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From Intention To Admission: How Benefits, Social Influences, and Perceived Control Shape Malaysian SPM Leavers' Intentions to Pursue Tertiary Education

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Abstract: As part of Malaysia's national agenda to strengthen its knowledge-based economy, multiple pathways have been established for Sijil Pelajaran Malaysia (SPM) [Malaysian Certificate of Education] leavers to pursue tertiary education. Nevertheless, tertiary enrolment rates remain relatively low, potentially undermining national human capital development objectives. Guided by an extended Theory of Planned Behaviour (TPB) framework, this study examined the factors associated with SPM leavers' intention to pursue tertiary education. A cross-sectional survey was conducted among 385 respondents using a 44-item questionnaire comprising eight predictor constructs and an intention measure. Multiple linear regression analysis showed that financial support ($\beta = 0.313$, $p < 0.001$), peer influence ($\beta = 0.270$, $p < 0.001$), academic preparedness ($\beta = 0.246$, $p < 0.001$), perceived benefits ($\beta = 0.137$, $p = 0.005$), and social media influence ($\beta = 0.094$, $p = 0.037$) were positively associated with intention. In contrast, social stigma was negatively associated with intention ($\beta = -0.188$, $p < 0.001$), whereas family influence and lack of knowledge regarding admission processes did not make statistically significant independent contributions. These findings indicate that, within the sampled SPM leavers, financial support, peer influence, academic preparedness, perceived benefits, and social media influence were independently associated with stronger intentions to pursue tertiary education, whereas social stigma was associated with weaker intentions.

Keywords: Malaysia; SPM leavers; tertiary education; educational intention; theory of planned behaviour

Introduction

Tertiary education remains central to Malaysia's aspiration to become a high-income, knowledge-driven economy because national competitiveness increasingly depends on a workforce able to respond to rapid technological and labour-market change. National development agendas emphasise advanced competencies, including digital and artificial intelligence capabilities, and closer alignment between graduate skills and Industry 4.0 requirements (Hamzah, 2024; Sharef et al., 2024). Investment in education and human-capital development is also associated with

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economic growth, employment opportunities, and broader social progress (Chaiya, 2024). However, highly skilled workers account for 24.9% of the workforce, below the national target of 35% by 2030 (Department of Statistics Malaysia, 2023; Government of Malaysia, 2025; Bernama, 2022). This shortfall reinforces the importance of sustaining progression to tertiary education as part of Malaysia's broader human-capital agenda.

For Sijil Pelajaran Malaysia (SPM) [Malaysian Certificate of Education] leavers, the transition after secondary school represents a critical point at which further study competes with employment and other pathways. FINCO (2023) identified financial constraints, poor academic performance, and family obligations as prominent reasons among surveyed upper-secondary students who intended or were inclined to work after SPM. Separate evidence indicated that approximately 390,000 SPM graduates, or 72.1%, were not inclined to continue their studies in 2019, while 258,497 of 373,974 SPM candidates did not pursue tertiary education in 2022 (Mutalib, 2022; Abd Hamid & Othman, 2024). These participation concerns coexist with labour-market mismatches.

Demand for skilled professionals is growing, yet digital skills gaps and occupational mismatches persist, and TalentCorp identifies occupations where employer demand exceeds the available supply of talent (Tee et al., 2024; TalentCorp and Institute of Labour Market Information and Analysis, 2024). At the same time, concerns about graduate unemployment, underemployment, and relatively low starting salaries have raised questions about the labour-market returns to tertiary qualifications (Che Awang, 2022; Othman et al., 2023; Radzi et al., 2024). Such mixed labour-market signals may affect how SPM leavers evaluate tertiary education as an investment and whether its anticipated benefits justify the financial, academic, and opportunity costs involved.

SPM leavers' intentions to pursue tertiary education are likely to reflect multiple considerations rather than academic performance alone. Previous research identifies concerns about the value of tertiary qualifications, fear of academic failure, limited parental support, household financial constraints, and the attractiveness of immediate employment or alternative career pathways (Hamid et al., 2024; Othman et al., 2023; Radzi et al., 2024). Evidence that tertiary education is not the preferred destination for some school leavers, including those with good SPM results, further suggests that academic attainment does not, by itself, explain post-school intentions (Radzi et al., 2024; Mohd Salleh, 2022). These considerations can be organised around three broad domains relevant to the present study: attitudinal beliefs about the benefits of tertiary education, social and normative influences, and control-related conditions and resources. Family expectations and peer relationships may shape perceived social support for further study, while social stigma may reinforce doubts about the value or relevance of tertiary qualifications (Damas & Kurniawati, 2025; Radzi et al., 2024). Social and digital environments form another important part of the context in which SPM leavers evaluate tertiary education. Contemporary digital environments extend these influences beyond face-to-face relationships. In this study, social media influence refers to the broader influence of online content and interactions, whereas social media influencers are individuals or content creators who may constitute one source of that influence. Social media influencers and online content may promote tertiary education and professional development, but may also portray entrepreneurship, content creation, gig-economy work, or rapid financial success as viable alternatives to formal qualifications (Lajnef, 2023; UCSI Poll Research Centre, 2023; Humairoh et al., 2026). These competing narratives illustrate why social media influence should not be assumed to operate uniformly in either a positive or negative direction. The feasibility of pursuing tertiary education also depends on the resources, capabilities, and information available to SPM leavers. Financial strain, educational debt, academic preparedness, and uncertainty about admission procedures may affect whether tertiary education is perceived as feasible or attainable (Benjamin et al., 2011; Bettinger et al., 2012; Hamid et al., 2024; Jumat@Mohamed et al., 2022). Financial support may provide access to enabling economic resources, academic preparedness may inform perceived capability to manage tertiary-level study, and lack of knowledge regarding admission processes may create an informational or procedural barrier. These conditions therefore provide a conceptual bridge to the control-belief domain of the Theory of Planned Behaviour.

Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) provides a suitable framework for examining these considerations because it explains behavioural intention in relation to attitudes, subjective norms, and perceived behavioural control. It also offers a coherent basis for examining how context-specific beliefs and conditions may be relevant to the formation of intention without requiring those variables to be treated as substitutes for the original constructs. Within TPB, attitudes are underpinned by behavioural beliefs about the likely outcomes of performing a behaviour, subjective norms by normative beliefs concerning the expectations of salient social referents, and perceived behavioural control by control beliefs about conditions that may facilitate or constrain behavioural performance (Ajzen, 1991). Accordingly, the eight predictors in this study were selected as context-specific factors aligned with these underlying belief domains, rather than as direct measures or replacements of the three canonical TPB constructs. Their inclusion reflects both TPB reasoning and recurring issues identified in research on educational intentions and post-SPM decision-making in Malaysia (Hamid et al., 2024; Mosbah et al., 2019; Othman et al., 2023; Yusoff et al., 2022).

Perceived benefits capture behavioural beliefs about anticipated returns from tertiary education, including career prospects, earnings, personal development, employment opportunities, and social mobility, and are therefore positioned as attitudinally relevant. Family and peer influence represent traditional social referents, while social media influence extends the normative environment to online content, communities, and social media influencers. Social stigma captures broader social judgements that may shape perceived approval of tertiary education. These four constructs are therefore treated as sources of normative influence relevant to subjective norms. Financial support represents access to facilitating economic resources, academic preparedness reflects perceived capability to manage tertiary-level study, and lack of knowledge regarding admission processes represents an informational or procedural barrier. These three constructs are consequently treated as control-related factors relevant to perceived behavioural control.

Although Malaysian studies have applied TPB to intentions concerning postgraduate study and educational programme choice (Mosbah et al., 2019; Yusoff et al., 2022), comparatively limited attention has been given to SPM leavers and the post-SPM transition. In particular, less attention has been directed towards examining attitudinally relevant, normative, and control-related contextual factors simultaneously, including contemporary normative influences such as social media influence and social stigma. Addressing this gap is important because post-SPM educational decisions may be made under intersecting academic, financial, social, and informational constraints.

Accordingly, this study examines the factors associated with SPM leavers' intention to pursue tertiary education using an extended TPB framework. Eight context-specific predictors are considered: perceived benefits, family influence, peer influence, social media influence, social stigma, financial support, academic preparedness, and lack of knowledge regarding admission processes. The study positions perceived benefits as an attitudinally relevant factor, the four social constructs as sources of normative influence, and the three resource- and capability-related constructs as control-related factors. This specification permits examination of the independent associations between these factors and intention while preserving the conceptual distinction between the contextual predictors and the original TPB constructs.

Rather than assuming that all eight factors are equally important, the study assesses their relative contributions within a single multivariable model. By focusing specifically on SPM leavers at the transition from secondary education, the study seeks to provide contextually relevant evidence on tertiary-education intentions in Malaysia and to identify factors that may inform more targeted educational and policy responses. Figure 1 summarises the proposed extended framework and the hypothesised associations between the eight predictors and the intention to pursue tertiary education.

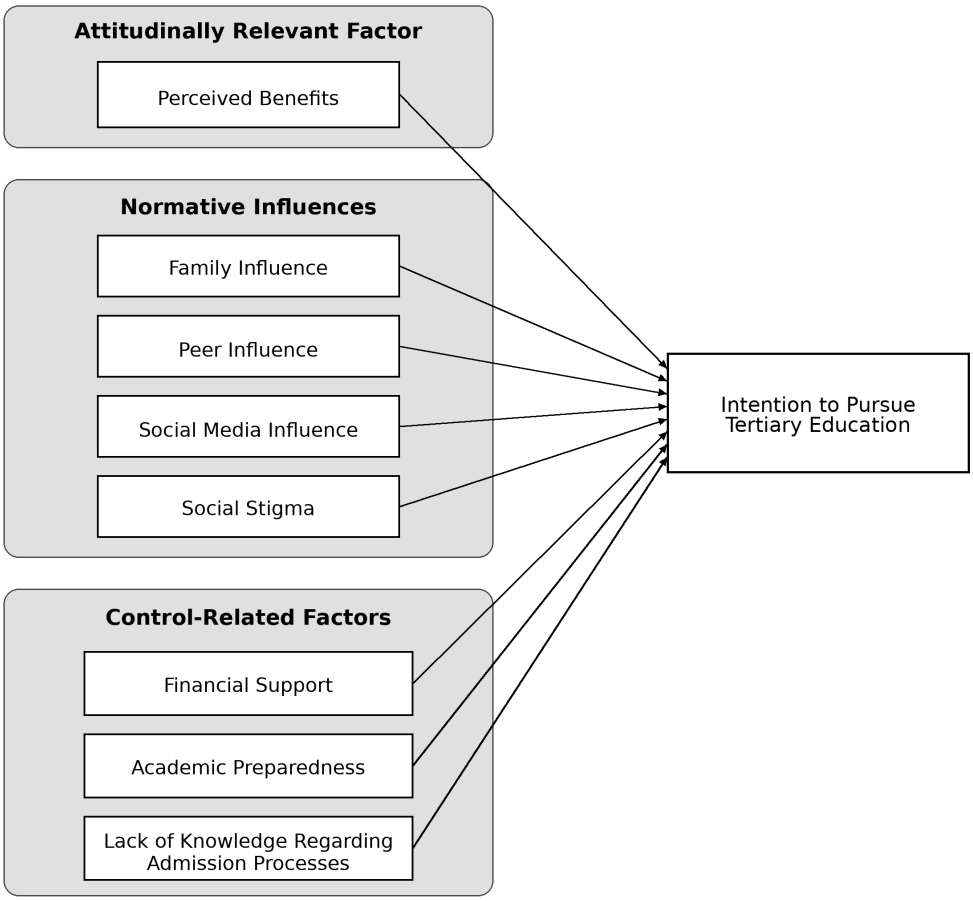


Figure 1. Proposed Extended TPB Framework of Context-Specific Factors Associated with SPM Leavers' Intention to Pursue Tertiary Education

Source: Authors

Note. The eight predictors are context-specific factors aligned with attitudinal, normative, and control-related domains of TPB and are not direct measures of the canonical constructs of attitude, subjective norm, and perceived behavioural control.

Literature Review

The Theory of Planned Behaviour (TPB) as aforementioned, is a widely used framework for examining behavioural intentions, including educational intentions. TPB integrates attitudinal, normative, and control-related determinants of intention and has been extensively validated across diverse behavioural domains (Ajzen, 1991; Hagger & Hamilton, 2024). The theory holds that intention is shaped by three proximal determinants: attitudes towards the behaviour, subjective norms, and perceived behavioural control. Behavioural intention is proposed as the most proximal antecedent of behaviour, while perceived behavioural control may also contribute directly to behaviour when it accurately reflects actual control (Ajzen, 1991).

Although TPB specifies the principal psychological determinants of intention, context-specific background factors may influence the behavioural, normative, and control beliefs that underpin

the core constructs rather than serving as substitutes for them (Ajzen, 1991). Applied studies may therefore examine contextually relevant variables that reflect the social, economic, institutional, and cultural conditions surrounding the behaviour under investigation. In the context of tertiary-education participation, individuals may report stronger intentions to pursue tertiary education when they hold favourable attitudes towards the behaviour, perceive stronger support from significant others, and believe they have greater control over the resources and opportunities required to do so (Mosbah et al., 2019; Yusoff et al., 2022).

The constructs examined in the present study are aligned with the TPB domains as contextually relevant factors rather than treated as direct equivalents of the original TPB constructs. Perceived benefits capture behavioural beliefs about expected outcomes and are therefore positioned as an attitudinally relevant factor. Family influence, peer influence, social media influence, and social stigma represent sources of normative influence relevant to subjective norms. Financial support, academic preparedness, and lack of knowledge regarding admission processes represent control-related factors relevant to perceived behavioural control, as they capture perceived resources, capabilities, informational barriers, and procedural constraints associated with pursuing tertiary education.

Extending the TPB with these eight context-specific constructs enables the framework to better reflect the social, economic, and educational conditions experienced by Malaysian SPM leavers. Although previous research supports the theoretical relevance of these factors, the strength and direction of their associations with intention may vary across populations, behaviours, and institutional contexts (Hagger & Hamilton, 2024).

Perceived Benefits of Tertiary Education

Perceived benefits are students' beliefs about the economic, occupational, social, and personal returns associated with tertiary education. Within the TPB framework, such beliefs are best understood as behavioural beliefs that may shape attitudes towards pursuing tertiary education, rather than as attitudes themselves (Ajzen, 1991). Anticipated benefits may include higher lifetime earnings, improved career prospects, greater employment security, personal development, and enhanced opportunities for upward social mobility (Bernal et al., 2024; Mahdzar et al., 2022). Perceived benefits therefore constitute an attitudinally relevant factor in SPM leavers' decisions about whether to pursue tertiary education. Accordingly, the following hypothesis is proposed:

H1: Perceived benefits are positively associated with SPM leavers' intention to pursue tertiary education.

Family Influence

Family expectations, parental encouragement, and household support are important social influences on students' educational trajectories. Within the TPB framework, family expectations and encouragement may contribute to subjective norms when perceived as approval or expectations from significant others (Ajzen, 1991). Parental involvement and high educational expectations are generally associated with stronger aspirations to pursue tertiary education, although the strength of this relationship may vary with household socioeconomic status and parents' educational backgrounds (Abd Hamid & Othman, 2024; Bernal et al., 2024; Damas & Kurniawati, 2025). Family influence may therefore be associated with educational intentions through normative expectations, while practical resources provided by families may also relate to perceived behavioural control. Based on this reasoning, the following hypothesis is proposed:

H2: Family influence is positively associated with SPM leavers' intention to pursue tertiary education.

Peer Influence

Peers are another important source of normative influence relevant to subjective norms within the TPB framework. Their influence may be supportive or discouraging, depending on the social and cultural norms operating within schools, friendship groups, and local communities. Positive peer influence may strengthen intentions to pursue tertiary education by fostering aspirations, reinforcing academic motivation, and normalising participation in tertiary education. Peer contexts may also operate through comparative processes, meaning that peer expectations need not be uniformly associated with higher-education participation (Van den Broeck et al., 2023). Peer influence should therefore be regarded as an important normative factor associated with the intention to pursue tertiary education. Accordingly, the following hypothesis is proposed:

H3: Peer influence is positively associated with SPM leavers' intention to pursue tertiary education.

Social Media Influence

Social media influence may shape young people's perceptions of education, employment, entrepreneurship, and success. In this study, social media influence refers to the impact of social media content and interactions on educational decision-making, whereas social media influencers are individuals or content creators who may exert such influence. Social media influence may operate in either a supportive or a discouraging direction (Lajnef, 2023; Humairoh et al., 2026). Social media influencers who promote education, skills development, and professional qualifications may encourage their followers to pursue tertiary education. In contrast, some influencers may discourage continued academic participation by portraying rapid income, entrepreneurship, or online fame as attainable without formal qualifications (Bernama, 2024). Based on the proposed relationship in this study, the following hypothesis is advanced.:

H4: Social media influence is positively associated with SPM leavers' intention to pursue tertiary education.

Social Stigma

Social stigma surrounding tertiary education may constitute a barrier to tertiary participation in Malaysia, particularly among school leavers who question the value and relevance of tertiary qualifications. Within this framework, social stigma refers to negative social judgements and narratives that devalue tertiary education or its perceived returns. Concerns about graduate unemployment, skills-related underemployment, rising educational costs, uncertain labour-market conditions, and the returns on educational investment may fuel doubts about whether tertiary education offers sufficient economic and occupational benefits (Abd Hamid & Othman, 2024; Moo & Wan, 2023). Such perceptions may reduce the perceived desirability of tertiary education and be associated with weaker intentions among SPM leavers to pursue tertiary education. On this basis, the following hypothesis is proposed:

H5: Social stigma is negatively associated with SPM leavers' intention to pursue tertiary education.

Lack of Knowledge Regarding Admission Processes

A lack of knowledge about tertiary admission processes may constrain students' perceived behavioural control by increasing uncertainty about how to pursue tertiary education. Uncertainty about entry requirements, financial-aid information, and application procedures may heighten the

perceived difficulty of navigating post-secondary applications (Bettinger et al., 2012; Gurantz et al., 2021). Consequently, limited knowledge of admission processes may be associated with lower confidence in navigating applications to tertiary institutions. Accordingly, the following hypothesis is proposed:

H6: Lack of knowledge regarding admission processes is negatively associated with SPM leavers' intention to pursue tertiary education.

Academic Preparedness

Academic preparedness is the extent to which students possess the knowledge, competencies, and learning capabilities required to succeed in tertiary education. Within the extended TPB framework, academic preparedness is treated as a control-related factor because perceptions of preparedness may shape students' confidence in their ability to manage the academic demands of tertiary education. These capabilities may include proficiency in core subjects, particularly English and mathematics, as well as the ability to engage in self-directed learning (Hamid et al., 2024; Radzi et al., 2024). Students who perceive themselves as academically prepared are likely to have greater confidence in meeting the demands of tertiary education. Conversely, students who lack confidence in their academic abilities may view tertiary education as excessively challenging or beyond their capabilities, thereby weakening their intention to pursue tertiary education (Kramer et al., 2025). Based on this reasoning, the following hypothesis is proposed:

H7: Academic preparedness is positively associated with SPM leavers' intention to pursue tertiary education.

Financial Support

Financial strain is a major structural barrier to tertiary participation. Limited household resources, high tuition fees, living expenses, transport costs, and other education-related expenditures may reduce students' perceptions of the financial feasibility of tertiary education (Benjamin et al., 2011; Bernal et al., 2024). Conversely, targeted financial support mechanisms, including tuition subsidies, scholarships, student loan schemes, and work-study opportunities, may mitigate these constraints and make tertiary education more financially feasible. Addressing financial strain is therefore important for promoting equitable participation in tertiary education across socioeconomic groups. Accordingly, the following hypothesis is proposed:

H8: Financial support is positively associated with SPM leavers' intention to pursue tertiary education.

Method

Research Design and Participants

This cross-sectional study was conducted among Malaysian Sijil Pelajaran Malaysia (SPM) leavers in March and April 2024. Ethical approval was obtained from the Research Ethics Committee of Universiti Teknologi MARA. Participation was voluntary, and all information collected from participants was treated as confidential. Eligible participants were required to (i) have completed Form 5 and (ii) belong to the 2023 SPM examination cohort. This group was selected because SPM leavers were at a transitional stage at which decisions about pursuing tertiary education or entering the workforce were particularly salient.

Sampling and Sample Size

Participants who met the inclusion criteria were recruited through snowball sampling. This approach was used to facilitate access to eligible SPM leavers during the specified data-collection period. The survey invitation, which included a link to the questionnaire hosted on Google Forms, was initially distributed via WhatsApp. Recipients were then encouraged to share the survey link with eligible friends, relatives, and other contacts within their social networks.

The target sample size was estimated using the Raosoft sample-size calculator. The population parameter was based on the 395,870 candidates officially reported by the Ministry of Education Malaysia as having registered for the 2023 SPM examination nationwide (Ministry of Education Malaysia, 2024). With a 95% confidence level, a 5% margin of error, and a 50% response distribution, the estimated minimum sample size was approximately 384 respondents. The final analytical sample comprised 385 respondents. Because participants were recruited via non-probability snowball sampling, these parameters served as a sample-planning benchmark rather than implying statistical representativeness of the wider population.

Conceptual Basis for Predictor Selection

The selection of the eight predictor factors was guided by a synthesis of the theoretical and empirical literature on students' educational aspirations and decisions to pursue tertiary education. Rather than treating these predictors as independent, the study conceptualises them as five interrelated dimensions that may shape tertiary education aspirations: individual, social, informational, academic, and financial determinants. Perceived Benefits represents the individual dimension, reflecting students' perceptions of the potential personal, educational, and career-related value of tertiary education. The social dimension encompasses Family Influence, Peer Influence, Social Media Influence, and Social Stigma, recognising that educational aspirations can be shaped by interpersonal relationships, social expectations, digital environments, and perceived societal attitudes. Lack of Knowledge Regarding Admission Processes represents the informational dimension, capturing barriers arising from inadequate awareness or understanding of tertiary education pathways and admission requirements. Academic Preparedness represents the academic dimension, reflecting students' perceived readiness and capacity to meet the academic demands of tertiary education. Finally, Financial Support represents the financial dimension, acknowledging that the availability of economic resources and support may facilitate or constrain students' ability to pursue further education. Collectively, these eight factors provide a multidimensional framework for examining tertiary education aspirations by incorporating both individual perceptions and the broader social and structural conditions surrounding students' educational decision-making.

Instrumentation

Data were collected using a self-administered, structured questionnaire informed by the TPB and previous studies of behavioural and educational intentions (Mokhlis et al., 2022; Mosbah et al., 2019; Yusoff et al., 2022). The instrument comprised 44 scale items and a sociodemographic section, organised into five sections covering participants' sociodemographic characteristics, perceived benefits, normative influences, control-related factors, and intention to pursue tertiary education. The first section collected participants' sociodemographic information, including gender, age, ethnicity, household income, state of residence, locality, and year of the SPM examination.

The second section assessed perceived benefits as behavioural beliefs relevant to attitudes towards pursuing tertiary education. The items measured respondents' evaluations of the anticipated social, economic, personal, skills-related, and career benefits of pursuing tertiary education. These items were adapted from previous studies on expected benefits and educational intentions to ensure their conceptual relevance to SPM leavers (Gayatri et al., 2010; Mosbah et al., 2019).

The third section assessed four sources of normative influence relevant to subjective norms: (i) family influence, (ii) peer influence, (iii) social media influence, and (iv) social stigma surrounding SPM leavers' educational choices. Items measuring parental and peer-related normative pressures were adapted from established research on educational intentions (Mosbah et al., 2019). Items on social media influence were informed by empirical studies of social media influencers and shifting norms among young people (Lajnef, 2023; Lou & Kim, 2019). Items measuring social stigma were adapted from regional studies examining social perceptions of students' participation in tertiary education (Radzi et al., 2024).

The fourth section assessed three control-related factors relevant to perceived behavioural control: (i) financial support, (ii) lack of knowledge about admission processes, and (iii) academic preparedness. The items were adapted from previous empirical studies on financial support, informational barriers, and preparedness for tertiary education (Bettinger et al., 2012; Jumat@ Mohamed et al., 2022; Shamsudin et al., 2019).

The fifth section operationalised participants' intention to pursue tertiary education using a five-item composite scale informed by previous studies of educational intention (Mosbah et al., 2019; Yusoff et al., 2022). The items were contextualised for SPM leavers and assessed intention to pursue tertiary education, plans to enrol in a tertiary programme, determination to continue studies at the tertiary level, expectations of pursuing tertiary education after SPM, and willingness to make the necessary effort to enrol. Accordingly, the five-item composite served as the study's measure of intention to pursue tertiary education.

All scale items were measured on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The development of the scales and the wording of the items were grounded in established TPB literature and educational-intention research to ensure conceptual alignment with the constructs under investigation (Gayatri et al., 2010; Mosbah et al., 2019). The complete questionnaire is provided in Appendix A.

Content Validity, Face Validity, and Reliability

The questionnaire underwent content validation by a panel of three experts with backgrounds in college counselling, school counselling, and psychology. The relevance of the items was assessed using the Item-level Content Validity Index (I-CVI) and the Scale-level Content Validity Index (S-CVI). Both indices reached 1.00, indicating unanimous agreement among the experts on the relevance of the questionnaire items (Polit et al., 2007).

Face validation was subsequently conducted with five recent SPM leavers to assess the clarity, comprehensibility, and suitability of the questionnaire. The Item-level Face Validity Index (I-FVI) and Scale-level Face Validity Index (S-FVI) both achieved values of 1.00, indicating that the questionnaire was considered clear and understandable by the target respondents (Yusoff, 2019).

A pilot study was then conducted with 30 SPM leavers to assess the internal consistency of the scales. Cronbach's alpha coefficients ranged from 0.734 to 0.862 across the constructs, exceeding the commonly accepted threshold of 0.70 and indicating acceptable to good internal consistency (Taber, 2018). The reliability coefficients for each construct are presented in Table 1.

Table 1. Cronbach's alpha Reliability Coefficients for the Study Constructs

Domain	Construct	Items	Cronbach's alpha
Attitudinally Relevant Factor	Perceived Benefits	5	0.792
Normative Influences	Family Influence	5	0.788
	Peer Influence	5	0.788
	Social Media Influence	4	0.796
	Social Stigma	5	0.862
Control-Related Factors	Lack of Knowledge Regarding Admission Processes	5	0.740
	Academic Preparedness	5	0.779
	Financial Support	5	0.734
Intention to Pursue Tertiary Education		5	0.810

As shown in Table 1, all constructs demonstrated satisfactory internal consistency. The Cronbach's alpha values for perceived benefits, family influence, peer influence, social media influence, social stigma, financial support, academic preparedness, and lack of knowledge regarding admission processes exceeded the commonly accepted minimum threshold of 0.70. These findings indicate that the items within each construct demonstrated acceptable internal consistency.

