

FOSTERING CREATIVITY IN THE MATHEMATICS CLASSROOM: PERSPECTIVES FROM PRIMARY SCHOOL TEACHERS

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ABSTRACT

Creativity has become a central goal of contemporary mathematics education, requiring instructional practices that promote originality, flexibility, and meaningful problem-solving. This study examined the level, interrelationships, and measurement validity of Creative Fostering Behaviour (CFB) among Malaysian primary mathematics teachers across six domains: Teaching Style, Innovative Teaching Practices, Confidence, Classroom Climate, Overcoming Barriers, and Asking Questions. A quantitative cross-sectional survey design was employed using an adapted instrument, with 600 teachers selected through multistage cluster random sampling. Data were analysed using descriptive statistics, Pearson correlation, and confirmatory factor analysis (CFA). The findings indicated high levels of creativity-supportive practices across all domains, with Confidence recording the highest mean ($M = 4.14$, $SD = 0.586$) and Asking Questions the lowest ($M = 3.93$, $SD = 0.544$). Correlation analysis revealed significant positive relationships among all domains ($p < .001$), supporting the multidimensional and interconnected nature of CFB. CFA results demonstrated acceptable model fit ($\chi^2/df = 2.34$, $RMSEA = .048$, $CFI = .962$, $TLI = .953$), with satisfactory reliability and validity. Overall, the findings highlight a gap in inquiry-based practices and underscore the need for targeted professional development to strengthen higher-order pedagogies in mathematics classrooms.

Keywords: *Creative fostering behaviour, mathematics teachers, creativity, classroom practices, primary education.*

INTRODUCTION

In recent years, creativity has become an increasingly important competency in 21st-century education, particularly within STEM disciplines such as mathematics. Although mathematics has traditionally been viewed as a rigid and procedural subject, it is now more widely recognised as a domain that supports divergent thinking, problem-posing, and the exploration of multiple solution strategies (Mann, 2006; Sriraman, 2005). This shift highlights the need for instructional approaches that emphasise originality, flexibility, and meaningful problem-solving, rather than reliance on rote memorisation. As a result, fostering creativity has emerged as a key goal in contemporary mathematics education.

Teachers play a crucial role in nurturing creativity in the classroom through their instructional practices, classroom climate, and underlying beliefs about teaching and learning. Cropley (1997) suggests that creativity can be developed through deliberate pedagogical strategies that promote flexibility, risk-taking, and openness to new ideas. Similarly, Sternberg's Investment Theory of Creativity (1988, 2006a, 2006b, 2017) highlights the importance of encouraging unconventional thinking and persistence against

challenges. In mathematics classrooms, such approaches may include the use of open-ended tasks, multiple-solution problems, and opportunities for inquiry and problem-posing, all of which contribute to the development of students' creative mathematical thinking (Bicer, 2021; Schukajlow & Krug, 2014).

Within the Malaysian context, fostering creativity has become a national educational priority. The Malaysia Education Blueprint 2013–2025 identifies creativity and innovation as essential outcomes for student development (Ministry of Education Malaysia, 2015). Despite this emphasis, existing studies indicate that classroom practices often continue to prioritise examination performance and procedural fluency over creativity-oriented instruction (Mardiah Hafizah et al., 2020; Nor Haniza & Nurzatulshima, 2021). As a consequence, students tend to rely on memorised algorithms rather than engaging in flexible problem-solving or generating original ideas (Roslan et al., 2021), suggesting a gap between policy aspirations and classroom practice.

Although teachers generally recognise the importance of creativity, a gap still exists between their beliefs and their actual classroom practices. Both local and international research indicate that teachers face challenges in implementing creativity-supportive pedagogies due to curriculum constraints, assessment pressures, and limited professional training (Jukić Matić, 2024; Leikin & Elgrably, 2022). In addition, there is limited empirical evidence examining how Malaysian primary mathematics teachers foster creativity across specific behavioural domains, particularly within the framework of Creative Fostering Behaviour (CFB).

To address this gap, the present study examines the extent to which Malaysian primary mathematics teachers demonstrate Creative Fostering Behaviour across six domains: Teaching Style, Innovative Teaching Practices, Confidence, Classroom Climate, Overcoming Barriers, and Asking Questions. Guided by Sternberg's Investment Theory of Creativity and Cropley's framework, this study provides empirical insights into teachers' creativity-supportive practices in mathematics classrooms and identifies areas that may require further pedagogical support and professional development.

