

INTERNATIONAL JOURNAL OF
EDUCATION, PSYCHOLOGY
AND COUNSELLING
(IJEPC)<https://gaexcellence.com/ijepe>A SYSTEMATIC REVIEW OF STUDIES WITH
INTELLIGENCE QUOTIENT ASSESSMENT IN MALAYSIAWei Jen Thor^{1*}, Zheng He Thor², Yu He Thor³¹Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia, Kedah, Malaysia thor_wei_jen@oyagsb.uum.edu.my <https://orcid.org/0009-0001-0337-9621>²Faculty of Engineering, Universiti Teknologi PETRONAS, Perak, Malaysia thor_24007641@utp.edu.my <https://orcid.org/0009-0001-4249-186X>³Faculty of Engineering & Technology, DRB-HICOM University of Automotive Malaysia, Pahang, Malaysia 103263391@student.dhu.edu.my <https://orcid.org/0009-0005-7082-2952>

*Corresponding Author

Article Info:

Article history:

Received date: 01.07.2026

Revised date: 15.07.2026

Accepted date: 05.08.2026

Published date: 02.09.2026

To cite this document:

Thor, W. J., Thor, Z. H., & Thor, Y. H. (2026). A Systematic Review of Studies with Intelligence Quotient Assessment in Malaysia. *International Journal of Education, Psychology and Counselling*, 11(64), 28-48.

Abstract:

This systematic literature review examined empirical studies pertaining to intelligence quotient (IQ) assessment within Malaysia's multicultural, multilingual context, addressing two principal research questions: what socioeconomic, nutritional, and biological factors are associated with IQ performance among Malaysian children and students, and how cognitive assessment tools are implemented across Malaysian educational settings. Despite growing recognition of IQ as a multidimensional construct with significant implications for educational planning and child development policy, existing Malaysian studies remain fragmented and insufficiently integrated into a coherent body of knowledge. A systematic search was conducted in accordance with the PRISMA 2020 framework, utilising Scopus and Web of Science (WoS) databases with the search terms "intelligence quotient," "assessment," and "Malaysia," covering publications from 2010 to 2026. The initial search yielded 270 records (Scopus, $n = 172$; WoS, $n = 98$), which were subjected to rigorous multi-stage screening, eligibility assessment, and duplicate removal ($n = 24$), resulting in a final corpus of five primary studies ($n = 5$) for qualitative synthesis. Thematic analysis identified two dominant themes: (1) what socioeconomic, nutritional, and biological determinants of intelligence; and (2) how intelligence and cognitive assessment in educational contexts. The findings underscore the multifaceted nature of IQ assessment in Malaysia and highlight the need for contextually sensitive interventions to address cognitive development disparities within the Malaysian education and public health landscape.

Cognitive Assessment, Educational Outcomes, Intelligence Quotient, Malaysia, PRISMA, Systematic Literature Review



© The authors (2026). This is an Open Access article distributed under the terms of the Creative Commons Attribution (CC BY NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact ijepe@gaexcellence.com.

Introduction

Intelligence quotient (IQ) assessment remains an essential tool in psychology, education, and public health for understanding cognitive functioning, predicting academic outcomes, and developing informed developmental policies (Strenze, 2007). IQ has been associated worldwide with children's academic success, socioeconomic paths, mental well-being, and life quality. Standardized cognitive frameworks like the Cattell–Horn–Carroll (CHC) model has shown significant cross-cultural applicability, which supports the careful application of intelligence tests among varied groups (Wilson et al., 2023). In parallel, critiques of methodology have pointed out that factor-analytic techniques may unintentionally emphasize a single "general intelligence" score, potentially overlooking the complexity of other cognitive profiles. Meanwhile, advancements in process-level cognitive evaluation, including neuropsychologically based models such as the Planning, Attention, Simultaneous, and Successive processing (PASS) framework, have broadened the understanding of intelligence beyond traditional IQ assessments (Das et al., 1994). Despite these global advances, systematic evaluations of how IQ assessment practices intersect with local social, cultural, and educational realities in specific contexts such as Malaysia remain limited.

In Malaysia, while IQ assessments have been conducted in separate studies focusing on child development, education, and public health, the overall evidence remains disjointed and lacks thorough consolidation. Existing Malaysian work has linked nonverbal IQ to socioeconomic status, parental educational attainment, nutritional status, and severe obesity (Poh et al., 2019), while other studies have examined cognitive processing in relation to academic skill development and the role of multiple intelligences (MI) within educational institutions. The diverse social landscape of Malaysia, which includes Malay, Chinese, Indian, and various indigenous groups, each with their own language policies and cultural perspectives, complicates the direct use of Western-standardized instruments. This diversity raises important questions about the contextual appropriateness of the assessment tools currently employed with Malaysian populations. This situation prompts significant inquiries regarding the suitability of the assessment tools presently used on Malaysian populations. Despite the practical consequences of IQ assessment for educational placement and clinical decision-making in Malaysia, no integrative synthesis exists that consolidates the available empirical evidence across these interrelated dimensions.

As a result of the points discussed above and based on the research questions, two main questions will be addressed by this systematic literature review: first, what socioeconomic, nutritional and biological factors are related to IQ performance in children and students in Malaysian schools and educational settings; and second, what are the means by which intelligence or cognitive testing instruments are used to evaluate educational outcomes in Malaysian settings? By synthesising evidence collected from Scopus and Web of Science databases through the PRISMA 2020 framework, the aim of this review is to consolidate fragmented research about IQ in Malaysia into one coherent, dual-themed review to clarify the empirical foundation that currently supports local policy and educational practice and highlight certain populations and/or assessment contexts that have not been examined by previous research. As such, this will be an essential document for anyone working in research, education or policy and interested in developing or enhancing evidence-based cognitive assessment practices relevant to Malaysia.

Background

Research on IQ evaluation in Malaysia highlights a field that is both diverse and evolving, influenced by the nation's distinct socio-cultural, linguistic, and educational context. In its initial stages, research in Malaysia mainly depended on conventional psychometric models, frequently using instruments created in Western contexts with little adaptation for local use. Yet, as the discipline evolved, Malaysian scholars became more aware of the constraints these methods posed in effectively understanding the complex aspects of intelligence in a society characterized by multiple ethnicities and languages. This realization spurred the development and validation of indigenous instruments developed by Universiti Kebangsaan Malaysia (UKM) such as the UKM1 and UKM2 tests, which underwent rigorous psychometric evaluation using advanced methodologies like Rasch analysis and Item Response Theory (IRT). By employing these techniques, researchers were able to identify and confirm the presence of multidimensional structures, such as visual-spatial, verbal-linguistic, and logical-mathematical domains. This process also allowed for the iterative refinement of test items, enhancing their reliability and validity. (Ariffin, Asari, et al., 2010; Ariffin, Mohamed, et al., 2010; Hayat et al., 2023). The adoption of confirmatory factor analysis (CFA) further enhanced the robustness of these tools, allowing for nuanced item-level diagnostics and the identification of measurement invariance across demographic groups. The widespread application of Rasch analysis in Malaysia has established a regional standard for psychometric precision, guaranteeing that cognitive evaluations are accurate and culturally appropriate (Hayat et al., 2023; Seok et al., 2020).

