

Assessment of Teacher Trainees' Knowledge in Inclusive Education Using The Rasch Model

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Article history

Received:
23 April 2025
Received in revised form:
17 June 2025
Accepted:
30 June 2025
Published online:
30 December 2025

ABSTRAK

Kajian ini bertujuan untuk menilai tahap penguasaan guru pelatih dalam Pendidikan Inklusif (PI) di Institut Pendidikan Guru Kampus Pendidikan Teknik (IPGMKPT) Malaysia. Pendidikan inklusif memainkan peranan penting dalam memastikan peluang pembelajaran yang adil bagi murid berkeperluan khas (MBK). Guru berperanan sebagai pemudah cara utama dalam mewujudkan persekitaran pembelajaran yang inklusif, memenuhi keperluan pelajar yang pelbagai, serta melaksanakan strategi pengajaran yang berkesan. Kajian ini meneliti pemahaman guru pelatih terhadap dasar, akta pendidikan khas, serta peranan individu dan organisasi dalam mempromosikan pendidikan inklusif. Kecekapan tenaga pengajar yang berkualiti amat penting bagi kejayaan pelaksanaan program PI di sekolah. Pendekatan kuantitatif digunakan dalam kajian ini dengan menerapkan Model Pengukuran Rasch untuk menganalisis pencapaian guru pelatih berdasarkan keputusan peperiksaan Kursus Pendidikan Inklusif yang dijalankan pada Mei 2024. Seramai 19 orang guru pelatih dalam bidang Bahasa Inggeris terlibat dalam kajian ini. Peta Wright digunakan untuk memaparkan tahap penguasaan guru pelatih secara visual. Hasil kajian menunjukkan bahawa skor min guru pelatih lebih tinggi daripada min item, menandakan bahawa sebahagian besar guru pelatih telah mencapai tahap pemahaman asas terhadap konsep pendidikan inklusif pada pelbagai tahap penguasaan. Item ujian berjaya membezakan guru pelatih mengikut tahap kebolehan mereka. Namun, beberapa item berada pada tahap lebih mudah di bawah min item, menunjukkan kekurangan dalam menilai kemahiran kognitif aras tinggi. Hasil kajian ini memberikan pandangan penting kepada pihak berkepentingan dalam pendidikan dan institusi latihan perguruan untuk membangunkan instrumen penilaian yang lebih komprehensif bagi mengukur kefahaman mendalam tentang pendidikan inklusif. Dapatan ini juga menekankan keperluan untuk program latihan yang lebih efektif bagi memperkukuh kecekapan guru pelatih dalam melaksanakan pendidikan inklusif secara berkesan.

Kata kunci: Pendidikan inklusif; Guru pelatih; Penilaian penguasaan; Model Pengukuran Rasch; Pendidikan khas

ABSTRACT

This study aims to evaluate the proficiency level of trainee teachers in Inclusive education (IE) at the Institute of Teacher Education, Technical Education Campus Malaysia (IPGMKPT). Inclusive education plays a crucial role in ensuring equitable learning opportunities for students with special needs (SSN). Teachers serve as key facilitators in fostering an inclusive learning environment, addressing diverse student needs, and implementing effective teaching strategies. This research examines trainee teachers' understanding of inclusive education policies, special education acts, and the roles of individuals and organisations in promoting inclusivity. Ensuring a competent teaching workforce is essential for the successful execution of IE programmes in schools. A quantitative approach was employed using the Rasch Measurement Model to analyse the performance of trainee teachers based on their scores from the Inclusive Education Course examination conducted in May 2024. The study involved 19 trainee teachers specialising in English Language. The Wright Map was utilised to represent the distribution of proficiency levels visually. Findings indicated that the mean score of the trainee teachers was higher than the mean item difficulty, suggesting that most trainees possessed a fundamental understanding of inclusive education concepts at varying levels of mastery. The test items effectively differentiated trainee teachers according to their abilities. However, some items were categorised as relatively easy below the item mean, highlighting a gap in the assessment of higher-order cognitive skills. The results provide valuable insights for

educational stakeholders and teacher training institutions in designing more comprehensive assessment tools that measure a deeper conceptual understanding of inclusive education. Furthermore, the findings underscore the need for enhanced training programmes to strengthen trainee teachers' competency in implementing inclusive education effectively. The scale rating structure was validated to ensure that ordinal categories functioned as intended.