Research Questions

Based on the objectives of the study, the following research questions were formulated:

1. What is the level of Creative Fostering Behaviour (CFB) among Malaysian primary mathematics teachers across the six domains: Teaching Style, Innovative Teaching Practices, Confidence, Classroom Climate, Overcoming Barriers, and Asking Questions?
2. How do the six domains of Creative Fostering Behaviour correlate with one another among primary mathematics teachers in Malaysia?
3. To what extent does the measurement model for Creative Fostering Behaviour prove to be a valid and reliable framework for this study's context?

LITERATURE REVIEW

Creative Fostering Behaviour

Creative Fostering Behaviour (CFB) refers to the deliberate actions teachers take to promote creativity among learners. These actions include encouraging divergent thinking, providing opportunities for open-ended inquiry, and supporting risk-taking in problem-solving. Cropley (1997) explains that creativity can be systematically nurtured through classroom environments that value originality, flexibility, and tolerance for ambiguity.

Building on this perspective, Sternberg's Investment Theory of Creativity (1988, 2006a, 2006b, 2017) conceptualises creativity as a combination of intellectual abilities, knowledge, thinking styles, motivation, and environmental influences. According to Sternberg, fostering creativity involves encouraging students to "buy low and sell high" in the world of ideas—that is, to explore unconventional approaches and persist even when such ideas are initially undervalued.

In practice, CFB includes strategies such as problem-posing, encouraging multiple solution pathways, and recognising novel approaches to mathematical tasks (Bicer, 2021; Schukajlow & Krug, 2014). Kandemir et al. (2019) operationalised this construct by developing a survey instrument to measure teachers' creative-fostering behaviours, thereby offering a practical framework for examining how creativity is supported in classroom settings. Recent studies also suggest that teachers' CFB is shaped not only by individual beliefs but also by institutional expectations and cultural influences (Jukić Matić, 2024; Leikin & Elgrably, 2022). Thus, CFB can be understood as both an individual practice and a reflection of the broader educational context.

Creative Fostering Behaviour among Mathematics Teachers

Creativity plays an important role in mathematics education, particularly as the subject has traditionally been associated with procedural learning and memorisation. However, contemporary research highlights that mathematics offers meaningful opportunities for creative engagement through activities such as problem-solving, conjecturing, and making abstract connections (Mann, 2006; Sriraman, 2005). In this regard, teachers are central to shifting classroom practices from procedural instruction to approaches that encourage flexible and innovative thinking.

Despite this, research indicates that mathematics teachers often struggle to translate these ideas into classroom practice. Zioga and Desli (2025) found that although teachers value creativity, there remains a gap between their beliefs and their instructional practices. Similarly, Nor Haniza and Nurzatulshima (2021) reported that Malaysian mathematics teachers tend to rely on traditional teaching approaches, limiting students' exposure to open-ended tasks and creative problem-solving opportunities.

Although effective strategies for fostering creativity such as model-eliciting activities, multiple-solution problems, and problem-posing tasks have been identified (Bicer, 2021), their implementation remains limited. Internationally, Leikin and Elgrably (2022) highlighted that curriculum constraints and assessment pressures often restrict teachers from adopting creativity-focused approaches. Within Malaysia, findings by Mardiah Hafizah et al. (2020) and Roslan et al. (2021) indicate that students frequently rely on memorised procedures, reflecting limited integration of creativity-supportive practices.

Overall, these findings suggest that while teachers recognise the importance of creativity, systemic and pedagogical constraints continue to hinder its consistent implementation. Addressing these challenges requires targeted professional development and institutional support to enable teachers to balance creativity with procedural fluency. These insights highlight the need for further investigation into how mathematics teachers perceive and implement Creative Fostering Behaviour in classroom settings.

Dimensions of Creativity-Fostering Behaviour among Mathematics Teachers

In mathematics education, Creative Fostering Behaviour (CFB) plays an important role in encouraging students to explore different ways of solving problems, question underlying assumptions, and actively engage in both problem posing and problem solving (Silver, 1997; Sriraman, 2005). Kandemir et al. (2019) introduced a multidimensional framework to examine CFB, drawing on Sternberg's Investment Theory of Creativity (1988, 2006a, 2006b, 2017) as well as Cropley's (1997) perspective on fostering creativity. The framework consists of six related dimensions, namely teaching style, innovative teaching practices, classroom climate, asking questions, overcoming barriers, and confidence, which together describe how teachers shape classroom environments that support creative thinking in mathematics.

