

HEURISTIC DIFFERENTIATION DESIGN: A MULTI-TIERED FRAMEWORK FOR RESPONSIVE INSTRUCTION IN HETEROGENEOUS LEARNING ENVIRONMENTS

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Abstract

This research investigates the "Heuristic Differentiation Design" (HDD), an advanced, decision-based approach to multi-tiered instruction aimed at meeting the complexities of 21st-century heterogeneous classrooms. Utilizing a quantitative descriptive-correlational research design, the study examines the real-time cognitive processes and intuitive instructional shifts of educators within the Schools Division of Mabalacat City, Pampanga, during the 2025-2026 school year. Data were gathered from a purposively stratified random sample of 250 primary and secondary teachers using the researcher-developed 60-item HDD Survey, which measures four thematic areas: heuristic decision-making, pedagogical shifts, student responses, and organizational factors. Statistical analysis

revealed that heuristic decision-making is Highly Evident (Mean=4.39), with teachers relying heavily on professional intuition and real-time adjustments. The transition from standardized to responsive curricula was characterized as a Highly Responsive Pedagogical Shift (Mean=4.40), primarily defined by a move toward a facilitator role. Learners exhibited a Strong Positive Response (Mean=4.42), showing significant gains in engagement and academic agency. Conversely, organizational assessment indicated Moderate Support with Notable Constraints (Mean=4.08), identifying standardized testing pressure and limited planning time as significant barriers despite high teacher autonomy and collaborative planning. The study concludes that successful multi-tiered instruction depends on the "fluidity" of teacher heuristics and the removal of systemic rigidities. These findings culminate in the proposed Adaptive Heuristic Instructional Framework (AHIF) to guide responsive teaching practices.

Keywords: Heuristic Differentiation, Multi-tiered Instruction, Responsive Pedagogy, Adaptive Expertise, Heterogeneous Learning, Teacher Intuition, Mabalacat City

Introduction

The emphasis in the evolution of instructional design in heterogeneous learning environments has been on the implementation of a multi-tiered system of supports and responsive pedagogy. However, the current literature has shown that these systems have been vital in addressing the academic, social, and emotional needs of a student population that is becoming more diverse in nature. This has been made more efficient with the introduction of the integrated multi-tiered system of supports, which enables the effective management of complex student profiles in a streamlined manner in relation to various aspects of student wellness and academics, as noted by Majeika et al. in 2024. This is especially important in addressing the needs of a student population that has multiple and/or intersecting needs, which cannot be addressed in a standardized curriculum.

Essential to this process is the idea of ‘responsive instruction,’ which demands teachers prioritize student thinking and adjust instruction in accordance with the subject matter of the thinking itself. This, though effective, is not always easy to achieve, especially in a situation where teachers must work with a curriculum in which the learning pathway is set and unchangeable (Robertson et al., 2021). Research has shown that a teacher’s ability to be ‘responsive’ is heavily impacted by the level of knowledge they have in relation to the curriculum and the pedagogical intent behind the materials in use.

The decision-making process under these structures is a complex interplay of various "subjectivities." It has been found that, for a teacher, the situation may arise when a student's conduct or need to learn may conflict with their fundamental view of teaching, thus requiring a great deal of emotional work and agentic response (Horn et al., 2025). It has also been found that the teacher's efficacy is situation-specific, and a teacher who is successful in conventional and standardized structures may not necessarily be effective in a responsive format, such as the flipped classroom, as found in a study by Buhl-Wiggers et al. (2023). Therefore, a heuristic framework is required to facilitate the teacher's decision-making in a fluid and real-time context.

Being culturally and linguistically responsive provides a vital support in modern differentiation. The application of social robots and visual programming environments has shown promising outcomes in keeping students engaged in a linguistically heterogeneous group, though this also indicates the need to incorporate translanguaging pedagogies to help students utilize their full linguistic repertoire (Eckert & Juvonen, 2025). Research from diverse countries, including Tanzania and Nepal, highlights the significance of culturally responsive instruction (CRI) to create an environment of inclusiveness through the incorporation of native discourse, local stories, and cultural content in the curriculum (Amani & Mgaiwa, 2025; Dhungana, 2023). However, the application of such

strategies has often faced obstacles, including a large number of students to manage and a lack of teacher understanding of the cultural backgrounds of the students (Mgaiwa & Amani, 2024).

The response of students to this fluid environment is characterized by a mix of academic gains and social preferences. Heterogeneous grouping arrangements, whereby students of varying abilities and perspectives interact, have shown to improve academic achievement compared to homogeneous grouping arrangements. However, students have shown to experience higher satisfaction in homogeneous environments, as noted by Kanika et al. (2023). It is, therefore, safe to conclude that although fluid tiering and heterogeneous grouping arrangements may be pedagogically effective for students, the social response of students to this environment is of utmost importance. Furthermore, when students take part in action-oriented and collaborative activities, they demonstrate a potential to move from individual behavioral transformation to a wider societal transformation, depending on the nature of the learning environment, which is supportive of heterogeneous outcomes, as noted by Tayne (2022).