Parallel to these methodological advancements, the literature consistently highlights the profound influence of Malaysia's socio-cultural and educational context on IQ assessment practices. Malaysia's population is characterized by its ethnic diversity comprising of Malays, Chinese, Indians, and numerous indigenous groups; and its complex language policies, which mandate the use of Malay alongside English, Mandarin, and Tamil in educational settings (Puteh-Behak et al., 2015; Ng, 2013). In a multilingual setting, the straightforward application of IQ tests developed in Western contexts is challenging, as differences in language skills can lead to considerable biases in the results. Research indicates that modifying international tools is essential to maintain equity, focusing on linguistic and cultural adjustments tailored to the unique aspects of Malaysian society (Hassan, 2012; Samuel et al., 2014). In addition, the understanding of intelligence in Malaysian culture differs from Western models, frequently highlighting a wider perspective that encompasses social, emotional, and cultural skills

alongside cognitive capabilities (Frischkorn et al., 2022). The increasing inclination to incorporate frameworks of MI and emotional intelligence into research and educational policy highlights these beliefs, questioning the dominance of conventional IQ as the only measure of intellectual capability (Seok et al., 2020; Wong et al., 2024; Wong & Koh, 2022).

A critical dimension emerging from the reviewed studies is the demographic and socioeconomic heterogeneity of populations included in Malaysian IQ research. Studies have covered a broad spectrum of age groups, ranging from preschool-aged children to university attendees, and have strived to include the nation's key ethnic and indigenous groups. (Ng, 2013; Swamy et al., 2013; Tey et al., 2016; Yahya & Ali, 2012). However, findings consistently demonstrate that socioeconomic factors, particularly family income and parental education, exert a significant influence on cognitive outcomes. Children from higher socioeconomic backgrounds, with parents possessing higher educational attainment, tend to perform better on IQ assessments, a pattern that persists across ethnic groups (Akubuilu et al., 2020; Poh et al., 2019; Ranabhat et al., 2016). Quantitative analyses reveal that low household income and limited parental education can double the likelihood of low or borderline nonverbal IQ in children, underscoring the role of environmental and resource-based disparities in shaping cognitive development (Poh et al., 2019; K. Swamy et al., 2013). Furthermore, research exploring biological correlates such as cranial capacity has found positive associations with IQ, mediated by factors like nutrition, parental engagement, and socioeconomic status (Swamy et al., 2013a; Swamy et al., 2013b). These findings highlight the need for targeted interventions and policy measures to address educational inequities and promote cognitive development across all segments of Malaysian society.

Recent developments in Malaysian IQ research indicate a significant shift towards a comprehensive view of intelligence, which combines conventional cognitive assessments with elements of emotional and cultural intelligence. Research utilizing tools like the Bar-On Emotional Quotient Inventory and the Malay adaptation of the Emotional Intelligence Scale has shown that emotional intelligence can reliably predict outcomes in both academic and professional settings. These studies highlight its consistency throughout academic years and its interplay with personality traits, impacting well-being and achievement (Nordin et al., 2019; Wong & Koh, 2022). The concept of cultural intelligence (CQ) has also gained prominence, particularly in the context of Malaysia's diverse educational and workplace environments, where adaptability and cross-cultural competence are increasingly recognized as essential for performance and satisfaction (Hamzah & Abdullah, 2018; Hartini et al., 2019). The shift in perspective indicates a departure from perceiving intelligence as a singular, unchanging entity, moving instead towards adopting a multifaceted framework that more accurately represents the complexities of Malaysia's diverse cultural landscape. To sum up, although the literature provides significant understanding of the intricacies involved in IQ evaluation in Malaysia, it also highlights ongoing deficiencies, particularly the necessity for more direct comparative studies among different ethnic groups and additional cross-cultural validation of assessment instruments. Future investigations should focus on creating comprehensive, culturally aware tools and utilize longitudinal, mixed methods approaches to explore the dynamic interaction between cognitive, emotional, and cultural aspects of intelligence within Malaysia's swiftly changing environment (Anderson & Varghese, 2020; Ariffin, Asari, et al., 2010; Poh et al., 2019; Wong & Koh, 2022). A summary of the key areas in the literature is summarized in Table 1.

Table 1: Key Findings from Studies on Intelligence Quotient Assessment in Malaysia

Theme	Key Insights
Methodological Advancements	Shift from traditional psychometrics to Rasch analysis, IRT and CFA; improved reliability and validity (Ariffin, Asari, et al., 2010; Ariffin, Mohamed, et al., 2010; Hamzah et al., 2019).
Socio-Cultural Influences	Multicultural, multilingual context necessitates cultural adaptation of IQ tests (Jin et al., 2011; Puteh-Behak et al., 2015; Ng, 2013).
Socio-Economic Disparities	Family income and parental education strongly influence IQ outcomes (Akubuilu et al., 2020; Poh et al., 2019; Ranabhat et al., 2016).
Emotional and Cultural Intelligence	Integration of emotional and cultural intelligence in IQ research; holistic intelligence models emerging (Hamzah & Abdullah, 2018; Nordin et al., 2019; S. K. Wong & Koh, 2022).

Note: IQ = intelligence quotient; IRT = item response theory; CFA = confirmatory factor analysis.

Research Question

In this systematic literature review, the formulation of research questions was directed by the PICo mnemonic framework, which includes Population, Interest, and Context. This framework was employed to guarantee conceptual clarity and alignment with the two main themes identified through thematic synthesis. By using this structured method, the development of research questions was both focused and academically rigorous, capturing the dual aspects of IQ assessment studies in the Malaysian context. The first research question addresses the thematic concern of issues and problems inherent in IQ research:

RQ1: What are the socioeconomic, nutritional, and biological factors associated with IQ performance among children and students in Malaysia?