Teaching Style. Teaching style refers to how teachers organise and deliver mathematics instruction, including the level of flexibility they demonstrate during lessons. A creativity-oriented teaching style involves balancing teacher guidance with opportunities for student autonomy, allowing learners to take an active role in their own learning process (Reed, 1957; Sawyer, 2011). Within mathematics classrooms, flexible instructional approaches enable students to apply different problem-solving methods and encourage the development of divergent thinking (Sriraman, 2004). Previous studies indicate that learner-centred teaching approaches are associated with higher levels of originality in students' mathematical responses (Haylock, 1997).

Innovative Teaching Practices. Innovative teaching practices refer to the use of varied instructional strategies, resources, and learning activities that support creative engagement in mathematics. Examples include the use of open-ended problems, tasks with multiple possible solutions, integration of digital tools, and model eliciting activities (Bicer, 2021; Chamberlin & Moon, 2005; Silver, 1997). Such approaches have been shown to enhance not only creativity but also students' conceptual understanding and problem-solving abilities (Craft, 2005). However, their use in classrooms is sometimes limited, particularly due to curriculum requirements and assessment-related pressures (Leikin & Elgrably, 2022).

Classroom Climate. Classroom climate describes the emotional and social conditions within the learning environment that may either support or restrict creative expression. When students experience a sense of psychological safety, they are more willing to test ideas and explore different approaches without fear of negative judgment (Amabile, 1996; Csikszentmihalyi, 1996). In mathematics settings, such an environment encourages students to share alternative strategies and become more comfortable with uncertainty (de Souza Fleith, 2000). Research has shown that classrooms characterised by trust and encouragement tend to promote greater student participation and creative engagement (Runco, 2004).

Asking Questions. The use of questioning is central to the development of creativity in the classroom. Teachers who employ open-ended and higher-order questions are better able to stimulate curiosity and support divergent thinking among students (Cai et al., 2013; Silver, 1994). In mathematics learning, effective questioning encourages students to explain their reasoning, consider different perspectives, and formulate their own problems (Haylock, 1997). Evidence suggests that inquiry-oriented questioning contributes to deeper understanding and enhances students' creative thinking processes (Krutetskii, 1976).

Overcoming Barriers. Overcoming barriers involves the actions taken by teachers to address factors that may limit students' creative engagement, such as fear of making mistakes, dependence on routine procedures, or low motivation. Cropley (1997) highlights the importance of reducing unnecessary constraints and treating errors as part of the learning process. Similarly, Amabile (1996) notes that supportive classroom conditions can encourage persistence and willingness to take intellectual risks. In mathematics education, where structured procedures are often emphasised, promoting flexibility and resilience can help students approach tasks in more creative ways (Sriraman, 2005).

Confidence. Confidence refers to both teachers' confidence in supporting creativity and their influence on students' beliefs in their own abilities. According to Bandura (1997), self-belief plays a crucial role in sustaining motivation and persistence, while Torrance (1974) emphasises its importance for creative expression. In mathematics classrooms, teachers who acknowledge students' ideas and encourage exploration contribute to the development of confidence needed for tackling unfamiliar and complex problems (Beghetto & Kaufman, 2007). Studies have also shown that higher levels of confidence are linked to continued engagement in creative tasks and improved problem-solving outcomes (Beghetto, 2007).

METHODOLOGY

This study adopted a descriptive research method and used a self-reported survey to gather quantitative data. Based on Creswell and Creswell (2018), surveys give respondents the chance to express their knowledge, attitudes, and opinions about the subject under study. The CFB of both novice and experienced primary mathematics teachers can be assessed in this context through survey research.

Ethical Consideration

Before data collection, approval was obtained from the Educational Planning and Research Division of the Malaysian Ministry of Education. The respective State Education Departments and school principals subsequently granted additional permissions. All participants were informed about the purpose of the study, and their consent was obtained before participation.

Instrumentations

The Creative Fostering Behaviour instrument used in this study was adapted from the scale developed by Kandemir et al. (2019) for mathematics teachers. The original instrument consisted of 36 items covering six domains, namely Teaching Style, Innovative Teaching Practices, Confidence, Classroom Climate, Overcoming Barriers, and Asking Questions.

Several adaptations were made to ensure suitability for the Malaysian primary school context. First, minor linguistic modifications were introduced to improve clarity and ensure that respondents easily understood the items. Second, contextual adjustments were carried out to align the items with local classroom practices, curriculum requirements, and teaching conditions in national primary schools.

