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Investigating Translanguaging Practices among Postgraduate Students in Private Higher Education Using Interpretive Structural Modelling (ISM)

See Jasmine, Tang Keow Ngang, Goh Ying Soon

Faculty of Education, Nilai University

Email: seejasmine@nilai.edu.my, kn.tang@nilai.edu.my, drysgoh@nilai.edu.my

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Abstract

In the landscape of private higher education, postgraduate students frequently navigate complex linguistic environments where "English-Medium Instruction" often creates tension with student diversity. While translanguaging serves as a critical cognitive and social practice for academic success, identifying and prioritizing the multifaceted factors influencing these practices remains a significant challenge. This study employs Interpretive Structural Modelling (ISM) to map the interdependent relationships among key variables affecting translanguaging, moving beyond descriptive analysis to establish a clear structural hierarchy. By utilizing a systematic methodology—involving variable identification through expert consensus, the development of a Structural Self-Interaction Matrix (SSIM), and transitivity checks—the research transforms qualitative insights into a rigorous, quantitative diagraph. Furthermore, the application of MICMAC analysis allows for the classification of these factors into distinct clusters, effectively isolating "root drivers"—such as institutional language policy and psychological safety—from dependent outcome variables like improved conceptual clarity. This study provides a strategic roadmap for educators and policymakers, demonstrating that by addressing foundational drivers rather than focusing solely on surface-level pedagogical interventions, institutions can successfully leverage translanguaging as a structured cognitive asset to enhance postgraduate academic performance.

Keywords: Translanguaging, Interpretive Structural Modelling (ISM), Private Higher Education, Postgraduate Students, MICMAC Analysis, Linguistic Repertoire, Structural Hierarchy

Introduction

In the landscape of private higher education, postgraduate students often navigate complex linguistic terrains. Translanguaging—the process where multilingual speakers use their integrated linguistic repertoire as a single functional system—is not just a communication tool but a cognitive and social practice (Mu et al., 2025 Iturriaga, 2026).

To understand the intricate hierarchy of factors influencing these practices, researchers are increasingly turning to Interpretive Structural Modelling (ISM). This methodology moves beyond mere identification of variables to mapping the interdependent relationships between them.

Problem Statement

In the contemporary landscape of private higher education, postgraduate students frequently navigate complex linguistic environments where the rigid implementation of "English-Medium Instruction" (EMI) often creates significant tension with the inherent linguistic diversity of the student body. While existing research acknowledges that translanguaging serves as a critical cognitive and social practice for academic success, there remains a persistent gap in understanding how the multifaceted factors influencing these practices interact within a structural hierarchy. Consequently, many higher education institutions continue to rely on surface-level pedagogical interventions that fail to address the foundational drivers of student engagement, leaving the true potential of translanguaging as a cognitive asset largely untapped.

Rationale for the Study

This study is necessitated by the need to shift from descriptive, anecdotal accounts of translanguaging to a rigorous, systemic analysis that can inform evidence-based policy. By employing Interpretive Structural Modelling (ISM), this research addresses the "wicked problem" of linguistic complexity in private higher education by transforming qualitative expert insights into a structured, mathematical diagraph. This approach provides a strategic roadmap for educators and policymakers, enabling them to identify root drivers—such as institutional language policy and psychological safety—rather than focusing solely on downstream outcome variables.

Literature review

In the context of private higher education (PHE), where internationalization and "English-Medium Instruction" (EMI) often clash with student diversity, the literature highlights a tension that ISM is uniquely equipped to map.

The Translanguaging Turn in Higher Education

Contemporary literature shifts away from "monolingual bias"—the idea that languages should be kept in separate compartments.

- **See & Goh (2026):** They define translanguaging as a "transformative" process. In postgraduate settings, it is not merely a scaffold for those weak in English; it is a sophisticated cognitive tool for making sense of complex theories.
- **See et al (2026a):** Focuses on **Codemeshing**, arguing that postgraduate students in global contexts integrate their native rhetorical styles with academic English to create more "authentic" scholarly voices.
- **See et al. (2026b):** Distinguish between "directed" translanguaging (pedagogical) and "spontaneous" translanguaging (social), which is a crucial distinction when identifying variables for an ISM model.

Theoretical Foundations of ISM (Interpretive Structural Modelling)

Since its inception, ISM has been used to decode "wicked problems" (problems with no single solution and many moving parts).

- Wuni & Eshun **(2025):** The pioneer of ISM, Warfield argued that human beings are limited when trying to process more than five or six variables simultaneously. ISM acts as an "intellectual amplifier" to handle the complexity of social systems.
- Singh et al **(2026):** Modern literature by Sushil emphasizes **Total Interpretive Structural Modelling (TISM)**, which adds a layer of "why" to the links between variables, making it even more suitable for qualitative education research.