This question targets Malaysian children and school-aged students as the population of interest, with a focus on identifying modifiable determinants of cognitive performance within socioeconomic and developmental contexts, thereby responding to the persistent gap in nationally representative evidence on IQ outcomes in Malaysia. The second research question reflects the theme of implementation and application of cognitive assessment:

RQ2: How are IQ and cognitive assessment tools implemented and applied to evaluate learning outcomes across educational settings in Malaysia?

This study looks at using cognitive and IQ tests on all Malaysian students at the primary, secondary as well as university level and how these tests are being used during traditional classroom instruction as well as distance learning. In addition, these two research questions collectively form a unified framework for the review, guiding the evidence synthesis towards comprehending the contextual factors influencing intelligence and scrutinizing the implementation of assessment practices in shaping educational decisions in Malaysia.

Material and Methods

In the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework, the Identification Phase represents the first step of a Systematic Literature Review (SLR). During this phase, all studies relevant to the SLR are retrieved from selected bibliographic databases prior to any form of screening or eligibility determination. In this study, we used a systematic approach to keyword searching in our SLR and three main keywords, search terms were used to conduct searches in two internationally recognised academic databases. As a result of the searches conducted using the three main keywords: intelligence quotient, assessment and Malaysia, we were able to retrieve 172 articles from the Scopus database and 98 from the Web of Science (WoS) resulting in a total of 270 articles being identified. Each database has its own range of journals it indexes and the fields it covers; thus, using just one database would not be exhaustive and would be a search biased by method.

The difference in retrieval numbers, where Scopus accounts for about 63.7% ($n = 172$) and WoS accounts for 36.3% ($n = 98$) of the total records, highlights the complementary roles of these platforms and supports the recommendation for multi-database searching as outlined in PRISMA 2020. Scopus, as a comprehensive multidisciplinary database, unsurprisingly produced a larger volume of records due to its wide-ranging inclusion of both regional and international journals. In contrast, WoS offered access to high-impact indexed journals that are not consistently found in Scopus. The initial evidence pool, comprising a total of 270 records, is comprehensive enough to support the subsequent PRISMA phases. These phases include the removal of duplicates, screening of titles and abstracts, and assessment of full-text eligibility, all conducted on a solid and representative dataset. By transparently reporting the identification results, the review's reproducibility and credibility are enhanced, which are essential for publication in high-impact peer-reviewed journals.

Identification

In this study, essential steps of the systematic review process were employed to collect a significant amount of relevant literature. The process started with the selection of keywords, followed by identifying related terms using dictionaries and thesaurus. All relevant terms were identified, and search strings were formulated for the Scopus and WoS (as shown in Table 2). This initial phase yielded 270 potentially relevant publications across the two databases.

Table 2: Database Search Strings Used in the Identification Phase

Database	Search string
Scopus	TITLE-ABS-KEY (((“intelligence quotient” OR IQ OR “cognitive assessment” OR “cognitive ability” OR “intelligence testing”) AND (assessment OR evaluation OR measurement OR “test”) AND (Malaysia OR “Malaysian”))) Date of Access: June 2026
Web of Science (WoS)	of (((“intelligence quotient” OR IQ OR “cognitive assessment” OR “cognitive ability” OR “intelligence testing”) AND (assessment OR evaluation OR measurement OR “test”) AND (Malaysia OR “Malaysian”))) Date of Access: June 2026

Note: TITLE-ABS-KEY = search restricted to title, abstract, and keywords.

Screening

After the Identification phase, the Screening stage was executed following the PRISMA 2020 guidelines to systematically narrow down the retrieved records using predefined exclusion criteria. A total of 171 records were eliminated due to language restrictions (only English and Malay publications were kept), publication year (studies published before 2010 were excluded to ensure the findings were current and relevant), and document type (conference papers, book chapters, and review articles were removed to concentrate on original empirical research). Additionally, in-press articles were excluded because they lacked finalized peer-reviewed content. Following this screening process, 99 records remained, comprising 65 records from Scopus and 34 from WoS, representing a retention rate of approximately 36.7% from the total identified pool of 270 records. Following this, a deduplication procedure was carried out to remove overlapping bibliographic entries from the two databases. This led to the deletion of 24 duplicate records, which was anticipated since both Scopus and WoS index several identical high-impact journals. Consequently, a streamlined and unique dataset of 75 records was obtained for further eligibility evaluation. The specific inclusion and exclusion criteria applied during the screening stage are summarized in Table 3

TABLE 3: The Selection Criterion for Searching

Criterion	Inclusion	Exclusion
Language	English & Malay	Other than English or Malay
Time frame	2010 – 2026	< 2010
Literature type	Journal (Article)	Conference, Book, Review
Publication Stage	Final	In Press
Country	Malaysia	Besides Malaysia

Eligibility

Following the deduplication process, a total of 75 records were subjected to a rigorous eligibility assessment in accordance with PRISMA 2020 guidelines. Full-text articles were evaluated against explicitly defined exclusion criteria, resulting in the removal of 70 records on the following grounds: studies deemed out of field, titles not aligned with the research focus, abstracts that did not correspond to the stated objectives of the study, inaccessibility of full-text articles, and the inclusion of non-scope intelligence assessments. Instruments like the Montreal Cognitive Assessment (MoCA) were deliberately left out of this review. MoCA is primarily used as a cognitive screening tool to identify mild cognitive impairment and dementia in clinical settings. As it does not assess IQ, it does not align with the definition of intelligence assessment used in this review. As a result, just 5 studies met all the eligibility criteria and were incorporated into the qualitative synthesis. Although this number is small, it highlights the highly specific and context-dependent nature of IQ assessment research in Malaysia, underscoring the necessity for additional empirical studies in this area. These 5 studies were only from the Scopus database; none from WoS.

Data Abstraction and Analysis

An integrative analysis was used as one of the assessment strategies in this study to examine and synthesise a variety of research designs (quantitative methods). The goal of the competent study was to identify relevant topics and subtopics. The stage of data collection was the first step in the development of the theme. Figure 1 shows how the authors meticulously analysed a compilation of five publications for assertions or material relevant to the topics of the current study. The authors then evaluated the current significant studies related to IQ assessment in Malaysia. The methodology used in all studies, as well as the research results, are being investigated. Next, the author collaborated with other co-authors to develop themes based on the evidence in this study's context. An analytic log was maintained throughout the data analysis process to document coding decisions, emerging interpretations, and any discrepancies requiring subsequent discussion. In the final step, the authors examined the outcomes to identify any discrepancies in the theme design process. When differences in concepts arise, they engage in discussions to reconcile these differences among themselves. Included studies and sources are listed in Table 4.

