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Instrument Validation of Parental Engagement Management Practices in Malaysian Education Setting Using EFA and CFA

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Abstract

This research aimed to confirm the validity and reliability of an instrument measuring Parental Engagement Management Practices within the Malaysian education context. This instrument was designed by adapting six types of parental engagement framework and aligning it with the functions of four management processes (planning, organizing, leading, and controlling). A total of 460 samples were involved in this study. Data analysis was conducted in two stages, the first stage using EFA and the second stage using CFA. The EFA findings showed that only 28 items for the four factors obtained high factor loading values. The CFA results also show that the proposed measurement model is consistent with the research data through the model fit index obtained (χ2= 657.999 (df= 202, p=0.000), χ^2/df= 3.257, CFI= 0.895, RMSEA= 0.090). Convergent validity and construct reliability also reached satisfactory levels. In conclusion, Parental Engagement Management Practices as an instrument is considered a valid and reliable tool for use in future research.

Keywords: Parental Engagement Management Practices, Malaysian Education, EFA, CFA, Instrument Validation.

Introduction

Parental engagement plays an important role in influencing academic achievement (Li & He, 2022) the holistic development (Epstein, 2018) and can also contribute to behavior issues (Haslam et al., 2020) among students in the context of their educational development process. Indeed, parental engagement is a critical aspect in improving the quality of education, especially when parents are actively engaged in their children's education, it is able to increase academic performance, better behavior, and higher motivation among students (Henderson & Mapp, 2002). Despite robust evidence demonstrating the positive academic outcomes of parental engagement for student success, a persistent gap often exists between parental aspirations and their actual practice. This gap is frequently rooted in parents' limited access to effective strategies and their uncertainty about their specific role in supporting their child's academic journey.

Furthermore, parental engagement has been emphasized in Malaysia through various educational initiatives and policies, including the Malaysian Education Development Plan 2013-2025, which outlines the important role of the community and parents in education (Ministry of Education Malaysia, 2013). line with this plan, a concerted effort is being made to explore innovative approaches to ensure sustained parental engagement in the student learning system. Therefore, efforts to enhance parental involvement will remain unstructured without the guidance of a systematic and evidence-based framework. This lack of a strategic approach significantly hinders the full realization of home-school collaboration's considerable potential. Accordingly, this research seeks to bridge this gap by providing practical solutions that can empower parents, while also benefiting teachers, schools, and the broader education system in achieving educational goals more effectively.

This research focuses on proposals to strengthen parental engagement in the educational environment especially in Malaysia (Hamid, 2023) with innovation through management concepts: planning, organizing, leading, and controlling (Hamid & Mansor, 2023a; Hamid & Mansor, 2023b). A positive assessment of the factors studied is seen as very important because it is hoped that it can influence parents' social support for students, teachers and the school as well as the development of the students' own social skills. Integrating the concept of parental engagement with management functions is seen as a unique approach to studying 'how' parents are more effectively involved in their children's educational activities whether inside the house or outside, especially at school. This research will provide valuable empirical evidence on the importance of effective parental engagement management practices as a valuable reference for creating a more successful educational ecosystem. The findings will offer parents evidence-based guidance to improve their engagement in academic activities. This, in turn, will create a supportive environment that enhances students' self-confidence, academic achievement, and emotional well-being while reducing behavioral issues. Furthermore, the findings will serve as a crucial reference for educators, school and policymakers in developing more effective collaborative programs and policies related to parental engagement.

However, existing instruments tend to focus on general aspects of parental engagement in the context of student education. Therefore, good research begins with a valid instrument. Validity is a fundamental prerequisite for quality, ensuring that a research tool accurately measures the variable it is designed to assess (Creswell & Creswell, 2018). Thus, this research is important for validating a comprehensive instrument for Parental Engagement Management Practices that is relevant to the Malaysian context. This article aims to discusses the validation process using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) approaches.

Literature Review

The concept of parental engagement has been a major focus of educational research for decades. Epstein (2002) proposed six comprehensive types of parental engagement, namely: (1) parenting, (2) communication, (3) volunteering, (4) home learning, (5) decision-making, and (6) collaboration with the community. This framework has been widely used in research to understand various aspects of parental engagement. In the context of management, Stoner, Freeman and Gilbert (1995) explains four basic management functions: planning, organizing, leading, and controlling and generally, individuals can perform these functions

extensively throughout life from the perspective of family ties. This Parental Engagement Management Practices was developed through the Epstein (2002) model which was combined and included in the management process model by Stoner et al. (1995). Integrating Epstein's framework with Stoner's management functions provides a unique approach to study 'how' parents are engaged in the educational management process. For example, parents may be engaged in planning the school curriculum (planning), assisting in organizing school programs (organizing), providing moral support to students and teachers (leading), or monitoring children's learning progress (controlling).