To establish validity, both face and content validation procedures were conducted. Feedback was obtained from five primary school teachers and nine experts in mathematics education, measurement, and language. In addition, a translation and back translation process was carried out following Behr (2017). The instrument was first translated into Bahasa Malaysia and then translated back into English by two experienced language lecturers to ensure consistency in meaning.

Initially, all items were measured using a 10-point Likert scale ranging from strongly disagree to strongly agree. The use of a larger number of response categories has been supported in previous studies, as it allows for greater measurement precision and variability, particularly in advanced statistical analyses such as structural equation modelling (Dawes, 2008; Preston & Colman, 2000). However, findings from Rasch analysis indicated that the 10-point scale did not perform optimally. Several categories were underutilised and showed disordered thresholds, suggesting that respondents experienced difficulty distinguishing between adjacent options. As a result, the scale was reduced to a 5-point format to improve clarity, response consistency, and overall measurement quality.

A pilot study involving 150 primary mathematics teachers was conducted to evaluate the instrument. Exploratory Factor Analysis confirmed that the items loaded appropriately onto their respective constructs. Rasch analysis was also used to assess item fit and measurement properties. Based on these results, several items were removed due to low loadings, cross-loadings, or misfit statistics. The refined instrument consisted of 21 items, with four items each for Teaching Style, Innovative Teaching Practices, and Classroom Climate, and three items each for Asking Questions, Overcoming Barriers, and Confidence.

Reliability analysis indicated strong internal consistency for the overall scale, with a Cronbach's alpha value of 0.947. The subscales also demonstrated acceptable to high reliability, with values ranging from 0.615 to 0.871, confirming that the instrument is suitable for measuring Creative Fostering Behaviour among Malaysian primary mathematics teachers.

Population and Sampling

The study was conducted between November and December 2021 in national primary schools across Malaysia, covering all thirteen states and three Federal Territories. The target population consisted of mathematics teachers teaching from Standard 1 to Standard 6. Official statistics indicate that this population includes approximately 57,993 teachers across 7,772 schools.

A multistage cluster sampling technique was used to ensure representation across geographically dispersed regions (Creswell & Creswell, 2017). Malaysia was first divided into five zones, after which one state from each zone was randomly selected. The selected states were Pulau Pinang, Perak, Melaka, Terengganu, and Sarawak. Districts and schools within these states were then selected randomly, and teachers from government primary schools were invited to participate. Efforts were made to ensure balanced representation across different regions.

Data Collections

Data were collected using an online survey, which was considered appropriate due to movement restrictions during the COVID-19 period and the wide geographical distribution of respondents (Creswell

& Creswell, 2017; Sekaran & Bougie, 2016). The survey link was distributed through heads of Mathematics panels in the selected schools. Participation was voluntary, and informed consent was obtained before completing the questionnaire.

A total of 709 teachers responded to the survey, of which 631 agreed to participate, resulting in a response rate of 89 percent. This level of participation is considered satisfactory for survey-based research (Gay et al., 2012). Following data screening and cleaning using IBM SPSS Statistics version 26, a total of 600 valid responses were retained for further analysis.

DATA ANALYSIS AND RESULTS

Data collected from the questionnaires were analysed using IBM SPSS Statistics version 26.0 and AMOS. The analysis was carried out in three stages to address Research Questions 1, 2, and 3. These stages included descriptive statistics, correlation analysis, and confirmatory factor analysis.

The sample was largely made up of female teachers, with 458 respondents representing 76.3 percent, while male teachers accounted for 142 respondents or 23.7 percent. In terms of age, most participants were between 41 and 50 years old, representing 46.2 percent of the sample, followed by those aged between 31 and 40 years at 32.3 percent. Regarding teaching experience, the majority reported between 11 and 20 years of experience, accounting for 46.3 percent, which indicates that most respondents were experienced teachers. In terms of academic qualifications, most participants held a bachelor's degree at 82 percent, while a smaller proportion held postgraduate qualifications at 7.8 percent.

Generally, the demographic characteristics indicate that the respondents were both experienced and academically qualified, which strengthens the credibility of the findings related to creativity by fostering practices in mathematics classrooms.

Level of Creative Fostering Behaviour

To determine the level of Creative Fostering Behaviour, the interpretation of mean scores followed the approach suggested by Best and Khan (1998). The scale range was first calculated by subtracting the minimum score from the maximum score, resulting in a value of four. This range was then divided into three equal intervals, producing a class width of approximately 1.33. Based on this calculation, the mean scores were categorised into three levels, namely low, moderate, and high, as presented in Table 1.