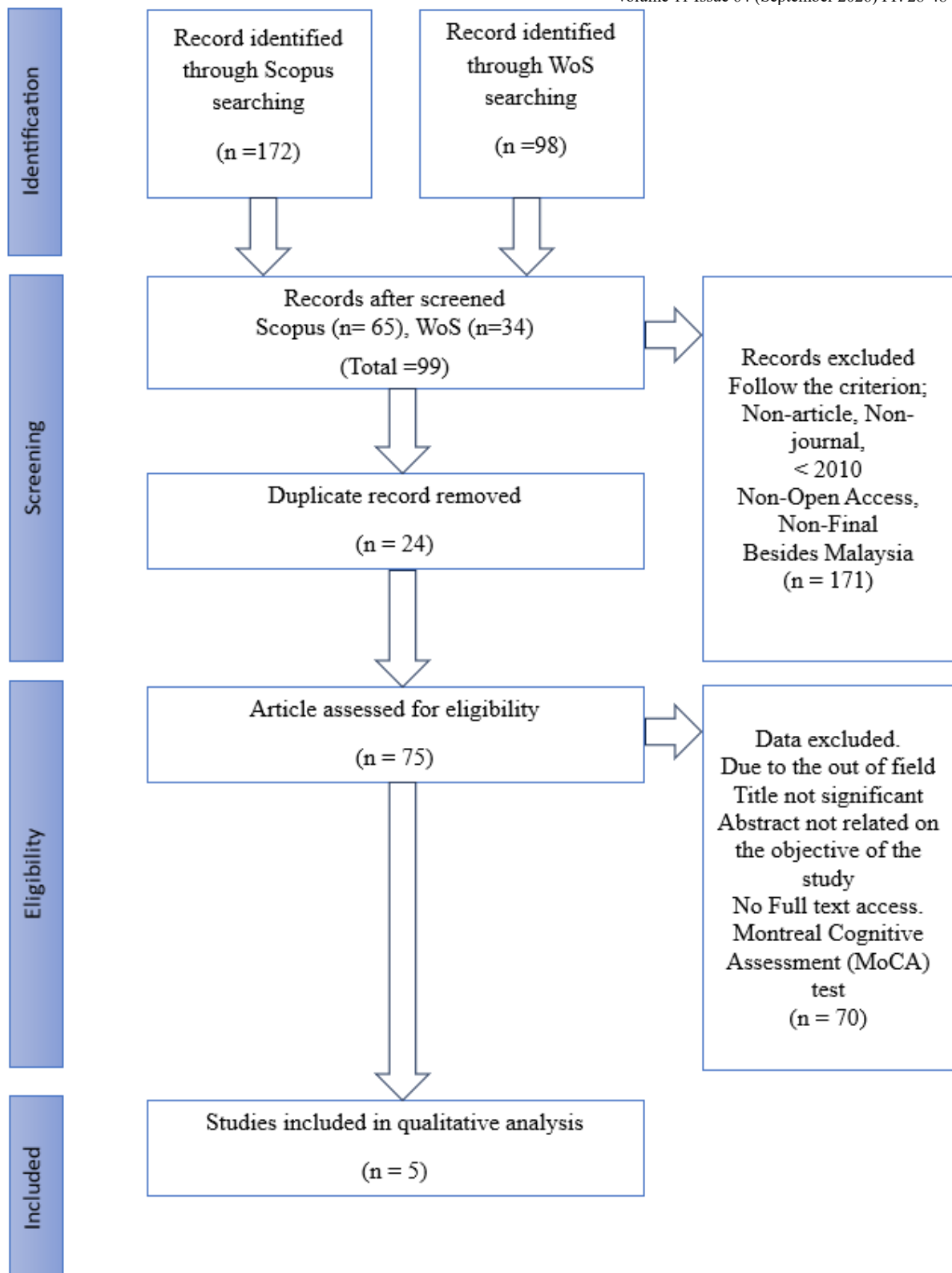


FIGURE 1. PRISMA 2020 Flow Diagram for Study Selection.

Table 4: Details Of Primary Studies and Database Source for Studies with IQ Assessment in Malaysia

No.	Authors	Title	Year	Journal	Scopus	WoS
1	Othman and Muhd Zain (2015)	Online collaboration for programming: Assessing students' cognitive abilities	2015	Turkish Online Journal of Distance Education	/	
2	Wong et al. (2024)	Path Analysis of Factors Influencing Multiple Intelligences of Malaysian Medical Students: A Multi-institutional Study	2024	Education in Medicine Journal	/	
3	Poh et al. (2019)	Low socioeconomic status and severe obesity are linked to poor cognitive performance in Malaysian children	2019	BMC Public Health	/	
4	Keat and Hj. Ismail (2011)	The relationship between cognitive processing and reading	2011	Asian Social Science	/	
5	Sandjaja et al. (2013)	Relationship between anthropometric indicators and cognitive performance in Southeast Asian school-aged children	2013	British Journal of Nutrition	/	

Quality of Appraisal

According to the guidelines proposed by Kitchenham (2007), once we had selected primary studies, we have to assess the quality of the research they present and quantitatively compare them. In this review, the methodological quality of each primary study was appraised using six quality assessment criteria adapted from Abouzahra et al. (2020) Each criterion was rated on a three-point scale: “Yes” (Y = 1) when the criterion was fully met, “Partly” (P = 0.5) when it was addressed but with some weaknesses, and “No” (N = 0) when it was not met. The six items produced a total quality score ranging from 0 to 6 for each study. A minimum total score of >3.0 was adopted as the threshold for inclusion in the qualitative synthesis, ensuring that only studies of at least moderate methodological quality were retained. Quality assessment was performed by all authors, with any uncertainties or borderline cases discussed with the co-authors until consensus was reached, thereby enhancing transparency and consistency in the application of the criteria. The application of these six quality criteria to the five primary studies, including individual item ratings and overall scores, is presented in Table 5.