Further, Hamid and Mansor (2023a) suggest that management practices can more effectively empower parental engagement in the context of student educational development. This approach is also supported by Hamid and Mansor (2023b) in order to encourage the active role of parents to encourage the process of student achievement in the 5.0 society environment. Furthermore, it is hoped that parental engagement at the community level can be enhanced to form strong social support, especially for efforts to address the issue of educational dropout in Malaysia (Hamid, 2023). Therefore, a specific instrument needs to be designed to serve as a tool for researchers to examine parental practices that more effectively influence their children's educational outcomes.

In fact, the validity and reliability of instruments are important for quality research (DeVellis, 2017). EFA is commonly used in the early stages of instrument development (Hair, Black, Babin, & Anderson, 2019; Kline, 2015). Its main purpose is to explore the underlying factor structure of a set of items when there is no clear theoretical model or when researchers want to empirically identify latent dimensions that may exist in the data. This process helps in reducing the number of items and identifying items that have high factor loadings on significant factors, thus improving the efficiency and initial construct validity of the instrument (Hair et al., 2019). In short, EFA plays a role in identifying latent dimensions and refining instrument items.

After the initial factor structure was identified through EFA, CFA was used to formally confirm the hypothesized factor model (Brown, 2015; Hair et al., 2019; Kline, 2015). CFA allows researchers to test the extent to which data fit the factor model derived from EFA or previously hypothesized. Consequently, this analysis provides stronger evidence of construct validity, as it involves testing specific hypotheses about the relationships between items and factors, as well as the relationships between the factors themselves. By combining these two approaches, ranging from EFA to CFA provides more comprehensive validity evidence for an instrument and is a best practice in an instrument validation to ensure strong construct validity.

Methodology

This research is a quantitative approach with a cross-sectional survey design. The research sample consisted of 460 parents or guardians of primary school students in Kuala Lumpur. A total of 126 samples were used for EFA and 334 in CFA procedure. The instrument is a questionnaire designed to measure the latent variable 'Parental Engagement Management Practices' through four factors: Planning (14 items), Organizing (14 items), Leading (11 items), and Controlling (11 items). These items were designed based on related literature and adapted from an existing instrument, namely the 'Measure of school, family, and community

partnerships' with reference to the six factors of parental engagement by Epstein (2002). Then, the items were modified based on the management process by Stoner et al. (1995) to measure the constructs of Planning, Organizing, Leading, and Controlling. All items were measured on a 5-point Likert scale, ranging from 1 (Never) to 5 (Very often). The instrument was validated for face and content by five experienced experts and demonstrated high reliability (Cronbach's Alpha > 0.9) in a pilot study involving 126 samples.

An EFA was conducted using SPSS version 27 to identify the instrument's factor structure. The analysis, which employed Principal Component Analysis with Varimax rotation, used criteria from Hair et al. (2019) that included: Kaiser-Meyer-Olkin to measure of sampling adequacy (≥ 0.50), a significant Bartlett's Test of Sphericity ($p<0.05$) to indicating that the correlation between the items is strong enough for factor analysis, communalities value (≥ 0.30), factor loadings (≥ 0.50), and a total variance explained of (≥ 60%). After that, CFA was performed using Maximum likelihood in AMOS version 21 to validate the factor structure identified in the EFA. The measurement model demonstrated a good fit with the research data, as evidenced by its goodness-of-fit (GOF) statistics. The model met the following acceptance criteria: Chi-square (χ^2), the associated degrees of freedom (df) and probability value (p-value) including the normed chi-square ($\chi^2/df < 5$), Comparative Fit Index (CFI) (≥ 0.8; Gaskin as cited in Zainol, 2020) and Root Mean Square Error of Approximation (RMSEA) (< 0.10; Cohen et al., 2018).

Results

The EFA results confirmed the existence of four main factors, consistent with the four hypothesized management functions: Planning, Organizing, Leading, and Controlling. Items with factor loadings less than 0.50 were removed to improve the clarity of the factor structure. The final instrument for the CFA consisted of 28 items (7 items by Planning, 8 items by Organizing, 8 items by Leading, and 5 items by Controlling). Table 1 shows a summary of the EFA results.