Keywords: Inclusive education; Teacher trainees; Proficiency assessment; Rasch Measurement Model; Special needs education

INTRODUCTION

Inclusive education (IE) is a fundamental approach within contemporary educational systems, designed to ensure that all students, including those with special needs (SSN), receive equitable opportunities for learning and development. This educational philosophy aligns with international frameworks such as the United Nations Convention on the Rights of Persons with Disabilities (CRPD), which emphasises the right of all children to access quality education in inclusive environments (UN, 2006). IE supports not only academic development but also social integration and mutual respect among learners, thereby promoting a more inclusive society (Hehir et al., 2016).

In Malaysia, the government has demonstrated its commitment to inclusive education through policies such as the Malaysian Education Blueprint (2013–2025), which emphasises integrating students with special needs into mainstream settings (Ministry of Education Malaysia, 2013). While the policy framework is robust, studies indicate that teacher preparedness remains a critical challenge (Abdullah et al., 2021). Many trainee teachers, particularly those in mainstream subjects, possess limited understanding of inclusive education principles, policies, and practices (Ainscow, 2019). Teacher preparedness is pivotal in ensuring inclusive education implementation becomes a classroom reality rather than remaining aspirational. Thus, assessing teacher trainees' knowledge is essential to bridge the gap between policy and practice.

Problem Statement

Inclusive education is widely recognised as essential for ensuring equitable learning opportunities for all students; however, despite recent policy advancements and curricular reforms, many teacher trainees remain insufficiently prepared to implement effective inclusive practices in the classroom. Recent studies have revealed that teacher trainees often lack the comprehensive understanding and higher-order cognitive skills required to navigate the complexities of inclusive education, thereby compromising the practical application of inclusive strategies (Abdullah et al., 2021; Ainscow, 2019). Moreover, current assessment frameworks have been criticised for focusing predominantly on fundamental knowledge while failing to capture the nuanced competencies necessary for adapting teaching methods to diverse learner needs (Rahman & Aziz, 2020; Chua et al., 2023). This gap between policy intent and classroom practice underscores the urgent need for robust evaluation models such as the

Rasch Measurement Model to enhance teacher training programmes and better prepare future educators for the challenges of inclusive education.

Research Objectives

- To determine the proficiency level of trainee teachers in inclusive education.
- To identify which aspects of inclusive education are most challenging, as revealed through the Rasch Measurement Model.
- To assess the effectiveness of the current assessment framework in differentiating trainee competency levels.

Research Question

1. What is the proficiency level of trainee teachers in inclusive education at IPGMKPT?
2. Which aspects of inclusive education are the most challenging for trainee teachers?
3. How effective is the current assessment framework in distinguishing trainee teachers' competency levels?

METHODOLOGY

A quantitative research design was used, applying the Rasch Measurement Model. Participants were 19 third-year English Language specialisation teacher trainees from IPGMKPT who completed the examination in May 2024. The Inclusive Education Course examination included eight structured questions (60 marks) and one essay (20 marks), guided by the "Jadual Spesifikasi Utama" (JSU). Student scores were converted from ratio data into an ordinal five-scale system:

1 = Fail (Gagal), 2 = Pass (Lulus), 3 = Average (Sederhana), 4 = Good (Cemerlang), 5 = Excellent (Amat Cemerlang).

The use of the ordinal scale was validated using the Rating Scale Structure output in Winsteps to confirm that categories functioned as expected. Thresholds were ordered, and response patterns demonstrated the validity of category functioning.

The collected data were subsequently inputted into the Statistical Package for the Social Sciences (SPSS) for preliminary analysis, followed by detailed Rasch Model analysis using Winsteps Version 3.69.1.11. This software enabled further exploration of item reliability, fit statistics, and trainee proficiency levels.

Study sample

The study employed a purposive sampling technique, selecting teacher trainees who had undertaken the Inclusive Education Course examination in May 2024. These participants were enrolled in the second semester of their third year at the Institute of Teacher Education, Technical Education Campus Malaysia (IPGMKPT), specialising in English Language. A total of 19 teacher trainees constituted the research sample. Their direct involvement in inclusive education training ensured that the assessment results would provide meaningful insights into their understanding and preparedness for inclusive teaching environments. By focusing on trainees from the English Language specialisation, this study offers an in-depth look at how individuals in this subject area grasp the principles of inclusive education and the extent to which their current training has equipped them for future classroom practice.