Table 5: Quality Of Appraisal Studies with IQ Assessment in Malaysia

Author	Title	QA1	QA2	QA3	QA4	QA5	QA6	Total Mark	Percentage (%)
Wong et al. (2024)	Path Analysis of Factors Influencing Multiple Intelligences of Malaysian Medical Students	Y (1)	Y (1)	Y (1)	Y (1)	P (0.5)	P (0.5)	5.0	83.3%
Poh et al. (2019)	Low Socioeconomic Status and Severe Obesity are Linked to Poor Cognitive Performance in Malaysian Children	Y (1)	Y (1)	Y (1)	Y (1)	Y (1)	Y (1)	6.0	100%
Sandjaja et al. (2013)	Relationship between Anthropometric Indicators and Cognitive Performance in Southeast Asian	Y (1)	Y (1)	Y (1)	Y (1)	P (0.5)	P (0.5)	5.0	83.3%

Author	Title	QA1	QA2	QA3	QA4	QA5	QA6	Total Mark	Percentage (%)
	School-aged Children								
Othman and Muhd Zain (2015)	Online Collaboration for Programming: Assessing Students' Cognitive Abilities	Y (1)	Y (1)	Y (1)	P (0.5)	P (0.5)	N (0)	4.0	66.7%
Keat and Hj. Ismail (2011)	The Relationship Between Cognitive Processing and Reading	Y (1)	Y (1)	P (0.5)	P (0.5)	P (0.5)	N (0)	3.5	58.3%

Note: The six criteria were: QA1: Is the purpose of the study clearly stated? QA2: Is the interest and the usefulness of the work clearly presented? QA3: Is the study methodology clearly established? QA4: Are the concepts of the approach clearly defined? QA5: Is the work compared and measured with other similar work? QA6: Are the limitations of the work clearly mentioned?

Although there is limited quantity of only five studies, based on the quality assessment results, the overall quality of the five studies included in this systematic literature review is considered acceptable to high, with total scores ranging from 58.3% to 100% and a mean quality score of approximately 78.3%. Poh et al. (2019) achieved the highest quality rating (100%), demonstrating exemplary adherence to all six quality criteria, with a clearly articulated purpose, rigorous nationally representative methodology, precisely defined concepts, explicit comparison with prior inconsistent findings, and transparent acknowledgement of research limitations. Similarly, Wong et al. (2024) and Sandjaja et al. (2013) both attained strong scores of 83.3%, with minor shortcomings primarily in the areas of comparative benchmarking against existing literature and explicit limitation reporting within their abstracts. Conversely, Othman and Muhd Zain (2015) and Keat and Hj. Ismail (2011) scored 66.7% and 58.3% respectively, with the principal quality gaps observed in QA5 and QA6, suggesting that while their research objectives and methodologies were adequately presented, these studies would benefit from more transparent discussion of their scope, constraints, and positioning relative to the broader body of literature. Albeit differences among the five studies, they all met the essential quality standards required for inclusion in the qualitative synthesis. Each study clearly articulated its research aim (QA1 = Y for all) and presented its findings with enough methodological detail to significantly contribute to the thematic conclusions of the review.

Result and Finding

The thematic synthesis in this review was formed using a methodical and repetitive analytical process. This involved a methodical review of the five eligible articles according to the research objectives, theoretical frameworks, methodology orientation and major findings to identify similar patterns of thought and the major research directions with respect to IQ testing in Malaysia. Basically, two separate, mutually exclusive were identified as the themes to organise this review's Discussion section following the thorough review of all five articles.

Theme 1: Socioeconomic, Nutritional, and Biological Determinants of Intelligence; consolidates studies that examine IQ as a developmental outcome influenced by modifiable environmental and biological factors, including household income, parental education level, and nutritional or anthropometric status among children. Theme 2: Intelligence and Cognitive Assessment in Educational Contexts; encompasses studies that investigate how cognitive and intellectual abilities are formally measured, applied, and developed within Malaysian educational institutions, spanning MI assessment in medical education, logical thinking evaluation in online collaborative learning environments, and cognitive processing assessment in primary school reading development. These two themes together illustrate the dual nature of IQ-related research in Malaysia: one aspect places intelligence within the wider socioecological frameworks, while the other emphasizes assessment as a means for educational understanding and a subject of academic study. This combination highlights the complex and context-dependent characteristics of intelligence research in the Malaysian educational and developmental context. An overview of these two themes, including their focus areas, number of contributing articles, and main research directions, is provided in Table 6.

Table 6: Thematic Breakdown of Studies with IQ Assessment in Malaysia

Theme	Focus Area	No. of Articles	Main Research Direction
Theme 1: Socioeconomic, Nutritional, and Biological Determinants of Intelligence	Environmental and biological factors influencing IQ/cognitive performance	2	Examines how socioeconomic status, nutritional/anthropometric indicators, and health conditions (e.g., obesity) associate with nonverbal IQ in Malaysian children
Theme 2: Intelligence and Cognitive Assessment in Educational Contexts	Assessment tools, cognitive processes, and learning outcomes	3	Explores how intelligence and cognitive abilities are measured and applied across educational settings in Malaysia, including MI, online learning, and reading skill development

Theme 1: Socioeconomic, Nutritional, and Biological Determinants of Intelligence

Focus Area: Environmental and biological factors influencing IQ and cognitive performance (Number of Articles: 2). Main Research Direction: Investigating how external determinants, including household income, parental education, nutritional status, and anthropometric indices, shape nonverbal IQ outcomes among Malaysian and Southeast Asian children.

The first theme unifies two different complete empirical studies to evaluate IQ as a developmental product, not a fixed or natural quality, and thus vulnerable to changes due to socio-economic, biological, and nutritional developmental influencing variables. Both studies utilized nonverbal IQ as their primary cognitive outcome; thus, achieving methodological consistency within the theme. Raven's Progressive Matrices is widely accepted and psychometrically sound in terms of being culturally neutral and validated for use as a measure of nonverbal cognitive ability. The consistency of nonverbal IQ as a standard measure for evaluating children's cognitive abilities highlights the need to choose tests that minimize language and/or cultural biases, especially considering Malaysia's multiculture/multilanguage society.

The study by Poh et al. (2019), conducted on a nationally representative sample of 2,406 Malaysian children aged 5 to 12 years drawn from the SEANUTS (Southeast Asian Nutrition Surveys) study, demonstrated compelling associations between socioeconomic disadvantage and diminished cognitive performance. Specifically, children from households in the lowest income bracket were approximately twice as likely to exhibit low or borderline nonverbal IQ, while those whose parents attained only primary-level education faced compounded risks, with maternal educational attainment yielding an odds ratio of 2.64. These findings are theoretically consistent with the established literature on the poverty-cognition nexus, whereby limited access to nutritious food, stimulating learning environments, and quality healthcare collectively impair neurocognitive development during critical sensitive periods. The study further revealed that children with severe obesity were twice as likely to score poorly on nonverbal IQ compared to their normal-weight peers, thereby implicating metabolic and physiological pathways, such as chronic inflammation, disrupted sleep, and reduced physical activity as additional mediators of intelligence outcomes.