Data Analysis

Data were analysed using IBM SPSS Statistics, version 26.0. Descriptive statistics summarised participant characteristics and the distributions of the study variables. Continuous variables were reported as means (M) and standard deviations (SD), whereas categorical variables were presented as frequencies (n) and percentages (%).

Composite mean scores were calculated for intention and each of the eight predictor constructs. Although individual Likert-scale items are ordinal, composite scores derived by averaging or summing multiple items measured on scales with five or more response categories are commonly treated as approximately continuous. This approach permits the use of means, standard deviations, and parametric statistical analyses (Norman, 2010).

For descriptive interpretation, mean scores on the five-point Likert scale were classified into three levels: low (1.00–2.33), moderate (2.34–3.66), and high (3.67–5.00). These cut-off points divide the scale into three equal intervals and are consistent with approaches used in Malaysian educational research (Ab Jalil & Amran, 2023; Jamil Ahmad, 2002).

Multiple linear regression (MLR) was conducted with all eight predictor constructs entered simultaneously to examine their independent associations with SPM leavers' intention to pursue tertiary education. Before the regression analysis, the relevant statistical assumptions were assessed. Multicollinearity was evaluated using the variance inflation factor (VIF). All predictors had VIF values below 5, indicating no problematic multicollinearity. Homoscedasticity was assessed by visually examining the residual scatterplot, which revealed no clear systematic pattern. The normality of the residuals was evaluated using a probability–probability plot, and the independence of residuals was assessed using the Durbin–Watson statistic. All statistical tests were two-tailed, and significance was set at $p < 0.05$..

Findings

Sociodemographic Characteristics of the Participants

The study had 385 respondents (Appendix B). The largest proportion of respondents was 17 years old (38.4%), followed by those aged 18 years (34.8%) and 19 years (26.8%). The gender distribution was nearly equal, with 50.9% male and 49.1% female. In terms of ethnicity, 48.8% of the respondents were Malay, 28.1% were Indian, 22.9% were Chinese, and 0.3% belonged to other ethnic groups. Household income was distributed across four categories: RM2,001–RM4,000 (29.9%), RM4,001–RM6,000 (24.9%), below RM2,000 (24.2%), and above RM6,001 (21.0%). Respondents were from various states, with the largest proportions from Johor (15.1%), Selangor (11.4%), and Pulau Pinang (9.6%). Most respondents lived in urban areas (58.7%), whereas 41.3% resided in rural areas.

Levels of Intention and Related Study Constructs

Table 2 presents the descriptive statistics for the constructs associated with SPM leavers' intentions to pursue tertiary education.

Table 2. Descriptive Statistics and Interpretation Levels of the Study Constructs

Construct	Attributes	Mean	SD	Level
Attitudinally Relevant Factor	Perceived Benefits	4.353	0.593	High
Total Mean		4.353		
Normative Influences	Family Influence	4.440	0.588	High
	Peer Influence	4.375	0.607	High
	Social Media Influence	4.281	0.651	High
	Social Stigma	4.215	0.793	High
Total Mean		4.328		
Control-Related Factors	Financial Support	4.321	0.617	High
	Lack of Knowledge Regarding Admission Processes	4.308	0.622	High
	Academic Preparedness	4.359	0.574	High
Total Mean		4.329		
Intention to Pursue Tertiary Education		4.378	0.584	High

Perceived benefits, the attitudinally relevant construct, recorded a mean score of 4.353 (SD = 0.593). This score was classified as high, indicating that respondents generally perceived tertiary education as offering substantial personal, educational, and occupational benefits.

Four normative-influence constructs were assessed. Family influence recorded the highest mean score (M = 4.440, SD = 0.588), followed by peer influence (M = 4.375, SD = 0.607), social media influence (M = 4.281, SD = 0.651), and social stigma (M = 4.215, SD = 0.793). Family influence therefore had the highest mean among the four normative-influence constructs.

Three control-related constructs were assessed: financial support, lack of knowledge regarding admission processes, and academic preparedness. Academic preparedness recorded the highest mean score (M = 4.359, SD = 0.574), followed by financial support (M = 4.321, SD = 0.617) and lack of knowledge regarding admission processes (M = 4.308, SD = 0.622). Academic preparedness therefore had the highest mean among the three control-related constructs.

The mean score for intention to pursue tertiary education was 4.378 (SD = 0.584), indicating a high level of intention among respondents. Overall, respondents reported high mean scores for perceived benefits, the four normative-influence constructs, the three control-related constructs, and for intention to pursue tertiary education.

Regression Diagnostic Tests

The assumptions underlying MLR analysis were assessed before interpreting the regression model. All the points in the probability–probability plot were distributed relatively closely around the diagonal reference line (Appendix C). The histogram of the residuals also displayed an approximately normal distribution (Appendix D). These findings suggested that the normality assumption was adequately satisfied. The scatterplot of the standardised residuals against the standardised predicted values (Appendix E).

The residuals were distributed randomly around zero, with no clear systematic or funnel-shaped pattern. This distribution indicated that the variance of the residuals was approximately constant across the predicted values, satisfying the assumption of homoscedasticity. Table 3 presents the tolerance and VIF values used to assess multicollinearity.

Table 3. Multicollinearity Diagnostics for the Predictor Variables

Construct	Attributes	Tolerance	VIF
Attitudinally Relevant Factor	Perceived Benefits	0.287	3.486
Normative Influences	Family Influence	0.326	3.070
	Peer Influence	0.331	3.025
	Social Media Influence	0.340	2.945
	Social Stigma	0.373	2.678
Control-Related Factors	Financial Support	0.319	3.131
	Lack of Knowledge Regarding Admission Processes	0.335	2.981
	Academic Preparedness	0.319	3.136

All tolerance values exceeded 0.10, while all VIF values were below 5. These results indicated that the predictor variables did not exhibit problematic multicollinearity.

Factors Associated with SPM Leavers' Intention to Pursue Tertiary Education

Table 4 presents the summary of the multiple linear regression model.

Table 4. Summary of the Multiple Linear Regression Model

R	R^2	Adjusted R^2	Standard Error of the Estimate	Durbin-Watson
0.861	0.742	0.736	1.499	1.915

The multiple correlation coefficient was R = 0.861. The model explained 74.2% of the variance in intention (R^2 = 0.742), with an adjusted R^2 of 0.736. The Durbin–Watson statistic was 1.915, suggesting no substantial first-order autocorrelation in the residuals. Table 5 presents the analysis of variance for the regression model.

Table 5. Analysis of Variance for the Multiple Linear Regression Model

Model	Sum of Squares	df	Mean Square	F	p-value
Regression	2424.445	8	303.056	134.855	< 0.001*
Residual	844.973	376	2.247		
Total	3269.418	384			

Note: * Statistically significant at $p < 0.05$.

The overall regression model was statistically significant, $F(8, 376) = 134.855$, $p < 0.001$, indicating that the set of eight predictors collectively explained a statistically significant proportion of the variance in SPM leavers' intention to pursue tertiary education. The significance of the overall model does not imply that each predictor made a statistically significant independent contribution. Table 6 presents the regression coefficients for the individual predictors.

Table 6. Multiple Linear Regression Coefficients for Factors Associated with SPM Leavers' Intentions to Pursue Tertiary Education

Construct	Attributes	Unstandardised		Standardised	p-value	Results
		B	Std. Error	Beta (β)		
Attitudinally Relevant Factor	Perceived Benefits	0.135	0.048	0.137	0.005*	Supported
Normative Influences	Family Influence	0.088	0.046	0.089	0.054	Not Supported
	Peer Influence	0.259	0.044	0.270	<0.001*	Supported
	Social Media Influence	0.085	0.040	0.094	0.037*	Supported
	Social Stigma	-0.138	0.032	-0.188	<0.001*	Supported
Control-Related Factors	Financial Support	0.296	0.044	0.313	<0.001*	Supported
	Lack of Knowledge Regarding Admission Processes	-0.043	0.042	-0.046	0.314	Not Supported
	Academic Preparedness	0.251	0.047	0.246	<0.001*	Supported

Note: * sig. at p-value at 0.05.

Perceived benefits were positively and significantly associated with intention to pursue tertiary education ($\beta = 0.137$, $p = 0.005$). Respondents reporting higher perceived benefits tended to report stronger intentions to pursue tertiary education. Therefore, H1 was supported.

Peer influence was positively and significantly associated with intention to pursue tertiary education ($\beta = 0.270$, $p < 0.001$). Respondents reporting higher peer influence tended to report stronger intentions to pursue tertiary education. Therefore, H3 was supported.

Social media influence was positively and significantly associated with intention to pursue tertiary education ($\beta = 0.094$, $p = 0.037$). Respondents reporting higher levels of social media influence tended to report stronger intentions to pursue tertiary education. Therefore, H4 was supported.

Family influence was positively, though not significantly, associated with the intention to pursue tertiary education ($\beta = 0.089$, $p = 0.054$). Thus, after accounting for the other predictors in the model, family influence did not make a statistically significant independent contribution, and H2 was not supported.Social stigma was negatively and significantly associated with the intention

to pursue tertiary education (β = -0.188, p < 0.001). Respondents reporting higher levels of social stigma tended to have weaker intentions to pursue tertiary education. Therefore, H5 was supported.

Academic preparedness was positively and significantly associated with intention to pursue tertiary education (β = 0.246, p < 0.001). Respondents reporting greater academic preparedness tended to report stronger intentions to pursue tertiary education. Academic preparedness was among the strongest positive predictors in the model. Therefore, H7 was supported.

Financial support had the largest positive standardised coefficient and was positively and significantly associated with intention to pursue tertiary education (β = 0.313, p < 0.001). Respondents reporting higher levels of financial support tended to report stronger intentions to pursue tertiary education. Therefore, H8 was supported.

Lack of knowledge of admission processes was negatively, though not significantly, associated with the intention to pursue tertiary education (β = -0.046, p = 0.314). Thus, after accounting for the other predictors in the model, lack of knowledge of admission processes did not make a statistically significant independent contribution, and H6 was not supported.

Discussion

This study examined the factors associated with SPM leavers' intention to pursue tertiary education using an extended Theory of Planned Behaviour framework. Perceived benefits, peer influence, social media influence, academic preparedness, and financial support were positively associated with intention, whereas social stigma was negatively associated with it. Family influence and lack of knowledge regarding admission processes did not make statistically significant independent contributions after accounting for the other predictors. Based on the standardised coefficients, financial support, peer influence, and academic preparedness were comparatively prominent. These findings concern behavioural intention, not subsequent enrolment, and the cross-sectional design does not establish causal relationships.

Attitudinally Relevant Beliefs: Perceived Benefits

Within the TPB framework, perceived benefits are best understood as behavioural beliefs that inform attitude formation rather than as attitude itself. SPM leavers who perceived greater anticipated benefits from tertiary education tended to report stronger intentions to pursue it. This finding aligns with research linking favourable evaluations of anticipated educational outcomes to stronger educational intentions (Cain & Sucuahi, 2024; Gayatri et al., 2010; Mahdzar et al., 2022) and with the TPB proposition that behavioural beliefs about expected outcomes contribute to attitudes towards performing a behaviour (Ajzen, 1991).

The perceived value of tertiary education, however, is likely to reflect expectations of its labour-market returns. Concerns about graduate employability, starting salaries, skills mismatch, educational costs, and debt may weaken confidence that a tertiary qualification will deliver adequate returns (Othman et al., 2023; Wong et al., 2015; Jumat@Mohamed et al., 2022; Che Awang, 2022). SPM leavers may therefore recognise the general benefits of tertiary education while remaining uncertain about the employment prospects and financial returns of particular programmes or fields of study (Moo & Wan, 2023).

Normative Influences: The Role of Family, Peers, Social Media, and Social Stigma

The normative findings indicate that social influences were source-specific rather than uniform. Peer and social media influences were positively associated with intention, social stigma was negatively associated with intention, and family influence did not make a statistically significant independent contribution. This variation is theoretically relevant because subjective norms concern perceived

expectations from salient others, whereas the present study distinguished several contextual sources through which normative pressures or social judgements may be experienced.

Peer influence was among the comparatively prominent positive predictors. During the post-SPM transition, friendship networks may provide social validation, practical information, and examples of possible post-secondary trajectories. When tertiary education is valued within these networks, further study may appear socially supported and attainable. This interpretation aligns with evidence linking supportive peer relationships to educational aspirations and attainment (Lorijn et al., 2022). Longitudinal research also indicates that stronger peer expectation cultures regarding post-secondary education are associated with higher subsequent participation in higher education (Van den Broeck et al., 2023). Peer influence is therefore best interpreted as a context-specific normative source rather than as the subjective-norm construct itself.

Social media influence was also positively associated with intention after accounting for the other predictors, suggesting that SPM leavers' normative and informational environments extend beyond face-to-face relationships. Here, social media influence refers to the measured construct, whereas social media influencers are individuals or content creators who may represent one source of that influence. Online communities, institutional platforms, and content creators may expose young people to information about educational pathways and to social cues concerning tertiary education (Raaper et al., 2024; Raaper et al., 2024; Humairoh et al., 2026). Research also suggests that students may perceive social media influencers as socially influential actors, although this does not establish a direct effect on educational intention (Council & Olowoyo, 2026).

The positive coefficient should not be taken as evidence that social media influence is inherently favourable. Digital environments can convey competing narratives about tertiary education and alternative routes to economic success. Related research has linked social media engagement to higher-education choice intentions via informational and attitudinal pathways (Nguyen et al., 2021; El-Merabet et al., 2025). The present study did not measure specific online content, source credibility, platform characteristics, or mediation pathways. Social media may therefore shape intention through several mechanisms, but these remain theoretical interpretations rather than effects demonstrated by the present data.

Social stigma showed the opposite pattern. Respondents who reported stronger negative social judgements about tertiary education tended to report weaker intentions to pursue it. Such stigma may reflect narratives that portray tertiary education as costly, unnecessary, or unlikely to yield returns commensurate with the required investment. In the Malaysian context, these judgements may become more salient when immediate employment is perceived as a more practical response to financial pressure (Othman et al., 2023; Radzi et al., 2024). This finding suggests that broader community narratives form part of the normative environment in which SPM leavers evaluate tertiary education.

This interpretation is broadly consistent with research indicating that stigmatising social narratives can intersect with educational participation and educational failure (Lisitsa et al., 2022). It also distinguishes social stigma from interpersonal influence. Whereas peers may convey approval or encouragement from salient individuals, social stigma may operate through broader judgements about the value or practicality of tertiary education. The present cross-sectional analysis did not directly test these mechanisms, so this explanation remains tentative.

The non-significant independent contribution of family influence should not be interpreted as evidence that families are unimportant in educational decision-making. Previous research identifies parental expectations, encouragement, and support as relevant to educational aspirations and attainment (Schörner & Bittmann, 2024). The present result indicates only that family influence did not explain additional variation in intention at the conventional level of statistical significance once the other predictors were considered simultaneously.

One possible explanation is that family influence overlaps with financial support, perceived benefits, or academic preparedness, leaving a smaller unique contribution in the model. Families may also shape educational decisions indirectly through beliefs about the value of tertiary education,

confidence in managing tertiary-level study, or access to financial and practical assistance (Hayek et al., 2022). These overlapping or indirect pathways were not tested in the present analysis and warrant further investigation.

Control-Related Factors: Academic Preparedness, Financial Support, and Lack of Knowledge Regarding Admission Processes

Among the control-related factors, academic preparedness was positively associated with intention and was among the more prominent positive predictors. Within the extended TPB framework, academic preparedness is relevant to perceived behavioural control because it reflects students' perceived capability to manage tertiary-level academic demands. SPM leavers who regarded themselves as more academically prepared tended to report stronger intentions to pursue tertiary education, suggesting that perceived readiness may influence whether further study appears attainable. Academic preparedness should, nevertheless, be understood as a context-specific control-related factor rather than a direct measure of perceived behavioural control.

The finding is consistent with evidence that academic self-efficacy predicts intentions to pursue higher education, even after accounting for academic performance and other background characteristics (Kramer et al., 2025). Longitudinal evidence likewise links a stronger academic self-concept with subsequent educational progression (Hansen et al., 2023). Together, these studies support the interpretation that perceived academic capability matters beyond objective academic performance alone and may help explain why academic preparedness retained a comparatively prominent independent association with intention.

Financial support had the largest positive standardised coefficient in the model. Within the extended TPB framework, it is best interpreted as a facilitating economic resource that may influence whether tertiary education appears financially feasible. This finding aligns with Malaysian evidence linking financial constraints and perceived financial aid to decisions and intentions regarding further study (Benjamin et al., 2011; Shamsudin et al., 2019; Drahman et al., 2025; Abd Hamid & Othman, 2024). Access to financial resources may therefore reduce perceived economic barriers to pursuing tertiary education.

Financial assistance does not necessarily resolve all economic concerns. Earlier Malaysian evidence has highlighted affordability constraints among lower- and average-income households (Benjamin et al., 2011), while anticipated educational debt and uncertain future earnings may continue to shape assessments of financial feasibility (Jumat@Mohamed et al., 2022; Wong et al., 2015). The present finding therefore concerns perceived access to a facilitating resource rather than evidence that financial support directly produces enrolment. Because the study measured intention at a single point in time, it cannot establish whether financial support subsequently enables application, enrolment, or persistence.By contrast, lack of knowledge of admission processes did not make a statistically significant independent contribution after accounting for the other predictors. One possible explanation is that respondents had sufficient access to admission-related information via centralised application systems, institutional websites, school counsellors, or social media, although this was not measured directly. If basic procedural information was readily available, variation in admission knowledge may have been less influential on intention than perceived academic capability or financial feasibility. This interpretation remains tentative and should not be read as evidence that admission information is unimportant for all SPM leavers.

International evidence also suggests that information alone may be insufficient to alter post-secondary decisions. Gurantz et al. (2021) found no overall enrolment change from simplified college-search and application information, while Bettinger et al. (2012) reported International evidence also suggests that information alone may be insufficient to alter post-secondary decisions. Gurantz et al. (2021) found no overall change in enrolment following the provision of simplified college-search and application information, whereas Bettinger et al. (2012) reported stronger outcomes when information was paired with direct application assistance. Informational barriers may therefore

matter differently across the transition from intention to application and enrolment, particularly when information is not accompanied by direct application support (Bettinger et al., 2012; Gurantz et al., 2021). Consequently, the non-significant coefficient in this study is limited to its independent association with intention within the present sample.

Integration with the Broader TPB Literature

Taken together, the findings broadly align with the TPB's emphasis on attitudinal, normative, and control-related considerations in forming behavioural intention. However, the study examined context-specific predictors aligned with these domains rather than direct measures of attitude, subjective norms, and perceived behavioural control. The substantial variance explained by the model should therefore be interpreted as evidence of the empirical relevance of this contextual specification, not as a direct test of the complete canonical TPB model. This distinction preserves the theoretical role of the original constructs while allowing social, economic, educational, and informational conditions relevant to Malaysian SPM leavers to be examined explicitly.

The differentiated results across the normative and control-related domains are also informative. The contrasting associations of peers, family, social media, and social stigma indicate that normative influences may vary by source. Likewise, academic preparedness, financial support, and lack of knowledge about admission processes showed independent associations with intention, suggesting that perceived capability, facilitating resources, and informational barriers need not contribute equally. This pattern is consistent with the broader TPB proposition that perceived capabilities and facilitating conditions can be relevant to behavioural control (Rhodes & Courneya, 2003).

Theoretical Contributions

Three theoretical contributions follow from this pattern. First, the study demonstrates the contextual utility of an extended TPB framework for examining Malaysian SPM leavers' intention to pursue tertiary education. By organising context-specific predictors around attitudinally relevant beliefs, normative influences, and control-related factors, the analysis links post-SPM decision-making to the TPB while preserving the distinction between these predictors and the canonical constructs. This provides a theoretically disciplined basis for examining locally salient conditions surrounding educational intention.Second, incorporating social media influence and social stigma broadens the normative context beyond traditional interpersonal referents and recognises that contemporary educational decisions may also be embedded in digital environments and wider social narratives. Third, the distinct independent associations across the eight predictors show that theoretically relevant contextual variables should not be assumed to contribute uniformly within an extended TPB framework. The contribution lies in demonstrating a differentiated pattern of context-specific associations that can inform more refined future tests of educational intention and subsequent enrolment behaviour.

Practical and Policy Implications

The practical and policy implications arise primarily from the significant associations of perceived benefits, peer influence, social media influence, social stigma, academic preparedness, and financial support with SPM leavers' intention to pursue tertiary education. Financial support had the largest positive standardised coefficient, followed by peer influence and academic preparedness. Because the study was cross-sectional and assessed intention rather than actual enrolment, these findings identify potential priorities for policy and institutional attention rather than interventions of demonstrated effectiveness.

The positive association with perceived benefits and the negative association with social stigma suggest that SPM leavers' evaluations of the value and legitimacy of tertiary education warrant attention. Tertiary institutions and relevant agencies could provide balanced, programme-specific information on educational costs, skills development, graduate outcomes, career pathways, and labour-market returns. This implication aligns with evidence that employability, affordability, and the value of qualifications inform post-SPM decisions (Benjamin et al., 2011; Othman et al., 2023; Moo & Wan, 2023). Such communication should draw on verifiable evidence and acknowledge labour-market uncertainty.

The positive associations of peer and social media influence suggest that the social and digital environments surrounding SPM leavers are relevant to their intention to pursue tertiary education. Schools and tertiary institutions could therefore consider engaging credible alumni as student-facing ambassadors to communicate realistic educational experiences and programme-to-career pathways across face-to-face and digital platforms. This implication aligns with research linking peer relationships and social media engagement to educational aspirations and institutional perceptions (Chen et al., 2023; Nguyen et al., 2021; Raaper et al., 2026). Such an approach would draw on alumni as relatable social referents rather than treating social media influence as inherently positive.

As a Malaysian example, Mohamad Sharhan Syazwan Mohd Ashri, professionally known as Chaan, is a UiTM Diploma in Music alumnus who later built a professional career as a music director (Jabatan Komunikasi Korporat, UiTM, 2008; Ruslan, 2023). His trajectory illustrates how an alumnus can offer prospective students a concrete example of a possible pathway from tertiary study to professional practice. However, such examples should be presented as individual trajectories rather than typical outcomes, and institutions should acknowledge that career development also depends on individual capability, continued practice, professional networks, industry experience, and labour-market conditions. The effectiveness of alumni-based outreach in shaping application or enrolment decisions should therefore be evaluated empirically.Academic preparedness was among the more prominent positive predictors, underscoring the need to attend to SPM leavers' perceived readiness for tertiary-level study. Secondary schools and tertiary institutions could consider targeted transition support, such as readiness assessments, academic counselling, or preparatory provision, for students reporting lower academic confidence. This implication aligns with evidence linking academic self-efficacy and self-concept to educational intentions and progression (Kramer et al., 2025; Hansen et al., 2023). Such support should be evaluated against subsequent application and enrolment outcomes.

Financial support warrants particular policy attention because it had the strongest positive standardised association with intention. Together with Malaysian evidence on affordability, financial aid, and educational debt, this finding supports improving access to targeted assistance and transparent communication about its conditions (Benjamin et al., 2011; Shamsudin et al., 2019; Drahman et al., 2025; Jumat@Mohamed et al., 2022; Wong et al., 2015). Providers of student financial assistance, including the National Higher Education Fund Corporation (PTPTN), could clearly explain eligibility, coverage, repayment obligations, and expected financial commitments. Whether such measures translate intention into actual enrolment requires programme evaluation and longitudinal follow-up.

Limitations and Directions for Future Research

This study is subject to several limitations. First, although the sample size of 385 respondents was adequate for the statistical analyses conducted, participants were recruited using snowball sampling. As a non-probability sampling technique, this approach may have produced a sample of socially or demographically similar respondents and may have introduced selection bias through network-based recruitment. The findings therefore should not be interpreted as statistically representative of the broader population of Malaysian SPM leavers.Second, the cross-sectional design captured

respondents' perceptions and intentions at a single point in time. Consequently, the findings cannot establish causal or temporal relationships between the predictor variables and the intention to pursue tertiary education. Longitudinal research is therefore needed to determine whether these intentions remain stable over time and whether they subsequently translate into actual applications and enrolment.Third, the analysis relied on multiple linear regression, which assumes linear and additive relationships among the variables. This approach may not capture more complex relationships, including interaction effects, indirect pathways, and non-linear patterns. Future studies could apply structural equation modelling to examine the measurement model and assess theoretically specified mediating or moderating relationships among the extended TPB constructs. Machine-learning approaches may also be used as complementary exploratory tools to identify complex predictive patterns, provided that their application remains theoretically grounded.

A further limitation concerns the measurement of the intention to pursue tertiary education. Although the five-item intention measure demonstrated satisfactory internal consistency (Cronbach's $\alpha = 0.810$), the predictor and outcome constructs were assessed using related self-report statements about the same educational decision. For example, the intention item "I plan to enrol in a tertiary-education programme" measures a respondent's plan to enrol, whereas the academic-preparedness item "I am confident that I can manage the academic workload expected in tertiary education" measures perceived capability rather than intention. These concepts are related but not identical. A student may feel confident about managing tertiary-level study yet not plan to enrol, while another may intend to enrol despite low academic confidence. Because the predictor and outcome items address closely related aspects of the same educational decision and were all self-reported, some observed associations may have been stronger, which may partly explain the relatively high R^2 of 0.742. Future studies should further assess the distinctiveness of these constructs and follow respondents longitudinally to determine whether stated intentions translate into actual applications and enrolment.Finally, the study relied on self-reported Likert-scale responses to measure perceptions and intentions. Self-report data may be affected by response styles, social-desirability bias, and shared method variance. In addition, treating composite Likert-scale scores as approximately continuous assumes that the aggregated scores provide a sufficiently interval-like measure for parametric analysis. Future research could strengthen the evidence by using larger and more diverse samples and by combining quantitative surveys with qualitative interviews, focus groups, or longitudinal follow-up of actual application and enrolment behaviour.