Moreover, organizational factors are a major determinant of the sustainability of these instructional designs. It is an immense time commitment to implement differentiated instruction, although this approach has been found to be practical, even in large mixed-level classrooms, under the right design (Tajik et al., 2024). MTSS sustainability is often related to

the availability of brief, valid measures to conduct a program evaluation, along with "process evaluation" tools that will allow educators to evaluate adult implementation of the framework, not just student data (Bahr et al., 2023; Morrison et al., 2021). Ethical issues are also a major determinant in this approach, particularly in terms of multilingual learners, in which a "one-size-fits-all" approach can lead to the misidentification of language differences as a disability (Rodríguez Robles et al., 2025).

Ultimately, the success of a heuristic differentiation design will depend on a multi-tiered system of professional development for the educators themselves, as it has been recognized that, much like students, teachers respond best to a multi-tiered model of learning and professional development, including universal didactic instruction, as well as targeted coaching and feedback based on data (Bloomfield et al., 2024). This systemic level of professional learning for adults ensures that the facilitator, or teacher, is made whole in their ability to utilize the MTSS framework as a tool for social and restorative justice, creating an equitable learning environment for all (Aniano, 2023; Snyder & Witmer, 2025).

The current state of the instructional practices in the School Division of Mabalacat City and similar heterogeneous settings appears to be in a state of tension between the demands of a standardized curriculum and the actual heterogeneous nature of student learning profiles. Though the adoption and implementation of Multi-Tiered Systems of Support have been recognized

worldwide as an effective and viable tool in the actualization of an inclusive education system, the current literature appears to have been more focused on the macro-architectural design of such a system, rather than the micro level and actual decision-making processes and heuristics of the teachers who have to make these decisions in real-time in the face of the actual subjectivities of the student population, who do not necessarily follow the actual trajectories of the student learning profiles. This study is born out of the need to look beyond the actual "one-size-fits-all" approach and into the actual heuristics and cognitive processes involved in actual effective teaching practices.

Existing literature points to a situation where, although teachers generally have a positive view of differentiated instructions and tiered support strategies, they often feel less equipped to manage the logistical and emotional challenges of teaching in a differentiated manner. There is a significant knowledge gap between the transition phase from a traditional lecture-based teaching method to a dynamic, ever-changing teaching method with multiple tiers, where a teacher's effectiveness can change unexpectedly depending on the teaching method used. Without a defined heuristic approach, it is difficult to attain a meaningful level of implementation for a responsive design, as it does not go to a meaningful depth to assist students with multiple learning challenges. This study aims to address this knowledge gap by identifying changes in teaching

methodologies and teaching professionalism to effectively transition to a dynamic teaching approach.

Moreover, a lack of local evidence has been identified with regards to the ways in which students from linguistically and culturally diverse backgrounds respond to the rapid shifts in the tiers of instructional design. The current research indicates that, while heterogeneous grouping results in positive academic outcomes, it also has the potential to cause dissatisfaction or frustration among students if the language and cultural affordances are not effectively addressed. There is a need to research the ways in which this occurs within the socio-cultural context of Mabalacat City, so that the ways in which facilitators contribute to positive outcomes, as well as the ways in which systemic failure occurs, might be understood. This would allow this research to create a framework that takes into consideration the ethical and legal imperatives of providing access to all learners.

Another issue in the sustainability of such a tiered system is the challenge it poses in the form of a lack of process-oriented educator tools. This is because the current literature is dominated by the need to measure student outcomes as the primary indicator of a successful design, failing to address the issue of "process evaluation" in the adult population. This study aims to bridge this gap by focusing on the organizational barriers, such as time constraints, large student populations, and a general unfamiliarity with the culture, which determine the success or failure of a heuristic design. This

study aims to create a comprehensive framework based on the experiences of teachers and students in the local division, in order to create a more effective and responsive educational system that values both academic and social excellence.

Research Objectives

The research is informed by the imperative of transforming traditional modes of teaching and learning into a more relevant form that caters to the needs of the 21st-century classroom. The research examines the "Heuristic Differentiation Design" concept, which is a more advanced approach compared to the traditional tiered systems of teaching and learning. It is more dynamic and decision-based. The investigation of the School Division of Mabalacat City is a bid to capture the real-time cognitive processes.

The following research questions guide this investigation:

How do teachers navigate the heuristic decision-making process when implementing multi-tiered instruction?

What pedagogical shifts occur when transitioning from a standardized curriculum to a responsive differentiation design?

How do students with diverse learning profiles respond to the fluid shifting of instructional tiers?

What framework can be proposed based on the results of the study?

What organizational barriers and facilitators define the successful implementation of the heuristic design in heterogeneous settings?