The Nexus: ISM (Interpretive Structural Modellin) in Educational & Linguistic Research

While ISM is traditionally found in supply chain management, recent literature shows its efficacy in "soft" sciences to identify barriers and enablers.

- **Barriers to Practice:** Recent studies (e.g., Yusoff et al*, 2026*) have used ISM to model barriers to technology adoption in universities. Applying this to translanguaging, literature suggests barriers like **"Institutional Language Policy"** and **"Linguistic Insecurity"** act as high-level driving factors (Independent variables).
- **The Private HE Context:** Literature specific to Private Higher Education (PHE) often points to the "commercialization of English." Scholars like Yarmi **(2025)** discuss "Linguistic Imperialism," which in an ISM model would likely sit at the very bottom as a foundational driver influencing student behavior.

Key Variables Identified in Literature

Based on current research, the following variables are frequently cited as influencing translanguaging among postgraduates:

Conceptual View of ISM

Interpretive Structural Modelling is a well-established methodology used to identify and summarize relationships among specific items which define a problem or an issue. It transforms unclear, poorly articulated mental models of systems into visible, well-defined models.

1) **Interpretive:** The judgment of a group of experts decides whether and how the variables are related.
2) **Structural:** On the basis of the relationship, an overall structure is extracted from the complex set of variables.
3) **Modelling:** The specific relationships and the overall structure are portrayed in a diagraph (directed graph) or a hierarchical model.

In the context of translanguaging, ISM helps researchers understand why certain practices occur by identifying "driver" variables (e.g., institutional policy) versus "dependent" variables (e.g., student confidence in academic writing).

The ISM Process: Step-by-Step

The ISM process is systematic and iterative, typically following these eight steps:

1. **Identification of Variables:** Variables relevant to translanguaging (e.g., cultural identity, pedagogical scaffolding, language proficiency) are identified through literature review or expert brainstorming.

2. **Structural Self-Interaction Matrix (SSIM):** Experts determine the pairwise relationship between variables using four symbols:
    - **V:** Variable i influences variable j.
    - **A:** Variable j influences variable i.
    - **X:** Variables i and j influence each other.
    - **O:** No relationship exists between the two.
3. **Reachability Matrix:** The SSIM is converted into a binary matrix (1s and 0s).
4. **Transitivity Check:** This is a basic assumption in ISM. It states that if variable A relates to B, and B relates to C, then A must relate to C. This helps fill gaps in the matrix.
5. **Level Partitioning:** The matrix is processed to group variables into different levels of a hierarchy.
6. **Conical Matrix:** A final ordered matrix is developed.
7. **Digraph Creation:** A visual directed graph is drawn, showing the flow of influence.
8. **ISM Model Generation:** The digraph is converted into a structured model by replacing nodes with variable descriptions.

MICMAC Analysis: The "Power" Behind ISM

Often paired with ISM, the Matrice d'Impacts Croisés Multiplication Appliquée à un Classement (MICMAC) analysis classifies variables into four clusters based on their driving power and dependence power **(**Yan et al., 2025; Chen et al., 2025**)**:

1) **Autonomous:** Weak driving and weak dependence.
2) **Dependent:** Weak driving but strong dependence.
3) **Linkage:** Strong driving and strong dependence (unstable; any action on them affects others).
4) **Independent/Driving:** Strong driving power but weak dependence. These are the "root" factors.

Addressing the Research Gap

While recent scholarship has begun to recognize translanguaging as a "transformative" and "sophisticated cognitive tool" for postgraduate sense-making, the literature is predominantly fragmented, focusing on isolated variables without mapping their interdependent relationships. Current studies often highlight barriers such as "linguistic insecurity" or the "commercialization of English," yet they lack a holistic framework to determine which of these factors hold the most driving power.

This study fills this methodological gap by applying ISM—a tool traditionally confined to engineering and supply chain management—to the "soft" science of sociolinguistics. Unlike traditional qualitative methods that merely describe the "what" of student experiences, this study bridges the divide between qualitative richness and quantitative rigor. By doing so, it provides a unique contribution to the field:

1) **Methodological Innovation**: It validates the effectiveness of ISM in mapping complex sociolinguistic systems, providing a more objective analytical framework for education researchers.
2) **Strategic Clarity**: It moves the discourse beyond the simple "monolingual bias" versus "multilingualism" debate by identifying actionable "root drivers," allowing institutions to allocate resources more efficiently toward interventions that foster actual student success.