Complementing the national-level evidence, the regional study by Sandjaja et al. (2013), which examined 6,746 school-aged children across Indonesia, Malaysia, Thailand, and Vietnam, corroborated the salience of nutritional status as a determinant of nonverbal IQ through anthropometric indices. Children with low weight-for-age Z-scores (WAZ) were 3.5 times more likely to have a nonverbal IQ below 89, while low height-for-age Z-scores (HAZ), a proxy for chronic malnutrition and stunting, similarly doubled the probability of below-average cognitive performance. These findings collectively affirm that undernutrition during childhood constitutes a significant, potentially preventable, risk factor for intellectual underperformance at both individual and population levels. The combined findings of the two studies within this theme convey a unified message: intelligence, as assessed by standardized IQ tests, is intricately linked to wider ecological and socioeconomic frameworks. Efforts aimed at reducing poverty, enhancing nutrition, and improving parental education are expected to significantly boost the cognitive resources of children in Malaysia and the surrounding regions.

Theme 2: Intelligence and Cognitive Assessment in Educational Contexts

Focus Area: Application and measurement of intelligence and cognitive abilities within formal Malaysian educational settings (Number of Articles: 3). Main Research Direction: Exploring how MI, logical thinking, and cognitive processing are assessed, developed, and linked to academic performance across diverse educational levels in Malaysia.

The second theme of research is represented by three separate research studies collectively examining the notion of intelligence and cognitive assessment both as an object of study and as an available method of teaching/learning in Malaysian educational institutions. While the first theme considered IQ as a measure of development that is impacted by external factors, the research in the second theme considers cognitive and intellectual abilities as flexible and adaptable skills that can be assessed, developed, and utilized to enhance student achievement and learning experiences at the secondary, postsecondary, and vocational levels.

These research studies include various models and theories of cognitive ability, such as Gardner's Theory of Multiple Intelligences, cognitive assessment based on Bloom's taxonomy, and the PASS cognitive processing model. The diversity of these three research studies further demonstrates the theoretical and methodological diversity that has characterized intelligence-related research in the context of Malaysian educational research.

In a cross-sectional multi-institutional study involving Malaysian medical students, Wong et al. (2024) applied the MI Inventory alongside SmartPLS-based path analysis to examine inter-institutional differences and demographic influences on MI. The study revealed that family income exerted a statistically significant effect on musical intelligence, and that students consistently scored lowest in the verbal/linguistic intelligence domain across all three universities, indicating a systematic gap in language proficiency among future medical professionals. The implications of this finding are important for education, indicating that those responsible for designing curricula in Malaysian medical education should deliberately incorporate language-focused learning activities. This is crucial to address the shortfall in this area of intelligence, especially since verbal and linguistic skills are essential for effective clinical communication and patient care.

Extended the assessment of cognitive abilities into an online collaborative learning environment at Universiti Teknologi MARA (UiTM), Malaysia, Othman and Muhd Zain (2015) using the Group Assessment Logical Thinking (GALT) test administered before and after online collaborative activities. Results indicated a significant 21.7% increase in high logical thinkers following the intervention, alongside a strong positive correlation between logical thinking skills and problem-solving performance in an online platform. These findings position online collaboration as a viable pedagogical strategy for enhancing higher-order cognitive abilities in computing students, while also demonstrating that Bloom's taxonomy-aligned assessment instruments are effective in capturing cognitive development within digital learning environments.

Finally, Keat and Hj. Ismail (2011) examined the relationship between cognitive processing and reading performance in Malaysian primary school students using the Cognitive Assessment System (CAS), grounded in the PASS model, alongside the Wide Range Achievement Test-4 (WRAT-4). The study found a strong positive correlation between overall cognitive processing

and reading performance; with simultaneous and planning processes demonstrating particularly robust associations with reading outcomes. This study is significant in affirming that neuropsychologically informed assessment tools such as CAS offer superior diagnostic sensitivity in identifying reading deficits compared to conventional IQ testing, thus advocating for the adoption of process-oriented intelligence assessments in Malaysian special education and early literacy intervention programs.

Discussion

Although only five empirical studies were included in this synthesis, they provide a multidimensional understanding of the IQ testing and assessment in Malaysia that relates directly to both of the research questions. RQ1 examined the socioeconomic, nutritional, and biological influences on the IQ test scores/performances of Malaysian children and students; the evidence from nationally representative and regionally representative samples clearly show that nonverbal IQ is structured primarily by material and health-related conditions. Children from low-income and parents of low-education backgrounds, children who are underfed or severely obese, have a significantly higher likelihood of low or borderline IQs than other children, which means that a child's cognitive performance is actually a reflection of their lifetime exposure to the cumulative effects of structural disadvantages in addition to individual traits. The findings of these five studies are similar to the findings of international studies that have shown a strong association between poverty, growth faltering, and metabolic risk factors with decreased neuro cognitive functioning skills. Hence, these results suggest that IQ differences in Malaysia should be considered in a socioecological context, as opposed to just a psychometric context, when interpreting IQ scores of children in Malaysia.

In relation to RQ2, which asked how intelligence and cognitive assessment tools are implemented and applied to evaluate learning outcomes across Malaysian educational settings, the reviewed studies show that intelligence and cognition are being assessed using a range of frameworks, including MI profiling in medical education, logical thinking tests in online programming courses, and PASS-based cognitive processing measures in primary school reading research. Across these contexts, verbal and linguistic domains emerge as relatively weak areas, both among medical students and younger learners, while logical reasoning and planning skills appear responsive to targeted pedagogical interventions such as collaborative online learning. This pattern suggests that language-related cognitive capacities may be under-supported in current curricula, whereas higher-order thinking skills can be strengthened when instructional design explicitly engages students in problem solving and interaction. Taken together, the two themes corresponding to RQ1 and RQ2 indicate that intelligence in Malaysia is shaped by the intersection of socioeconomic conditions, nutritional status, and educational practice, and that assessment results should be interpreted with careful attention to these contextual factors.

Simultaneously, various limitations moderate the robustness of the conclusions drawn for both research questions. The evidence base rests on a small number of cross-sectional studies, which offer restricted coverage of IQ tools and infrequent reporting on local standardization or factorial invariance. Moreover, all five included studies were indexed in Scopus, with none meeting eligibility criteria from WoS, which further underscores the fragmented and sparse nature of the evidence base. Many evaluations depend on nonverbal tools like Raven's Progressive Matrices, which are beneficial for diverse cultural groups but offer only a limited

perspective on cognitive abilities. Despite these constraints, the consistent links found across different samples and methodologies allow for a careful yet meaningful interpretation of the observed trends for both RQ1 and RQ2, serving as an essential foundation for more extensive research on intelligence evaluation in Malaysia.