Conclusion

This study identified a distinct pattern of associations between context-specific factors and Malaysian SPM leavers' intention to pursue tertiary education within an extended TPB framework. Among the sampled respondents, perceived benefits, peer influence, social media influence, academic preparedness, and financial support were positively associated with intention, whereas social stigma was negatively associated with it. These findings indicate that tertiary-education intention reflects a combination of attitudinally relevant beliefs, social influences, perceived academic capability, and access to financial resources.Family influence and lack of knowledge about admission processes did not make statistically significant independent contributions in the multivariable model. Based on the standardised coefficients, financial support, peer influence, and academic preparedness showed the strongest positive associations with intention. Taken together, the findings support the value of a contextually extended TPB perspective for understanding educational intention among the sampled SPM leavers, although the cross-sectional, non-probability design precludes causal inference and national generalisation. Future policy and institutional responses should therefore focus on reducing financial and academic barriers, strengthening credible social support, and addressing stigmatising narratives, while evaluating whether changes in intention translate into actual tertiary participation.

Note

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Declaration on the Use of Artificial Intelligence

During the preparation of this manuscript, the authors used OpenAI's ChatGPT to assist with language editing, consistency checking, and refinement of academic presentation. The authors retained full responsibility for the study design, data collection, statistical analysis, interpretation, theoretical framing, and final manuscript content. AI was not used to generate or alter the study data or to conduct statistical analyses. All AI-assisted revisions were reviewed and approved by the authors.

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Appendix A. Questionnaire Factors Associated with SPM Leavers' Intention to Pursue Tertiary Education

Instructions: For Sections B-E, indicate the extent to which you agree with each statement.
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Section A. Eligibility and Sociodemographic Information
Eligibility for the study is based on completion of Form 5 and membership of the 2023 SPM examination cohort.

Item	Information	Response
D1	Have you completed Form 5?	Yes / No
D2	Year of SPM examination	2023 / Other: _____
D3	Age (years)	_____
D4	Gender	Male / Female / Other / Prefer not to say
D5	Ethnicity	Malay / Chinese / Indian / Other / Prefer not to say
D6	Monthly household income	RM2,000 or below / RM2,001-RM4,000 / RM4,001-RM6,000 / RM6,001 or above / Prefer not to say
D7	State of residence	_____
D8	Locality	Urban / Rural

Section B. Attitudinally Relevant Factor

Item	Statement	1	2	3	4	5
	PERCEIVED BENEFITS					
P1	Obtaining a tertiary qualification would enable me to contribute positively to my community.					
P2	Obtaining a tertiary qualification would improve my prospects of securing well-paid employment.					
P3	Pursuing tertiary education would help me develop skills that are useful for my future career.					
P4	Completing tertiary education would give me a strong sense of personal achievement.					
P5	Obtaining a tertiary qualification would improve my opportunities for career advancement.					

Section C. Normative Influences

Item	Statement	1	2	3	4	5
	FAMILY INFLUENCE					
F1	My parents or guardians encourage me to pursue tertiary education.					
F2	People in my family whose opinions matter to me generally value tertiary education.					
F3	My parents or guardians expect me to pursue tertiary education.					
F4	My parents or guardians believe that pursuing tertiary education would be a good choice for me.					
F5	My parents or guardians would support my decision to pursue tertiary education.					

Appendix A. Questionnaire Factors Associated with SPM Leavers' Intention to Pursue Tertiary Education (Continued)

Item	Statement	1	2	3	4	5
	PEER INFLUENCE					
I1	My friends encourage me to pursue tertiary education.					
I2	Most of my friends plan to pursue tertiary education.					
I3	My friends generally have favourable views of tertiary education.					
I4	My friends think that I should pursue tertiary education.					
I5	My friends would support my decision to pursue tertiary education.					

Item	Statement	1	2	3	4	5
	SOCIAL MEDIA INFLUENCE					
S1	Content I see on social media generally encourages consideration of tertiary education.					
S2	I consider information shared on social media when evaluating my educational options.					
S3	Social media influencers or content creators whom I follow generally present tertiary education as valuable.					
S4	Educational experiences shared by students or graduates on social media encourage me to consider tertiary education.					

Item	Statement	1	2	3	4	5
	SOCIAL STIGMA					
T1	People around me sometimes view pursuing tertiary education instead of working immediately as impractical.					
T2	People around me often question whether tertiary education is worth the time required.					
T3	People around me often doubt whether tertiary education leads to worthwhile career opportunities.					
T4	In my community, tertiary education is sometimes regarded as an unnecessary financial burden.					
T5	People around me commonly believe that tertiary qualifications are unnecessary for success.					

Section D. Control-Related Factors

Item	Statement	1	2	3	4	5
	FINANCIAL SUPPORT					
C1	I have access to sufficient financial support to pursue tertiary education.					
C2	Financial support from my family or household would be available if I pursued tertiary education.					

Appendix A. Questionnaire Factors Associated with SPM Leavers' Intention to Pursue Tertiary Education (Continued)

Item	Statement	1	2	3	4	5
C3	I would have financial support available to help cover my living expenses while studying.					
C4	I could obtain external financial assistance if needed to pursue tertiary education.					
C5	The financial support available to me would be sufficient to sustain my tertiary studies.					

Item	Statement	1	2	3	4	5
	LACK OF KNOWLEDGE REGARDING ADMISSION PROCESSES					
L1	I am unsure about the entry requirements for tertiary-education programmes.					
L2	I lack sufficient information about the tertiary-education programmes available to me.					
L3	I am unfamiliar with the procedures for applying to tertiary institutions.					
L4	I am unsure about the application deadlines for tertiary institutions.					
L5	I do not know where to obtain reliable information about tertiary-education admissions.					

Item	Statement	1	2	3	4	5
	ACADEMIC PREPAREDNESS					
A1	My SPM education has adequately prepared me for tertiary-level study.					
A2	My SPM academic results indicate that I am academically prepared for tertiary-level study.					
A3	I am able to analyse and solve academic problems effectively.					
A4	I am able to study independently.					
A5	I am confident that I can manage the academic workload expected in tertiary education.					

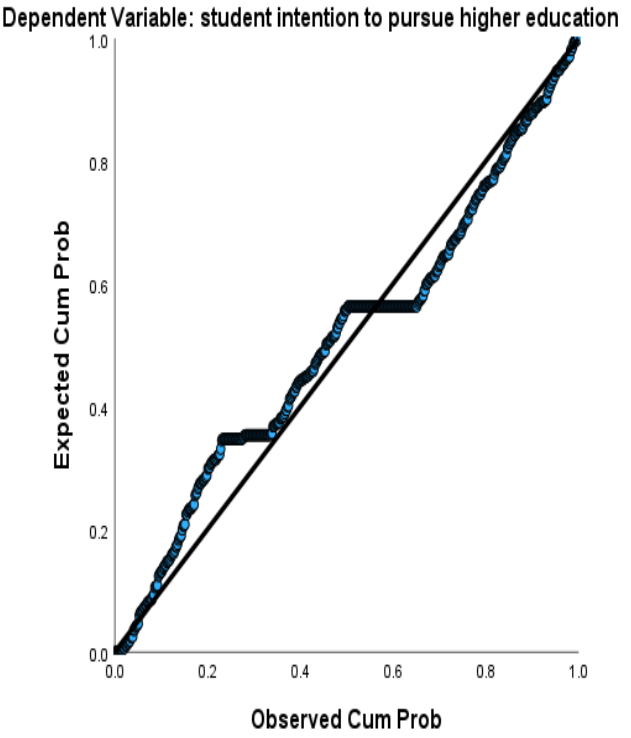
Section E. Intention to Pursue Tertiary Education

Item	Statement	1	2	3	4	5
	INTENTION TO PURSUE TERTIARY EDUCATION					
E1	I intend to pursue tertiary education.					
E2	I plan to enrol in a tertiary-education programme.					
E3	I am determined to continue my studies at the tertiary level.					
E4	I expect to pursue tertiary education after SPM.					
E5	I am willing to make the necessary effort to enrol in tertiary education.					

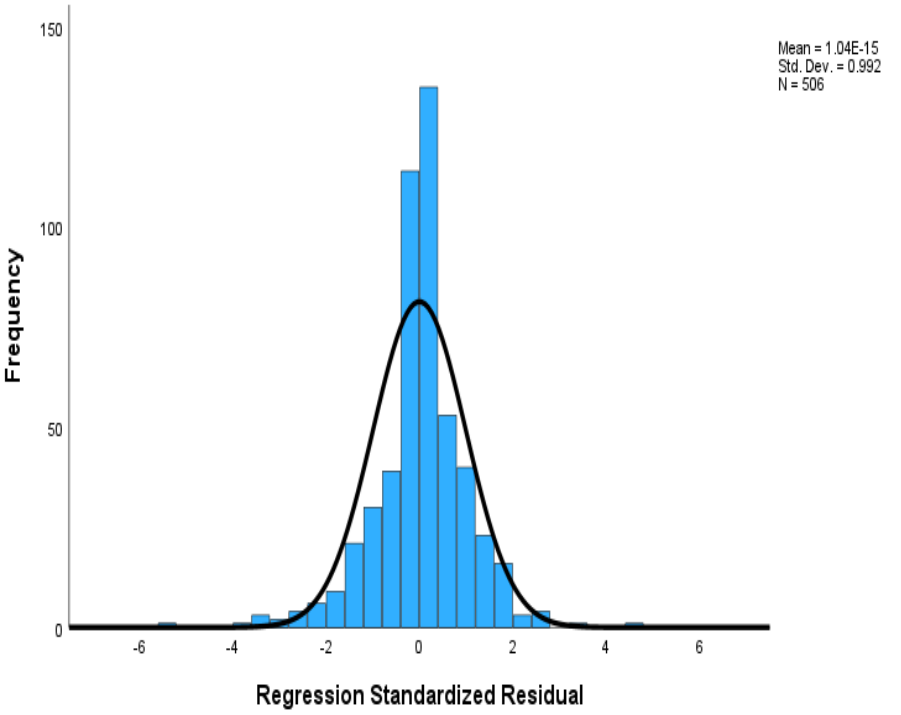
Appendix B. Sociodemographic Characteristics of the Respondents (N = 385)

Characteristics		n	%
Age (years)	17	148	38.44
	18	134	34.81
	19	103	26.75
Gender	Male	196	50.90
	Female	189	49.10
Ethnicity	Malay	188	48.80
	Indian	108	28.10
	Chinese	88	22.90
	Others	1	0.30
Household Income	< 2,000	93	24.20
	2,001 – 4,000	115	29.90
	4,001 – 6,000	96	24.90
	> 6,001	81	21.00
States	Johor	58	15.10
	Kedah	24	6.20
	Kelantan	22	5.70
	Melaka	19	4.90
	Negeri Sembilan	28	7.30
	Pahang	24	6.20
	Pulau Pinang	37	9.60
	Perak	32	8.30
	Sabah	27	7.00
	Sarawak	16	4.20
	Selangor	44	11.40
	Terengganu	31	8.10
	Wilayah Persekutuan	23	6.00
Locality	Urban	226	58.70
	Rural	159	41.30

Appendix C. Normal P–P Plot of Standardised Regression Residuals.



Appendix D. Histogram of Standardised Regression Residuals



Appendix E. Scatterplot of Standardised Residuals Against Standardised Predicted Values



Temporal Reconstruction of International Student Learning: A Conceptual Framework for Japanese Higher Education

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Abstract: Research increasingly connects international students' mobility motives, university experiences, learning, and post-graduation planning, but how these domains become mutually interpretive across narrated time remains underspecified. This conceptual paper develops temporal reconstruction through a structured literature synthesis, using Japanese higher education as its primary specification context. The framework shifts analysis from separate domains to a present-centred configuration linking four reference points: pre-arrival motives, purposes at university entry, current meanings of learning, and anticipated post-graduation pathways. It addresses narrated meaning, not observed longitudinal change. Continuity, discontinuity, redirection, and reinterpretation describe relations that may coexist within one account. The framework makes visible how anticipated futures reorganise present learning, earlier motives acquire new meanings, and stability coexists with change. It offers an interpretivist scaffold for qualitative and comparative inquiry across Japanese and other higher-education settings, allowing linguistic, institutional, and mobility conditions to shape different configurations.

Keywords: international students; learning motivation; temporal reconstruction; international higher education; student mobility

Introduction

International student learning unfolds within the broader internationalisation of higher education, encompassing cross-border mobility and institutional, national, and policy arrangements that shape educational possibilities (Knight, 2004; Altbach & Knight, 2007; de Wit & Altbach, 2021). Mobility scholarship examines students' motivations and experiences of studying abroad (Brooks & Waters, 2011), links mobility to wider life-course aspirations (Findlay et al., 2012), recognises international students as occupying multiple mobility and social roles (King & Raghuram, 2013), and treats students as agents in knowledge formation and circulation (Madge et al., 2015). A single snapshot of motivation or adjustment is therefore insufficient.Four questions often organise research on international student learning: destination choice, university experience, learning motivation, and post-graduation plans. Each has generated a substantial literature. Their separation can obscure how students themselves connect them. Destination-choice research identifies economic, social,

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educational, and reputational considerations (Mazzarol & Soutar, 2002; Findlay et al., 2012). International-student research separately documents loneliness and isolation (Sawir et al., 2008), supportive international social networks and learning communities (Montgomery & McDowell, 2009), and multidimensional connectedness (Hasnain & Hajek, 2022). Language-motivation research examines reasons for learning, self-guides, and dynamic motivational processes (Dörnyei, 2005; Dörnyei & Ushioda, 2009; Boo et al., 2015). Liu-Farrer (2009) examines international education as a channel into labour mobility in Japan, while Mosneaga and Winther (2013) examine study-to-work transitions, host-country career continuation, and longer-term settlement in Denmark.

A student may arrive with language or cultural interests and encounter unexpected academic or social experiences. Anticipated employment, postgraduate study, return migration, or onward mobility may then reshape what learning is for. Motivation concerns both intensity and the purpose of learning within the student's changing situation. The analytical question is relational: how do earlier motives, present experience, current learning, and anticipated futures become meaningful in relation to one another?

Japan is the primary specification context, not the framework's exclusive theoretical source. Across varied linguistic and institutional environments, Japanese may be a subject of study or a resource for academic participation, everyday life, employment, or further study. Studies document different parts of this nexus: motivations, learning experiences, and perceived outcomes at national universities (Huang & Chen, 2022); educational-mobility motivations and experiences in Japanese-language schools (Karki, 2025); and education as a channel into labour mobility, including the use of linguistic and cultural competence (Liu-Farrer, 2009). These strands inform questions about how educational, linguistic, social, and future-oriented concerns become temporally related. The changing function of a host or additional language, rather than Japanese itself, provides a contextual relation to examine across higher-education systems.

Recent studies reinforce a process orientation. Tan et al. (2026) examine how learning beliefs evolve among Chinese international students during their first academic year in Malaysia, while Karki (2025) examines motivations and experiences of educational mobility among Nepali students in Japanese-language schools. Temporal reconstruction asks a distinct present-centred question: how do students connect what brought them abroad, what they encountered after arrival, what they now consider worth learning, and the futures they regard as possible? This interpretive focus differs from stage models of learning change and typologies of mobility motives.

Temporal reconstruction refers to the present-centred interpretive linking of four analytic reference points: pre-arrival motives, purposes at university entry, current meanings of learning, and post-graduation pathways. University-life experiences and institutional conditions provide contexts in which these relations are confirmed, weakened, redirected, disconnected, or reinterpreted. The framework is a qualitative analytical lens, not a stage model or a new data-collection technique. This conceptual paper reports no human-participant data.

The paper makes four contributions. First, it integrates five literature domains: second-language motivation; international student experience and connectedness; agency and self-formation; career and mobility; and temporality and narrative meaning. Second, it shifts analysis from separate themes or variables to relations among temporal reference points, revealing how anticipated futures reorganise learning, similar motives acquire different meanings, and stability and change coexist. Third, it specifies the cross-temporal configuration of meaning as the unit of analysis and distinguishes narrated temporality from observed longitudinal change. Fourth, it offers common comparative questions while allowing linguistic, institutional, economic, and mobility conditions to generate different processes and categories.

International Student Learning as a Temporally Situated Process

The framework begins with a premise shared by several strands of contemporary scholarship: students are active meaning-makers situated within changing contexts. Marginson (2014) explicitly

contrasts student self-formation with adjustment-centred approaches. Related scholarship conceptualises international mobility through becoming and agency (Tran, 2016; Tran & Vu, 2018), while a systematic review documents the growing attention to international-student agency across the field (Inouye et al., 2023). More recent work extends self-formation to higher education more broadly (Marginson, 2024) and conceptualises mobility as agency situated within engagement with disciplinary knowledge (Lee, 2025). Temporal reconstruction builds on this agential orientation, focusing specifically on how students connect past motives, present learning, and possible futures in their accounts.

Learning motivation: from intensity to meaning

Motivation research distinguishes both the quality and the reasons for engagement. Self-determination theory emphasises forms of regulation (Deci & Ryan, 1985; Ryan & Deci, 2000), and Noels et al. (2000) relate second-language learning orientations to intrinsic and extrinsic forms of motivation. Dörnyei (2005) and Dörnyei and Ushioda (2009) connect language-learning motivation to future self-guides and the learning experience.

Later L2-motivation scholarship documents a changing field and increasingly foregrounds dynamic perspectives (Boo et al., 2015; Al-Hoorie, 2017; Dörnyei et al., 2015), while multilingual research challenges models that treat a learner's different language motivations as separate systems (Henry, 2017). For mobile students, purposes can shift across educational, linguistic, and professional domains, making a simple high-versus-low representation insufficient.

Person-in-context perspectives locate motivation within the learner's lived social world (Ushioda, 2020), while investment research foregrounds identity, ideology, and access to valued resources (Darvin & Norton, 2023). Thus, the same activity can change function: Japanese study may begin as cultural interest, become necessary for participation, and later serve professional preparation. Motivational intensity and the meaning of learning can diverge.

A temporal approach asks how earlier reasons, current circumstances, and anticipated possibilities relate to what learning means now. Earlier motives may remain salient but be reinterpreted; anticipated futures may reorganise present study before being realised.

University experience: where meanings are tested and revised

International students encounter academic, social, and everyday conditions—including coursework, relationships, finances, administration, isolation, and employment—that shape participation and the perceived feasibility of study. Acculturation research emphasises adaptation within person–environment relations (Berry, 1997), while international-student research documents how social, institutional, cultural, and linguistic environments can contribute to loneliness and isolation (Sawir et al., 2008).

Social relations can also become learning environments. International student communities may provide social and learning support (Montgomery & McDowell, 2009); connectedness is multidimensional, encompassing social, cultural, political, place, and translocal dimensions (Hasnain & Hajek, 2022); and institutional contexts can shape students' social and educational experiences (Arkoudis et al., 2019). Context therefore enters the process through which learning becomes more or less meaningful.

An agential perspective emphasises students' capacity to use, resist, and reorganise context. Self-formation and becoming scholarship foreground students as agents of their own trajectories (Marginson, 2014; Tran, 2016), and work on 'agency in mobility' develops this emphasis within transnational mobility (Tran & Vu, 2018). A systematic review documents the broader agency turn in international higher education (Inouye et al., 2023). Recent studies extend the argument to engagement with disciplinary knowledge (Lee, 2025), multiple forms of agency in study abroad (Tran & Huynh, 2026), and future-oriented aspirations within self-formation (Qin et al., 2026).

In Japan, Japanese may be both an object of study and a resource for classes, everyday participation, part-time work, or employment. Temporal reconstruction examines changes in these functions as learning meanings, rather than as a single developmental trajectory.

Career, post-graduation pathways, and anticipated mobility

International student education is future-oriented. Destination choice is shaped by home- and host-country factors (Mazzarol & Soutar, 2002), while mobility research situates study abroad within students' broader motivations and experiences (Brooks & Waters, 2011), life-course aspirations (Findlay et al., 2012), and multiple migration and social roles (King & Raghuram, 2013). Post-study career continuation in the host country and longer-term settlement may remain open questions during study (Mosneaga & Winther, 2013).

Japan makes this education–migration nexus visible. Liu-Farrer (2009) shows how international education can channel labour mobility and how Chinese students in Japan use linguistic and cultural competencies in labour-market roles. Japanese-language and career-education scholarship addresses employment-oriented language education and career education (Koga, 2018; Maruyama, 2023), organisational socialisation and resignation processes among former international students employed in Japanese companies (Nabeshima, 2020), career formation under job-rotation systems (Sakai, 2024), and career decisions among former international-student employees who returned home (Watabe, 2022).

In temporal reconstruction, post-graduation pathways serve as both anticipatory reference points and later outcomes. Host-country work, return, postgraduate study, onward mobility, or undecided options can reorganise present learning: language may become professional preparation, disciplinary knowledge may gain transfer value, or several linguistic and professional options may remain open.

The relation is reciprocal: anticipated pathways shape present learning, while current learning and university experience alter which futures appear feasible or desirable.

Temporality, agency, and narrative meaning

Temporal reconstruction also draws on temporally embedded agency. Emirbayer and Mische (1998) conceptualise agency as informed by the past, oriented towards the future, and evaluated in the present. Hitlin and Elder (2007) likewise argue that different temporal orientations entail different forms of agency. Applied to international student learning, remembered motives, current contingencies, and imagined futures can jointly organise what study means.

Recent research makes temporality explicit in international studentship. Shahjahan et al. (2025) theorise clock time, temporal discontinuities, and relations among temporality, privilege, and oppression; Spangler and Jayadeva (2026) examine university rhythms, everyday routines, and lifecourse trajectories across the United Kingdom, Denmark, and Germany; Zhao (2026a) analyses future-oriented waiting; and Zhao (2026b) uses temporal positioning to examine the international-student experience. Temporal reconstruction narrows this agenda to the meaning of learning and the cross-temporal configuration through which temporal positions reinterpret one another.

Agency is also ecological: it is achieved through active engagement with contexts-for-action (Biesta & Tedder, 2007). Mobility and self-formation scholarship likewise links student projects to changing contexts and structures (Tran & Vu, 2018; Marginson, 2024; Tran & Huynh, 2026). Financial, linguistic, institutional, relational, and labour-market conditions are therefore treated here as factors that may alter available possibilities.

Narrative inquiry treats interview narratives as constructed accounts rather than transparent records of experience (Riessman, 2008). Accordingly, a single interview can show how a student presently relates remembered motives to anticipated futures; longitudinal data are required to establish change over time.

The temporal integration problem

These literatures already connect domains. Huang and Chen (2022) examine motivations, learning experiences, and perceived benefits in Japanese national universities. Tan et al. (2026) examine the evolution of learning beliefs through social interaction, reflection, and culturally diverse classroom experiences; Karki (2025) examines motivations and experiences related to educational mobility in Japanese-language schools. These advances sharpen the question of temporal integration.

The unresolved problem concerns temporal integration in the meaning of learning. Direct temporality research has identified several relevant dimensions: clock time and temporal discontinuities (Shahjahan et al., 2025), university, everyday, and lifecourse rhythms (Spangler & Jayadeva, 2026), future-oriented waiting (Zhao, 2026a), and temporal positioning (Zhao, 2026b). Less specified is how domains usually examined separately become mutually interpretive within a student's present account. Existing studies often place motives, experiences, learning, and outcomes side by side or illuminate the temporal organisation of studentship, leaving cross-temporal reinterpretation of learning underspecified. A difficult experience can alter the significance assigned to an earlier motive; a new professional aspiration can make a previously peripheral subject central; a decision to return can change the value assigned to a university experience. Temporal reconstruction addresses this gap by treating these relations, rather than the domains in isolation, as the analytical object.

The framework asks how one temporal position interprets another, not simply whether motives, experience, or plans changed. It can distinguish a stable activity with a reinterpreted purpose, a changed future with continuing language commitment, or similar starting motives that diverge under different institutional and social conditions.

Conceptual derivation and criteria of adequacy

The four reference points and relational patterns were developed through a structured, theory-oriented, purposive synthesis of the literature; no participant data were used. The design most closely follows theory synthesis, which integrates complementary literature streams to generate a higher-order analytical perspective and makes the role of each stream explicit (Jaakkola, 2020).

Five literature clusters were purposively assembled to shape the internal analytical architecture: second-language motivation; international student experience and connectedness; agency and self-formation; career and mobility; and temporality and narrative meaning. Two additional clusters—internationalisation of higher education and comparative education—supported contextual transfer and cross-context use.

Sources were retained to define constructs, document integrative or contrasting relations, or specify contextual or boundary conditions. Selection prioritised conceptual relevance and complementary explanatory value, combining foundational works, reviews, and recent studies across Japan, Asia, and other higher-education settings. Examples illustrate our synthesis of the literature; the framework was not inferred from unpublished cases or anecdotes.

The synthesis proceeded in four passes. First, recurring constructs were mapped to their temporal functions. Second, distinct functions were separated: reconstructed pre-arrival reasons; university-specific entry aims; present meanings of learning; and anticipated pathways that organise learning. Distinguishing pre-arrival motives from entry purposes is an analytic contribution of the synthesis, not a distinction directly reproduced from one source. Third, experiences and institutional arrangements were treated as contextual conditions whose significance depends on interpretation. Fourth, continuity, discontinuity, redirection, and reinterpretation were retained as

relational descriptors, not student types. Table 1 links each reference point and analytical function to the principal literature strands informing its construction. These are integrative constructs, so the literature entries indicate their grounding rather than one-to-one source attributions.

Table 1. Four analytic reference points in the temporal reconstruction framework and their literature grounding

Reference point	Central question	Illustrative considerations	Analytical focus	Indicative literature
Pre-arrival motives	Why did the student choose the destination?	Language/culture; family or teacher influence; costs; institutional conditions; imagined work	Read the starting point as a present reconstruction	Mazzarol and Soutar (2002); Findlay et al. (2012); Brooks and Waters (2011)
Purposes at university entry	What did the student expect to study or become?	Programme and field choice; desired content; expectations; clarity of goals	Examine how broad motives become specific, remain diffuse, or shift at university entry	Mazzarol and Soutar (2002); Findlay et al. (2012); Huang and Chen (2022)
Current meanings of learning	What does educational engagement mean or enable now, and why?	Language and disciplinary learning; participation, professional preparation, or self-development only when explicitly construed as learning or as what learning enables	Analyse the present significance and function of learning; treat living, financial, relational, or administrative experiences as context unless they are linked to learning meaning	Dörnyei and Ushioda (2009); Ushioda (2020); Darvin and Norton (2023); Marginson (2024); Lee (2025)
Post-graduation pathways	What futures does the student regard as possible?	Host-country work; return; postgraduate study; onward mobility; multiple options	Examine how anticipated futures organise, narrow, expand, or reopen present learning	Liu-Farrer (2009); King and Raghuram (2013); Mosneaga and Winther (2013)

Note. Indicative literature identifies principal sources used in the structured conceptual synthesis. The four reference points are integrative analytic constructs rather than direct reproductions of any single source.