Table 1
EFA Results

Criteria Value	Results	Acceptable Value
Kaiser-Meyer-Olkin	0.842	≥ 0.50
Bartlett's Test of Sphericity	0.000	≤ 0.05
Communalities	0.498 until 0.846	≥ 0.30
Factor loadings	0.502 until 0.794	≥ 0.50
Total variance explained of	67.95 percent	≥ 60%

Furthermore, CFA was performed on 334 samples to test the four-factor model (Planning, Managing, Leading, and Controlling) identified through EFA. The data were first screened for normality, outliers, and multicollinearity to meet the assumptions of normally distributed data. In order to enhance the measurement instrument's efficiency and validity as well as to improve the model's fit index, six items (Organizing: OR2, Leading: L4, L5, L7, L8, and Controlling: C4) were removed during the model modification process. Then, the CFA

results validated that the measurement model demonstrated a good fit with the empirical data. A summary of the fit index values for the tested model is presented in Table 2.

Table 2
CFA Results

GOF Statistic	χ^2 (df, p)	χ^2/df	CFI	RMSEA
Measurement Model	657.999 (202, 0.000)	3.257	0.895	0.090
Acceptable Value	Significant at α = 0.05	1-5	>0.8	<0.10

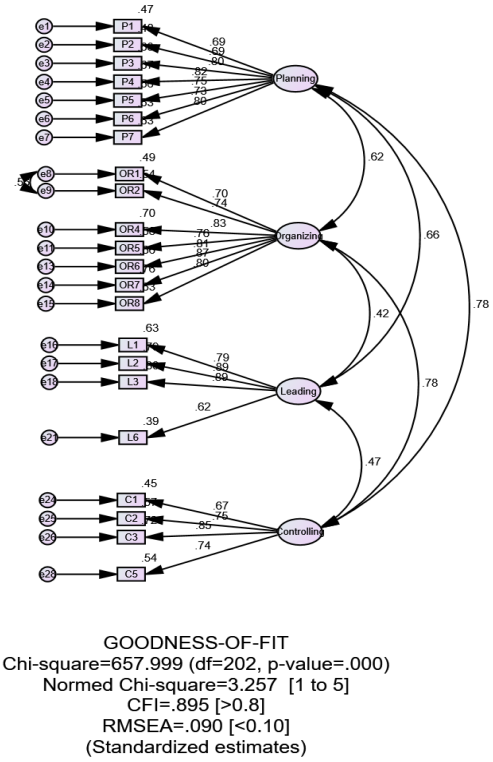

Figure 1. Measurement Model of Parental Engagement Management Practices

Figure 1 Measurement Model of Parental Engagement Management Practices, shows that its indicators are robust in measuring each factor of the model. The Planning factor is well-represented by indicators P1, P2, P3, P4, P5, P6 and P7; Organizing factor is measured by OR1, OR2, OR4, OR5, OR6, OR7, and OR8; Leading factor by L1, L2, L3, and L6; and the Controlling factor by C1, C2, C3 and C5. The model's marginal fit with the empirical data is validated by a series of fit indices, χ^2= 657.999 (df= 202, p=0.000), χ^2/df= 3.257, CFI= 0.895, RMSEA= 0.090. These results show that the CFI and RMSEA indices marginally approached the stringent criteria (CFI ≥ 0.9, RMSEA ≤ 0.08) suggested by Hair et al. (2019), which are considered acceptable during the initial phase of instrument development. Therefore, further model refinement is suggested in future research.

Furthermore, the result confirmed that the four-factor model demonstrated strong construct validity and reliability. Convergent validity was established by all standardized factor loadings being significant and exceeding the 0.70 threshold. Additionally, the Composite Reliability (CR) and Average Variance Extracted (AVE) values for each factor were

consistently above the recommended thresholds of 0.70 and 0.50, respectively (CR > 0.70; AVE > 0.50). These results indicate high internal consistency and strong convergent validity, as recommended by Fornell and Larcker (1981). The model's excellent fit with the empirical data was further supported by all fit indices falling within the acceptable ranges.

Conclusions

This research successfully validated an instrument for measuring Parental Engagement Management Practices, specifically to the context of educational environment in Malaysian. By integrating parental engagement framework by Epstein (2002) with management functions by Stoner et al. (1995), the instrument offers a more comprehensive perspective on the role of parents within the educational system. EFA conducted with 126 samples revealed a clear factor structure that met the criteria set by Hair et al. (2019). Subsequently, CFA with a sample of 334 confirmed that the model demonstrated a marginal fit with the research data.

This validated instrument is a reliable and valid tool for both researchers and education practitioners to assess the level and form of parental engagement across four key management functions: planning, organizing, leading, and controlling within activities related to their children's education. It can be utilized to identify strengths and weaknesses in current parental engagement practices, thereby facilitating the design of more effective interventions to enhance home-school collaboration. For future research, this instrument could be employed on a larger scale or in different educational contexts. Furthermore, a promising avenue for future research is to explore the relationship between the dimensions measured by this instrument and student learning outcomes.

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