Table 1. *Categorization of Levels According to Mean Values*

Weighted Average	Result Interpretation
1.00 – 2.32	Low
2.33 – 3.65	Moderate
3.66 – 5.00	High

As shown in Table 2, all six domains were rated highly, indicating that Malaysian primary mathematics teachers regularly engage in practices that support creativity. Confidence (CF) recorded the highest mean value ($M = 4.14$, $SD = 0.586$), suggesting a strong focus on encouraging student participation, risk-taking, and persistence during problem-solving activities.

Teaching Style (TS) ($M = 3.98$, $SD = 0.499$) and Overcoming Barriers (OB) ($M = 3.98$, $SD = 0.535$) also received high ratings, reflecting teachers' efforts to promote flexible approaches to problem solving and to minimise students' fear of failure. Innovative Teaching Practices (IT) and Classroom Climate (CC) showed similarly strong levels of implementation. In comparison, Asking Questions (AQ) recorded the lowest mean ($M = 3.93$, $SD = 0.544$), although it still fell within the high category. These results suggest that creativity-related practices are widely applied in classrooms, although inquiry-based questioning appears to receive comparatively less emphasis.

Table 2. *Descriptive Statistics for TS, IT, CF, CC, OB and AQ.*

No	Sub-Constructs	Mean	SD	Interpretation
1.	Teaching Style (TS)	3.98	0.499	High
2.	Innovative Teaching Practices (IT)	3.97	0.536	High
3.	Confidence (CF)	4.14	0.586	High
4.	Classroom Climate (CC)	3.96	0.567	High
5.	Overcoming Barriers (OB)	3.98	0.535	High
6.	Asking Questions (AQ)	3.93	0.544	High

The analysis of response frequencies presented in Table 3 shows consistently high levels of agreement across all constructs. For Teaching Style, more than 70 percent of respondents indicated that they use instructional approaches that support multiple solution methods, encourage the sharing of ideas, and promote learner autonomy. A similar pattern was observed for Innovative Teaching Practices, where approximately 80 to 84 percent of teachers emphasised originality, required students to justify their reasoning, and encouraged the use of mathematics in real-world situations.

The highest agreement levels were associated with the Confidence construct, with more than 80 percent of respondents indicating that they encourage students to express ideas freely, persist in challenging tasks, and propose alternative solutions. Classroom Climate also demonstrated strong support, with agreement levels ranging from about 71 to 87 percent, suggesting that many classrooms provide supportive and engaging learning environments.

For Overcoming Barriers, more than 80 percent of respondents reported efforts to reduce fear of failure and encourage perseverance. In contrast, although Asking Questions was still positively rated, it showed slightly lower levels of agreement compared to the other domains, indicating that inquiry-based strategies may not be as strongly emphasised.

Overall, these findings indicate that teachers actively support creativity in their classrooms, while also pointing to the need for greater emphasis on inquiry-oriented questioning practices.

Relationships Among Creative Fostering Behaviour Domains

To explore the relationships among the six domains of Creative Fostering Behaviour, Pearson correlation analysis was conducted, as presented in Table 4.

The results show that all domains were positively and significantly related at the 0.001 level, indicating that creativity-fostering practices tend to occur together within classroom settings. Confidence (CF) demonstrated strong associations with Teaching Style (TS) ($r = .78, p < .001$) and Classroom Climate (CC) ($r = .81, p < .001$), highlighting its importance in supporting a positive learning environment. Innovative Teaching Practices (IT) also showed a significant relationship with Asking Questions (AQ) ($r = .69, p < .001$), suggesting that teachers who adopt more innovative approaches are more likely to incorporate inquiry-based strategies in their teaching.

Overall, the pattern of relationships supports the view that Creative Fostering Behaviour is multidimensional and interconnected, with each domain contributing to the promotion of creativity in mathematics classrooms.

Measurement Model of Creative Fostering Behaviour

To validate the dimensional structure of Creative Fostering Behaviour (CFB), Confirmatory Factor Analysis (CFA) was conducted using AMOS.

The hypothesised six-factor model demonstrated acceptable fit to the data, $\chi^2/df = 2.34$, RMSEA = .048, CFI = .962, and TLI = .953, meeting established criteria for model adequacy (Hair et al., 2019). Meanwhile, all standardized factor loadings were statistically significant ($p < .001$) and ranged from .63 to .88, indicating satisfactory indicator reliability. Composite Reliability (CR) values ranged from .78 to

.91, while Average Variance Extracted (AVE) values exceeded the recommended threshold of .50, supporting convergent validity.