Source: Authors

Conceptual adequacy was assessed against six criteria: theoretical grounding, discriminant clarity, relational coherence, coverage of stability and change, parsimony, and empirical revisability. Each criterion required a distinct analytical function and an answerable empirical question. The framework was also evaluated against studies integrating motives and experience in Japanese contexts (Huang & Chen, 2022; Karki, 2025), studies foregrounding temporality (Shahjahan et al., 2025; Spangler and Jayadeva, 2026; Zhao, 2026a, 2026b), studies linking learning beliefs to sociocultural experience (Tan et al., 2026), and studies linking language, agency, and future aspirations in self-formation (Qin et al., 2026). Table 2 summarises these checks; empirical validation remains for future work.

Empirical work should prompt revision if reference points collapse, important relations fall outside the structure, patterns obscure the data, or a simpler configuration explains the accounts equally well. The present claim concerns conceptual adequacy—transparent derivation, coherence, analytical usefulness, and testability—not established empirical adequacy.

Table 2. Conceptual derivation and design-based adequacy checks

Criterion	What the criterion requires	How the framework addresses it
Theoretical grounding	Grounded in established theory or cumulative research.	Grounded in motivation, student-experience, agency/self-formation, mobility, temporality, and narrative literatures.
Discriminant clarity	Elements have distinct analytical functions and explicit boundaries.	Reference points differ by temporal/interpretive function; "current meanings of learning" is separated from contextual experience.
Relational coherence	Relations among elements are explicitly specified.	The unit is a cross-temporal configuration linking the reference points supported by the account within contextual conditions.
Coverage	The structure accommodates stability, change, ambiguity, and coexisting relations.	Relation-specific patterns may coexist; stable, ambiguous, and open-ended accounts remain analytically legitimate.
Parsimony	Only the minimum structure required by the analytical problem is retained.	Four reference points, contextual conditions, and relational patterns are retained without fixed developmental order or student types.
Empirical revisability	The framework generates answerable questions and can be contradicted.	Future data may collapse, extend, reorder, or reject elements when distinctions fail, important relations fall outside the framework, or a simpler account fits better.

Source: Authors

Ontological and epistemological position

Ontologically, temporal reconstruction is relational and contextual. Motives, purposes, experiences, and future possibilities acquire significance through their connections to other temporal positions and study conditions, rather than possessing invariant meanings. The meaning of learning is thus constituted relationally, not discovered as a single stable attribute.

Epistemologically, the framework is interpretivist. In future empirical applications, qualitative interview accounts would be treated as constructed narrative data through which students articulate and reconstruct relations among remembered pasts, current concerns, and anticipated futures (Riessman, 2008). The phrase "interview accounts" therefore refers to the form of data the framework is designed to analyse, not to data reported in this conceptual paper, which contains no participant interviews. This does not imply that material conditions are merely subjective. Language regimes, finances, institutional rules, relationships, and labour-market opportunities can be materially consequential; the interpretive question is how those conditions enter the student's account and become significant for learning.

Data collection should elicit concrete events, people, constraints, turning points, and cross-temporal links rather than only ratings or isolated themes. Analysis should distinguish reported events from assigned meanings, identify relation-bearing segments, and assemble case-level configurations

before cross-case comparison. Claims concern the organisation of meaning and the conditions that make particular relations salient. Causal or observed-change claims require additional designs, especially longitudinal data.

A Temporal Reconstruction Framework

Temporal reconstruction examines how a present account connects the four reference points within university-life experiences and institutional conditions. These temporal anchors do not imply a developmental sequence or fixed student types. Their function is to specify how remembered motives and anticipated pathways enter current learning meaning.

Reconstruction denotes present interpretation: pre-arrival motives and entry purposes are remembered, while post-graduation pathways are anticipated. The analytical object is the configuration through which these remembered pasts and imagined futures become relevant to current learning.

The first, pre-arrival motives, concerns why the student initially considered a destination and higher education abroad. Possible elements include language or cultural interests, perceived educational opportunities, affordability, safety, geographical proximity, family or teacher influence, and imagined employment or personal development. International student mobility research shows that destination choice involves multiple push and pull factors (Mazzarol & Soutar, 2002), while study abroad can be embedded in wider life-course aspirations (Findlay et al., 2012). These elements are analysed as present reconstructions of a starting point, with causal status left open.

Purposes at university entry concern how broader pre-arrival motives connect to a university, programme, or field. Aims may be clear, partly specified, or shaped by admissions opportunities and advice. Separating this reference point from pre-arrival motives reveals whether a mobility project becomes more specific, remains diffuse, or is redirected at entry.

The third reference point, current meanings of learning, refers specifically to the present significance, purpose, and perceived function that a student assigns to educational engagement. It asks what the student presently understands learning to be for and what kinds of learning are worth pursuing. Its core objects are language learning and disciplinary study. Academic participation, professional preparation, independence, relationships, or personal development enter this reference point only when the student explicitly construes them as part of what is being learned or what learning is meant to enable. The construct therefore concerns the meaning of educational engagement rather than the totality of the student's current life.

Several experiences are excluded from this reference point unless the account links them to learning meaning. Housing, finances, friendship, part-time employment, administrative procedures, and immigration conditions are coded as contextual conditions when they are reported only as circumstances. They become analytically relevant to current meanings of learning when the student explains how they alter what learning is for, what is worth learning, or how learning is used. This boundary separates the focal construct from the wider ecology of student experience.

The fourth reference point, post-graduation pathways, includes employment in the host country, return to the home country, postgraduate education, onward mobility to another country, and combinations or undecided possibilities. International-student migration research highlights students' multiple roles as actual or potential workers (King & Raghuram, 2013), and host-country research shows that study-to-work transitions and longer-term settlement can remain linked to international study (Mosneaga & Winther, 2013). The analysis focuses on how anticipated futures organise, narrow, expand, or reopen present learning.

Contextual conditions include language environments, coursework, teacher and peer relations, living and economic conditions, part-time work, immigration arrangements, scholarships, progression requirements, career support, and international student services. Their analytical relevance lies in

how they enable, constrain, test, or reorganise relations among reference points, not in automatically constituting learning meanings. Analysis asks both what happened and what interpretive work it performs.

Relational patterns and coding logic

Four relational patterns serve as sensitising descriptors of a relation, not as classifications of students. Continuity is coded when an earlier orientation remains substantively connected to a later one: its function may be elaborated, but its organising purpose is retained. Discontinuity is coded when a previously meaningful orientation no longer organises current learning or future planning; a replacement direction is not required. Redirection is coded when experience or a newly salient possibility establishes a different organising direction for learning or pathway planning. Reinterpretation is coded when a current position or anticipated future changes the meaning attributed to an earlier motive or experience, even if the observable activity itself remains similar.

The basic coding unit is a meaning-bearing relational segment: the smallest contiguous stretch of an account in which the student links at least two reference points, or links one reference point to a contextual condition in a way that explains or changes its significance. One sentence may suffice, but several adjacent sentences may be required when the relation is distributed across an exchange. The case-level unit of analysis remains the cross-temporal configuration assembled from these relation-specific segments.

Several patterns can coexist within one student account because the codes apply to specific relations, not to the person as a whole. A language-learning purpose may show continuity while a career orientation is redirected, and the same student may retrospectively reinterpret an earlier cultural motive. Discontinuity and redirection are distinguished by their analytic target: discontinuity concerns the loss of an earlier organising relation, whereas redirection concerns the emergence or prioritisation of a different direction. They may co-occur when both are narrated. Reinterpretation is distinguished by retrospective re-meaning and does not require a new behavioural direction. Ambiguous segments should remain unclassified until the relation is sufficiently supported.

Table 3. Operational distinctions among relational patterns

Pattern	Operational definition / inclusion	Key distinction	Illustrative relation
Continuity	Earlier orientation remains substantively linked to a later one; the organising purpose is retained.	Requires an explicit persisting or extending relation, not mere repetition.	Cultural interest remains a reason for Japanese study as additional academic uses emerge.
Discontinuity	An earlier orientation no longer organises current learning or future planning.	Targets loss of the earlier relation; no replacement direction is required.	A Japan-based career ceases to shape present study without a specified alternative.
Redirection	Experience or a newly salient possibility establishes or prioritises a different organising direction.	Targets emergence of a different direction; it may co-occur with discontinuity.	A new disciplinary interest reorganises study toward postgraduate education.

Pattern	Operational definition / inclusion	Key distinction	Illustrative relation
Reinterpretation	A current position or anticipated future changes the meaning attributed to an earlier motive or experience.	Requires retrospective re-meaning; observable activity may remain unchanged.	An emerging postgraduate orientation recasts earlier Japanese-cultural interest as broader cross-cultural learning.

Note: Illustrative relations are hypothetical.

Source: Authors

Worked hypothetical example

Consider an explicitly hypothetical student who chose Japan because of an interest in Japanese language and culture and initially imagined working there after graduation. At university entry, the student selected a business programme and expected Japanese study to support that goal. During university, difficulty participating in a Japanese-medium seminar made language proficiency seem instrumental rather than purely cultural, while a sustainability course and interactions with international peers created a new academic interest. The student now treats Japanese as a resource for participation and professional communication and gives greater priority to sustainability-related disciplinary learning. The student no longer treats immediate employment in Japan as the organising goal and instead prioritises postgraduate study in another country. Looking back from this emerging postgraduate orientation, the student now understands the earlier interest in Japanese culture not only as an attraction to Japan but as an early expression of a broader desire to learn across cultural boundaries. This vignette is illustrative only and does not represent participant data.

The account contains several patterns. Continued interest in language and culture at entry shows continuity. Re-reading that interest as broader cross-cultural learning shows reinterpretation, distinct from a contemporary shift in the instrumental function of Japanese. Sustainability and postgraduate study become new priorities, showing redirection. Immediate employment in Japan ceases to organise the future, showing discontinuity despite continuing Japanese study. The analysis identifies coexisting temporal relations without assigning the student a single type.

Table 4. Hypothetical worked example of temporal reconstruction

Analytical position	Hypothetical case element	Pattern(s)	Analytical reading
Pre-arrival → entry	Japanese language/ culture interest; imagined work in Japan; business-programme entry with continued Japanese study.	Continuity	Earlier language/culture orientation remains linked to the university-entry purpose.
Present/future position → earlier motive	From an emerging postgraduate orientation, earlier cultural interest is re-read as a broader cross-cultural learning desire.	Reinterpretation	A present/future position changes the meaning attributed to an earlier motive: retrospective re-meaning.
New academic experience → current learning	A sustainability course and international-peer interaction make disciplinary learning a new priority.	Redirection	A newly salient academic direction reorganises what the student now considers worth learning.

Analytical position	Hypothetical case element	Pattern(s)	Analytical reading
Current learning → future pathway	With sustainability-related disciplinary learning now central, immediate employment in Japan is no longer the organising goal; postgraduate study in another country is prioritised.	Discontinuity + redirection	The earlier future loses its organising role (discontinuity) while a different future gains priority (redirection).
Whole account	Japanese remains important while academic and career orientations change.	Coexistence	Different relations display all four patterns; the account is not assigned a single type.

Source: Authors

Cross-temporal configuration and propositions

Figure 1 presents an open configuration. Bidirectional links indicate interpretive reference, not sequential transitions, and may connect non-adjacent reference points. Relational patterns describe these links, not additional stages. Students may move between reference points within an interview, and an experience may take on different meanings depending on the future considered.

The case-level unit is the cross-temporal configuration assembled from relation-bearing segments. Cross-case comparison examines how similar motives or experiences are organised differently across conditions. This is consistent with narrative analysis of constructed meaning-making (Riessman, 2008), while substantive categories remain open to emergence from the data.

The framework generates five propositions for empirical examination. P1: relating current learning to earlier motives and anticipated futures should reveal distinctions beyond those captured by motivational intensity alone. P2: post-graduation pathways can function as present interpretive resources as well as later outcomes. P3: the significance of university experiences depends on how they are related to motives, self-understanding, and possible futures, so similar experiences can support different meanings of learning. P4: temporal relations should form configurations with open ordering, allowing continuity, discontinuity, redirection, and reinterpretation to coexist within or across accounts. P5: contextual differences should alter these configurations; comparative value lies in identifying the conditions under which particular connections become salient. Consistent evidence against any proposition would warrant revision or rejection of the corresponding element.

International and Comparative Significance

Specified for Japanese higher education, the framework addresses an international and comparative problem. Its architecture draws on international scholarship, while Japan is the primary context for specifying analytical questions and boundary conditions. The framework therefore separates analytical architecture from contextual configuration: the four reference points and relational patterns provide a common scaffold, whereas the functions assigned to language, study, participation, and future mobility remain context-dependent. Comparative inquiry can then ask how context produces variation across trajectories and systems (Phillips & Schweisfurth, 2014) without treating the Japanese configuration as universal.

Temporal reconstruction links system and institutional conditions to students' interpretive organisation of mobility. National policies, institutional strategies, and transnational opportunities shape internationalisation (Knight, 2004; Altbach & Knight, 2007; de Wit & Altbach, 2021), while mobility scholarship examines motivations and experiences that extend beyond recruitment (Brooks

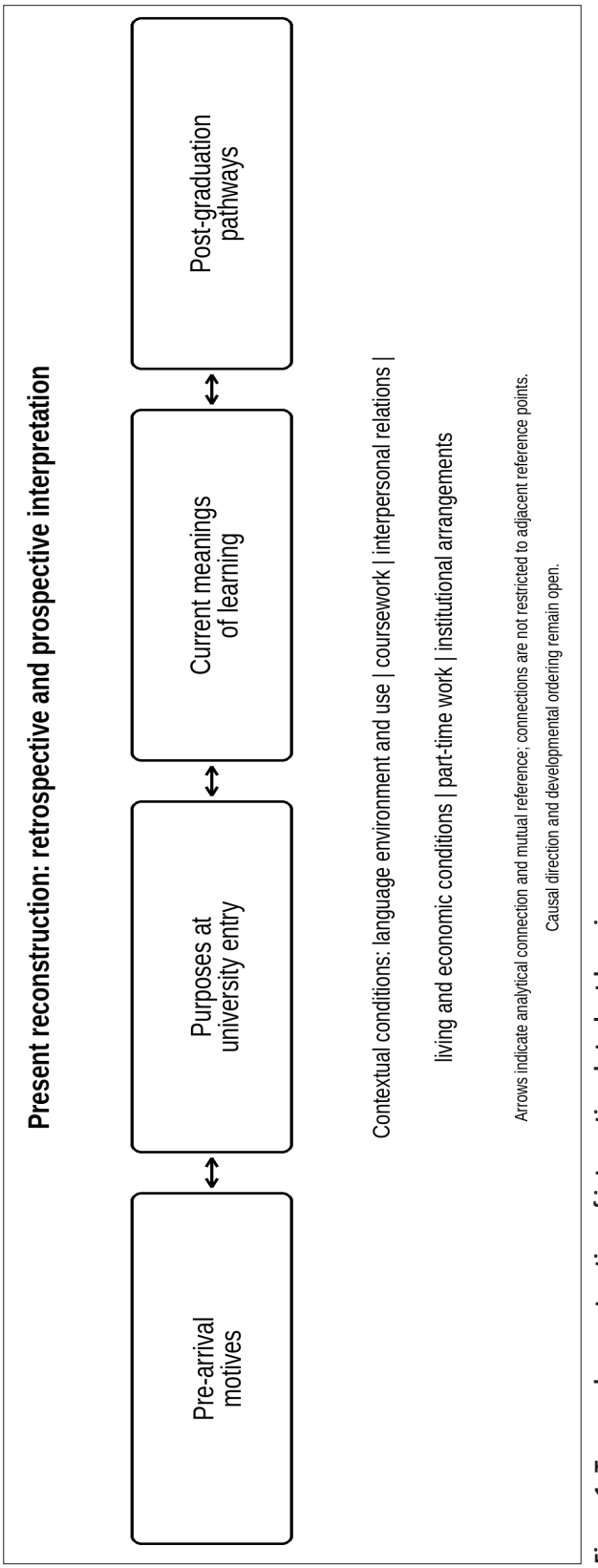


Figure 1. Temporal reconstruction of international student learning

Source: Authors

& Waters, 2011) and the multiple migration and social roles occupied by international students (King & Raghuram, 2013). Language arrangements are treated in this framework as an additional contextual condition whose function may differ across settings.

Japan is analytically informative not because Japanese is assumed to have a unique psychological status. Studies in Japan document different components of the language–education–mobility nexus: motivations and educational experiences (Huang & Chen, 2022; Karki, 2025), the labour-market role of linguistic and cultural competence (Liu-Farrer, 2009), and links between Japanese-language education and career preparation (Koga, 2018; Maruyama, 2023). Read together, these strands make Japan a productive setting for asking how a linguistic resource may change function as educational and mobility projects are reconstructed; this cross-temporal relation is the present paper's synthesis rather than a finding attributed to any one source. Japanese higher education is itself heterogeneous, so these functions need not coincide in English-medium programmes or across institutions. The contextual contribution of Japan is therefore the visibility of a potentially changing relation among language, participation, and future pathways, not a claim that the resulting temporal pattern is uniquely Japanese.

The same analytical questions can be asked in other higher-education systems. Where a host or additional language mediates academic participation, social access, professional preparation, or post-study work, researchers can examine whether its meaning shifts as anticipated futures change. Where the medium of instruction and the host-society language differ, or where several languages are in play, the framework can assess whether these functions are distributed across languages rather than concentrated in one. Research across Malaysia, China, and European settings separately illustrates how classroom and sociocultural experience can be linked to learning beliefs (Tan et al., 2026), how language, institutions, and future aspirations can intersect in self-formation (Qin et al., 2026), and how institutional and lifecourse rhythms shape temporal experience (Spangler & Jayadeva, 2026). Cross-context relevance therefore lies in the relational questions, not in assuming that Japanese-language patterns will be reproduced elsewhere.

Nationality and cultural background are treated as conditions rather than as sufficient explanations. Research conceptualises international students as agents of self-formation and mobility (Marginson, 2014; Tran & Vu, 2018), as contributors to knowledge formation and circulation (Madge et al., 2015), and as agents whose mobility is situated within engagement with disciplinary knowledge (Lee, 2025). Qin et al. (2026) further show how linguistic and institutional challenges, reflexive agency, and future-oriented aspirations intersect in self-formation. The framework compares how such conditions shape cross-temporal relations.

Comparison can occur within institutions, across programmes, or across countries, examining variation in language backgrounds, pathway expectations, media of instruction, support structures, and mobility regimes. Comparative use can ask whether host-language learning moves from cultural interest to participation or to an employment resource, whether post-study pathways revalue language or disciplinary learning, and which institutional arrangements strengthen or weaken these relations. A pattern that differs from Japan is not a failure of transfer; it is the comparative result the scaffold is designed to reveal. Longitudinal studies can also compare narrated futures with later pathways.

Implications for Qualitative Inquiry and Educational Practice

Interviews can use the four reference points while remaining open to other experiences. Prompts address pre-arrival expectations, purposes for entry, consequential university experiences, meanings of current learning, and possible futures. Follow-ups seek concrete people, events, constraints, turning points, tensions, ambiguities, and links through which one temporal position changes another's significance. Order and emphasis follow the student's account.

Analysis can proceed in three passes. First, identify statements associated with the four reference points and consequential contextual conditions without imposing relational pattern codes.

Second, code meaning-bearing relational segments using continuity, discontinuity, redirection, and reinterpretation as sensitising descriptors, while retaining unclassified or ambiguous segments when warranted. Third, assemble a case-level cross-temporal configuration and only then compare configurations across cases. This order keeps the reference points separate from substantive categories generated from data and prevents the four patterns from becoming predetermined student types. Stable, mixed, and open-ended accounts remain analytically legitimate.

The framework also has practical implications. Student support is often divided among language education, academic advising, welfare support, and career services, even though students experience these domains together. Participation difficulties, part-time work, and career plans can alter the perceived value of language or disciplinary learning. Research on international-student connectedness identifies multiple social, cultural, political, place, and translocal dimensions (Hasnain & Hajek, 2022), while research on student experience highlights the interaction of social and educational needs within institutional settings (Arkoudis et al., 2019). Advising that asks how experiences connect to present learning and anticipated futures may reveal needs missed by a simple measure of motivational level.

Language educators can examine changing language-learning functions; international student advisers can explore living, economic, and relational conditions within accounts of study; career services can connect employment and mobility planning to current learning. The effectiveness of these applications remains an empirical question.

Boundary Conditions and Research Agenda

First, a single interview can reveal present relations among remembered motives and anticipated futures, not longitudinal change. The framework distinguishes narrated temporality from longitudinal evidence.

Second, overlapping reference points should be coded by their analytical function, not by chronology alone. Statements serving multiple functions retain that overlap; repeated failure to maintain a distinction may justify merging or refining reference points.

Third, contextual conditions vary in salience. Field, language proficiency, finances, immigration status, family circumstances, employment opportunities, and institutional support can alter available projects and the meanings of learning. An ecological view of agency treats agency as achieved through active engagement with contexts-for-action rather than as a possession of the individual (Biesta & Tedder, 2007).

Fourth, Japanese-language schools, Japanese- and English-medium degrees, postgraduate settings, and exchanges may configure language and disciplinary learning differently. National-university evidence (Huang & Chen, 2022) and language-school evidence (Karki, 2025) do not establish a single national pattern. Comparative applications must specify institutional and linguistic arrangements, rather than treating languages or nations as homogeneous containers.

Fifth, the purposive, theory-oriented literature synthesis is necessarily selective. Additional literature may identify relations, constructs, or boundary conditions that require extension, reorganisation, or narrowing.

Future research can test the reference points qualitatively, compare how institutional and national conditions alter cross-temporal relations, and revisit students longitudinally to compare anticipated with experienced futures. Such work can move the heuristic towards empirically grounded explanations of continuity, change, and branching.

Conclusion

Temporal reconstruction analyses relations across narrated time rather than treating motivation, university experience, agency, and post-graduation planning as separate domains. Four reference points organise inquiry into linguistic, academic, social, economic, and institutional conditions.

Its cross-temporal configuration links remembered motives, present learning, and anticipated futures, showing how university experiences can alter their interpretation. Narrated temporality remains distinct from observed longitudinal change; empirical work may retain, revise, collapse, extend, or reject framework elements.

Specified for Japanese higher education, the framework offers context-sensitive comparison, not a Japan-specific trajectory model. Shared relational questions allow language functions, media of instruction, institutional supports, and mobility regimes to vary. The comparative question remains: under what conditions do international students reconstruct the meaning of learning across time?

Declaration on the Use of Artificial Intelligence

OpenAI ChatGPT (GPT-5.6 Sol; used in 2026) was used as a copy-editing aid on the authors' existing text to improve language, readability, structural clarity, consistency, and formatting during manuscript revision. All conceptual claims, source selection, interpretations, and final decisions were reviewed and verified by the authors, who take full responsibility for the creation and accuracy of the manuscript. No generative AI was used to generate or analyse empirical data.

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Navigating Language Transition in Education: Lived Experiences of Tamil-Medium Students in Malaysia

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Abstract: This study explores the lived experiences of Tamil-medium primary school graduates in Malaysia as they transition to Bahasa Melayu (BM)-medium secondary schools, focusing on linguistic, academic and emotional adjustment. Guided by Bronfenbrenner's Ecological Systems Theory and employing Interpretative Phenomenological Analysis (IPA), the study collected data through small-group interviews with 20 Form One students and semi-structured interviews with 20 teachers from national secondary and Tamil primary schools. Findings show that students' adjustment to the new medium of instruction (MOI) varied with their prior BM exposure and the linguistic and relational support available during the transition. Although all students progressed directly to Form One, some continued to experience difficulties with academic vocabulary, subject learning and assessment demands in BM. Family preparation, peer support, teacher scaffolding and multilingual classroom practices facilitated adjustment, though the availability and continuity of such support varied across contexts. The study conceptualises the MOI shift as an uneven ecological transition, demonstrating that adjustment to a new instructional language is shaped not by linguistic proficiency alone, but by the interaction of relational, educational, institutional and broader structural conditions. The findings highlight the importance of recognising MOI adjustment as a continuing process beyond formal entry into secondary schooling.

Keywords: Medium of Instruction, Educational Transition, Tamil-medium Education, Ecological Systems Theory, Interpretative Phenomenological Analysis

Introduction

Educational transition is widely recognised as a complex process involving academic, social and emotional adjustment as learners move between stages of schooling (Harris & Nowland, 2020; Jindal-Snape et al., 2019). When this transition also involves a change in the medium of instruction (MOI), learners must adapt not only to new academic expectations but also to unfamiliar linguistic and cultural environments (Gill, 2013; Pfenninger & Lendl, 2017; Poon & Lau, 2016). These challenges are particularly significant in multilingual societies such as Malaysia, where language and schooling are closely tied to identity and educational opportunity.

Malaysia is a multi-ethnic and multilingual nation comprising Malay, Chinese and Indian communities, alongside diverse indigenous communities. This diversity is reflected in the country's education system, where language has historically been closely connected to schooling and community identity. *Bahasa Melayu* (BM) is the national language and the principal MOI within the national education system, while provisions for mother-tongue education allow Mandarin and Tamil to be used as media of instruction in national-type primary schools (Karunanithi & Sivanadhan,

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2025). Vernacular schooling has consequently served not only an educational function but also an important role in maintaining the linguistic and cultural identities of minority communities (Mukherjee & David, 2011).

At the primary level, students may attend Sekolah Kebangsaan (National Schools; SK), where BM is the MOI, or Sekolah Jenis Kebangsaan Cina (Chinese National-Type Schools; SJKC) and Sekolah Jenis Kebangsaan Tamil (Tamil National-Type Schools; SJKT), where Mandarin and Tamil are used as the primary MOI, respectively. However, national secondary schools use BM as the primary MOI, requiring students progressing from national-type primary schools to undergo an MOI transition. For Tamil-medium students, this transition is particularly significant because no equivalent Tamil-medium secondary pathway exists within the national school system (Bedi, 2024; Mukherjee & David, 2011). The transition from Tamil to BM therefore represents a significant linguistic and educational adjustment.

To support this transition, the Ministry of Education (MOE) introduced Kelas Peralihan (Remove Class), a preparatory programme designed to strengthen BM proficiency before entry into secondary school. However, policy changes and the removal of the Primary School Achievement Test (UPSR) have led to an increasing number of students bypassing this transitional support (MOE, 2013; Punniaseelan & Subramaniam, 2022). As a result, many students enter BM-medium secondary classrooms with uneven linguistic preparation.