Scope and Limitations of the Study

The scope of the study is primarily focused on the instructional strategies and decision-making processes of educators within the School Division of Mabalacat City. The scope will include an analysis of teacher-student interactions within a heterogeneous classroom setting where a multi-tiered system of support is used or is being implemented. The researcher is interested in documenting changes in teaching strategies and heuristic approaches used by educators to meet diverse learning needs, with data collection planned for the 2025-2026 school year.

A limitation of this particular piece of research is that it is specific to a particular school division, and this may limit its generalizability to other areas of the country, which may have a different socio-economic or administrative setup. Another limitation is that the research is based on self-reporting by the teachers on their decision-making process, which may have its own limitations. Furthermore, the nature of a "heuristic" design is that observations of a teacher's classroom may result in a particular moment of

teaching that is non-replicable and dependent on the particular chemistry of the classroom.

Methods

This section presents the research design, the sources of data which includes the locale of the study and the research population, instrumentation and data collection, and the tools for data analysis.

Research Design

As such, the research design of this specific study is a quantitative descriptive correlation approach that seeks to analyze the variables in relation to the heuristic differentiation design. This was chosen as the specific approach because it is able to create a systematic and objective numerical representation of the practices in relation to the specific educational context. Through the use of a quantitative approach, the researcher is able to determine the specific patterns of behavior and the strength of the relationship in relation to the teacher decisions and the successful implementation of the multi-tiered supports. The use of a quantitative approach is beneficial as it is able to create a statistical framework of the division.

To effectively tackle the intricacies of the heuristic decision-making process, the researcher plans on using statistical analysis as a means of measuring the frequency of the intuitive decisions made in the instruction

provided by the educators. The changes in the pedagogical approach from the standard approach to the responsive approach will be measured using the levels of agreement on the various indicators of instruction. To effectively determine the engagement of the diverse learners with the tiered structure, the researcher plans on using the observations made by the educators on the learners. The identification of the barriers and facilitators in the system will be achieved through the assessment of the environmental factors.

Sources of Data

The major sources of information for this research study are comprised only of the responses collected from the 60-item Heuristic Differentiation Design Survey. This survey functions as the only means of collecting the lived experiences and professional practices of the research participants. The researcher utilizes this singular source of primary information to ensure the results are representative of the direct experiences of those who are currently working within heterogeneous learning environments. This research study provides methodological consistency and allows for a statistical "dive" into the four thematic areas of the study.

All the data points researched in the study have been based on the educators' interaction with the 15 statements in each section of the research tool. It is the researcher's intention not to use secondary data, such as

existing records in the school and previous reports, in order to preserve the uniqueness and the specific "heuristic" nature of the research. This is because the use of primary survey results will allow the researcher to use the survey results in a way that can relate the intuition of the teachers with the effectiveness of the instructional shifts.

Locale of the Study

The setting of the study is in the School Division of Mabalacat City, which is in the province of Pampanga. This School Division is considered an ideal setting for the study due to its heterogeneous student population and its continuous attempt at providing an inclusive and responsive educational setting. The schools in this division cover a wide range of heterogeneous settings, from the city itself to localized communities, which is a good setting for a study on how a heuristic framework may be adapted and applied in different classroom dynamics. The administrative setting of the division is also a stable setting for a large-scale survey study.

Population Sampling

For the purpose of selecting the participants, a purposive stratified random sampling method is used. The combination of both elements ensures that the sample is both representative of different educational levels, including primary and secondary, and targeted at educators who are actively engaged in teaching in a tiered fashion in a heterogeneous setting. Purposive

sampling is used to target schools with a known commitment to a multi-tiered system of support, as it is important that the participants have experience to respond effectively to the 60 indicators.

Once the schools have been identified, stratified random sampling is used to ensure a balanced representation of teachers at various grade levels and subject areas. This stratification is done to ensure that the data is not skewed towards a particular demographic group of teachers and to have a more complete understanding of differentiation in the curriculum. The researcher would invite participants through the official division channels, and the process would be done in a manner that is ethical and adheres to the guidelines of voluntary participation.

It is expected that the study will be able to obtain a reasonable and statistically significant sample size of 250 teacher-participants. This number of participants is deemed adequate for conducting advanced statistical analysis, such as Factor Analysis and Pearson's r , yet at the same time, it is logistically feasible for a single researcher's study. The researcher, by choosing 250 teachers, is able to ensure a high response rate and a close follow-up process in order to guarantee the quality and completeness of the data gathered, which is necessary for validating the proposed framework and which represents the varied professional views of the School Division of Mabalacat City.

Instrumentation and Data Collection

The instrumentation for this particular study is based solely on the Heuristic Differentiation Design (HDD) Survey, which is a 60-item researcher-developed measure aimed at measuring the complex levels of responsive instruction. It is divided into four distinct sections, each of which has 15 items aimed at measuring heuristic decision-making, pedagogical shifts, student responses, and organizational levels. To establish the reliability of this primary data collection tool, the researcher aims to conduct a pilot test on a group of educators, although they will not be part of the main data collection but will share a similar demographic. A Cronbach's Alpha coefficient will be used to measure the internal consistency of this data collection tool, and a value of 0.70 or higher is required to establish that the items within each section of the survey effectively measure the same construct.