Conclusion

The present study represents a comprehensive review of relevant empirical research regarding the testing of IQ in Malaysia from 2010 until 2026. The study employed the PRISMA 2020 framework and conducted comprehensive searches in Scopus and WoS to locate original journal articles that adhered to specific methodological and contextual standards. Following a multi-stage process of screening, eligibility verification, and quality assessment, five primary studies were selected. This low volume underscores the need for more IQ assessment-based research in Malaysia. These studies were then synthesized into two main themes: the socioeconomic, nutritional, and biological factors influencing intelligence, and the assessment of intelligence and cognition within educational settings. Across the first theme, the review shows that socioeconomic disadvantage, suboptimal nutritional status, and severe obesity are consistently associated with poorer IQ performance, underscoring that cognitive outcomes in Malaysian children and adolescents are closely linked to modifiable environmental and health-related factors rather than fixed innate differences. Across the second theme, the review documents how multiple intelligence inventories, logical thinking tests, and cognitive processing measures are being used within Malaysian schools and universities, demonstrating positive links between assessed cognitive skills and educational outcomes, and highlighting persistent weaknesses in verbal/linguistic domains alongside promising gains from well-designed learning interventions.

The review contributes to the discipline by combining disparate local studies through a common thematic system to show the relationship between developmental and educational perspectives of intelligence. Instead of attempting to map all tools and psychometric methods comprehensively, the synthesis offers a realistic evaluation of what the current evidence can reveal and highlights distinct gaps in validation efforts, longitudinal studies, and the inclusion of under-represented groups. In practical terms, the results suggest the necessity for policies that combine nutritional aid, poverty alleviation, and early education programs with more advanced, culturally aware cognitive evaluations in educational and clinical settings. Limitations include the restriction to two databases, the exclusion of grey literature, language filters, and the small number of eligible studies, all of which constrain generalisability and leave some regions, ethnic groups, and age ranges underexplored. Future studies should aim to enhance the scope of databases, refine the psychometric assessment of tools used in local contexts, and employ both longitudinal and mixed-methods strategies. This approach will allow for a comprehensive understanding of how cognitive development is shaped by the interplay of socioeconomic factors and educational experiences over time. This review demonstrates the necessity of synthesizing the available data to present both what is currently known and unknown about IQ testing in Malaysia. Researchers can build upon more solid evidence which is essential for the advancement of theory, research, and practice in this area.

Acknowledgements: The authors would like to express their sincere gratitude to the Malaysian Mensa Society for providing the ideas for this paper.

Funding Statement: No Funding.

Conflict of Interest Statement: The authors declare that there is no conflict of interest regarding the publication of this paper. All authors have contributed to this work and approved the final version of the manuscript.

Ethics Statement: This study did not involve any human participants, animals, or sensitive data requiring ethical approval. The authors confirm that the research was conducted in accordance with accepted academic integrity and ethical publishing standards.

Author Contribution Statement: All authors contributed significantly to the development of this manuscript. All authors read and approved the final version of the manuscript prior to submission.

References

- Abouzahra, M. (2017). Systematic literature reviews in information systems: Guidelines and applications. *International Journal of Information Systems and Project Management*, 5(2)45–60.
- Akubuilu, U., Iloh, K., Onu, J., Ayuk, A., Ubesie, A., & Ikefuna, A. (2020). Academic performance and intelligence quotient of primary school children in Enugu. *The Pan African Medical Journal*, 36. <https://doi.org/10.11604/pamj.2020.36.129.22901>
- Anderson, E. J., & Varghese, F. P. (2020). Culture-free/fair intelligence testing. In *The Wiley Encyclopedia of Personality and Individual Differences, Measurement and Assessment* (pp. 153–157). John Wiley and Sons Ltd. <https://doi.org/10.1002/9781119547167.ch96>
- Ariffin, S. R., Asari, S. M., Mohamed, S., Shahar, S. N., Ishak, N. M., Din, R., Ahmad, A. G., Yamat, H., Majid, R., & Yasin, S. F. M. (2010). Validity of UKM1 intelligence test using Rasch analysis. *Procedia - Social and Behavioral Sciences*, 7, 205–209. <https://doi.org/10.1016/j.sbspro.2010.10.029>
- Ariffin, S. R., Mohamed, S., Isa, A., Sarif, S. H., & Ahmad, A. G. (2010). Validity of UKM2 intelligence test using Rasch analysis. *International Conference on Education and Educational Technologies - Proceedings*, 303–308.
- Hamzah, N. H., & Abdullah, S. H. (2018). A conceptual framework on cultural intelligence towards international students' satisfaction in Malaysia IHLs. *Journal of Social Sciences Research*, 2018(Special Issue 4), 50–57. <https://doi.org/10.32861/jssr.spi4.50.57>
- Das, J. P., Naglieri, J. A., & Kirby, J. R. (1994). Assessment of cognitive processes : the PASS theory of intelligence. In *A Longwood professional book TA - TT -*. Allyn and Bacon. <https://doi.org/LK> - <https://worldcat.org/title/28148761>
- Frischkorn, G. T., Hilger, K., Kretzschmar, A., & Schubert, A.-L. (2022). Intelligenzdiagnostik der Zukunft: Ein Plädoyer für eine prozessorientierte und biologisch inspirierte Intelligenzmessung. *Psychologische Rundschau*, 73(3), 173–189. <https://doi.org/10.1026/0033-3042/a000598>
- Hamzah, F. M., Rashid, M. N. A., Rahman, M. N. A., & Rasul, M. S. (2019). Rasch model analysis for evaluating validity and reliability of authentic learning instruments in Malaysian polytechnics. *International Journal of Innovation, Creativity and Change*, 9(7), 51–62.
- Hartini, H., Fakhrorazi, A., & Islam, R. (2019). The effects of cultural intelligence on task performance and contextual performance: An empirical study on public sector employees in Malaysia. *Humanities and Social Sciences Reviews*, 7(1), 215–227. <https://doi.org/10.18510/hssr.2019.7126>
- Hassan, N. (2012). English proficiency level among science students. *Advances in Natural and Applied Sciences*, 6(8), 1476–1480.
- Hayat, B., Putra, M. D. K., & Isa, K. (2023). Rasch Calibration and Differential Item Functioning (DIF) Analysis of the Indonesian National Assessment Program-Language (INAP-L). *World Journal of English Language*, 13(6), 402–413. <https://doi.org/10.5430/wjel.v13n6p402>
- Jin, L., Razak, R. A., Wright, J., & Song, J. (2011). Issues in developing grammatical assessment tools in Chinese and Malay for speech and language therapy. In *South and Southeast Asian Psycholinguistics* (pp. 145–156). Cambridge University Press. <https://doi.org/10.1017/CBO9781139084642.016>