Discriminant validity was confirmed, as inter-construct correlations were lower than the square root of AVE values. In addition, all first-order constructs loaded significantly onto the higher-order CFB construct, providing evidence for its multidimensional yet unified structure. These results confirm that the measurement model is both valid and reliable for assessing creativity-fostering practices among Malaysian primary mathematics teachers.

DISCUSSIONS AND CONCLUSIONS

This study examined the extent to which Malaysian primary mathematics teachers demonstrate Creative Fostering Behaviour (CFB) across six domains: Teaching Style, Innovative Teaching Practices, Confidence, Classroom Climate, Overcoming Barriers, and Asking Questions. Overall, the findings indicate that teachers report consistently high levels of creativity-supportive practices across all domains. Among these, Confidence emerged as the most strongly emphasised dimension, while Asking Questions was comparatively less prominent.

One possible explanation for the strong emphasis on Confidence is that teachers prioritise creating a supportive and non-threatening classroom environment. In such environments, students are more likely to express their ideas, take intellectual risks, and persist in challenging tasks. This aligns with Bandura’s (1997) concept of self-efficacy, which highlights the importance of belief in one’s capabilities, as well as Torrance’s (1974) view that confidence is fundamental to creative expression. Similarly, Cropley (1997) emphasised that psychological safety is a key condition for fostering creativity in educational settings.

Table 3. *The Results in Frequencies and Percentages*

Name of Item Construct		Frequency (Percentage)				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Teaching Style	TS1: I plan activities that enable students to solve problems in a variety of ways	0 (0.0%)	1 (0.2%)	151 (25.2%)	373 (62.2%)	75 (12.5%)
	TS2: I get students to share their different solutions	0 (0.0%)	3 (0.5%)	116 (19.3%)	387 (64.5%)	94 (15.7%)
	TS3: I plan appropriate methods/strategies/techniques so that students can apply their knowledge and problem-solving ability in different areas.	0 (0.0%)	1 (0.2%)	94 (15.7%)	385 (64.2%)	120 (20.0%)
	TS4: Although I support my students in their learning, I make them responsible for their own learning.	0 (0.0%)	5 (0.8%)	84 (14.0%)	384 (64%)	127 (21.2%)
Innovative Teaching Practices	IT1: I want my students to prove the solution of the problem	0 (0.0%)	4 (0.7%)	117 (19.5%)	366 (61.0%)	113 (18.8%)

	IT2: I encourage my students to arrive with original ideas	2 (0.3%)	7 (1.2%)	117 (19.5%)	378 (63.0%)	96 (16.0%)
	IT3: I want my students to apply their knowledge or solution methods in real-world situations.	0 (0.0%)	4 (0.7%)	85 (14.2%)	383 (63.8%)	128 (21.3%)
	IT4: I ask my students to solve problems using different visual or verbal elements.	0 (0.0%)	5 (0.8%)	133 (22.2%)	370 (61.7%)	92 (15.3%)
Confidence	CF1: I encourage my students to suggest alternative solutions that can challenge my ideas and problem-solving strategies.	0 (0.0%)	4 (0.7%)	115 (19.2%)	346 (57.7%)	135 (22.5%)
	CF2: I encourage my students to articulate their ideas without fear of embarrassment.	0 (0.0%)	1 (0.2%)	73 (12.2%)	314 (52.3%)	212 (35.3%)
	CF3: No matter how difficult the problem is, I encourage my students to take the challenge,	0 (0.0%)	2 (0.3%)	78 (13.0%)	337 (56.2%)	183 (30.5%)
Classroom Climate	CC1: My students can use any form (such as verbal, graphical, dance, drama etc.) to demonstrate how they solved the problems.	2 (0.3%)	25 (4.2%)	170 (28.3%)	307 (51.2%)	96 (16.0%)
	C2: I start my class with telling an event, joke, story and scenario, etc. to get students attention.	2 (0.3%)	10 (1.7%)	159 (26.5%)	319 (53.2%)	110 (18.3%)
	CC3: My students understand that they should make an effort to come up with different solutions to the problems.	0 (0.0%)	7 (1.2%)	111 (18.5%)	366 (61.0%)	116 (19.3%)
	CC4: I reward my students if they propose original or extraordinary ideas in the classroom.	0 (0.0%)	4 (0.7%)	72 (12.0%)	327 (54.5%)	197 (32.8%)
Overcoming Barriers	OB1: Since my students know what my expectation, they follow standard routine procedures in the learning process	0 (0.0%)	4 (0.7%)	110 (18.3%)	390 (65.0%)	96 (16.0%)
	OB2: My students know that they should not use the expression "I could not solve the problems".	0 (0.0%)	4 (0.7%)	100 (16.7%)	392 (65.3%)	104 (17.3%)