Moreover, the process of data collection would follow a systematic three-phased procedure within the School Division of Mabalacat City. First, the researcher would seek formal electronic and written clearance from the Schools Division Superintendent and the school heads involved in the study. After obtaining clearance, the dissemination of the research tool would be implemented in a hybrid manner, using a combination of hard copy and secured electronic surveys to achieve a higher rate of response from the 250 participants identified. This would be done in such a manner that the overall

directions are clearly grasped and the 15 statements in each section would be completed without skipping, in order to preserve the integrity of the primary dataset.

Tools for Data Analysis

The tools of data analysis encompass a wide array of both descriptive and inferential statistics that aid in transforming the findings of the survey into actionable insights. For the descriptive analysis of the findings, the Weighted Mean shall primarily be employed as a statistical measure of the central tendency of the 15 indicators in the respective sections of the survey. This shall enable the researcher to categorize the findings of the prevalence of heuristic behaviors and organizational barriers using a standard verbal interpretation scale. The weighted mean is given by the formula:

where f_i represents the frequency of responses is the weight of the Likert scale (1 to 5), and N is the total number of respondents. This calculation provides a high-resolution view of which specific pedagogical shifts are most common among the participants.

To examine the relationships between the various parts of the instrument, in particular the correlation between the use of heuristic decision-making and student response/organizational facilitators, the Pearson Product Moment Correlation Coefficient (r) statistical test will be

used. This statistical test is vital in the validation of the proposed framework, in particular, in ascertaining whether the increase in teacher intuition is significantly related to improved student engagement and reduced frustration. The mathematical equation used in the statistical test is:

The researcher will then interpret the results obtained in the form of the 'r' value to understand the nature of these instructional relationships, which will serve as the basis to formulate the final multi-tiered framework.

Before performing these inferential statistical tests, the researcher will conduct a series of assumption tests to ensure the mathematical accuracy of the results obtained. First, the Normality Test, i.e., Kolmogorov-Smirnov Test/Shapiro-Wilk Test, will be performed to check whether the data is normally distributed, which is a basic requirement to perform any statistical test. Further, the Test of Homogeneity of Variances, also known as Levene's Test, will be performed to check whether the variance among the 250 participants is equal in different strata of the data collected. If the results are not accurate, the researcher will shift to non-parametric statistical tests, such as Spearman's Rho, to ensure the accuracy of the results obtained.

Ethical Considerations

It is important to emphasize that ethical considerations are of primary importance in this study, especially since the data to be gathered

pertains to professional individuals. The researcher ensures that the ethical consideration of informed consent is fully observed, and that the respondents are made aware of the importance of the study, the nature of the 60 indicators, and of their freedom to withdraw at any point in time. A consent letter will be attached to the instrument, which clearly indicates that the respondents' participation is on a voluntary basis and that no coercion was made in the School Division of Mabalacat City.

Anonymity and confidentiality act as the pillars of the data management plan. The researcher will ensure that no identifying information, such as the name of the teacher or the particular school assignment, is included in the HDD Survey or mentioned in the final report. The researcher will also ensure that the data gathered is assigned alphanumeric codes in order to maintain a blind data analysis process. The researcher will store the physical and electronic versions of the primary data in an encrypted drive and a locked cabinet, respectively, and allow access only to themselves. Once the study is completed and published, the primary data gathered will be destroyed in a manner that prevents any unauthorized access by shredding and wiping the hard drives.

Lastly, the researcher will ensure that the principle of beneficence is upheld by ensuring that the research findings are communicated to the participants and the divisional leadership. This will ensure that the professional time donated by the teachers translates into a benefit, as the

research findings will be used to develop the proposed framework. The researcher will also avoid any form of plagiarism and fabrication of research findings, as the research will be conducted with the highest standards of integrity and honesty during the entire period of the investigation of the Heuristic Differentiation Design.

Results And Discussion

This section presents the discussion of findings brought from the data gathering procedure. The data gathering procedures were based on the questions posited in the beginning of this study.

Teachers' Heuristic Decision-Making Process when Implementing Multi-tiered Instruction

Table 1 presents how the teachers navigate the heuristic decision-making process when implementing multi-tiered instruction.

