, it is recommended to expand the study by involving a larger and more diverse group of experts from various geographic regions and educational settings. This would enhance the generalizability of the findings and provide a broader perspective on the training needs for non-option special education teachers. Additionally, incorporating a mixed-methods approach that combines qualitative interviews or case studies with the Fuzzy Delphi Method could help capture a wider range of insights, including divergent opinions that might be overlooked in a consensus-driven process.

Another area for further research could focus on the long-term impact of the training strategies identified in this study. By conducting longitudinal studies, researchers can assess the effectiveness of these strategies over time and evaluate how different levels of experience among special education teachers influence the outcomes. Moreover, exploring the role of continuous professional development, such as ongoing education and training programs, could provide valuable insights into how to sustain and enhance the skills of special education teachers in the long term. These recommendations would contribute to a more comprehensive understanding of effective training practices for special education teachers and support the development of more robust and adaptable training programs.

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Article Contribution to Related Field of Study

Special education ,rehabilitation center and early intervention program

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