	OB3: I diminish the fear of my students who have difficulty with proposing different solutions or ideas.	0 (0.0%)	7 (1.2%)	111 (18.5%)	369 (61.5%)	113 (18.8%)
Asking Questions	AQ1: I ask my students to come up with original problems.	0 (0.0%)	5 (0.8%)	127 (21.2%)	375 (62.5%)	93 (15.5%)
	AQ2: I ask my students questions with more than one answer (such as open-ended questions).	0 (0.0%)	7 (1.2%)	139 (23.2%)	358 (59.7%)	96 (16.0%)
	AQ3: Since my students know that I value their ideas, they do not hesitate to express their ideas and propose something.	1 (0.2%)	8 (1.3%)	119 (19.8%)	356 (59.3%)	116 (19.3%)

Table 4. Correlations Among CFB Domains

Constructs	TS	IT	CF	CC	OB	AQ
TS	1					
IT	.74**	1				
CF	.78**	.76**	1			
CC	.75**	.73**	.81**	1		
OB	.70**	.72**	.77**	.74**	1	
AQ	.68**	.69**	.71**	.70**	.66**	1

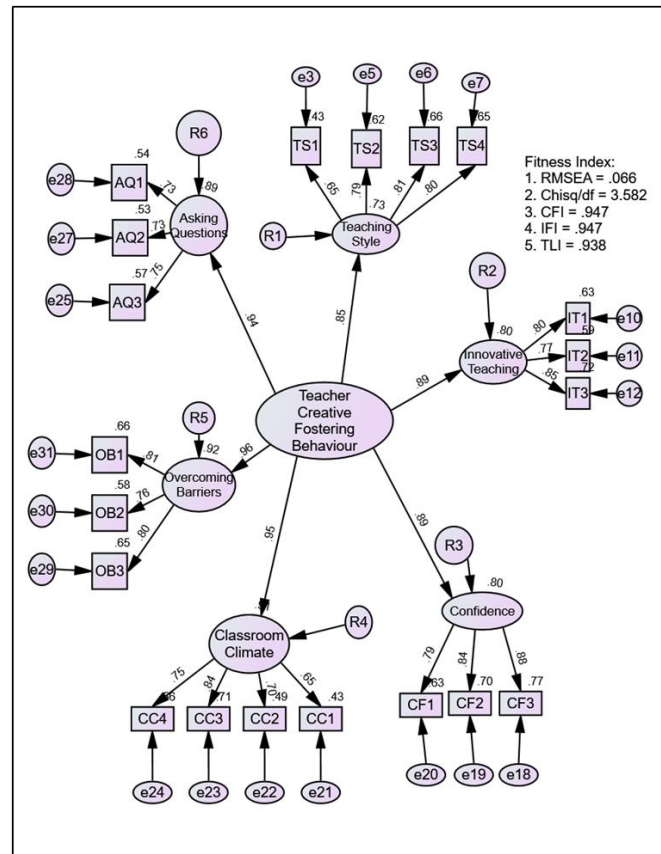


Figure 1. Measurement Model for Creative Fostering Behaviour

When compared with international findings, a similar pattern can be observed, where affective aspects of teaching are often more readily implemented than cognitively demanding creative practices (Leikin & Elgrably, 2022). However, the relatively high emphasis on Confidence in this study may also reflect Malaysia's ongoing policy focus on holistic student development, as outlined in the Malaysia Education Blueprint 2013–2025. This suggests that teachers are increasingly aware of the importance of supporting students' emotional and motivational readiness for learning.

The high levels reported for Teaching Style and Innovative Teaching Practices suggest that teachers perceive themselves as adopting flexible and student-centred instructional approaches. These practices are consistent with research indicating that creativity in mathematics can be enhanced through multiple solution pathways, real-world applications, and opportunities for exploration (Mann, 2006; Sriraman, 2005). Nevertheless, it is important to note that self-reported practices may not always reflect actual classroom implementation. Previous studies have highlighted a potential gap between what teachers believe they are doing and what is enacted in practice (Leikin & Sriraman, 2016). This raises important questions about the extent to which these practices are consistently applied in real classroom settings.