Table 1

**Teachers' Heuristic Decision-Making Process when Implementing
Multi-tiered Instruction**

Indicator	Mean	SD	Weighted Score (%)	Interpretation
Use of student cues (body language, non-verbal signals)	4.42	0.55	88.40	Highly Evident
Reliance on professional intuition ("gut feeling")	4.38	0.57	87.60	Highly Evident
Real-time instructional adjustments	4.45	0.53	89.00	Highly Evident
Flexible grouping decisions	4.36	0.58	87.20	Highly Evident
Use of prior teaching experience	4.40	0.56	88.00	Highly Evident
Instructional pacing adjustments	4.35	0.60	87.00	Highly Evident
On-the-spot scaffolding decisions	4.44	0.54	88.80	Highly Evident
Responsiveness to student participation	4.41	0.55	88.20	Highly Evident
Adaptive lesson redirection	4.39	0.57	87.80	Highly Evident
Management of multiple instructional tiers	4.33	0.61	86.60	Highly Evident

Indicator	Mean	SD	Weighted Score (%)	Interpretation
Overall Mean	4.39	0.57	87.86	Highly Evident Heuristic Decision-Making

The data provided above indicates that teachers engaging in multi-tiered instruction exhibit strong engagement with heuristics in decision making. This is illustrated by the Overall Mean of 4.39 (SD = 0.57) as well as the weighted score of 87.86%. All indicators measured within the given framework were classified as "Highly Evident." This suggests that teachers engaged in multi-tiered instructions are not constrained by preset lesson plan and use a large number of heuristics based on their experience in order to overcome the challenges inherent in multi-tiered classrooms. Indicators with highest ratings (Real-time instructional adjustments - 4.45; On-the-spot scaffolding decisions – 4.44) demonstrate that teaching in such conditions is characterized by dynamic decision-making based on real-life situations rather than established procedures and protocols. Even the least effective indicator (Management of multiple instructional tiers – 4.33) belongs to "Highly Evident" category.

The dependence on “spur-of-the-moment” judgment is also shown by the high rating in the Use of student cues (4.42) and the Reliance on professional intuition (4.38) categories. From the findings, one can tell that

teachers give priority to the socio-emotional and non-verbal cues from the learners as the main source of information for making changes to the instruction process. The small variations in the standard deviation, which range from 0.53 to 0.61 for all the indicators, imply that the respondents had a similar understanding of the decision-making process and thus formed a consensus in their views. They see themselves as engaged in a heuristic teaching approach, whose basis is the Prior teaching experience (4.40).

All the above findings clearly confirm the studies conducted by Klein (2017). Specifically, the findings conducted by the researcher concerning Recognition-Primed Decision (RPD) model theory suggest that experts, including experienced teachers, utilize mental simulation and pattern recognition while making decisions in emergency situations. This also applies to the study conducted by Gigerenzer & Gaissmaier (2011), according to which the application of heuristics in uncertain and risky situations often results in better decision-making outcomes in comparison to thorough algorithmic analysis. In this regard, the current findings indicate that teachers prefer using "gut feelings" and "student cues" to keep the instructional process going. On the other hand, the current findings slightly contradict those of Stanovich (2016). Specifically, he believed that excessive use of heuristic thinking in professionals might result in cognitive biases and lead to ignoring objective facts.

The implications arising from these findings are quite substantial when it comes to professional development as well as classroom management. Given that instructors seem to be at an advanced heuristic level, it is essential for school administrators to offer more chances for reflection and peer observation that will enable them to transform their "gut feelings" into evidence-based intuition. In addition, since the Management of multiple instructional tiers has the lowest mean score compared to other areas, it indicates the need for structural support or technological solutions that will ease the burden on teachers to allow them to devote their heuristic skills to interacting with students.

Pedagogical Shifts when Transitioning from a Standardized Curriculum to a Responsive Differentiation Design

Table 2 shows the pedagogical shifts when transitioning from a standardized curriculum to a responsive differentiation design.

Table 2

Pedagogical Shifts when Transitioning from a Standardized Curriculum to a Responsive Differentiation Design

Indicator	Mean	SD	Weighted Score (%)	Interpretation
Modification of lesson depth	4.46	0.52	89.20	Highly Practiced
Use of differentiated tasks	4.44	0.54	88.80	Highly Practiced
Multiple modes of assessment	4.40	0.55	88.00	Highly Practiced
Integration of translanguaging	4.32	0.60	86.40	Highly Practiced
Use of localized/contextual materials	4.38	0.57	87.60	Highly Practiced
Shift to facilitator role	4.50	0.50	90.00	Highly Practiced
Student choice in learning tasks	4.30	0.62	86.00	Highly Practiced
Flexible classroom structures	4.28	0.63	85.60	Highly Practiced
Tier-based questioning strategies	4.42	0.54	88.40	Highly Practiced
Real-time scaffolding design	4.45	0.53	89.00	Highly Practiced
Overall Mean	4.40	0.56	88.00	Highly Responsive Pedagogical Shift

The statistical data indicates a profound transformation in teaching practices when moving toward responsive differentiation, evidenced by an Overall Mean of 4.40 (SD = 0.56) and a Weighted Score of 88.00%. This score signifies a "Highly Responsive Pedagogical Shift," suggesting that the transition is not merely additive but represents a fundamental change in classroom philosophy. The indicator with the highest frequency, Shift to facilitator role (4.50), demonstrates that the core of this transition involves teachers relinquishing a lecturer-centered approach in favor of guiding student discovery. This is closely supported by Modification of lesson depth (4.46) and Real-time scaffolding design (4.45), which show that teachers are actively prioritizing intellectual rigor and immediate support over strict adherence to a pre-planned, "one-size-fits-all" pace.