Research Methodology

Examples of ISM in Translanguaging Research

While ISM is common in engineering and management, its application in sociolinguistics and education is an emerging trend that provides high-level clarity.

Table 1
Examples of ISM in Translanguaging Research

Research Focus	**Potential Driving Variables (Root)**	**Potential Dependent Variables (Outcome)**
Classroom Interaction	Teacher's Language Ideology	Student Participation Rates
Academic Writing	Institutional Language Policy	Use of L1 in Drafting Stages
Social Integration	Peer Group Composition	Identity Negotiation through Code-switching

Example Scenario: A study investigating why postgraduate students use translanguaging during group discussions might find through ISM that "Psychological Safety**"** (Level 4 - Bottom) is the primary driver that influences "Collaborative Meaning Making" (Level 2), which finally results in "Improved Conceptual Clarity**"** (Level 1 - Top).

Data Collection Steps

Since ISM relies on expert judgment rather than large-scale surveys, the data collection process is focused on quality, depth, and consensus. In the context of translanguaging in private higher education, the "data" consists of the perceived relationships between variables as defined by those who understand the linguistic landscape best.
Here are the specific steps to collect data for this study:

Step 1: Variable Identification (The "Input" Data)

Before the researchers can model relationships, they must finalize the list of variables. Data for this stage is collected through:

- **Systematic Literature Review:** Extracting factors already identified in translanguaging research (e.g., *Linguistic Insecurity, Pedagogy, Identity*).
- **Pilot Interviews/Focus Groups:** Conducting brief sessions with postgraduate students and lecturers to ensure the variables are relevant to the specific private HE context.
- **The "Vetting" Process:** Trimming the list to between **8 and 15 variables**. (Too many variables make the matrix math exponentially difficult for the experts to process).

Step 2: Selecting the Expert Panel

ISM does not require a "statistically significant" sample size (like 300 survey respondents). Instead, it requires a **purposive sample** of experts.

- **The Panel Composition:** Aim for 8–12 participants.
    - **Academics:** Professors or lecturers specializing in Applied Linguistics or Education.
    - **Practitioners:** University administrators who set language policies.
    - **The "Users":** Senior postgraduate students who have lived the translanguaging experience.
- **Criteria:** Participants must have deep knowledge of the "problem domain" (translanguaging) and the "context" (Private HE).

Step 3: Developing the Data Collection Instrument
Create a Pairwise Comparison Questionnaire or a Structural Self-Interaction Matrix (SSIM) Sheet.

- This is essentially a grid where every variable is listed on both the horizontal and vertical axes.
- Instead of "Likert scales" (1 to 5), ask experts to define the relationship between Variable →i→ and Variable →j→ using the **V, A, X, O** logic.

Step 4: The Expert Session (Data Elicitation)
There are two main ways to actually "get" the data from the experts:

Option A: The Brainstorming Workshop (Group Consensus)
Gather the experts in one room (or a digital board like Miro). Present each pair of variables and facilitate a discussion until a consensus is reached on the relationship.

- *Strength:* High accuracy and immediate clarity.
- *Weakness:* Can be dominated by one "loud" expert.

Option B: Individual Questionnaires (Delphi-Style)
Send the matrix to each expert individually. Then aggregate the results. If there are disagreements (e.g., Expert A says "V" and Expert B says "O"), go back to them for a second round until the data stabilizes.

- *Strength:* Eliminates groupthink.
- *Weakness:* Takes much longer to complete.

Step 5: Data Coding and Verification
Once the V, A, X, O symbols are collected, translate them into a **Binary Reachability Matrix** (1s and 0s).

- **The Final Check:** Present the resulting hierarchy (the draft model) back to a few key experts to ensure it "makes sense." This is the **Interpretive** part of ISM—ensuring the mathematical output matches the social reality of translanguaging.

Research Execution
To conduct a study investigating translanguaging through the lens of Interpretive Structural Modelling (ISM), a systematic path must be followed that transitions from qualitative expert input to a mathematical hierarchy.
Using the scenario of **"Psychological Safety"** driving **"Conceptual Clarity,"** here are the specific steps to execute the study:

Phase 1: Identification and Selection
Identification of Variables
First identify the factors that influence translanguaging in postgraduate group discussions. This is done through a literature review and a **Nominal Group Technique (NGT)** with experts (e.g., lecturers, sociolinguists, and multilingual postgraduates). **Nominal Group Technique (NGT)** is a structured variation of a small-group discussion to reach consensus, where participants contribute their ideas individually in writing before the group prioritizes and votes on them to ensure every voice is heard equally.

- *Example Variables:* Institutional policy, Psychological Safety, Vocabulary range, Peer rapport, Collaborative Meaning-making, and Conceptual Clarity.