Existing Malaysian MOI research has largely focused on language policy, proficiency and academic outcomes, particularly in relation to reforms such as the Teaching and Learning of Science and Mathematics in English (Pengajaran dan Pembelajaran Sains dan Matematik dalam Bahasa Inggeris, PPSMI) policy (Ab Rashid et al., 2017; Mohandhas, 2015; Rahman & Singh, 2021). Limited attention has been paid to how vernacular school students experience the transition to BM-medium secondary education, especially Tamil-medium learners who bypass the Remove Class. Although studies of Chinese-medium learners and multilingual schooling have highlighted issues of identity, belonging and adjustment (Ho, 2018; Ho et al., 2018; Lee & Ting, 2016), the lived experiences of Tamil-medium students remain underexplored.

Responding to this gap, the present study explores how Tamil-medium primary school graduates experience the transition into BM-medium secondary education and how schools attempt to support this process. Guided by Bronfenbrenner's Ecological Systems Theory (EST), the study contributes to broader discussions on equitable transition support, multilingual education and language-in-education policy in Malaysia. In the Malaysian education system, Primary 6 refers to the final year of primary schooling, while Form One refers to the first year of secondary schooling. Accordingly, the study addresses the following research questions:

RQ1: How do students from Tamil primary schools experience the shift in the medium of instruction when transitioning from Primary 6 to Form One?

RQ2: How do primary and secondary schools prepare students from Tamil primary schools for the shift in the medium of instruction?

Literature Review

Shift in Medium of Instruction and Its Challenges

Transitions involving a shift in the MOI are widely recognised as complex linguistic, cognitive and emotional processes. International research indicates that students navigating a new MOI without adequate scaffolding may experience difficulties in comprehension, classroom participation, confidence and adjustment (Brock-Utne, 2007; Chan & Walsh, 2024; Sibomana, 2022). In Tanzania, abrupt shifts from Kiswahili to English have been shown to produce persistent "language shock," particularly among learners with limited opportunities to use their home language or access peer

support (Roemer, 2024). In Rwanda, students and teachers rapidly transitioning to English as the MOI rely on vocabulary scaffolding and code-switching, which only partially mitigate learning difficulties (Ndabaga et al., 2023; Sibomana, 2022). Similar findings in Hong Kong show that students navigating English-medium lessons often minimise classroom interaction and rely on memorisation rather than meaningful engagement (Chan & Walsh, 2024). Across South and Southeast Asia, sudden MOI transitions have repeatedly been shown to widen achievement gaps for learners with limited exposure to the target language outside school (Jhingran, 2005).

Malaysia's multilingual context reflects similar dynamics. While students may complete primary schooling in national-type schools with Tamil or Mandarin as the MOI, most transition to BM-medium secondary education (Dumanig et al., 2012; Karunanithi & Sivanadhan, 2025). For Tamil-medium learners, progression to secondary school may therefore involve adjusting to both a new level of schooling and a different instructional language (Bedi, 2024; Punniaseelan & Subramaniam, 2022). Research suggests that although code-switching is widely used in Asian classrooms, it primarily addresses surface-level comprehension gaps and is less effective when teachers and students do not share the same home language (Afitska et al., 2013; Hamdan, 2023). Studies also indicate that Tamil-medium students may encounter challenges in developing and applying BM for academic learning after transitioning to a BM-medium environment (David & McLellan, 2014; Ramasamy, 2025).

Within the Malaysian education system, the Remove Class has historically functioned as a transitional mechanism intended to strengthen students' BM readiness before progression to Form One (Raman, 2022). Students who meet the stipulated BM requirement may, however, progress directly into Form One and bypass this transitional year. For these students, the move from Tamil-medium primary education to BM-medium secondary education occurs alongside the broader primary–secondary school transition. The significance of this direct progression therefore lies not in bypassing the Remove Class itself, but in the simultaneous linguistic, academic and social adjustments associated with entering secondary education through a different MOI.

These interconnected demands suggest that MOI transition cannot be understood solely in terms of individual language proficiency. An ecological perspective draws attention to how students experience the shift within their immediate classroom interactions and support (Ndabaga et al., 2023), connections between their prior and receiving educational contexts, institutional structures, and the broader language-in-education environment in which transitions between Tamil- and BM-medium schooling occur (Bedi, 2024). EST therefore provides a useful basis for examining how conditions across students' educational environments may interact in shaping their experiences of MOI transition.

Taken together, the literature establishes that a shift in MOI can introduce additional linguistic and academic demands during educational transition. However, the primary–secondary transition and the MOI transition are often examined as related but distinct educational processes. For Tamil-medium students who progress directly into BM-medium Form One, these transitions occur concurrently, creating a context in which adjustment to secondary schooling cannot be easily separated from adjustment to a new instructional language.

Medium of Instruction Policy in Malaysia

Malaysia's MOI policies have long been shaped by its multiethnic context and post-independence emphasis on national unity (Gill, 2013). The National Language Act 1967 established BM as the national language, a position reinforced by the Education Act 1996, which establishes BM as the principal MOI within the national education system (MOE, 1996). While national-type primary schools may use Tamil or Mandarin as the MOI, students continuing into national secondary schools encounter a shift to BM-medium learning upon entry to Form One. For Tamil-medium pupils, this shift is particularly significant because, unlike Chinese learners who have the option of continuing through Chinese Independent Secondary Schools, no equivalent Tamil-medium secondary pathway exists (Bedi, 2024; Raman, 2022). For Tamil-medium pupils entering national secondary schools,

the primary–secondary transition therefore coincides with a substantial change in the linguistic environment of formal learning.

The Malaysia Education Blueprint (MEB) 2013–2025 acknowledges disparities in language readiness, noting that national-type schools allocate fewer instructional hours to BM during early primary years (MOE, 2013). Although BM instructional time aligns with national schools by Year Six, research has identified continuing challenges in aspects of BM proficiency among Tamil-medium pupils (Muthusamy et al., 2024; Vasuthevan & Subramaniam, 2025). The 2019 UPSR, which was the final administration of the examination before its abolition was announced in 2021, showed Tamil school pupils performing below national averages in BM, with only 40.11% achieving satisfactory proficiency (Muthusamy et al., 2024). Earlier research similarly identified limited exposure to BM and language-related learning challenges as factors associated with pupils' educational experiences (Arumugam, 2008). Following the abolition of UPSR, BM readiness has increasingly been assessed through school-based mechanisms, including the Language Literacy Detection Test (*Ujian Pengesanan Literasi Bahasa Melayu, UPLBM)*, placing greater attention on how readiness for progression into BM-medium secondary education is determined (Leong, 2022).

Recent results from the Malaysian Certificate of Education (*Sijil Pelajaran Malaysia*, SPM), the national examination taken at the end of secondary schooling, indicate the strongest national performance since 2013, with improved national average grades and 94% of candidates qualifying for certification (The Vibes, 2025). However, publicly reported SPM statistics remain aggregate and do not provide BM performance specifically for students transitioning from different primary-school MOIs, limiting what can be inferred about longer-term outcomes for Tamil-medium learners (The Vibes, 2025). Policy discussions have also introduced BM proficiency thresholds for Year Six pupils in Chinese and Tamil schools, reflecting continued policy attention to BM readiness before progression into secondary education (Leong, 2022).

Although the MEB 2013–2025 calls for targeted support for vernacular-to-BM transitions (MOE, 2013), questions remain regarding how linguistic readiness and transition support are addressed as students move between different instructional languages. Research on BM learning among Tamil-school pupils has identified continuing linguistic challenges that may be relevant to their preparation for BM-medium learning (Punniaseelan & Subramaniam, 2022). Policy analyses of Malaysia's multilingual education system also draw attention to tensions between national language objectives and the linguistic realities of learners educated through different primary-school MOIs (Renganathan & Kral, 2018). Through Bronfenbrenner's EST, language-in-education policies can be situated within the macrosystem, while their implementation may shape institutional arrangements and the immediate educational environments in which students experience MOI transition (Bronfenbrenner, 1979). This perspective situates students' linguistic adjustment within the broader policy and institutional conditions surrounding their transition rather than treating it solely as an individual proficiency issue.

This policy context provides an important foundation for examining how Tamil-medium pupils experience the transition to BM-medium secondary education and how broader language-in-education structures intersect with their experiences of adjustment.

Supportive Strategies for Navigating Medium of Instruction Shift

Research across multilingual education systems has identified strategies to support learners adjusting to a new instructional language. When preparation for the MOI shift is limited, difficulties with comprehension and classroom participation may increase reliance on peers and other forms of informal support (Clegg & Simpson, 2016; Heugh et al., 2010). In Malaysia, BM proficiency remains important for educational progression (Hashim, 2009; Muthusamy et al., 2024; Nahar, 2020), while research on Tamil-school learners continues to identify challenges in developing the BM proficiency required for academic learning (Punniaseelan & Subramaniam, 2022).

Studies in multilingual contexts identify several strategies for supporting learners during MOI transitions. Integrating language and subject learning, particularly alongside sustained teacher development, can strengthen students' access to academic content (Dafouz & Gray, 2022; Poon & Lau, 2016). Other forms of scaffolding, including simplified materials, visual aids and accessible explanations, can support comprehension and participation when students are learning through a less familiar MOI (Gibbons, 2015; Milligan et al., 2016). Together, these approaches highlight the importance of making academic content linguistically accessible while students develop greater proficiency in the instructional language.

More recently, translanguaging has emerged as an approach that enables learners to draw strategically on their broader linguistic repertoires during learning (Tai & Wei, 2020; Wei, 2018). Rather than treating languages as entirely separate resources, translanguaging can support comprehension, participation and meaning-making. In Tamil-to-BM transitions, this could involve the strategic use of Tamil for clarification or expression while students progressively develop their capacity to learn through BM. However, the application of translanguaging within Malaysian educational contexts remains an emerging area of research (Rajendram, 2021; Too, 2023).

The effectiveness of these strategies also depends on the educational conditions in which they are implemented. Malaysian research points to continuing questions surrounding the linguistic preparation and support available to learners moving between different language environments (Punniaseelan & Subramaniam, 2022; Raman, 2022). Teacher capacity is particularly relevant because scaffolding, multilingual clarification and responsive language support depend partly on teachers' ability to recognise and respond to learners' linguistic needs. These considerations occur within Malaysia's broader multilingual education system, where language policy and educational structures shape patterns of language use and language shift (David & McLellan, 2014; Hashim, 2009). Support for MOI transition therefore involves not only particular classroom strategies, but also the institutional and pedagogical conditions that enable them to be used effectively. The interaction between individual adjustment and support within the receiving environment can further shape students' experiences of educational transition (Harris & Nowland, 2020; Jindal-Snape et al., 2019).

Taken together, these studies demonstrate that adjustment to a new MOI can be supported through linguistic scaffolding, multilingual classroom practices and responsive educational environments. However, the lived experiences of Tamil-medium pupils who progress directly into BM-medium Form One without the transitional Remove Class remain under-examined, particularly in relation to how they experience and navigate support during the simultaneous school-level and MOI transition.

Theoretical Framework: Bronfenbrenner's Ecological Systems Theory

Bronfenbrenner's EST provides a useful framework for examining how Tamil-medium students experience the transition to BM-medium secondary schooling. EST enables MOI transition to be examined in relation to the multiple ecological contexts surrounding students' educational experiences.

EST conceptualises human development as occurring through interconnected ecological systems (Bronfenbrenner, 1979, 1986). The microsystem refers to immediate environments such as classrooms, teachers and peer relationships. The mesosystem captures interactions between these environments, including home–school relationships. The exosystem includes institutional structures that indirectly influence learners, such as curriculum expectations and transitional support mechanisms. The macrosystem encompasses broader cultural, linguistic and educational policies shaping schooling experiences. The chronosystem considers change and development over time; however, it was not emphasised in the present study because participants' transition experiences were examined within a defined period rather than longitudinally.

In this study, EST is used as a complementary interpretive lens for considering students' experiences across these ecological contexts. It provides a framework for examining how experiences

associated with MOI transition may be situated within immediate learning environments, connections between educational and home contexts, institutional structures and the broader language-in-education environment. Rather than assuming in advance which ecological factors shape students' adjustment, the framework provides a means of interpreting the contexts within which their reported experiences occur.

Research Design

This study employed a qualitative design grounded in Interpretative Phenomenological Analysis (IPA) to explore how Tamil primary school pupils in Malaysia experienced the transition from Tamil-medium instruction to BM as the MOI in national secondary schools. IPA is underpinned by phenomenological, hermeneutic and idiographic commitments. Its phenomenological orientation enables attention to participants' lived experiences, while its hermeneutic orientation recognises the double interpretative process through which participants make sense of their experiences and researchers subsequently interpret that sense-making. Its idiographic commitment emphasises detailed engagement with individual accounts (Rajendran & Rajeswari, 2026; Smith et al., 2009). IPA was selected because the study sought not only to identify challenges associated with the shift in MOI, but also to understand how students made sense of its linguistic, academic, relational and identity-related dimensions. This emphasis on depth and meaning-making produces context-specific findings rather than statistically generalisable claims (Rajendran & Rajeswari, 2026). The interpretative nature of IPA also requires reflexive awareness of the researcher's role, particularly in multilingual research where interpretation across languages adds another layer to the meaning-making process (Ai, 2024).

The study followed these core principles of IPA while adapting their application to the research context. Participants were purposively selected based on their direct experience of the MOI transition, and the interviews were designed to elicit detailed accounts of these experiences. Analysis involved close engagement with particular accounts before identifying broader patterns across participants, allowing interpretations to develop from the data rather than from predetermined theoretical categories. However, the study adapted the conventional IPA preference for individual interviews by using small-group interviews. This supported collective recall and shared meaning-making but may have limited the depth of some individual accounts and influenced how experiences were expressed within the group. Thus, the study was guided by the core commitments of IPA rather than following a conventional IPA design in all respects.

Bronfenbrenner's EST was used as a complementary analytical lens. While IPA guided the methodological approach and the initial interpretation of participants' lived experiences, EST was used subsequently to situate these experiences within their broader ecological contexts. EST was not used to predetermine the initial codes or themes; rather, it was introduced after patterns had been identified in participants' accounts. In MOI transition contexts, microsystem experiences such as classroom interactions and peer relationships shape how pupils encounter the new language environment, while mesosystem connections such as home-school interactions influence how families and schools support the transition. Exosystem factors, including placement decisions and the availability of BM support, indirectly affect readiness and adjustment, while macrosystem structures such as national language policy establish the compulsory shift from Tamil-medium to BM-medium education at Form One.

Using EST allowed pupil narratives to be interpreted not only at a personal level but also within the broader institutional and policy conditions shaping their transition. Although the chronosystem was acknowledged, it was not emphasised because the study was not longitudinal. Thus, IPA and EST served distinct but complementary functions: IPA remained central to understanding how pupils made sense of their lived experiences, while EST was applied at the later interpretative stage to contextualise these experiences across ecological systems. The combination of IPA and EST enabled

the study to examine how pupils made sense of their experiences while situating those interpretations within the systems that supported or constrained them.

Selection of Participants

This study employed purposive sampling involving 40 participants across seven schools: four national secondary schools and three Tamil primary schools. The participating schools were selected based on their willingness to facilitate the participation of eligible students and educators in the study. Sampling began at the secondary level, where 20 Form One pupils, all aged 13 years, who had recently completed Tamil-medium primary schooling were identified. The sample comprised seven boys and 13 girls. All 20 pupils had transitioned directly into Form One without attending Remove Class. In accordance with the formal progression requirement, they had passed BM in Year Six and therefore did not require placement in Remove Class. Pupils who met these criteria and were willing to participate were identified with the assistance of teachers at the participating secondary schools. Their proximity to the transition enabled detailed reflection on their experiences.

Using a reverse-tracking approach, these pupils were then traced back to the Tamil primary schools they had attended. Twenty educators were purposively recruited from the participating schools, comprising 11 from Tamil primary schools and nine from national secondary schools. The primary-school participants included teachers of BM, Tamil, Science and Mathematics, as well as Heads of BM Departments, while the secondary-school participants comprised BM, Science and Mathematics teachers. Their teaching experience ranged from three to 30 years. Educators were selected based on their direct involvement in teaching the pupils and their experience teaching core subjects in which BM proficiency was particularly relevant. Teachers and school leaders were recruited to provide insight into pupils' preparedness and institutional responses to the transition. This design enabled triangulation between pupils' lived experiences and educators' perspectives.

Although socioeconomic background was not a selection criterion, the sample reflected the demographic composition of Tamil-medium schools, with most pupils from B40 (Bottom 40%) households, referring to the lower-income segment of Malaysian households (Department of Statistics Malaysia, 2023), and having varying levels of exposure to BM or English. The final sample of 20 pupils and 20 educators aligns with IPA recommendations for smaller, information-rich samples that support detailed idiographic analysis while identifying patterns across cases (Smith et al., 2009).

Data Collection Methodologies

Data collection was designed to capture both pupils' lived experiences and institutional perspectives on the MOI transition through two complementary interview methods.

For RQ1, small-group interviews were conducted with the 20 Form One students. Although IPA commonly uses individual interviews, group discussions were selected because they encouraged collective recall, peer validation and co-construction of meaning, enabling students to surface both shared and contrasting experiences of linguistic, academic and social adjustment.

For RQ2, individual semi-structured interviews were conducted with 20 teachers and school leaders from the same schools. These interviews explored institutional practices, expectations and perceived challenges in supporting pupils' MOI transition. Individual interviews allowed educators to speak openly about school policies, instructional constraints and professional judgments that might not emerge in group settings.

All interviews were conducted in quiet school spaces and in Tamil or BM, according to participants' preferences, to ensure privacy and comfort. With informed consent, sessions were audio-recorded, transcribed verbatim and translated where necessary. All interviews were transcribed and translated by the lead researcher, who is proficient in Tamil, BM and English and has a Tamil-medium educational background. To check translation accuracy, a sample of translated transcripts was independently reviewed by Tamil and BM teachers who were not participants in the study. Where

words or expressions lacked a direct English equivalent, the original term was retained alongside the closest contextual English interpretation to preserve its intended meaning.

Ethical Considerations

Ethical approval was obtained from Taylor's University, and research permissions were granted by the Selangor State Education Department and the Educational Planning and Research Division (EPRD). As data collection spanned six months, EPRD approval was obtained twice to cover the period. Permission was also obtained from the leadership of each participating school.

Informed consent was obtained from all participants, with written parental consent for student participants. Participants were informed that participation was voluntary and that they could withdraw from the study. Pseudonyms were used to protect participants' identities, and research data were securely stored, with access restricted to the researcher.

Student group interviews were conducted in secluded classrooms to ensure privacy. Students were informed, including through the consent documentation, not to share group discussions outside the interview. However, complete confidentiality between participants could not be guaranteed due to the nature of group interviews.

Data Analysis

Data analysis followed an iterative, idiographic process consistent with IPA, guided by the analytical procedures outlined by Smith et al. (2009). After transcription and translation where necessary, each participant's transcript was read repeatedly to support close engagement with the account. During these readings, initial notes and codes were recorded to capture significant linguistic, experiential and contextual features within each participant's narrative. These initial interpretations were then examined for connections and organised into emerging experiential themes. Analysis was conducted participant by participant, with each account considered on its own terms before patterns were examined across participants (Smith et al., 2009).

The initial codes and emerging themes were revisited and refined throughout the analytical process. Codes and themes were documented in Word and Excel, and analytical matrices were developed to compare patterns across participants. These matrices were used to identify both shared patterns and differences across participants' accounts. These comparisons informed the development and refinement of the final themes, while maintaining clear links to the original participant accounts and supporting extracts.

An audit trail was maintained through coded transcripts, code-to-theme tables, analytical matrices and successive records of theme development. These materials documented the progression from individual transcripts and initial interpretations to emerging and final themes, thereby providing transparency in the analytical decision-making process.

Findings

Experiencing the Medium of Instruction Shift

Students described varied experiences of transitioning from Tamil-medium primary schooling to BM-medium secondary education. Although participants shared similar educational pathways, their experiences differed according to their prior exposure to BM and the support available before and during the transition. While some students entered secondary school with greater linguistic preparation and support, others described limited preparation and greater difficulty adjusting to BM-medium learning.

Early Expectations and Preparation for Secondary School

Students entered secondary school with differing expectations about the shift from Tamil to BM as the MOI. For many, anticipation of the transition was accompanied by concerns about whether they would understand academic content in BM and cope with the demands of secondary schooling. These concerns were often discussed within students' immediate support systems before the transition. Reva, for example, recalled repeatedly raising specific concerns with her family:

> *"I ask them about:*
> 1. *What if I did not understand the language and subjects taught in BM?*
> 2. *What if I failed my BM in primary school and transitioned to Remove instead of Form One?" (Reva)*

For Reva, the anticipated MOI shift created both linguistic and academic uncertainty, while ongoing conversations with her parents provided reassurance before the transition.

For some students, family preparation combined emotional reassurance with practical guidance. Veena described frequent conversations with her mother during Primary 6 that built confidence and were accompanied by practical preparation:

> *"I had many talks with my mother about learning in BM during primary 6. She would share the things that she knows. She gave me a lot of advice and told me to be confident since I am not very weak in BM." (Veena)*

Her mother also encouraged her to seek free tuition and familiarise herself with Form One content, which Veena retrospectively associated with an easier adjustment to secondary school.

Preparation was also provided by Tamil primary schools, although the forms of support differed across students. Nearly half of the students described their primary-school teachers, particularly BM teachers, as contributing to their preparation for the new MOI. Karun, for example, recalled:

> *"My BM teacher did prepare me. She gave a lot of advice on how the situation in secondary school would be when using BM and told me to adapt to the situation there. Her advice was very helpful." (Karun)*

Preparation also took more practical forms. Gita, who recalled nervousness about her BM proficiency, responded to her teacher's description of secondary-school expectations by reading BM comic books and watching BM cartoons, practices she later associated with her ability to learn through BM.

Anticipatory anxiety was not universal. Maara considered himself sufficiently proficient in BM and reported little concern about the MOI shift, although he still followed his mother's advice to watch BM videos, which he felt expanded his vocabulary and supported subsequent BM-medium learning.

Importantly, the presence of parental advice did not necessarily mean that students felt adequately prepared. Charu, for example, recalled receiving advice from her parents only once or twice and questioned its usefulness:

> *"They just mentioned how everything in secondary school will be in BM but what is the point of that advice? I did not feel like that advice benefited me in any way because I already knew everything will be in BM at secondary school. It didn't help me to prepare for secondary school." (Charu)*

Charu's account shows that preparation depended not simply on whether families discussed the transition, but also on students' perceptions of the frequency, specificity and usefulness of that support.

Taken together, students' accounts show considerable variation in how they approached the impending MOI shift. While some entered secondary school having received sustained emotional reassurance, practical preparation or targeted language exposure from families and primary-school teachers, others experienced more limited preparation, and a small number did not anticipate the transition with the same degree of concern. Preparation was therefore experienced not as a uniform form of support, but as differing combinations of reassurance, practical guidance, language exposure and students' own existing confidence in BM.

Peer Relationships and Dependency

Peer relationships became an important means through which students managed difficulties understanding lessons conducted in BM. Although these students qualified for direct entry into Form One, several still relied on classmates to translate unfamiliar vocabulary, explain lesson content and clarify classroom instructions. Shiva and Raja both described peer support as integral to making sense of BM-medium learning:

> *"I usually will translate BM into Tamil to understand the lesson or instructions and when I do not understand something, I will get my friends to translate for me instead of using a dictionary." (Shiva)*

> *"Me asking friends is how I understand the learnings in BM and also the instructions in BM. I depend on a lot of friends too for translations and explanations." (Raja)*

Their accounts show that direct entry into Form One did not necessarily equate to independent academic functioning in BM; for some students, peers operated as an immediate linguistic bridge to classroom content.

Peer support also extended beyond Tamil-speaking friendships. Rina described drawing on classmates from different ethnic backgrounds:

> *"I am also seated in a mixed group of peers. So I will usually also ask my Malay friends if they can explain better for me. I do not just depend on my Tamil speaking friends." (Rina)*

Rekha similarly sought clarification from classmates across ethnic groups, particularly in mixed seating arrangements. Thus, access to linguistic support was not necessarily dependent on a shared home language or ethnicity.

Conversely, students who initially lacked accessible peer support described greater difficulty navigating BM-medium learning. Lalli, who entered secondary school without friends from her Tamil primary school, connected this absence with her difficulty learning academic subjects through BM:

> *"There were no friends from my Tamil primary school who came to this secondary school. Only after a while did I manage to make new friends. So until then I really had a tough time trying to learn all the subjects in BM and moving to a new school from my primary school." (Lalli)*

Lalli's experience highlights how the simultaneous loss of familiar peer networks and the shift to BM-medium learning could compound the difficulty of entering secondary school.

Rekha reported a similar initial experience. Although there were other Indian students in her Form One classroom, she was the only student from her Primary 6 class and described being afraid of having to communicate in BM among unfamiliar classmates:

> *"I was very scared because I had to speak in BM. In class, there were only about 11 Indian students. The majority were Malay students. I was very sad because I was the only student from my Primary 6 class who went to my current Form One class. No other friends went to the same class as me. So even though they were Indian students, all of them were new to me." (Rekha)*

Rekha's experience further distinguishes ethnic familiarity from relational familiarity: the presence of other Indian students did not immediately reproduce the security of established friendships. As new relationships developed, however, she began drawing on classmates across ethnic backgrounds for support with BM-medium learning.

Overall, peer relationships functioned as informal linguistic and academic resources during the MOI shift, but their value depended on the accessibility and familiarity of those relationships. Students with readily available peer support drew on classmates for translation and explanation, whereas those entering without established networks described greater initial difficulty. Over time, these networks could expand beyond familiar Tamil-speaking peers , making newly formed cross-ethnic relationships another source of support for BM-medium learning.

Interactions with Secondary-School Teachers

Students' interactions with secondary-school teachers shaped how they sought support when experiencing difficulties with BM-medium learning. While some students felt comfortable approaching teachers for clarification, others became hesitant after interactions they perceived as dismissive or intimidating. Avni, for example, described feeling embarrassed when asking for simpler explanations:

> *"Some teachers get very upset when I ask simple explanations. If the teacher were to say, 'Oh, you do not even know this or understand this?' then I feel embarrassed, and after that, I will rarely approach that teacher." (Avni)*

For Avni, a perceived dismissive response transformed a request for linguistic clarification into an experience of embarrassment, which subsequently discouraged her from seeking help from that teacher.