Similarly, the strong ratings for Classroom Climate and Overcoming Barriers suggest that teachers are making efforts to reduce students' fear of failure and encourage perseverance. These findings are in line with Amabile's (1996) and Csikszentmihalyi's (1996) perspectives, which emphasise the role of supportive environments in enabling creativity. However, when viewed within the Malaysian context, these practices may still operate within relatively structured classroom environments, where opportunities for student autonomy and risk-taking are somewhat moderated by curriculum and assessment expectations.

Despite these generally positive findings, Asking Questions emerged as the least emphasised domain. This is a particularly important result, as questioning plays a central role in promoting higher-order thinking and creativity. A likely reason for this pattern is the continued emphasis on examination-oriented teaching, which may limit opportunities for open-ended questioning and exploratory dialogue. In addition, teachers may not have sufficient training in designing higher-order or divergent questions, as teacher education programmes often place greater emphasis on content delivery rather than inquiry-based pedagogy.

Cultural factors may also contribute to this finding. In many Asian educational contexts, including Malaysia, classroom interactions are often shaped by respect for authority and a preference for structured learning environments. As a result, students may be less inclined to challenge ideas or engage in open-ended discussions, which in turn may influence teachers' use of questioning strategies.

Taken together, these findings suggest that while teachers demonstrate a strong awareness of creativity-supportive practices, the implementation of more cognitively demanding strategies, particularly inquiry-based questioning, remains limited. This highlights the need to move beyond general awareness of creativity and focus more explicitly on developing specific pedagogical skills that support higher-order thinking.

From a theoretical perspective, the findings provide support for Sternberg's Investment Theory of Creativity and Cropley's framework, demonstrating that creativity-fostering behaviour operates across multiple interconnected domains. The results also reinforce Kandemir et al.'s (2019) multidimensional conceptualisation of CFB, confirming its relevance within the Malaysian primary school context.

In conclusion, this study contributes to the growing body of research on creativity in mathematics education by providing empirical evidence on how teachers foster creativity in classroom settings. While the overall findings are encouraging, they also point to specific areas—particularly questioning practices that require further attention. Addressing these gaps will be essential in ensuring that creativity is not only valued at the policy level but is also meaningfully enacted in everyday classroom practice.

IMPLICATIONS FOR PRACTICE AND POLICY

The findings of this study offer several important implications for teacher education, professional development, and educational policy, particularly in strengthening creativity-oriented practices in mathematics classrooms.

First, teacher education programmes need to place greater emphasis on the pedagogical aspects of creativity. While pre-service teachers are often introduced to the concept of creativity, there is a need to move beyond theoretical understanding toward practical classroom application. In particular, teacher preparation should focus on developing competencies in designing open-ended questions, facilitating inquiry-based learning, and supporting student-generated problem-solving. Providing opportunities for microteaching, lesson design, and reflective practice may help pre-service teachers translate these ideas into meaningful instructional strategies.

Second, professional development initiatives for in-service teachers should adopt a more targeted and practice-oriented approach. Rather than focusing solely on raising awareness about the importance of creativity, training programmes should emphasise specific instructional techniques, such as questioning strategies, problem-posing activities, and the use of multiple solution pathways. In addition, sustained forms of professional learning such as coaching, mentoring, and collaborative lesson study may be more effective in helping teachers integrate creativity into their everyday teaching practices. This is particularly relevant in addressing the relatively lower emphasis on inquiry-based questioning identified in this study.

At the policy level, there is a need to ensure closer alignment between curriculum intentions, assessment practices, and classroom implementation. Although creativity is highlighted as a key educational goal in national policy documents, its integration into classroom practice may be constrained by the continued emphasis on examination performance. As such, assessment systems should be expanded to include tasks that value reasoning, originality, and open-ended problem solving. Without such alignment, efforts to promote creativity may remain largely aspirational rather than operational.

Furthermore, school leadership plays a critical role in creating conditions that support creativity-oriented teaching. School leaders can encourage innovation by fostering a culture of experimentation, supporting reflective practice, and providing teachers with the flexibility to try new instructional approaches without fear of negative evaluation. Creating professional learning communities within schools may also facilitate the sharing of best practices and collaborative problem-solving among teachers.

Finally, the findings suggest that strengthening creativity in mathematics education requires a systemic approach. Efforts at the level of teacher education, professional development, curriculum design, and school leadership must work together to ensure that creativity is not only promoted in policy but is also meaningfully enacted in classroom practice.

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