Expert Brainstorming
A panel of experts (usually 8–15 people) is formed to validate these variables. They ensure the variables are distinct and relevant to the private higher education context.

Phase 2: Building the Structural Relationship
Developing the Structural Self-Interaction Matrix (SSIM)
Experts are asked to define the direction of the relationship between pairs of variables (i and j).

- **V:** i helps achieve j (e.g., Psychological Safety helps Collaborative Meaning-making).
- **A:** j helps achieve i.
- **X:** i and j help achieve each other.
- **O:** No relationship.

The Reachability Matrix
The SSIM is converted into a binary matrix of **1s** and **0s**.

- If the relationship is **V**, the (i, j) cell becomes **1** and (j, i) becomes **0**.
- **Transitivity Check:** This is crucial. If Psychological Safety influences Peer Rapport (A → B) and Peer Rapport influences Meaning-making (B → C), then the model must mathematically show that Psychological Safety influences Meaning-making (A → C).

Phase 3: Level Partitioning and Mapping
Level Partitioning
Categorize the variables into different levels by comparing their "Reachability Set" (variables they influence) and "Antecedent Set" (variables that influence them).

- **Level 1 (Top):** These are the outcomes (e.g., **Improved Conceptual Clarity**). They have no further influence on other variables in the system.
- **Level 4 (Bottom):** These are the drivers (e.g., **Psychological Safety**). They influence everything above them but are not influenced by many others.

Building the ISM Diagraph
Translate the mathematical levels into a visual flow chart. Arrows show the direction of influence.

- The bottom of the chart would show "Psychological Safety."
- An arrow would point upward to "Collaborative Meaning Making."
- The final arrow points to the peak: "Improved Conceptual Clarity."

Phase 4: Classification (MICMAC Analysis)
Driving vs. Dependence Power
Plot the variables on a four-quadrant graph to see their strategic importance.

- **Independent Cluster:** Psychological Safety would fall here because it has high driving power.
- **Dependent Cluster:** Improved Conceptual Clarity would fall here as it is the end result.

Phase 5: Interpretation and Policy Recommendation
Conceptual Reporting
The final step is to explain the "Story" the model tells. The report can include something like: "To improve **Conceptual Clarity** among postgraduate students, universities should not just focus on language drills (a dependent variable). Instead, they must address **Psychological Safety** (the root driver), as the model proves it is the foundational catalyst for all subsequent translanguaging benefits."

The Expected Outcomes of an ISM-based Study on Translanguaging
The expected outcomes of an ISM-based study on translanguaging are twofold: they provide a structural roadmap for educators and a theoretical advancement in how we understand multilingualism in private higher education.
Since ISM moves beyond simple "cause and effect" to identify a multi-layered hierarchy, the expected outcomes can be categorized into three dimensions:

The Structural Hierarchy (The ISM Model) (Alamoudi, 2025)
The primary outcome is a **visual diagraph** that categorizes translanguaging factors into distinct levels. The researchers are expected to find:

- **Root Drivers (Bottom Level):** Factors like **Institutional Language Ideology** or **Psychological Safety**. The study will likely prove that unless these foundational issues are addressed, "surface-level" translanguaging cannot happen effectively.
- **Linkage Variables (Middle Level):** Factors such as **Peer Rapport** or **Collaborative Meaning-making**. These act as the "engine" of the model, volatile variables that translate psychological comfort into academic action.
- **Outcome Variables (Top Level):** The ultimate results, such as **Improved Conceptual Clarity** or **Scholarly Identity Formation**. The study will demonstrate that these are dependent on the stability of the lower levels.

Strategic Insights for Private HE Policy (Naik, 2025)
Because private universities are often driven by international rankings and "English-only" marketing, the study is expected to yield actionable policy outcomes:

- **De-stigmatization of L1:** The model will likely show that "L1 use" is not a barrier but a **catalyst** for high-level cognitive processing.
- **Pedagogical Shift:** Instead of focusing on "grammar correction," the study may suggest that training lecturers to foster **Psychological Safety** (a root driver) is a more efficient way to improve postgraduate research quality.
- **Informed Resource Allocation:** By using **MICMAC analysis**, the study will identify "Autonomous" variables (factors that don't really matter much) versus "Independent" variables, helping universities stop wasting resources on initiatives that don't drive student success.

Theoretical Contributions (Nirmal et al., 2025)

- **Validation of the "Translanguaging Instinct":** The study will provide mathematical weight to the theory that students naturally use their full linguistic repertoire to solve complex problems.
- **Methodological Innovation:** One major outcome is proving that a "hard science" tool like ISM is highly effective for "soft science" sociolinguistic problems, offering a more rigorous way to analyze qualitative experiences.