FINDINGS AND DISCUSSION

The findings of this study indicate that the overall performance of teacher trainees in inclusive education was satisfactory, with the mean score of the trainees exceeding the mean item difficulty. This suggests that most trainees have acquired a basic understanding of inclusive education principles. However, some test items were categorised as relatively easy, which may indicate a gap in assessing higher-order cognitive skills. While the fundamental grasp of inclusive education is evident, more challenging assessments are needed to evaluate deeper conceptual understanding and problem-solving abilities (Jordan, Carlile, & Stack, 2017). While most trainees demonstrated basic IE knowledge, misfitting items highlighted gaps in the assessment tool. The validated rating scale supported the ordinal conversion. Comparisons with earlier research (Jordan et al., 2017; Chua et al., 2023) emphasised the need for enhanced assessments and training.

Infit Item

The study employed the Mean Square (MNSQ) index to assess item fit, with an acceptable range set between 0.6 and 1.4 (Linacre & Wright, 1994). The analysis (Table 1) revealed that items **5, 11, 9, 14, and 13** aligned well with the Rasch Model and effectively differentiated trainee proficiency levels. In contrast, **items 2, 10, and 6** did not meet the model's fit criteria, suggesting that these items may not have effectively measured trainee competency. It is noteworthy that although **items 2 and 6** were flagged for misfit, they were also identified as among the most challenging in the subsequent analysis.

Table 1. Infit Statistics for Test Items

Item	Infit MNSQ	Interpretation
5	1.11	Acceptable
11	1.06	Acceptable
9	0.92	Acceptable
14	0.84	Acceptable
13	0.76	Acceptable
2	1.64	Misfit
10	1.56	Misfit
6	1.42	Borderline/Misfit

Wright Map

The Wright Map was utilised to visually represent the distribution of item difficulty alongside the proficiency levels of the teacher trainees. The map indicated that **ITEM2, ITEM6, and ITEM11** were among the most difficult items. Interestingly, **ITEM2** and **ITEM6**, which were flagged for misfit, were also positioned near the top of the difficulty axis, suggesting they may not have effectively captured the intended cognitive constructs despite their difficulty. Conversely, **ITEM11**, while also highly challenging, demonstrated an acceptable fit, supporting its utility for assessing higher-order thinking.

Figure 1 illustrates the vertical alignment between item difficulty and person ability levels, with more capable respondents located higher on the left axis and more difficult items located

higher on the right axis. Items that cluster around the same levels as the respondents are considered well-targeted.

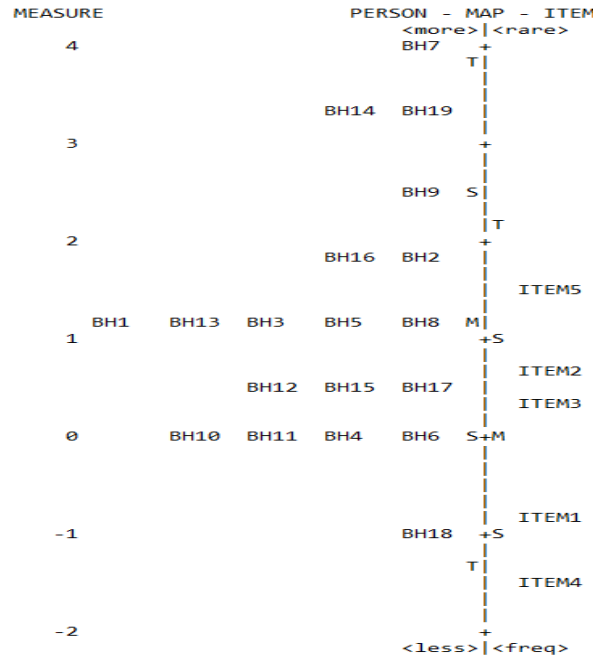


Figure 1. Wright Map (Item-Person Distribution)

Reliability and Item Separation Index

Reliability analysis (Table 2) showed an item reliability index of 0.82, which falls within the acceptable range of 0.81–0.90 as suggested by Fisher (2007). This high reliability score indicates that the difficulty levels of the assessment items were well distributed. Additionally, the person reliability index (Cronbach’s Alpha) was found to be 0.87, reflecting strong internal consistency within the assessment (Hair, Celsi, Oritinau, & Bush, 2017). The item separation index was 2.33, confirming that the assessment successfully distinguished between different proficiency levels among the trainees (Wright & Masters, 1982).

Table 2. Reliability and Separation Statistics

Index	Value
Item Reliability	0.84
Person Reliability	0.87
Item Separation Index	2.33

CONCLUSION

The Rasch analysis identified gaps in current assessment practices. Trainees possessed foundational knowledge but lacked proficiency in higher-order skills. Validated ordinal scales confirmed score reliability. Future studies should broaden the sample and explore mixed-method assessments.

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