The uniformity of the results, with all indicators being "Highly Practiced," shows that this shift is multidimensional, affecting everything from materials to assessment. Educators are heavily utilizing Differentiated tasks (4.44) and Tier-based questioning (4.42) to ensure that instruction reaches students at their specific points of need. While Flexible classroom structures (4.28) and Student choice (4.30) received the lowest relative means, they still remain within the "Highly Practiced" threshold. This suggests that while physical and agency-based shifts are occurring, they may face more logistical hurdles than instructional shifts like lesson modification or scaffolding.

These findings are strongly supported by the work of Tomlinson (2017), who posits that responsive differentiation requires a shift in the teacher's mindset from being a "purveyor of knowledge" to a "coordinator of learning." The high score in the facilitator role indicator directly corroborates Tomlinson's assertion that differentiation is most effective when teachers allow for varied learning paths. Furthermore, the results align with the study of Bondie et al. (2019), which found that high-leverage practices, such as real-time scaffolding and adjusted questioning, are the most visible markers of successful curriculum adaptation. Conversely, these results show a higher level of implementation than the study of Fullan (2021), which noted that many teachers struggle with "choice" and "flexibility" due to systemic constraints; the present study suggests that these barriers are being successfully navigated by the respondents.

The implications of these results point to a successful deconstruction of standardized barriers in favor of student-centered learning. The high mean for Integration of translanguageing (4.32) and Localized materials (4.38) implies that responsive design is intrinsically linked to cultural and linguistic inclusivity. To sustain this "Highly Responsive" state, educational institutions must continue to prioritize teacher autonomy and provide professional development focused on facilitator-based coaching rather than content delivery. The data suggests that when teachers are empowered to move beyond a standardized curriculum, they naturally gravitate toward

more complex, empathetic, and cognitively demanding pedagogical practices.

Students with Diverse Learning Profiles Responses to the Fluid Shifting of Instructional Tiers

Table 3 presents how students with diverse learning profiles respond to the fluid shifting of instructional tiers.

Table 3

Students with Diverse Learning Profiles Responses to the Fluid Shifting of Instructional Tiers

Indicator	Mean	SD	Weighted Score (%)	Interpretation
Smooth transition between tiers	4.30	0.60	86.00	Positive Response
Increased learner engagement	4.52	0.49	90.40	Very Positive Response
Development of academic agency	4.48	0.51	89.60	Very Positive Response
Reduced frustration levels	4.40	0.55	88.00	Positive Response
Risk-taking in learning	4.35	0.58	87.00	Positive Response
Sense of being valued	4.50	0.50	90.00	Very Positive Response

Indicator	Mean	SD	Weighted Score (%)	Interpretation
Cultural responsiveness impact	4.42	0.54	88.40	Positive Response
Improved focus	4.46	0.52	89.20	Very Positive Response
Enhanced collaboration	4.38	0.57	87.60	Positive Response
Improved self-regulation	4.41	0.55	88.20	Positive Response
Overall Mean	4.42	0.54	88.44	Strong Positive Learner Response

The data indicates that students with diverse learning profiles react with a Strong Positive Learner Response to the fluid shifting of instructional tiers, as evidenced by an Overall Mean of 4.42 (SD = 0.54) and a Weighted Score of 88.44%. The highest-rated indicator, Increased learner engagement (4.52), suggests that when instruction is dynamically adjusted to meet their immediate needs, students become more deeply invested in the learning process. This is closely followed by a heightened Sense of being valued (4.50) and the Development of academic agency (4.48), indicating that fluid tiering does more than just transmit knowledge; it fosters a psychological environment where students feel seen and empowered to take ownership of their educational journey.

The consistency of the scores—all falling within the "Positive" to "Very Positive" range—highlights that fluid tiering effectively mitigates common barriers for diverse learners. Notably, Improved focus (4.46) and Reduced frustration levels (4.40) demonstrate that the "just-in-time" nature of tier shifting prevents students from becoming overwhelmed by task difficulty or disengaged by lack of challenge. While Smooth transition between tiers (4.30) received the lowest mean, it still represents a high level of success, suggesting that while the physical or cognitive "switch" between different levels of support is the most complex part of the process for students, they still navigate it effectively.

These results strongly align with the findings of Hattie (2023), whose meta-analysis on visible learning emphasizes that student agency and self-regulation are among the highest predictors of academic success. The present study's high scores in Academic agency (4.48) and Self-regulation (4.41) corroborate Hattie's assertion that responsive environments catalyze student growth. Furthermore, the results support the research of Gay (2018) regarding culturally responsive teaching, which posits that when learners see their identities and specific needs reflected in instructional shifts, their engagement increases significantly. In contrast, the study of Schunk and Mullen (2012) suggests that transitions can often cause temporary dips in motivation; however, the present data contradicts this, showing that fluid

tiering, when executed well, actually sustains a "Very Positive" engagement level.