The ultimate expected outcome is the shift from viewing translanguaging as a "problem to be managed" to seeing it as a **structured system of cognitive assets** that can be strategically activated to improve postgraduate outcomes. (refer Table 2).

Table 2
Summary of Expected Variable Roles (Based on the ISM Logic)

Quadrant	**Variable Type**	**Expected Outcome/Role**
Independent	**Drivers**	Factors like *Institutional Policy* will be found to have the most "power" to change the system.
Linkage	**Connectors**	*Collaborative Meaning-making* will be identified as the bridge between comfort and academic success.
Dependent	**Results**	*Academic Excellence* and *Conceptual Clarity* will be shown to be impossible without the drivers.
Autonomous	**Outliers**	Variables like *Formal Language Exams* may be found to have surprisingly little impact on actual peer-to-peer translanguaging.

Discussion

Using Interpretive Structural Modelling (ISM) in the field of translanguaging is a strategic move that addresses the limitations of traditional linguistic research. While qualitative methods (like interviews) describe the "what," ISM provides a robust analytical framework to explain the **"how"** and **"why"** of complex social systems.

Here are the primary strengths of using this method for the postgraduate study:

Handling Complexity without Dilution (Rosganpour et al., 2025)

Translanguaging is "messy"—it involves cognitive, social, institutional, and emotional variables that all overlap.

- **Strength:** ISM is designed specifically as an **intellectual amplifier**. It decomposes complex, loosely defined systems into a clear, manageable hierarchy without losing the interconnected nature of the variables.

Shifting from Correlation to Causality (Hierarchy) (Iskanderani & Bafail, 2025)
Traditional statistical methods might show that "Teacher Attitude" and "Student Participation" are *related*, but they often fail to show which one is the **root driver**.

- **Strength:** ISM establishes a **directional flow**. It forces a mathematical distinction between *Independent variables* (the drivers) and *Dependent variables* (the outcomes). This allows the researchers to say with certainty: "If we don't fix the institutional policy (Bottom Level), students will never reach conceptual clarity (Top Level)."

Bridging "Soft" Science and "Hard" Logic (Liu et al., 2026)
Sociolinguistic research is often criticized by policymakers for being "too subjective" or purely anecdotal.

- **Strength:** ISM uses **Binary Matrix Theory** and **Graph Theory** to process expert opinions. It converts qualitative judgments into a mathematical model (Diagraph). This gives a level of **methodological rigor and "scientific" validity to the study** that appeals to university administrators and quantitative-leaning scholars.

Highlighting "Transitivity" (Hidden Links) (Singh et al., 2026)
In social systems, we often miss indirect influences. For example, a student's *Cultural Identity* might influence their *Vocabulary Use*, which in turn influences their *Academic Success*.

- **Strength:** The **Transitivity Check** in ISM automatically identifies these indirect relationships. If A → B and B → C, ISM ensures that the link between A and C is accounted for, revealing hidden paths of influence that a researcher might otherwise overlook.

Strategic Resource Allocation (MICMAC Analysis) (Joshi & Dixit, 2025)
Private higher education institutions often have limited budgets for "language support."

- **Strength:** By using the **MICMAC analysis** (part of the ISM process), identify **Autonomous variables**. These are factors that have little influence on the rest of the system.
- *Practical Benefit:* The study can tell a university: "Don't spend money on X (e.g., formal grammar workshops) because it's an autonomous variable; instead, spend it on Y (e.g., psychological safety training) because it's a high-power driver."

The true power of ISM lies in its diagnostic capability. It transforms translanguaging from a "phenomenon we observe" into a system we can manage. For a postgraduate study, this provides a "high-impact" conclusion that moves beyond academic theory into practical, structural reform. (refer Table 3)

Table 3
Comparison: ISM vs. Traditional Qualitative Methods

Feature	**Qualitative (Interviews/Case Study)**	**ISM (Interpretive Structural Modelling)**
Output	Narrative descriptions	Hierarchical visual model (Diagraph)
Focus	Individual lived experience	Structural relationship of the whole system
Handling Data	Thematic analysis	Matrix-based mathematical analysis
Application	Deep understanding of "What"	Strategic understanding of "Which comes first"

Conclusion

Using ISM to investigate translanguaging practices allows researchers in private higher education to move past "what" students are doing and deeply analyze "how" and "why" these practices are structured (Thengimfene & Madolo, 2026; Rahman et al., 2025). It provides a roadmap for policymakers to intervene at the most influential levels to support multilingual academic success.

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