This reluctance could also be specific to individual teachers rather than reflecting students' relationships with teachers generally. Although Veera described himself as comfortable with most teachers, an early interaction made him afraid to approach his BM teacher:

> *"No, I am not scared of the teachers. But I am scared of my BM teacher because she has been strict since day 1. I was so scared to speak to her after she scolded me for not even understanding a simple thing and asking her a lot of questions." (Veera)*

In contrast, some teachers made clarification more accessible by strategically using Tamil. Karun and Veena described how individual teachers used Tamil to clarify BM-medium content when needed:

> *"Even though my Maths teacher refuses to speak in Tamil to me, my Sejarah [History] and Geography teachers speak in Tamil with me. Whenever I approach them to ask doubts, they are willing to explain in Tamil." (Karun)*

"For example, I have a Maths teacher who is okay with speaking in Tamil. The teaching will be done in Malay but when she gives exercises then I will approach her personally so that I can clarify any doubts in Tamil. So it was very helpful when the teachers are willing to do that." (Veena)

In these accounts, Tamil did not replace BM as the MOI but instead functioned as a supplementary linguistic resource. Importantly, access to this support varied across teachers and subjects, meaning that students could encounter markedly different language practices within the same school.

Teacher support did not always resolve comprehension difficulties. Viha and Reva described turning to peers when uncertainty remained after teachers' explanations, indicating that support during the MOI transition often operated through overlapping rather than isolated sources.

Overall, teacher support was experienced as relational and uneven rather than uniformly available. Particular interactions could discourage further help-seeking, while approachable teachers and the strategic use of Tamil made BM-medium content more accessible. Students therefore navigated support selectively across teachers, subjects and peers, revealing that adjustment depended not simply on the availability of teachers but on how accessible and responsive students experienced that support to be.

Language Challenges and Academic Confidence

For some students, communicative familiarity with BM did not translate into confidence in the academic language required for secondary-school learning. Urvi explained:

"It's tough. Even though I am okay with BM it's difficult for me to understand their vocabularies... they use new words that I have never heard before." (Urvi)

The distinction between conversational and academic BM was also evident in how students experienced familiar subject content. For Rekha, encountering previously learned subjects through BM made that knowledge feel unfamiliar:

"I am struggling to learn Maths, Science and Sejarah [History] in BM... Now we open the textbook and everything is in BM. So almost everything is new learning for me. I am starting from the beginning." (Rekha)

These difficulties extended into assessment. Rekha described understanding teacher explanations but struggling to interpret examination questions, while Urvi became confused when familiar concepts were presented in differently worded questions. Classroom comprehension therefore did not necessarily translate into confidence when students had to independently interpret academic questions in BM.

However, the MOI shift did not account for every academic difficulty. Urvi acknowledged that Mathematics had already been challenging when taught in Tamil:

"I was already struggling with Maths when I learnt in Tamil. So now I'm learning it in BM and trying to remember the formulas. It's tough." (Urvi)

For her, the MOI shift added a linguistic demand to an existing subject-related difficulty.

Despite differing levels of prior exposure to BM and other languages, several students continued to experience Tamil as the easier language for academic learning. Mugi, who had previously encountered core subjects in BM through tuition, explained, "Tamil is easier to learn subjects in... I still think learning subjects in Tamil is a lot easier for me" (Mugi). Urvi similarly associated Tamil

with stronger academic performance. These accounts associated Tamil primarily with familiarity, comprehension and perceived academic competence rather than with explicitly articulated cultural identity tensions.

Overall, students' accounts distinguished general BM proficiency from the academic language demands of BM-medium learning. Difficulties centred on unfamiliar vocabulary, interpreting assessment questions and confidence in academic performance, although these challenges were not attributable to the MOI shift alone. Where students preferred Tamil, this was expressed primarily through familiarity, comprehension and perceived academic competence rather than through explicit identity conflict.

School Supports Across the Transition to Bahasa Melayu as Medium of Instruction

Teachers across both Tamil primary schools and national secondary schools described a range of strategies used to support students transitioning into BM-medium education. Some practices were intentionally implemented to prepare students for BM-medium learning, while others emerged as informal responses to the linguistic difficulties students encountered after transition. Teachers from Tamil primary schools are identified as PT, while secondary school teachers are identified as ST in the findings below.

Linguistic Scaffolding and Classroom Language Practices

Teachers described linguistic support as beginning before students entered secondary school and continuing, although less consistently, after the MOI shift. Tamil primary-school teachers reported initiating conversations about the transition because they perceived students as having limited awareness of what learning academic subjects through BM would involve. PT4 explained:

> *"I always inform my students of the importance of learning and mastering the BM Language. I have informed them numerous times to make them understand the fact that here you are learning BM as a language subject but in secondary you will be learning academic subjects using BM as the MOI." (PT4)*

These discussions reframed BM from a language subject into the anticipated language of academic learning, making preparation for the MOI shift an explicit part of some teachers' practices.

Within primary-school classrooms, teachers differed in how they balanced BM exposure with immediate comprehension. Several described code-switching to Tamil as necessary when students struggled to understand instructions or lesson content. PT10, the Head of the BM Department at one of the participating primary schools, explained:

> *"My teachers cannot fully teach in BM. I advise them to usually translate the lesson in Tamil as they deem fit to ensure the teachers are supporting the students' language understanding in every BM lesson... Of course you cannot conduct 100% or 70% of a BM lesson in Tamil and only the remaining 30% in BM. We are conducting 70% of the class in BM." (PT10)*

In contrast, PT9 deliberately minimised teacher-led code-switching and aimed to conduct more than 90% of BM lessons in BM, preferring students to provide Tamil meanings when clarification was necessary. These contrasting practices reflected different approaches to linguistic preparation: while some teachers prioritised comprehension through multilingual scaffolding, others emphasised sustained BM exposure and reduced reliance on Tamil.

Advance exposure to subject-specific terminology represented another form of preparation. PT3 described systematically introducing BM equivalents during Tamil-medium Science lessons:

"As you know, Science is taught in Tamil in our school. But I do want the students to learn the basic scientific knowledge in BM. So everytime I say a science term in Tamil, I will go through it in BM. This is a repetitive process in the hope that the more students listen to these terms in BM, the more they will remember them, making it easier to learn in Form one later on." (PT3)

A similar anticipatory approach was reported by PT7, who introduced Mathematics concepts and chapter names in Tamil, BM and English from Year 4. Unlike code-switching, used primarily for immediate comprehension, these practices familiarised students in advance with terminology they would later encounter through a different MOI. This was also reflected in students' accounts, with Veera, Rina and Rekha describing prior exposure to multilingual Mathematics terminology as helpful when they encountered the subject through BM in Form One.

At secondary-school level, linguistic scaffolding was less uniformly available. Some teachers encouraged greater use of BM during lessons, while others provided multilingual clarification where their linguistic resources allowed. ST15, for example, used English to clarify mathematical terminology where she considered it more accessible to students. Thus, post-transition linguistic support varied according to individual teachers' linguistic resources and instructional practices.

Overall, linguistic preparation did not take a uniform form. Teachers used different combinations of sustained BM exposure, multilingual clarification and advance exposure to academic terminology, reflecting different attempts to balance students' immediate comprehension with preparation for greater independence in BM-medium learning.

Collaborative and Peer-Supported Learning

Teachers used grouping and peer support to facilitate students' participation in BM-medium learning. Some secondary-school teachers deliberately grouped former Tamil primary-school students with peers more proficient in BM. ST5 explained:

"I used a mixed-race grouping method but I will ensure there is one SK Indian student [an Indian student from a National School] with the SJK T students [students from Tamil National-Type schools] because I want those from SK to help those from SJK T. As time goes by, I think there are some improvements in these students' language proficiency because they are forced to speak in BM." (ST5)

This use of more BM-proficient peers as linguistic support was also evident in ST6's classroom:

"I will mix the SJK T students [students from Tamil National-Type Schools] with them and also will ensure to mix some Malay students with them. So that there is at least one person to explain the instructions to them. That way the students can at least do some work in the class and meet some of their objectives." (ST6)

However, teachers differed in how they viewed mixed-ability grouping. ST8 found that students experiencing greater difficulty could become passive when grouped with stronger classmates:

"Even though I like to use the grouping strategy where we let the highly able students work with poor students, in my experience, those poor ables are still unable to perform. These students just become passengers or passive learners while the remaining teammates do what is needed." (ST8)

ST8 therefore preferred similar-ability grouping, challenging the assumption that placing less proficient students with stronger peers necessarily increased participation. While some teachers viewed stronger peers as linguistic and academic resources, ST8 perceived mixed-ability grouping as potentially reinforcing passivity among students already experiencing difficulty.

Grouping was not confined to secondary school. PT4 reported using both mixed- and similar-ability groupings at primary level depending on the task, indicating that peer-supported learning operated across the transition, although its organisation varied according to teachers' perceptions of students' proficiency and participation.

Overall, peer-supported learning provided additional opportunities for linguistic clarification and classroom participation, but its perceived effectiveness depended on how groups were organised. Rather than functioning as a uniform transition strategy, grouping was adapted according to teachers' judgments about students' proficiency, participation and potential dependence on stronger peers.

School-Based Transition and Language Support

Beyond classroom-based strategies, teachers described several organised initiatives to strengthen students' preparation for BM-medium secondary education. At primary-school level, these included vocabulary-development activities and programmes that provided early exposure to secondary-school content. PT2 described the Kamus Bergerak (Moving Dictionary), in which students encountered BM vocabulary alongside visual and multilingual cues:

> *"Since mine are older students, our Kamus Bergerak [Moving Dictionary] includes a lot of verbs like Menjinjing [to carry something by hand] and Menjunjung [to carry something on the head]. Each tag will contain a word with an image attached to help the students better imagine the word. The tag will also have the English and Tamil translation of the BM word." (PT2)*

The initiative extended language preparation beyond regular classroom instruction by combining repeated exposure to BM vocabulary with visual and multilingual scaffolds.

Eight primary-school teachers also described a former transition programme in which Year 6 students were introduced to selected Form One content after completing the primary syllabus. The programme was intended to familiarise students with secondary-school content and terminology before the MOI shift. PT3 recalled:

> *"It was good for the students. Students used to write the concept and scientific terminologies in BM followed by Tamil. At least, it will be easier for them to revise as they look at what they have written." (PT3)*

Student accounts similarly reflected the perceived value of structured transition exposure, with Viha describing an activity introducing pupils to the secondary-school environment as *"very useful."* However, teachers reported that the Form One preparation programme had subsequently been discontinued following changes to the assessment calendar and curriculum schedule, thereby reducing the time previously available for transition preparation.

At secondary-school level, targeted support appeared more limited. ST10 described additional BM classes in which students received vocabulary modules and additional language practice:

> *"I know my students' BM teacher is giving them some modules to improve their vocabulary in BM. They will call these students to the library to have extra classes. I can now see a slight improvement." (ST10)*

Additional language support was therefore available to some students after transition, although teacher accounts indicated fewer targeted initiatives at secondary-school level than at primary-school level.

Overall, organised school support ranged from vocabulary development and advance exposure to secondary-school content to additional BM instruction after transition. However, continuity across the transition was uneven: some structured primary-school preparation had been discontinued, while targeted support at secondary level appeared more limited.

Structural Constraints on Transition Support

Teachers also described structural and contextual factors that limited the consistency with which transition support could be provided. At primary-school level, these accounts often concerned students' opportunities to reinforce BM learning beyond the classroom. Importantly, these were teachers' perceptions of students' home circumstances rather than independently verified conditions. PT7, for example, perceived irregular attendance as affecting continuity of learning:

> *"It is the parents who hinder their children from attending school. Based on what I hear from students, parents tell their child it's okay to skip school to attend events." (PT7)*

Teachers also perceived limited BM exposure and family circumstances as constraining language development beyond school. PT7 reported that some parents did not encourage BM use at home, while PT4 perceived work demands among some lower-income families as limiting opportunities for academic support. Collectively, these accounts indicate that primary-school teachers viewed preparation for the MOI shift as extending beyond what could be achieved within school hours.

> *"I cannot afford to go slow or teach slowly for these students... There is no win-win situation here. If I were to focus only on these students, the rest will be left out and if I were to focus on the other students, these students who are going through a shift in MOI... will be left out." (ST2)*

ST2's account captures the tension between providing additional support to students experiencing the MOI shift and maintaining the instructional pace required for the wider class. ST4 described a similar constraint in Mathematics, where pressure to complete the syllabus limited the scope for additional transition support.

For some teachers, these pressures resulted in practices that prioritised task completion over comprehension. ST8 explained:

> *"Due to curriculum demands and time constraints, sometimes I have no choice but to get these students to copy the answers or what is written on the board without any understanding. So at the end of the lesson, all they have done is copy." (ST8)*

ST10 reported a similar practice, asking students who could not keep pace with BM-medium lessons to copy notes or answers to provide evidence for school-based assessment. Together, these accounts show how curriculum, assessment and time pressures could shift classroom priorities from comprehension to task completion.

Overall, teachers portrayed transition support as constrained by factors operating both within and beyond the classroom. Primary-school teachers perceived attendance, home-language exposure and family circumstances as shaping students' preparation, while secondary-school teachers emphasised curriculum pace, class size and assessment requirements. Consequently, the support available during the MOI transition often depended on what individual teachers and schools could accommodate within existing institutional demands, rather than on a sustained transition framework..

Discussion

The findings suggest that the shift in MOI extended beyond language adjustment to involve broader academic, emotional and social negotiation. Guided by Bronfenbrenner's EST, the study shows that students' transition experiences were shaped by interconnected influences across classroom relationships, home–school interactions, institutional practices and wider policy structures. Rather than reflecting language proficiency alone, the transition emerged as an uneven ecological process, with access to support varying across contexts and influencing students' adjustment to BM-medium secondary education.

Microsystem Influences: Immediate Relationships, Language Experiences, and Classroom Adjustment

At the microsystem level, students' adjustment to the shift in MOI was shaped by their immediate relationships and classroom interactions. Family members, peers and teachers influenced how students anticipated and responded to the linguistic and academic demands of BM-medium secondary schooling. Curson et al. (2019) similarly identified family and friendship support as central to pupils' experiences of the primary-to-secondary transition. This study extends that understanding by showing that, when the school transition coincides with a change in MOI, the form of support matters alongside its availability. Sustained conversations, practical preparation and exposure to BM were experienced as more useful than general advice about the impending language shift. Readiness for BM-medium schooling was therefore not solely an individual linguistic attribute but was partly produced through the support available within students' immediate environments.

Peers also assumed a specifically linguistic and academic role during the transition. Previous research has associated peer support with more positive adjustment during the primary-to-secondary transition (Virtanen et al., 2020). In this study, peers helped students interpret vocabulary, instructions and subject content, extending their role beyond social reassurance. Such support was not confined to Tamil-speaking friendships; some students drew on Malay and other classmates to access BM-medium learning. Teachers similarly attempted to formalise peer support through mixed-proficiency grouping, although some observed that weaker students could become passive alongside stronger peers. This accords with Tajabadi et al. (2023), who found that collaborative interactions produced stronger outcomes than dominant–passive pairings. These findings suggest that the value of peer support during an MOI transition lies not simply in access to more proficient classmates, but in whether peer interaction enables active linguistic and academic participation rather than dependence.

Teacher support involved both relational and pedagogical dimensions. Students' willingness to seek clarification was influenced by their interactions with individual teachers, indicating that the availability of support did not necessarily mean that students felt able to access it. This is consistent with broader evidence linking supportive teacher relationships with students' adjustment and well-being (Aldrup et al., 2018). Teacher relationships also intersected with language practices. Students valued multilingual clarification when BM explanations were insufficient, while teachers differed in how they balanced Tamil support with sustained BM exposure. Strategic code-switching and translanguaging have been shown to facilitate comprehension and engagement during a shift from mother-tongue instruction to another MOI (Pillay, 2025), although excessive use may reduce target-language exposure and reinforce linguistic dependence (Oyedele et al., 2022). The findings therefore position multilingual clarification as a negotiated form of support: Tamil could provide temporary access to difficult BM-medium content, while sustained BM exposure remained important for developing greater independence in the new MOI.

The findings further distinguish competence in BM as a language from preparedness to learn academic subjects through BM. Although all participants had qualified for direct entry into Form One, some continued to experience difficulty with subject-specific vocabulary, examination questions and

familiar concepts presented through BM. This resonates with Cummins' (2000) distinction between conversational proficiency and the more cognitively demanding language required for academic learning. Soto-Corominas et al. (2020) similarly found persistent differences across dimensions of oral language proficiency among adolescent second-language learners despite several years of schooling. In the present context, meeting the BM requirement for progression into Form One did not necessarily indicate readiness to interpret, learn and be assessed on disciplinary knowledge through BM. This distinction suggests that eligibility for direct transition and academic-language readiness should not be treated as equivalent.

Students' preference for Tamil further reinforces the importance of distinguishing linguistic familiarity from identity-based interpretation: participants primarily associated Tamil with comprehension and perceived academic competence rather than explicitly articulating the MOI shift as an identity conflict. Overall, the microsystem findings demonstrate that immediate relationships shaped the transition not only through emotional support but through access to linguistic explanation, academic clarification and opportunities to participate in BM-medium learning.

Mesosystem Influences: Continuity and Connections Across Learning Contexts

At the mesosystem level, students' transition was shaped by the degree of continuity across the immediate contexts surrounding their learning. The findings suggest uneven alignment between students' language experiences at home and the linguistic demands of secondary schooling. Families differed in how they prepared students for BM-medium education, and students entered secondary school with varying opportunities to use BM beyond school. Research on MOI transitions similarly indicates that differences between learners' existing linguistic resources and the language of schooling can affect learning across the transition (Daly et al., 2023). In the present study, this suggests that MOI adjustment cannot be understood solely through the support available within home or school separately, but through the extent to which students' linguistic experiences across these contexts aligned with the demands of BM-medium learning.

A more pronounced discontinuity occurred between primary and secondary schooling. Primary teachers described deliberate efforts to prepare students through increased BM exposure, introducing subject terminology in multiple languages, and, in some cases, transition-oriented activities. However, comparable linguistic support after entry into secondary school was less systematic and depended more heavily on individual teachers and available school initiatives. Discontinuity between primary and secondary settings is well established in transition research (Prendergast et al., 2019), while Pfenninger and Lendl (2017) specifically demonstrate the importance of continuity in language input and pedagogy across this transition. The present findings extend this issue to an MOI shift: preparation before transition did not necessarily connect with sustained linguistic scaffolding after transition. Thus, students were navigating not only a change in educational setting but also a potential discontinuity between how their linguistic needs were anticipated before transition and how they were supported after it.

Connections between peer relationships and classroom practices provided another form of mesosystem support. Students' informal reliance on classmates for linguistic and academic clarification was, in some classrooms, reinforced by teachers' deliberate use of mixed-proficiency grouping. Teacher and peer support have been shown to make complementary contributions to adolescents' engagement and school adjustment (Kiefer et al., 2015). However, the present findings show that connecting these forms of support was not inherently beneficial; teacher-organised peer support could facilitate participation, but could also reinforce passivity when students became dependent on more proficient classmates. The mesosystem therefore appears consequential not merely because multiple sources of support are present, but because of how effectively they connect across students' learning contexts. Overall, the findings suggest that successful adjustment to an MOI transition depends partly on continuity across home, primary-school and secondary-school experiences, rather than on isolated support within any single setting.

Exosystem Influences: Institutional Conditions Shaping Transition Support

At the exosystem level, teachers' capacity to support students through the MOI transition was shaped by institutional conditions beyond individual classroom interactions. Curriculum demands, class size and limited instructional time constrained opportunities for sustained linguistic support and, in some cases, shifted classroom priorities towards task completion rather than comprehension. The relationship between class size and opportunities for individualised teacher attention is well established (Blatchford et al., 2002). In the present study, these constraints were particularly significant because students adjusting to BM-medium instruction sometimes required additional explanation of vocabulary, instructions and subject content. Support for the MOI transition therefore depended not only on teachers' willingness or pedagogical choices, but also on the conditions that enabled them to respond to students' linguistic needs.

Institutional conditions also affected the sustainability of transition support. School-level initiatives demonstrated recognition of students' language and transition needs, yet some could not be sustained alongside assessment, curriculum and scheduling demands. Mowat (2019) similarly identified organisational and resource constraints as barriers to implementing and sustaining primary-secondary transition support. The present findings show how such pressures can affect support for an MOI transition specifically: institutional recognition of students' needs did not necessarily translate into sustained provision when transition initiatives competed with other school priorities. Consequently, recognition of transition needs at school level did not necessarily produce sustained institutional support, leaving provision more dependent on individual classroom practices.

The availability of linguistic support also varied according to local capacity. Secondary-school support depended partly on teachers' linguistic resources and the initiatives available within particular schools, resulting in uneven opportunities for additional BM or multilingual assistance. Cunningham (2012) similarly reported substantial variation in provision for bilingual learners across schools, linked to differences in resources, funding and teacher preparation. While the present study does not establish the same institutional mechanisms, it demonstrates that students undergoing the same formal MOI transition did not necessarily encounter equivalent forms of support. From an ecological perspective, the exosystem therefore shaped transition indirectly by enabling or constraining what schools and teachers could provide, making institutional capacity an important condition of students' access to sustained linguistic support.

Macrosystem Influences: Language Policy and Expectations of Linguistic Readiness

At the macrosystem level, the MOI transition reflects the wider organisation of language and schooling in Malaysia. Tamil-medium education is available at the national-type primary level, whereas public secondary education operates through the national language (Renganathan & Kral, 2018). Remove Class is formally positioned within this structure as a one-year transitional class for pupils from primary schools where the MOI is not the national language, with BM achievement used to determine progression into Form One. The participants in this study had met the relevant BM requirement and progressed directly to Form One, yet some continued to experience difficulty learning subject content through BM. This suggests an important distinction between meeting a language-based progression criterion and being fully prepared for the academic-language demands of BM-medium secondary schooling.

This distinction is relevant to how linguistic readiness is conceptualised within transition structures. Language proficiency measures may not capture all the language demands of academic learning; in the Malaysian context, Wan Osman (2025) similarly found that standardised language proficiency accounted for only part of the variation in university students' academic reading performance. Although the educational level and language context differ from those of the present study, the broader distinction remains pertinent: demonstrated proficiency in a language does not necessarily encompass the disciplinary language required for academic learning. The present findings

therefore do not question the value of BM proficiency as a progression criterion, but indicate that meeting this criterion does not necessarily eliminate the need for linguistic scaffolding when BM becomes the medium through which subject terminology, disciplinary knowledge and assessment tasks are encountered.

The macrosystem findings therefore locate students' experiences within a structural transition between two established language environments rather than solely within individual language proficiency. For Tamil-medium primary-school pupils progressing directly to national secondary schooling, progression involves a dual transition: a change in educational level alongside a change in the language through which much of the curriculum is accessed. Recognising this dual transition is important because successful progression into Form One does not necessarily mark the completion of linguistic adjustment, particularly as students encounter the academic uses of BM as the new MOI.

Integrating the Ecological Systems: The MOI Shift as an Uneven Ecological Transition

Taken together, the findings show that the transition from Tamil-medium primary education to BM-medium secondary schooling cannot be understood solely as an individual process of language adjustment. Students' experiences emerged through interactions across ecological levels, with immediate relationships, continuity across learning contexts, institutional capacity, and the wider organisation of language in schooling collectively shaping the support available during the transition. The uneven alignment of these influences produced correspondingly uneven experiences of adjustment.

The key contribution of this study is to conceptualise the MOI shift as an uneven ecological transition. Students' capacity to navigate BM-medium learning depended not only on their linguistic preparedness but also on whether support across immediate relationships, educational contexts and institutional conditions aligned during the transition. The unevenness of the transition thus lay not simply in differences between individual learners, but in differences in the support structures surrounding them. This shifts attention from locating transition difficulty primarily within the learner towards understanding how multiple ecological systems collectively enable or constrain adjustment to a new MOI.

Implications

The findings suggest that transition support for students moving from Tamil-medium primary education to BM-medium secondary schooling should extend into the early stages of secondary education. Students who qualify for direct progression to Form One may still benefit from support with academic BM, particularly in subject-specific terminology and assessment demands. Transition planning should therefore consider linguistic adjustment as a continuing process rather than one completed at school entry.

At classroom level, strategic multilingual clarification and carefully structured peer support may provide useful scaffolds as students develop greater independence in BM. At school level, stronger coordination between Tamil primary schools and receiving secondary schools could improve continuity in language preparation and enable secondary teachers to build on support provided before transition. More broadly, recognising MOI transition as an ecological process highlights the need for transition practices that consider students' prior linguistic experiences alongside the classroom and institutional conditions shaping their adjustment. Support should address not only students' entry into BM-medium secondary schooling but also their continued capacity to learn through BM after entry.

Limitations

Several methodological limitations should be considered when interpreting the findings. The study was situated within seven schools in Selangor and involved a purposively defined group of students who transitioned directly from Tamil-medium primary education to Form One, alongside educators from the participating schools. Consistent with the idiographic orientation of IPA, the study prioriti sed contextual depth over statistical generalisability; consequently, the findings should be understood as contextually situated, and their transferability to other Malaysian educational settings requires consideration of local linguistic and institutional conditions. Student data were generated through small-group interviews, which supported shared reflection on transition experiences but may also have shaped individual disclosure through group dynamics. In addition, the study captured participants' experiences within a defined period rather than longitudinally, limiting examination of the chronosystem dimension of EST, particularly how students' linguistic, academic and relational adjustment may evolve over time. Future longitudinal and multi-context research could build on these findings by examining how MOI transition experiences and support develop across different stages and educational settings.

Conclusion

This study advances understanding of medium-of-instruction (MOI) transition by demonstrating that a change in MOI involves more than a shift in the language of instruction. For Tamil-medium primary school graduates entering BM-medium secondary education, the shift changes the linguistic conditions through which academic content is understood, classroom interaction occurs, and participation in learning is negotiated. When this coincides with the transition to secondary school, students must navigate new academic expectations while learning through a different instructional language. MOI transition should therefore be recognised as a distinct dimension of educational transition rather than treated as an incidental consequence of progression between school levels.

The study further contributes by conceptualising MOI transition as an uneven ecological transition. Students' adjustment to a new MOI is not determined by language proficiency alone, but by how linguistic preparedness interacts with the relational, educational, institutional and structural conditions surrounding the transition. This helps explain why formal eligibility to progress directly into Form One did not necessarily correspond with readiness to access academic learning through BM. More importantly, it shifts the analytical focus from perceived linguistic deficits within individual learners towards the conditions that enable or constrain their adjustment to a new instructional language.