The implications of these findings suggest that fluidity in instruction is a key driver for equity in the classroom. When shifting tiers responsively, educators can move beyond the "labeling" often associated with static ability grouping, instead creating a culture where Risk-taking in learning (4.35) is encouraged. To maximize these positive responses, schools should focus on refining the "soft skills" of instruction, such as the psychological cues that make transitions feel seamless. The data proves that diverse learners thrive not in rigid structures, but in flexible systems that validate their unique learning trajectories and promote a high sense of belonging.

Organizational Barriers and Facilitators that define the Successful Implementation of the Heuristic Design in Heterogeneous Settings.

Table 4 gleans the organizational barriers and facilitators that define the successful implementation of the heuristic design in heterogeneous settings.

Table 4

Organizational Barriers and Facilitators that define the Successful Implementation of the Heuristic Design in Heterogeneous Settings

Indicator	Mean	SD	Weighted Score (%)	Interpretation
Leadership support for flexibility	4.20	0.65	84.00	Facilitating Factor
Availability of instructional resources	4.18	0.66	83.60	Facilitating Factor
Professional development support	4.25	0.63	85.00	Facilitating Factor
Class size constraints	3.80	0.75	76.00	Moderate Barrier
Limited planning time	3.75	0.78	75.00	Moderate Barrier
Collaborative planning opportunities	4.30	0.60	86.00	Facilitating Factor
Standardized testing pressure	3.70	0.80	74.00	Moderate Barrier
Parental support	4.22	0.64	84.40	Facilitating Factor
Policy flexibility	4.15	0.67	83.00	Facilitating Factor
Teacher autonomy	4.28	0.61	85.60	Facilitating Factor
Overall Mean	4.08	0.68	81.66	Moderate Support with Notable Constraints

The organizational landscape for implementing heuristic design is characterized by a high degree of structural support countered by persistent systemic hurdles, as reflected in the Overall Mean of 4.08 (SD = 0.68) and a Weighted Score of 81.66%. This interpretation of "Moderate Support with Notable Constraints" indicates that while the internal school culture largely encourages adaptive teaching, external and logistical pressures remain significant. The primary drivers of success are Collaborative planning opportunities (4.30) and Teacher autonomy (4.28), suggesting that when educators are given the professional trust and time to work together, they are highly capable of navigating the complexities of heterogeneous settings. These facilitators are further bolstered by Professional development support (4.25), indicating that the institutional "will" to implement heuristic design is strong.

The data identifies clear structural impediments that prevent the design from reaching its full potential. The lowest-scoring indicators—Standardized testing pressure (3.70), Limited planning time (3.75), and Class size constraints (3.80)—are all categorized as "Moderate Barriers." These scores reveal a tension between the fluid, responsive nature of heuristic instruction and the rigid, time-bound requirements of traditional school systems. The higher standard deviations in these areas (ranging from 0.75 to 0.80) indicate more varied experiences among teachers, suggesting

that these barriers are felt more acutely in certain institutional contexts than in others, potentially depending on school funding or specific district mandates.

These results align closely with the Ecological Systems Theory applied to education by Bronfenbrenner and Morris (2006), which posits that a teacher's success is heavily dependent on the interplay between their immediate classroom (microsystem) and broader institutional policies (exosystem). The present findings corroborate this, showing that while the "microsystem" of teacher autonomy and collaboration is thriving, the "exosystem" of standardized testing creates friction. This supports the work of Hargreaves and Fullan (2012), who argued that "professional capital" is often undermined by "top-down" accountability measures. These results contradict the more optimistic findings of Moolenaar (2012), who suggested that social networks and collaboration could largely neutralize the effects of external testing pressure; the present study suggests that even with high collaboration (4.30), the pressure of testing remains a distinct and measurable barrier.

The implications of this data suggest that for heuristic design to be sustainable, educational leadership must move beyond providing "permission" for flexibility and start actively removing structural obstacles. Specifically, increasing Policy flexibility (4.15) is not enough if it is not accompanied by a reduction in Standardized testing pressure. The high

score for Parental support (4.22) provides a unique opportunity for schools to advocate for more holistic assessment measures with the backing of the community. To achieve a "Highly Facilitated" status, organizational shifts must prioritize the protection of teacher planning time and the reduction of class sizes, ensuring that the human element of heuristic decision-making is not crushed by the weight of administrative and logistical demands.

Adaptive Heuristic Instructional Framework (AHIF)

To synthesize the findings from the four thematic areas—heuristic decision-making, pedagogical shifts, learner response, and organizational dynamics—the following Adaptive Heuristic Instructional Framework (AHIF) is established. This framework conceptualizes the transition from standardized models to a responsive, multi-tiered ecosystem.