- Keat, O. B., & Hj. Ismail, K. B. (2011). The relationship between cognitive processing and reading. *Asian Social Science*, 7(10), 44–52. <https://doi.org/10.5539/ass.v7n10p44>
- Kitchenham, B., & Charters, S. (2007). Guidelines for performing systematic literature reviews in software engineering. Technical Report, Ver. 2.3 EBSE Technical Report. EBSE.
- Nordin, S., Rameli, M. R. M., Siang, T. J., & Alhassora, N. S. A. (2019). Emotional intelligence in relation to ethical values of Malaysian university students. *Indian Journal of Public Health Research and Development*, 10(6), 1401–1406. <https://doi.org/10.5958/0976-5506.2019.01494.3>
- Othman, M., & Muhd Zain, N. (2015). Online collaboration for programming: Assessing students' cognitive abilities. *Turkish Online Journal of Distance Education*, 16(4), 84–97. <https://doi.org/10.17718/tojde.88618>
- Poh, B., Lee, S. T., Yeo, G. S., Tang, K., Afifah, Ab. R. N., Hanisa, A. S., Parikh, P., Wong, J., Ng, A. L. O., Poh, B., Norimah, A., Ruzita, A., Budin, S., Ng, A. L. O., Haslinda, M. D. S., Wong, J., Ismail, M., Rahman, J., Kamaruddin, N., ... Jamil, N. (2019). Low socioeconomic status and severe obesity are linked to poor cognitive performance in Malaysian children. *BMC Public Health*, 19. <https://doi.org/10.1186/s12889-019-6856-4>
- Puteh-Behak, F., Khaja, F. N. M., & Darmi, R. (2015). Sociocultural Insights into Conducting Qualitative Educational Research in Malaysia. In *Meanings and Motivation in Education Research* (pp. 91–102). Taylor and Francis. <https://doi.org/10.4324/9781315749631-10>
- Ranabhat, C., Kim, C.-B., Park, M. B., Kim, C. S., & Freidoony, L. (2016). Determinants of body mass index and intelligence quotient of elementary school children in mountain area of nepal: An explorative study. *Children*, 3(1). <https://doi.org/10.3390/children3010003>
- Samuel, M., Khan, M. H., Ng, L. L., & Cheang, K. W. (2014). Articulation of medium of instruction politics in the Malaysian Chinese press. *Discourse*, 35(2), 206–218. <https://doi.org/10.1080/01596306.2012.745731>
- Sandjaja, Poh, B., Rojroonwasinkul, N., Nyugen, B. K. Le, Budiman, B., Ng, L., Soonthorndhada, K., Xuyen, H. T., Deurenberg, P., & Parikh, P. (2013). Relationship between anthropometric indicators and cognitive performance in Southeast Asian school-aged children. *British Journal of Nutrition*, 110. <https://doi.org/10.1017/s0007114513002079>
- Seok, C. B., Hashmi, S. I., Madlan, L., & Mutang, J. A. (2020). Psychometric study of bar-on emotional quotient inventory: Youth version in Malaysian sample. *Pertanika Journal of Social Sciences and Humanities*, 28(2), 1357–1369.
- Sheng Ng, W. (2013). Counseling and psychotherapy in Malaysia: The joy and pain of (continuous) pioneering work. In *Handbook of Counseling and Psychotherapy in an International Context* (pp. 215–225). Taylor and Francis. <https://doi.org/10.4324/9780203864906-29>
- Strenze, T. (2007). Intelligence and socioeconomic success: A meta-analytic review of longitudinal research. *Intelligence*, 35(5), 401–426. <https://doi.org/10.1016/J.INTELL.2006.09.004>
- Swamy, K. B., Zubaidi, A. L., Suwaibah, A., Azmi, H., Norizahar, K., Husbani, M. A. R., & Rohayah, H. (2013a). The craniofacial indices correlate with age, gender and environmental influences-a study in Malaysian school children. *World Applied Sciences Journal*, 27(2), 250–256. <https://doi.org/10.5829/idosi.wasj.2013.27.02.81129>

- Swamy, K., Zubaidi, A., Mahmud, J. S., Abidin, Z., & Campus, K. (2013b). Correlation Between Cranial Capacity and Mental Ability among School Children in Kuala Terengganu, Malaysia. *Middle-East Journal of Scientific Research*, 17, 1016–1022. <https://doi.org/10.5829/idosi.mejsr.2013.17.08.8176>
- Tey, N. P., Siraj, S. B., Kamaruzzaman, S. B. B., Chin, A. V, Tan, M. P., Sinnappan, G. S., & Müller, A. M. (2016). Aging in multi-ethnic Malaysia. *Gerontologist*, 56(4), 603–609. <https://doi.org/10.1093/geront/gnv153>
- Wilson, C. J., Bowden, S. C., Byrne, L. K., Vannier, L. C., Hernandez, A., & Weiss, L. G. (2023). Cross-National Generalizability of WISC-V and CHC Broad Ability Constructs across France, Spain, and the US. *Journal of Intelligence*, 11(8), 159. <https://doi.org/10.3390/JINTELLIGENCE11080159>
- Wong, R. S.-Y., Siow, H.-L., Kumarasamy, V., Suhaimi, N. S. F., & Das, P. (2024). Path Analysis of Factors Influencing Multiple Intelligences of Malaysian Medical Students: A Multi-institutional Study. *Education in Medicine Journal*, 16(3), 141–155. <https://doi.org/10.21315/eimj2024.16.3.11>
- Wong, S. K., & Koh, P. C. L. (2022). Examining Emotional Intelligence among Malaysian Learners of Higher Education. *International Journal of Learning in Higher Education*, 29(1), 37–52. <https://doi.org/10.18848/2327-7955/CGP/v29i01/37-52>
- Yahya, N. A., & Ali, N. A. M. (2012). Malaysian traditional knowledge and herbal gardens: Informal education on plant resources for health. In *Health Education in Context: An International Perspective on Health Education in Schools and Local Communities* (pp. 191–198). Sense Publishers. https://doi.org/10.1007/978-94-6091-876-6_21