This understanding has broader relevance for multilingual education systems in which students move between instructional languages across stages of schooling. Access to the next level of education does not, by itself, ensure access to learning when the language through which that learning occurs also changes. Recognising MOI as an integral dimension of educational transition therefore provides a more nuanced basis for understanding linguistic readiness and the continued support students may require after entering a new educational setting.

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Declaration on the Use of Artificial Intelligence

Generative AI (ChatGPT) was used for language refinement and editorial support during manuscript preparation. All intellectual content, interpretation, analysis and final writing decisions remain the responsibility of the authors.

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A Bibliometric and Thematic Network Analysis of Faculty–Student Mentoring in Undergraduate Medical Education

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Abstract: This bibliometric analysis maps the global research landscape of faculty-student mentorship in undergraduate medical education from 2000 to 2024. Analysing 167 publications from the Scopus database, the study identifies key international trends and thematic network patterns, including professional development, career guidance, and mentor-mentee dynamics across diverse educational contexts. The findings show that scholarly discourse frequently addresses mentorship in relation to educational equity, access, and institutional development within medical training systems. The study highlights growing attention to mentoring in relation to professional development, career progression, diversity, and educational development. It underscores the need for further research to inform context-specific strategies that address equity challenges and formalise mentorship programmes, offering significant relevance for scholars, practitioners, and policy-makers in international medical education.

Keywords*:* mentors, curriculum, physician's role, program development, interprofessional relations

Introduction

Mentorship is widely recognised as an important component of medical education, particularly in the context of increasing complexity in healthcare systems and training environments (Teo et al., 2024). The literature frequently associates mentorship with areas such as academic development, professional identity formation, career planning, and psychosocial support (Frei et al., 2010; Preovolos et al., 2024; Sambunjak et al., 2006, 2010). Mentoring relationships are also commonly discussed in relation to supporting students through key transitions, including entry into medical school and progression into clinical training (Preovolos et al., 2024). In response, many institutions have introduced structured faculty–student mentorship programmes within undergraduate medical education (Mubuuke et al., 2020).

The concept of faculty–student mentoring has evolved from informal relationships to more structured, institutionalised programmes, reflecting broader shifts in educational priorities and an increasing emphasis on holistic development (Akinla et al., 2018; Fornari et al., 2014; Frei et al., 2010). In medical education, mentoring is characterised by a dual focus on professional formation and psychosocial support within complex, high-stakes learning environments (Sambunjak et al., 2010; Skjevik et al., 2024). Prior scholarship highlights the adaptive, context-dependent nature of mentoring systems, shaped by interpersonal, institutional, and cultural factors (Kalén et al., 2010;

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Sambunjak et al., 2010). Ongoing discussions also address variations in mentoring models, including formal, informal, peer, and virtual approaches, particularly following shifts during the COVID-19 pandemic (Bishop et al., 2023; Farrukh & Hoor, 2022).

Literature Review

Studies on Mentoring in Medical Education

Despite increasing scholarly attention, research on mentorship in undergraduate medical education remains fragmented. Existing studies have examined diverse aspects such as research engagement, equity, and well-being, but findings are dispersed across methodological approaches. Most prior reviews have been systematic, narrative, or scoping in nature, with limited application of bibliometric techniques (Appendix A). Previous work has documented four main thematic areas. First, studies examining programme models, e.g. group-based mentoring, and their outcomes (Fornari et al., 2014; Frei et al., 2010; Skjevik et al., 2020). These reviews collectively indicate that while mentoring is widely endorsed, evidence-based effectiveness remains limited by heterogeneity in programme design and outcome measurement. Second, peer and near-peer mentoring as an alternative or complement to faculty mentoring, which may support transition and academic adjustment (Fornari et al., 2014; Frei et al., 2010; Akinla et al., 2018; Preovolos et al., 2024). Third, the growing literature examining equity in mentoring, especially for underrepresented groups (Farkas, Allenbaugh, et al., 2019; Farkas, Bonifacino, et al., 2019; Feeley et al., 2024; Shen et al., 2022). Fourth, mentor training and preparation, identifying approaches, providing practical guidance, and aligning mentor-mentee expectations (Hee et al., 2020; Ramani et al., 2006; Sheri et al., 2019).

However, bibliometric analyses in this area remain scarce, particularly those focusing on faculty–student mentoring in medical schools, as shown in Appendix B. This gap limits a comprehensive understanding of research trends, influential contributors, and thematic developments within the field. Mentorship research also intersects with broader discussions on educational equity, workforce development, and academic socialisation (Chua et al., 2020), including efforts to address disparities in access to professional opportunities (Feeley et al., 2024).

Knowledge Production and Transferability in International and Comparative Education

Bibliometric findings raise comparative questions about whose knowledge is most visible, how mentoring models transfer across contexts, and what conditions shape adaptation. Comparative education offers conceptual resources for interpreting these patterns, particularly because educational policies and practices do not simply transfer across national boundaries but undergo translation, adaptation, and legitimisation, emphasising selective borrowing (Phillips & Ochs, 2004; Steiner-Khamsi, 2016). Hence, models developed in well-resourced settings often assume protected faculty time, formal coordination, manageable student groups, and established networks. Where these conditions do not hold, transfer requires careful attention to local institutional, cultural, and professional contexts.

A second comparative concern is the geopolitics of knowledge production, in which Global North institutions and English-language publications dominate international databases (Demeter & Goyanes, 2021). Consequently, bibliometric analyses in mentoring research may overrepresent research from well-resourced settings and under-represent scholarship from low- and middle-income countries, offering limited insight into contexts with different institutional capacity, faculty availability, and educational resources. This may reinforce knowledge hierarchies when partners from underrepresented settings are treated as sites for implementation rather than as sources of knowledge (Shiyama et al., 2026).

The Present Study

There are three key gaps to address. First, research on mentoring programme design, outcomes, and challenges remains fragmented across systematic, scoping, and thematic reviews, with different focuses and methodological approaches. Second, existing bibliometric analyses have not focused specifically on faculty–student mentoring in undergraduate medical education, leaving unanswered questions about publication trends, influential contributors, and thematic patterns in this field. Third, to our knowledge, the international distribution of mentoring research and its implications for transferability and contextual adaptation have not been systematically examined from a comparative education perspective.

Therefore, there is a need to systematically map the structure and evolution of research on faculty–student mentoring in undergraduate medical education. This study employs a bibliometric approach to analyse publication trends, key contributors, and thematic patterns in the literature. The research addresses the following questions: (1) What are the publication trends in this field over time? (2) Which institutions and countries are most active, and how do these patterns vary? (3) Which keywords and themes are most frequently used, and how have they evolved? (4) What thematic structures emerge from co-occurrence analyses of terms?

Bibliometric analysis offers a systematic approach to mapping research trends and identifying knowledge gaps by examining publication patterns, citation networks, and keyword relationships (Maggio et al., 2021). This method enables the visualisation of a field's intellectual structure, clarifying how faculty–student mentorship is represented in medical education research and highlighting areas for future investigation.

Methods

Data Search

This bibliometric analysis investigated trends in research on faculty-student mentorship in undergraduate medical education. We followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) reporting guidelines, adapted for bibliometric analysis to ensure transparent identification and screening of records (Page et al., 2021). We collected data from the Scopus database, a well-regarded source of peer-reviewed publications, on 26th November 2024. Scopus was selected for its broad coverage of peer-reviewed scientific content, including a substantial medical education literature (Baas et al., 2020). The keyword search strings used were as follows: (mentor* PRE/3 medical AND students) OR (mentor* PRE/3 undergraduate AND medical AND education) OR (mentor* PRE/3 medical AND school*) OR (mentor* PRE/3 medical AND training) OR (mentor* PRE/3 medical AND curriculum) OR (mentor* PRE/3 mbbs) OR (mentor* PRE/3 md) OR (mentor?mentee* PRE/3 medical AND students) OR (mentor?mentee PRE/3 undergraduate AND medical AND education) OR (mentor?mentee PRE/3 medical AND school) OR (mentor?mentee PRE/3 medical AND training) OR (mentor?mentee PRE/3 medical AND curriculum) OR (mentor?mentee PRE/3 mbbs) OR (mentor?mentee PRE/3 md) in TITLE-ABS-KEY. In total, we identified 567 documents from the Scopus database for our initial dataset.

Data Screening

Two co-authors independently screened the dataset to ensure relevance and accuracy, as shown in Figure 1.

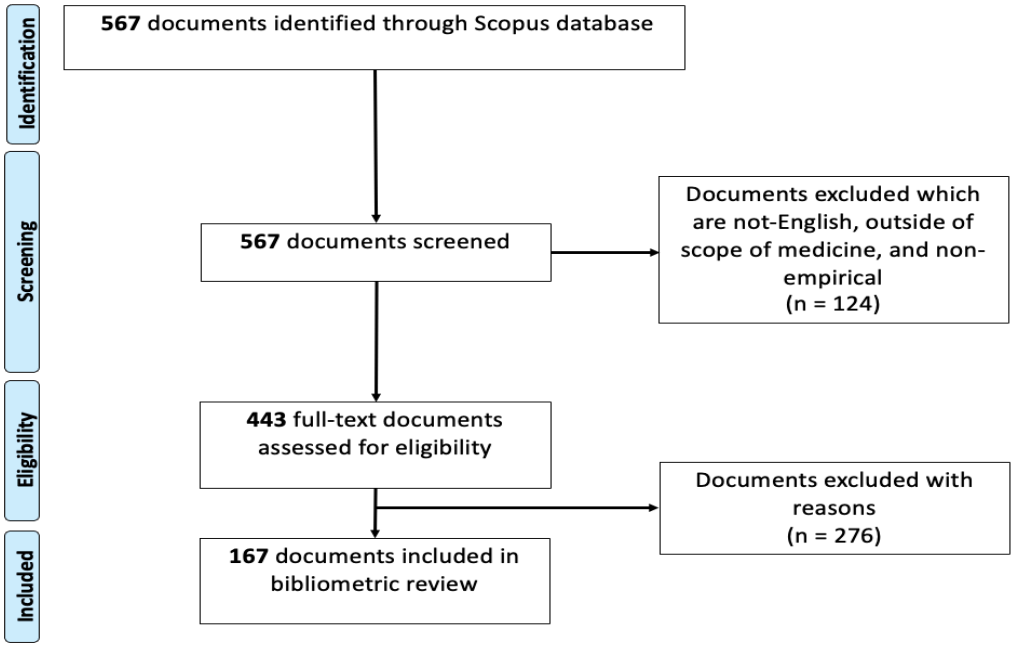


Figure 1. PRISMA Flow Chart for Bibliometric Analysis of Faculty-Student Mentoring in Undergraduate Medical Education

Discrepancies were resolved through negotiation. Duplicates and publications outside the scope of medicine, e.g. nursing, business, and engineering, were excluded, reducing the number to 499. We also excluded non-empirical materials such as technical reports, letters, and editorials, leaving 460 publications. We then restricted the dataset to English-language publications, further narrowing it to 443. The inclusion and exclusion criteria are listed in Table 1 below. The remaining 443 records were screened against the predefined population, educational level, mentoring relationship, publication period, and document eligibility criteria, resulting in 167 documents for the final analysis. We included articles from 2000 onwards, a period during which structured, formalised mentorship programmes began gaining global traction in medical education, as reflected in the growing literature from this period (Farahani et al., 2021; Rambaree, 2018). The dataset was exported from the Scopus database in comma-separated values (.csv) format for further analyses.

Table 1. Inclusion and Exclusion Criteria for Bibliometric Analysis of Faculty-Student Mentoring in Undergraduate Medical Education

Inclusion criteria	Exclusion criteria
Original articles, reviews, conference proceedings, books.	Non-empirical materials such as technical reports, letters and editorials, abstract only with no full article available
English articles	Non-english documents without english translation
Investigate undergraduate medical students	Non-medical population
Documents published between 2000 to 2024	Before 2000 or after 2024
Documents focusing on faculty-undergraduate student mentoring in medical school including one-to-one/didactic, group, informal, formal or structured mentoring	Documents focusing on post-graduate mentoring, or peer/near-peer mentoring only

Data Analyses

Data analyses and visualisation of the dataset were conducted using several bibliometric tools, including Scopus analyser, VOSviewer version 1.6.20 (http://www.vosviewer.com), Bibliometrix (http://www.bibliometrix.org), an R-based package for quantitative bibliometric analysis, and the web interface Biblioshiny (Aria & Cuccurullo, 2017; van Eck & Waltman, 2010). The .csv file was imported into VOSviewer and Bibliometrix. These tools supported the identification of keyword patterns, keyword co-occurrence, citation trends, and thematic network analysis and visualisation to explore research connections and patterns.

Keyword co-occurrence analysis was conducted using VOSviewer to identify major conceptual groupings and thematic structures within the literature, combining quantitative keyword co-occurrence analysis with interpretive examination of the resulting clusters (Farahani et al., 2021; Rambaree, 2018). Synonyms and singular/plural forms were harmonised to standardised keywords. This visualised structure illustrates how themes such as professional development, diversity, and academic performance are interlinked within the literature. The resulting dataset provided a clear basis for understanding relationships and thematic network areas within the literature, offering insight into how mentorship is represented in medical education research. The minimum number of keyword co-occurrences was set at 5 at full counting. The threshold was selected to retain recurring terms while limiting very low-frequency associations; alternative thresholds may yield somewhat different cluster structures. The selected keywords were verified to preserve only relevant terms. Generic terms (e.g. humans), situational terms (e.g. COVID-19), overly specialty-specific terms (e.g. orthopaedics), regional terms (e.g. United States (US)), indexing-related terms (e.g. Medline), and technical terms (e.g. organisation) were excluded from final analyses. To ensure the trustworthiness of the results generated by VOSviewer, the co-authors cross-examined the thematic network clusters. Discrepancies were resolved through discussion.

Results

Publication Trends and Citation Profiles

We retrieved a total of 145 articles (86.8%), 19 review papers (11.4%), one book chapter (0.6%) and one conference proceeding (0.6%) from 94 sources (journals and books). The average age of the documents is 6.62 years. The documents were written by 810 authors, with an average of 5.06 co-authors per document. Of these, ten authors single-authored some documents. Multi-national co-authorship, defined as a publication containing author affiliations from two or more countries, accounts for 9.1% of the documents.

By subject area, the majority of publications on faculty-student mentorship in medical schools were in Medicine (77.0%) and Social Sciences (52.0%). Other subject areas included Health Professions, Psychology, multidisciplinary, and others. In general, the number of publications has steadily increased since 2000, as shown in Figure 2. Between 2000 and 2010, the number of publications fluctuated between 0 and 5 per year. From 2010 to 2019, the number increased to a range of 6-10, with a decline in 2014 (n=3). Since 2020, the number has risen steadily to more than ten per year, with a peak of 21 publications in 2023.

As of the time of analysis, these documents had been cited 38,384 times in total. The most-cited document was a systematic review of types, objectives, and effects of mentoring programmes for medical students, with 313 citations (Frei et al., 2010). This was followed by a review of the types, goals, effectiveness, and efficiency of structured mentoring programmes among medical students and doctors, with 170 citations (Buddeberg-Fischer & Herta, 2006). The third most-cited publication offered tips for developing effective mentors, with 145 citations (Ramani et al., 2006).

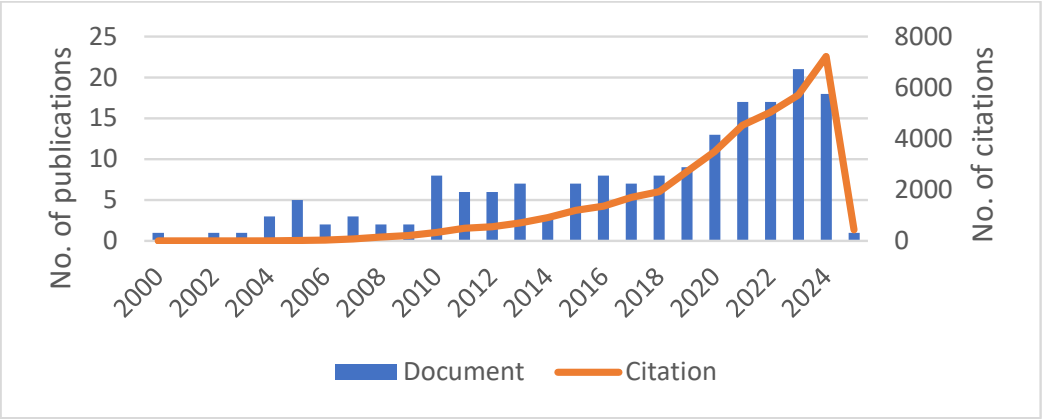


Figure 2. Number of Publications and Citations per Year from 2000 to 2024

Source: Authors

Countries and Institutional Contributions

In total, authors from 25 countries published on this topic. The country with the highest number of publications was the US (97), followed by the United Kingdom, Germany, Sweden and Canada (Appendix C). In parallel, the US also dominated citation impact, with 85 cited publications and a total of 2359 citations. Sweden recorded the highest citation-per-publication ratio (28.5) among the countries represented in the dataset, although this estimate should be interpreted cautiously given its smaller publication volume (n=8). Notably, all publications from Sweden were affiliated with Karolinska Institutet, which was also the institution with the highest affiliation in this field.

As illustrated by the collaboration map (Appendix D), where blue shades denote national publication volume and brown line thickness represents cross-country co-authorship, very few inter-country collaborations were recorded. The highest level of collaboration was between Singapore and the United Kingdom, with five publications, followed by Canada-Norway and Sweden-Norway, each with two publications. Meanwhile, other countries, such as the United Kingdom, Germany, and Australia, recorded one international collaboration each.

Keyword Analysis

A total of 856 keywords were used by authors across these publications. The frequency of authors' keywords is shown in Appendix E. In line with our search terms used to identify the documents, the top keywords revolve around "mentoring", "mentorship", "medical student", "medical students", and "mentor". However, several emerging keywords are specialty-based, such as "surgical education", "surgery", and "neurosurgery"; role of mentoring, e.g. "career choice", "professional development", and "diversity"; and further training, such as "residents" and "residency". Although less frequent, these emerging keywords indicate that the topic extends into specialty training, career development, and diversity-related discussions.

Thematic Co-occurrence Analysis

Of the 856 keywords identified, 123 met the inclusion threshold. In the network visualisation (Figure 3), node size represents frequency, link strength indicates co-occurrence, and colours denote clusters of related terms. Three central, frequently co-occurring terms were "mentorship," "mentoring," and "medical students," forming the core of the network. Although closely related, "mentorship"

and "mentoring" appear in distinct clusters, suggesting variation in their use within the literature. Because the analysis is based on author-supplied keywords, the resulting clusters reflect patterns of terminology and conceptual associations in the indexed literature rather than definitive boundaries between mentoring practices.

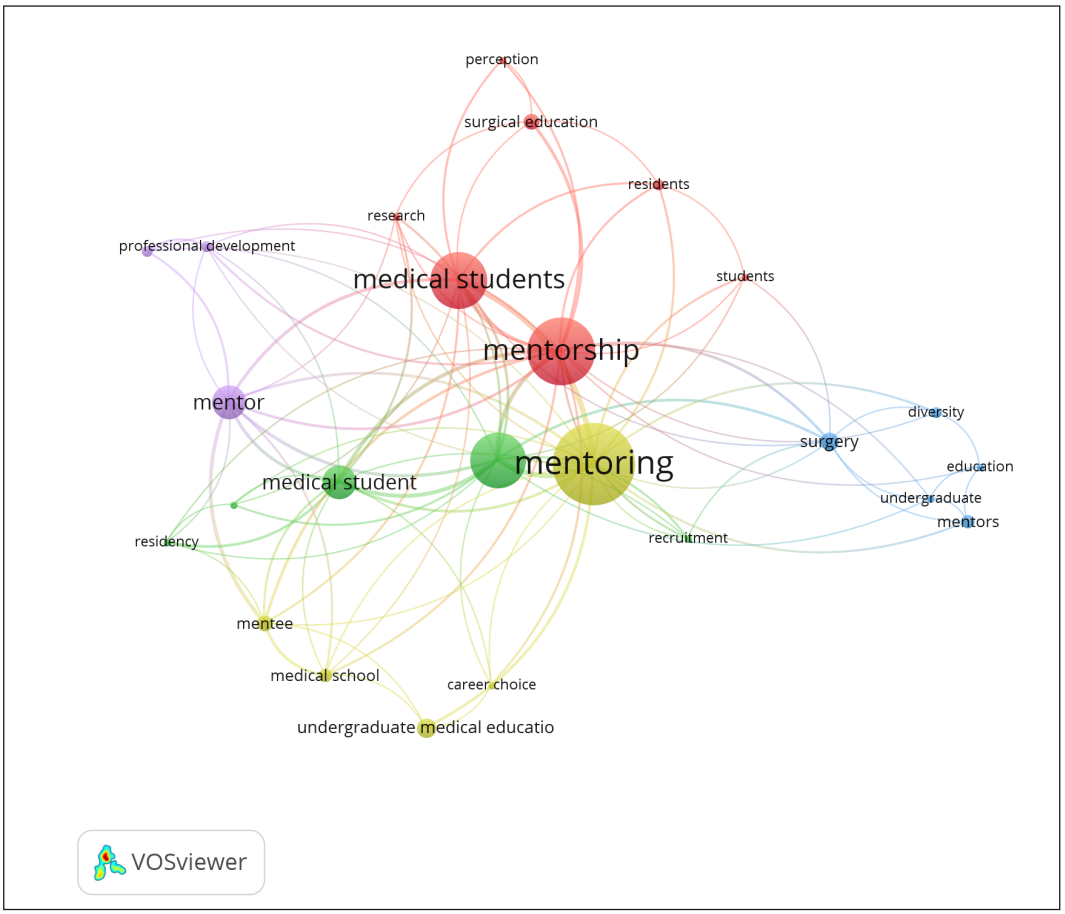


Figure 3. Co-occurrence Analysis of Author Keywords

Source: Image generated using VOSviewer software

Five clusters were identified. The first cluster (red) groups terms related to mentorship, medical students, research, and residency, reflecting associations with academic and specialty-related contexts. The second cluster (green) includes mentoring, recruitment, and residency, reflecting associations with career pathways. The third cluster (purple) centres on mentorship and professional development, highlighting the mentor–mentee relationship. The fourth cluster (blue) includes education, diversity, and surgical fields, indicating links between mentoring and educational contexts. The fifth cluster (yellow) focuses on mentees, career choice, and undergraduate medical education, reflecting transitions into residency. Overall, the clusters demonstrate interconnected themes across mentoring, career development, education, and diversity within medical education research.

Co-occurrence Terms

The co-occurrence term network (Figure 4) illustrates relationships between key terms across the dataset, with node size indicating frequency and links indicating co-occurrence strength. Three major

clusters were identified. The red cluster comprises terms related to medical education processes and training frameworks. The green cluster reflects career-related themes, including speciality and survey-based research. The blue cluster captures perceptual and response-based terms, indicating a focus on feedback and evaluative approaches. These clusters broadly represent methodological, career-oriented, and perception-based dimensions within the literature.

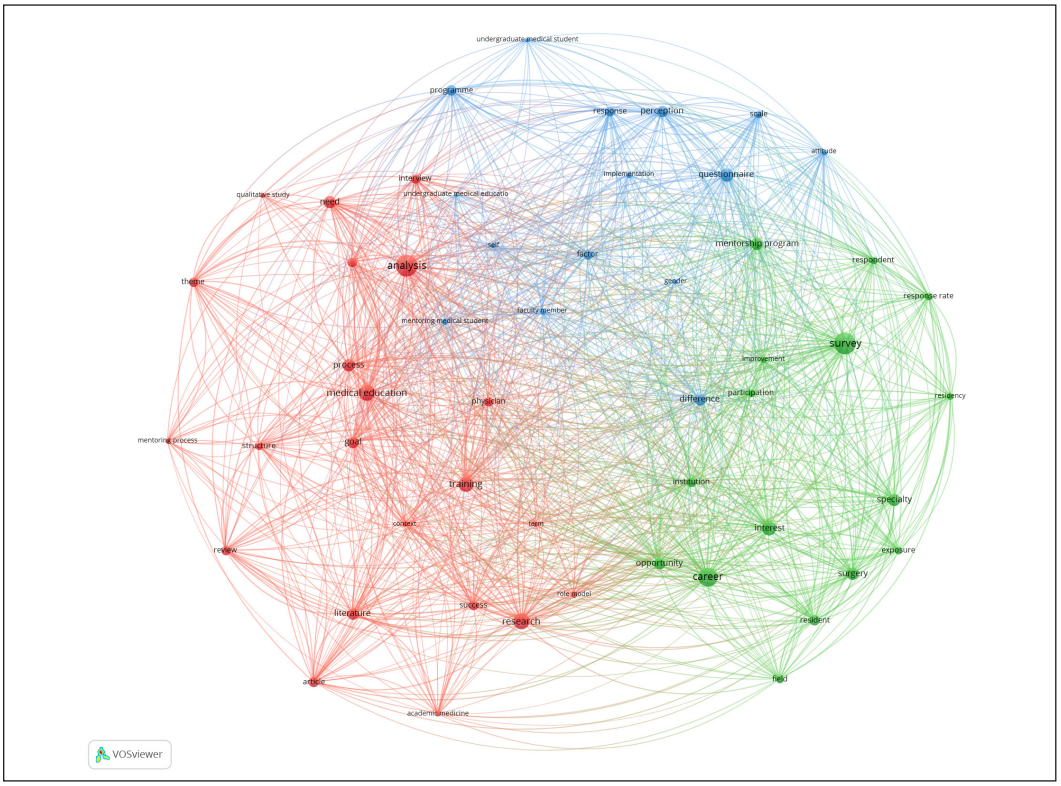


Figure 4. Analyses of Co-occurrence Terms

Source: Image generated using VOSviewer software

Discussion

Global growth and uneven knowledge base on faculty–student mentoring

The growth of scholarship on faculty–student mentoring suggests that mentoring has become an increasingly visible area of medical education research. More importantly, the thematic breadth of the literature indicates that mentoring is increasingly linked to professional development, career progression, diversity, educational development, and transitions through medical training, consistent with earlier scholarship that described mentoring as a multidimensional component of medical education (Kalén et al., 2010; Sambunjak et al., 2010).