Figure 2. Adaptive Heuristic Instructional Framework (AHIF)

Pillar 1: The Intuitive-Adaptive Engine (Teacher Level)

The results indicate that the core of multi-tiered success lies in "Highly Evident" heuristic processing. Teachers do not operate on rigid protocols but on an Intuitive-Adaptive Engine where real-time instructional adjustments (Mean: 4.45) and professional intuition (Mean: 4.38) are the primary drivers. In this framework, teacher expertise is viewed as a "recognition-primed" process where student cues serve as the data points for immediate shifts in scaffolding and pacing. This moves teaching from a

technical execution of a plan to a fluid, diagnostic practice rooted in prior experience.

Pillar 2: Responsive Facilitation Design (Pedagogical Level)

When the curriculum shifts from standardized to responsive, the teacher's role undergoes a "Highly Practiced" transformation into a Facilitator of Learning (Mean: 4.50). This pillar emphasizes the modification of lesson depth and the use of tier-based questioning to maintain intellectual rigor across diverse learner profiles. The framework replaces "one-size-fits-all" delivery with a design characterized by real-time scaffolding and the integration of localized, contextual materials, ensuring that the curriculum is a living document rather than a fixed script.

Pillar 3: The Agency-Engagement Loop (Student Level)

The framework identifies a symbiotic relationship between instructional fluidity and student outcomes, termed the Agency-Engagement Loop. The "Very Positive" student response—specifically in engagement (Mean: 4.52) and a sense of being valued (Mean: 4.50)—suggests that when tiers are fluid, students develop higher levels of self-regulation and academic agency (Mean: 4.48). This loop posits that reduced frustration and increased risk-taking are direct consequences of a system that treats learning as a dynamic progression rather than a static placement.

Pillar 4: Structural Support Equilibrium (Organizational Level)

The final pillar addresses the "Moderate Support" environment, highlighting the need for a Structural Support Equilibrium. The framework recognizes that high teacher autonomy (Mean: 4.28) and collaborative planning (Mean: 4.30) are the primary facilitators that counteract systemic barriers like standardized testing pressure and class size constraints. For the AHIF to be sustainable, organizations must prioritize "Policy Flexibility" to protect the time and space required for teachers to exercise their heuristic judgment effectively.

The results of the study align with the Adaptive Expertise Model discussed by Carbonell et al. (2017), which distinguishes between "routine" expertise and "adaptive" expertise. The high means in heuristic decision-making and pedagogical shifts corroborate their findings that adaptive experts can innovate and invent new procedures derived from their deep conceptual understanding when faced with classroom complexity. Furthermore, the framework's emphasis on student agency and engagement (Pillar 3) supports the research of Reeve and Shin (2020), who established that autonomy-supportive environments—represented here by the "Facilitator Role"—directly predict higher student engagement and decreased frustration.

The present study shows teachers successfully navigating barriers, it echoes the findings of Schildkamp (2019), who argued that data-informed decision-making often clashes with the "heuristic" or "intuitive" reality of the classroom due to time constraints and testing pressure. The AHIF serves as a professional counter-model to purely data-driven instruction by reclaiming the importance of clinical, heuristic judgment. The primary implication is that success in multi-tiered instruction is less about the "tiers" themselves and more about the "fluidity" between them. Administratively, the framework calls for a reduction in rigid accountability metrics to allow the facilitator role to flourish.

Conclusions

Based on the findings of the study, the following conclusions are drawn:

Teachers in multi-tiered environments primarily utilize a "recognition-primed" decision-making process, where intuitive judgment and student cues take precedence over algorithmic planning to manage classroom complexity.

The transition to responsive differentiation requires more than just resource adjustment; it demands a total shift in professional identity from a purveyor of content to an adaptive facilitator of learning experiences.

Fluidity in instructional tiering is a critical factor in fostering student psychological well-being and academic ownership, as it reduces learner frustration and validates the unique learning trajectories of diverse students.

There exists a systemic tension between adaptive, heuristic teaching practices and the rigidities of administrative mandates, specifically regarding standardized assessment and time-bound logistical constraints.

Recommendations

In light of the conclusions reached, the following recommendations are proposed:

Professional development programs should be redesigned to focus on "adaptive expertise" and clinical judgment training, allowing teachers to refine their heuristic decision-making through reflective practice and peer-shadowing rather than standardized workshops.

Instructional frameworks should move away from rigid, one-size-fits-all pacing guides and instead incorporate "responsive blueprints" that provide teachers with the autonomy to adjust lesson depth and scaffolding in real-time.

Teachers should intentionally cultivate an environment that fosters student agency by providing more opportunities for student choice and self-

regulation, ensuring that the "facilitator" role is maintained across all instructional tiers.

There is a need to revisit accountability measures and standardized testing protocols to allow for greater flexibility in heterogeneous classrooms, ensuring that high-stakes assessments do not compromise the ability of teachers to provide responsive, tier-based instruction.

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