The geographical distribution of the literature, however, presents a more complex picture. Research output is concentrated in a relatively small number of countries, with the US accounting for the largest share of publications, while countries such as Sweden contribute fewer publications yet demonstrate comparatively high citation visibility. This contrast suggests that research productivity and scholarly influence do not necessarily develop in parallel. More importantly, it raises a question about whose knowledge becomes most visible within the international mentoring literature. The

geographical concentration should not be interpreted as evidence that mentoring is less developed in countries with fewer publications. Rather, it reflects the distribution of indexed scholarship and may be influenced by structural and contextual factors discussed below. Previous work on mentoring and international research environments similarly highlights the importance of institutional and contextual conditions, including cultural and linguistic diversity, research capacity, networking, and the practical constraints affecting research development (Oikarainen et al., 2018; Olopade et al., 2018). Because this study analysed English-language publications indexed in Scopus, the observed geographical pattern should therefore be understood as the distribution of visible research rather than the distribution of mentoring practices worldwide.

From a comparative education perspective, this pattern reflects what has been described as the geopolitics of knowledge production, namely the dominance of high-income countries in global academic publishing (Demeter & Goyanes, 2021). In parallel, international research partnerships often reproduce rather than challenge knowledge hierarchies, with scholars from well-resourced institutions occupying positions of visibility and authority (Shiyama et al., 2026). Consequently, the international evidence base on mentoring is likewise a product of unequal opportunities to produce, publish, and circulate educational knowledge. The underrepresentation of resource-constrained settings in scholarly networks has likewise been recognised in studies examining mentorship capacity and academic development in low- and middle-income countries (Nakanjako et al., 2011; Noormahomed et al., 2019).

From Knowledge Production to Transferability Across Educational Systems

Much of the literature remains closely tied to national or institutional contexts, while only a small proportion of publications involve multinational co-authorship. This pattern does not necessarily signal a weakness in individual studies; rather, it suggests that opportunities to examine mentoring comparatively across educational systems remain limited. Mentoring scholarship has long recognised the influence of local educational, professional, cultural, and interpersonal contexts on how mentoring relationships are developed and experienced (Oikarainen et al., 2018; Pérez-Martinot, 2024).

The comparative education literature on policy borrowing provides a framework for understanding why transferability requires careful consideration, as it involves complex dynamics of translation, adaptation, and legitimisation rather than being straightforward (Phillips & Ochs, 2004). Furthermore, borrowing involves selectively extracting educational practices embedded in specific institutional and cultural contexts, which are then adapted to local circumstances (Steiner-Khamsi, 2016). Mentoring may involve broadly transferable principles, while the conditions under which those principles are enacted can differ substantially. Faculty availability, student numbers, workload, institutional hierarchy, programme structure, professional expectations, and access to career networks may all influence how mentoring is organised and experienced. Earlier research has similarly emphasised the importance of mentor preparation, institutional support, and clearly defined mentoring structures in determining how mentoring relationships function (Mubuuke et al., 2020; Ramani et al., 2006).

The cases below illustrate how these conditions vary. In Sweden, mentoring research is closely associated with Karolinska Institutet, the institution with the most publications and the highest citation-per-publication ratio in the present dataset. Longitudinal mentoring has been examined as part of professional development during clinical training (Kalén et al., 2010). In Singapore, the National University of Singapore is among the most active institutions and accounts for the strongest international collaboration in the dataset, with the United Kingdom, suggesting a mentoring research agenda embedded in international networks. By contrast, studies from Uganda and Mozambique describe mentoring in settings where limited faculty capacity, competing workloads, and constrained research infrastructure shape what mentoring can be provided (Mubuuke et al., 2020; Nakanjako et al., 2011; Noormahomed et al., 2019). These cases suggest that similar mentoring aims may be

pursued under very different institutional conditions, making transferability an empirical question rather than an assumption.

A mentoring model developed within a highly resourced medical school may assume protected faculty time, formal programme coordination, manageable student groups, and established professional networks. These assumptions may not hold in institutions with larger student cohorts, faculty shortages, or different organisational structures. Evidence from resource-limited academic settings shows that limited institutional capacity and competing professional demands can shape mentoring provision (Bhatia et al., 2013; Nakanjako et al., 2011). The issue, therefore, is not whether one system is a "better" mentoring model, but whether the conditions that support a particular model are understood when it is transferred elsewhere.

This has important implications for comparative education. International mentoring research should move beyond identifying successful programmes towards examining the conditions for transferability. Comparative studies could ask which elements of mentoring are broadly applicable across contexts and which need to be adapted to local institutional, cultural, and professional conditions. Such an approach would reduce the risk of treating mentoring frameworks developed in highly represented countries as universal solutions.

Mentoring as a Multidimensional Educational Practice

The thematic network offers further insight into why transferability requires careful consideration. The co-occurrence patterns link mentoring to multiple themes. Rather than representing unrelated applications, these themes indicate that mentoring serves several interconnected functions within medical education. Mentoring appears to sit between the formal curriculum and informal professional socialisation. Students encounter formal teaching, assessment, clinical training, and institutional requirements, while mentoring may provide a space in which they interpret these experiences, develop professional identities, understand expectations, and consider future career pathways (Frei et al., 2010; Kalén et al., 2010; Sambunjak et al., 2010).

The prominence of career- and transition-related themes is therefore significant. It suggests that mentoring is often situated within the broader educational trajectory from undergraduate study to postgraduate training, rather than treated as a separate student-support activity. This aligns with the literature on mentoring in relation to career planning, residency transitions, professional development, and near-peer support (Akinla et al., 2018; Preovolos et al., 2024).

At the same time, the presence of diversity and equity-related themes indicates that mentoring is also connected to questions of participation, access, and professional opportunity. Studies of structured mentoring programmes have described mentoring as a means of supporting students from underrepresented groups and addressing barriers to educational and professional progression (Farkas, Bonifacino, et al., 2019; Feeley et al., 2024). However, the bibliometric evidence does not establish the effectiveness of mentoring in addressing these inequalities. Rather, it shows that equity and diversity have become part of the conceptual space in which mentoring is discussed.

The literature also highlights functions beyond academic guidance. In some contexts, mentoring is discussed in relation to psychosocial support, professional values, moral development, and students' sense of belonging (Bhatia et al., 2013; Ismawi et al., 2026; Nebhinani et al., 2020). This broader framing is particularly relevant to international and comparative education, as the balance among academic, professional, psychosocial, and relational functions may vary with educational structures and cultural expectations.

The diversity of themes therefore shows that what constitutes an important mentoring function in a particular educational system depends on how that system organises professional socialisation, career guidance, student support, and transition into postgraduate training. A function central to mentoring in one setting may already be supported by other institutional structures in another. This supports the view of mentoring as a multidimensional educational practice, whose meaning is partly shaped by context.

Equity, Resource Constraints, and the International Evidence Base

The geopolitics of knowledge production also has implications for equity (Demeter & Goyanes, 2021; Shiyama et al., 2026). Because disproportionate scholarship on mentoring is generated by a limited number of well-resourced research environments, the literature may provide relatively little insight into how mentoring operates where institutional capacity, faculty availability, and educational resources differ. This highlights a gap in research representation rather than an absence of practice, and may reflect differences in research funding, publication opportunities, language, database indexing, institutional research priorities, or access to international scholarly networks (Noormahomed et al., 2019; Olopade et al., 2018). Studies from resource-constrained settings have also documented challenges associated with faculty workload, limited institutional support, and the development of sustainable mentoring capacity (Bhatia et al., 2013; Mubuuke et al., 2020).

At the same time, the literature indicates that mentoring arrangements can take various organisational forms. Near-peer, group-based, and other alternative approaches have been explored where conventional faculty-to-student arrangements may be difficult to sustain because of faculty availability or programme structure (Akinla et al., 2018; Farrukh & Hoor, 2022). These approaches should not be automatically characterised as universally scalable or cost-effective; rather, they illustrate how mentoring structures may be adapted to particular institutional conditions.

For international education scholarship, this distinction is significant. A globally relevant evidence base for mentoring requires not only more studies from underrepresented regions but also greater attention to locally defined priorities. More equitable collaboration would involve jointly defining research questions, recognising contextual expertise, and examining whether the assumptions underlying established mentoring models remain appropriate across different educational environments.

From Universal Models to Context-Sensitive Policy

Taken together, the findings suggest that the key policy challenge is to determine what constitutes an appropriate mentoring arrangement in particular educational contexts. This distinction is central to comparative education because it shifts attention from simple policy transfer to contextual adaptation.

The increasing visibility of mentoring research also aligns with broader educational concerns regarding inclusive and equitable access to quality education, including the principles articulated in Sustainable Development Goal 4 (Tatto, 2021). However, the bibliometric evidence should not be interpreted as demonstrating that mentoring has become a universally established component of educational quality assurance. Rather, the increasing attention to structured programmes, equity, professional development, and career progression suggests growing interest in institutionalising mentoring within medical education (Skjevik et al., 2020).

Institutional policies can provide structures, expectations, faculty development, and mechanisms for monitoring mentoring provision, but formalisation alone does not guarantee meaningful or equitable mentoring. Implementation needs to consider faculty workload, student numbers, institutional capacity, access to mentors, professional hierarchies, and the particular purposes assigned to mentoring. Previous studies of mentoring capacity in resource-constrained settings reinforce the importance of institutional support and feasible programme structures (Nakanjako et al., 2011; Noormahomed et al., 2019).

A more equitable research agenda would therefore involve researchers from underrepresented settings as partners in defining research questions, evaluating mentoring models, and interpreting findings. This would help move the field away from one-directional transfer of established models and towards reciprocal knowledge exchange in which local educational priorities are treated as sources of knowledge rather than simply as sites for implementation.

This principle of contextual adaptation is also evident in national policy contexts. For example, the human-centred orientation associated with the Falsafah Pendidikan Kebangsaan and the Malaysia MADANI framework offers a relevant policy context for considering mentoring as part of broader student development and relational educational practices (Iskandah et al., 2025). This should be understood as a contextual illustration rather than an empirical finding generated by the bibliometric analysis.

Similarly, the Malaysian Qualifications Agency's national standards provide a policy context in which faculty development and institutional quality assurance can be considered alongside mentoring provision (Malaysian Qualifications Agency, 2025). This illustrates the broader comparative principle that international evidence may be most useful when it is critically adapted to national educational priorities, institutional structures, and cultural expectations.

The international mentoring literature can therefore contribute to policy development by identifying recurring functions such as academic guidance, professional development, career support, psychosocial support, and professional socialisation while comparative research can examine how these functions are organised differently across educational systems. The international mentoring literature can therefore inform policy development by identifying recurring functions, including academic guidance, professional development, career support, psychosocial support, and professional socialisation. Comparative research can then examine how these functions are organised differently across educational systems. The value of international comparison lies not in identifying a universally superior model, but in understanding how mentoring can be meaningfully adapted across different educational environments. in understanding how mentoring can be meaningfully adapted across different educational environments.

Limitations and Future Research

Several limitations should be considered when interpreting these findings. First, the analysis relied on Scopus as the sole bibliographic database and may therefore have missed relevant publications indexed elsewhere. Second, the inclusion of English-language publications may have under-represented non-English-speaking educational contexts. These limitations are particularly important given that the study's central contribution concerns the international distribution and visibility of mentoring research.

Third, bibliometric analysis identifies patterns of publication, citation, and thematic association, but it cannot establish how mentoring programmes operate in practice or whether particular models yield better educational outcomes. Keyword co-occurrence can reveal conceptual relationships within the literature, but it does not, on its own, demonstrate differences in mentoring practices between countries or regions.

Future research should therefore move from mapping the field towards examining how mentoring works, for whom, under what conditions, and with what degree of transferability across educational systems. Comparative and mixed-methods studies could investigate mentoring programmes across different institutional and resource contexts, while longitudinal research could examine relationships with professional identity formation, career decisions, postgraduate transitions, and student participation. Such work would complement existing evidence concerning mentoring, professional development, peer support, and student transitions (Akinla et al., 2018; Preovolos et al., 2024).

Greater cross-country collaboration would enable researchers to distinguish between mentoring features that appear consistently across contexts and those that are context-dependent. Importantly, such collaboration should involve researchers from currently underrepresented settings as partners in defining research priorities and interpreting evidence, thereby building a more representative international evidence base. Overall, this study maps an expanding but uneven international research landscape and demonstrates why mentoring should be understood as an educational practice whose functions, implementation, and meaning are shaped by context. The next stage of scholarship should

therefore place greater emphasis on comparative evidence, contextual adaptation, and reciprocal international knowledge exchange.

Conclusion

In conclusion, this bibliometric analysis highlights research trends in faculty-student mentorship in undergraduate medical education. Despite the growing number of publications, the study found underrepresentation of studies from developing countries and limited international collaboration. Future research could explore how these elements interact over time and across different medical education systems, examining how these themes evolve and how access is discussed for diverse groups. Another underexplored area concerns regional disparities in mentoring within medical schools and their implications for cross-context collaborations.

Note

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Declaration on the Use of Artificial Intelligence

During the preparation of this manuscript, the authors manually conducted all data collection, screening, bibliometric analyses, and methodological interpretations. Generative artificial intelligence tools were used solely for literature searches, writing assistance, editing, and structural revisions. Specifically, Scopus AI was used to identify up-to-date and relevant literature. ChatGPT was used to organise paragraphs and ensure academic flow based on the original content, to perform language editing, and to organise points in response to reviewers' queries, which the authors then reviewed and finalised for accuracy. Gemini was used to suggest ways to consolidate text, reduce word counts, and optimise the reference list. Following the use of these tools, the authors thoroughly reviewed, edited, and verified the entire manuscript, taking full responsibility for the final content of the publication

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Appendix A. Summary of Previous Review on Faculty-Student Mentoring in Medical Schools

Type of review (Reference)	Search terms	Data source	No of documents	Attributes examined
Systematic (Skjevik et al., 2020)	(Mentor OR Mentors OR Mentoring OR Mentorship OR Physician apprenticeship) AND (Education OR Medical/ and education OR medical undergraduate OR (medical ADJ3 student*) OR (medical ADJ3 undergraduate)	Ovid MEDLINE, EMBASE, PsycINFO and ERIC	20	Aims, structures, contents and program evaluations group-based mentorship programs for undergraduate medical students.
Systematic (Farkas, Allenbaugh, et al., 2019)	Not disclosed	PubMed, PsycINFO, Education Resources Information Center, and Cochrane Databases of Systematic Reviews	30	Models of mentorship for US medical students.
Systematic (Feeley et al., 2024)	Ment,*" "Medical student," "undergraduate medical education," "Underrepresented minorities," "URM," "URG," "UIM," "underrepresented in Medicine," "URiM," "minorit,*"	PubMed, Ovid Medline, and EMBASE	17	Impact of mentoring programme on underrepresented groups in undergraduate medical education
Scoping (Preovolos et al., 2024)	medical student*, peer mentor* and medical education	Medline, ERIC, EMBASE, Web of Science, WorldWideScience and the British Library	20	Peer mentoring among medical students benefits, elements for success and challenge
Systematic (Akinla et al., 2018)	peer, buddy, mentor∗, counsel∗, advise∗, tutor∗, student, medical, school	PubMed, Embase, Scopus, ERIC, Ovid, PsycINFO, and the Cochrane Highly Sensitive Search Strategies	5	Outcomes of near-peer mentoring schemes for first-year medical students in the transition phase.
Thematic (Sng et al., 2017)	"mentor", "mentoring", "mentorship" "mentoring relationships" AND "medicine" or their combinations in Medicine.	PubMed, ERIC, Cochrane Database of Systematic Reviews, OVID and ScienceDirect	49	Key aspects of mentoring relationships between senior physicians and junior doctors and/or medical students to inform efforts to improve mentoring programs

Appendix A. Summary of Previous Review on Faculty-Student Mentoring in Medical Schools (continued)

Type of review (Reference)	Search terms	Data source	No of documents	Attributes examined
Scoping (Sheri et al., 2019)	'mentor training', 'mentorship training', 'mentoring competency', 'faculty development' AND 'medical faculty' and their combinations	PubMed, ERIC, EMBASE, SCOPUS, Google Scholar, and grey literature databases.	68	Available mentor training programs are in undergraduate and postgraduate medicine and how they may inform the creation of an evidenced-based framework for mentor training
Scoping (Wisdom et al., 2025)		Medline	93	Benefits and challenges of mentoring as described by mentors in a medical setting (physicians, residents, dentists, pharmacists, and nurses)
Systematic (Hee et al., 2020)	'matching', 'mentor', 'mentoring', 'mentorship', 'medical students', 'medical school' AND 'medicine' or their combinations	ERIC, Embase, Web of Science, PubMed, Cochrane Database of Systematic Reviews, CINAHL, OVID and Science Direct	36	Matching in novice mentoring in undergraduate and postgraduate medical and allied health programs
Systematic (Shen et al., 2022)	Concepts of mentoring, women, and academic medicine and used a combination of subject headings and keywords	MEDLINE, Embase, Scopus, Current Contents Connect via Web of Science, Cochrane Library, and PsycINFO.	91	Impact of mentoring on women's career outcomes in academic medicine.
Scoping ((Chua et al., 2020)	Not disclosed	PubMed, ScienceDirect, ERIC, Embase, Scopus, Mednar, and OpenGrey	71	Mentoring structures in novice mentoring among medical students and junior doctors in medicine and surgery postings

Appendix B. Bibliometric Analyses on Mentoring in Medical Schools

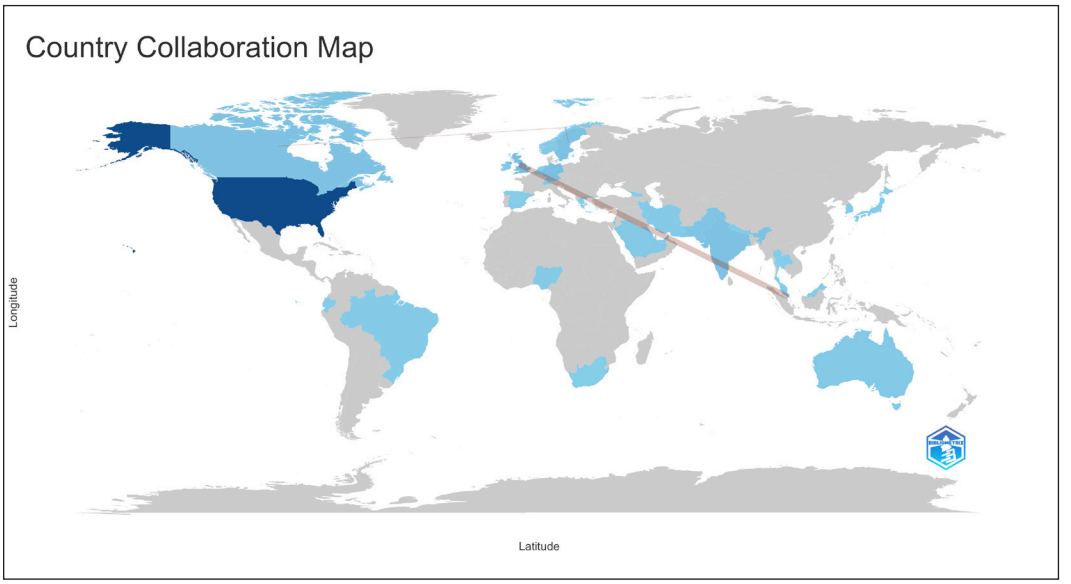
Reference	Search terms	Data source	No of documents	Focus
Osorio Meniz et al. (2022)	Tutorship, formative strategy, personal development, university students)	Scopus between 2003 and 2023	82	Mentoring as a formative strategy for the personal development of university students
Bataeineh and Haq (2020)	"Mentoring OR Mentorship or Coaching OR Leadership"	Web of Science from 1970 to 2014.	100	100 most cited articles of mentoring in education that indexed in the world-leading database, i.e., Web of Science
Masalimova et al. (2024)	(TITLE (mentoring) AND KEY ("science education") OR KEY ("biology education") OR KEY ("chemistry education") OR KEY ("physics education") OR KEY ("STEM education") OR KEY (stem)) AND (LIMIT-TO (SUBJAREA, "SOCI")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "j")) AND (EXCLUDE (PUBYEAR, 2023))	Scopus between 2000 to 2022	67	Research on mentoring in science education
Alonso-Muñoz et al. (2022)	"mentoring" AND (university OR "higher education")	Web of Sciences	232	Trends in Mentoring at Higher Education

Appendix C. Top 5 Countries, Institutes, and Sources that Contributed to Relevant Publications

Country/ Institution/Source		TP	NCP	TC	C/P	C/CP	h
Country	United States	97	85	2359	24.4	27.8	25
	United Kingdom	12	11	232	19.3	21.1	7
	Germany	10	9	169	16.9	18.8	6
	Sweden	8	8	228	28.5	28.5	6
	Canada	7	7	104	14.9	14.9	5
Institution	Karolinska Institutet	8	8	240	30.0	30.0	6
	Boston University Chobanian & Avedisian School of Medicine	6	6	268	44.7	44.7	6
	National University of Singapore	6	6	218	36.3	36.3	6
	NUS Yong Loo Lin School of Medicine	6	6	218	36.3	36.3	6
	University of California	6	5	222	37.0	44.4	4
Source	Medical teacher	12	12	680	56.7	56.7	11
	Academic Medicine	8	8	656	82.0	82.0	7
	BMC Medical Education	12	12	519	43.3	43.3	7
	Medical Science Educator	7	6	34	4.9	5.7	4
	Journal of Surgical Education	7	4	26	3.7	6.5	3

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index.

Appendix D. Country Scientific Production and Collaboration Map



Source: Image generated using Bibliometrix software

Appendix E. Top Author Keywords

Keywords	Total publication	%
mentoring	37	21.0
mentorship	30	17.0
medical students	25	14.2
medical education	24	13.6
medical student	14	8.0
mentor	14	8.0
undergraduate medical education	8	4.5
surgery	7	4.0
mentee	6	3.4
surgical education	6	3.4
medical school	5	2.8
mentors	5	2.8
diversity	4	2.3
professional development	4	2.3
residents	4	2.3
undergraduate medical students	4	2.3
career choice	3	1.7
covid-19	3	1.7
education	3	1.7
medical education & training	3	1.7
neurosurgery	3	1.7
perception	3	1.7
recruitment	3	1.7
research	3	1.7
residency	3	1.7
students	3	1.7
undergraduate	3	1.7

BOOK REVIEW

How the New Education Establishment Betrayed the World's Poorest Children: Broken Promises, Broken Schools. By Joanna Härmä (2025). 241 pages. ISBN: 978-1-3504-6923-5 (eBook). London: Bloomsbury Academic. 22.49 (Euros) (eBook).

In *How the New Establishment Betrayed the World's Poorest Children*, Joanna Härmä examines global education governance and the political economy of education, highlighting inequalities between the Global North and the Global South in teacher quality, school facilities, and learning resources. Central to her critique is the rise of low-cost private schools in response to governments' failure to provide quality public education. Drawing particularly on experiences in Sub-Saharan Africa and India, Härmä explores how these schools have developed amid broader educational and development challenges. This review examines her arguments through a multilevel framework, considering how educational inequalities emerge and interact at the micro (household), meso (school), and macro (government and international policy) levels.

At the micro level, Härmä highlights how household conditions shape children's cognitive development and learning opportunities. Inadequate nutrition, domestic responsibilities, and limited parental support can undermine children's educational performance. These challenges are particularly pronounced among families in rural and underserved areas, where access to quality education is often limited. As a result, children from disadvantaged households face barriers that can perpetuate poverty across generations.

At the meso level, Härmä examines the challenges facing schools, particularly those in Sub-Saharan Africa. Poor classroom conditions, inadequately trained teachers, and limited educational resources undermine the quality of teaching and learning in government schools. These shortcomings have contributed to the growth of low-cost private schools, which many parents perceive as offering better educational opportunities for their children. However, Härmä observes that the quality of learning in the public and private schools she encountered differs little, with both relying heavily on rote memorization rather than deeper conceptual understanding. She attributes this partly to teachers' limited subject knowledge, pedagogical skills, and professional training. Overcrowded classrooms further constrain effective teaching, as teachers must devote considerable attention to classroom management rather than to facilitating learning. These challenges are compounded by a shortage of qualified teacher trainers and weak regulatory oversight, which have allowed poorly regulated teacher training institutions to emerge.

At the macro level, Härmä examines how governments in the Global North and multilateral organizations have sought to address educational challenges in the Global South through development assistance and policy recommendations. Although such interventions may be intended to improve educational access and quality, they often introduce externally determined priorities that do not necessarily reflect local needs and realities. Recipient governments may consequently adjust their educational and fiscal policies to align with donor frameworks and to comply with associated monitoring and evaluation requirements. Härmä illustrates these dynamics through the Punjab Education Foundation in Pakistan, a public-private partnership supported by international development approaches. Its initiatives include education vouchers, financial support for small private schools in underserved areas, and the transfer of underperforming government schools to private management.

While Härmä identifies teacher quality as a major constraint on learning, the issue extends beyond the availability of adequately trained teachers. Equally important are the institutional conditions that enable teachers and school managers to apply their knowledge and skills effectively. Teacher training, therefore, should not be understood merely as the transfer of knowledge and pedagogical techniques, but also as a means of developing teachers' capacity to respond to local conditions and diverse learner needs. In this regard, uniform approaches to teacher training may be insufficient if they do not allow for contextual adaptation. This suggests that improving educational quality requires attention not only to teacher qualifications but also to the institutional support, professional autonomy, and policy conditions that shape classroom practice. These conditions, in turn, are influenced by broader educational policies and governance structures.

Härmä's discussion of international development assistance also raises important questions about the relationship between financial resources and policy influence. From a political economy perspective, development grants are not merely sources of educational funding; they may also shape policy priorities and the direction of educational reform in recipient countries. This complicates the assumption that increased financial assistance necessarily leads to improved educational outcomes. The effectiveness of such assistance depends partly on the capacity of governments and educational institutions to translate resources and policy recommendations into meaningful improvements in teaching and learning. It also depends on how these interventions interact with existing political, economic, and institutional conditions. Thus, the issue is not merely whether external assistance is provided, but how its priorities are determined, implemented, and sustained within local education systems.

Ultimately, Härmä's book critiques development approaches that prioritize educational access without adequately addressing the conditions for meaningful learning. It also highlights the tensions between externally driven reforms and the realities of education systems in the Global South. However, these tensions, in themselves, do not establish that external interventions are the direct cause of systemic educational failures. Rather, they point to the need for a more careful examination of how international policies interact with domestic institutions, resources, and political priorities. Moving beyond one-way policy transfers and uniform educational solutions requires greater recognition of the role of local actors, including governments, school managers, and teachers, in shaping educational reform. Strengthening their agency and institutional capacity is essential to developing policies and pedagogical practices that respond to local needs while addressing the structural inequalities that continue to constrain educational opportunities.

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