How Instructors Can Promote Mental Adaptability Among Science, Math, ICT, and TechVoc Learners Facing Heavy Academic Tasks

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ABSTRACT

The increasing academic rigor in Science, Mathematics, ICT, and TechVoc programs has placed substantial cognitive demands on learners, intensifying their susceptibility to mental overload and reduced adaptability. This study explored how instructors perceive students' mental adaptability under heavy academic tasks and identified instructional practices that support students' cognitive resilience. Using a qualitative exploratory research design, semi-structured phone-call interviews were conducted with twelve (24) instructors from various tertiary institutions in Mindanao, Philippines. Participants were selected through purposive sampling based on their experience teaching high-demand subjects and handling students exhibiting signs of academic strain. Thematic analysis revealed four primary indicators of declining adaptability: disengagement and loss of focus, disrupted workflow and task-sequencing errors, physical manifestations of cognitive fatigue, and behavioral coping responses such as avoidance or overdependence. Findings further showed that students adapt more quickly to structured, predictable tasks but struggle significantly with concept-heavy, multi-step, or cognitively layered activities, especially when compounded by overlapping deadlines. Instructors reported that effective adaptability support involves slowing instructional pace, breaking tasks into micro-steps, providing mental breaks, offering emotional reassurance, and implementing structured scaffolding through checkpoints. Decisions on whether to push or slow down were informed by cognitive cues, emotional signals, classroom atmosphere, and awareness of students' cumulative workload. The study concludes that mental adaptability is shaped not only by learners' intrinsic capacities but also by the responsiveness, judgment, and pedagogical strategies of instructors. It emphasizes the need for context-aware teaching practices and coordinated workload management to preserve cognitive sustainability in high-demand academic environments.

Keywords: Instructors, Mental Adaptability, Science, Math, ICT, TechVoc, Academic Tasks

1. INTRODUCTION

The intensifying academic rigor in higher education has placed unprecedented cognitive demands on learners, especially those pursuing Science, Mathematics, ICT, and Technical-Vocational disciplines. These programs are characterized by accelerated content delivery, sustained analytical reasoning, and continuous performance-based requirements that expose students to heightened cognitive strain (Wu et al., 2024). As academic institutions pursue globally competitive standards, the

complexity and density of learning tasks have increased, creating conditions in which students must consistently demonstrate high-level thinking despite limited time and mental recovery. Under such circumstances, learners experience cumulative stress, information saturation, and decreasing tolerance for academic pressure, making adaptability a critical yet often overlooked component of student success (Prakong, 2024; Gomez et al , 2025).

Mental adaptability conceptualized as a learner's capacity to reorganize thinking patterns, recalibrate focus, and regulate cognitive effort during demanding tasks has become a central construct in understanding academic resilience. Stockinger et al. (2021) emphasized that when students face dense workloads, their adaptability becomes unstable, leading to mental shutdown, reduced cognitive persistence, and emotional disengagement. Active teaching in high-demand subject areas, corroborate this through observed behaviors such as late outputs, sudden withdrawal from class participation, slowed cognitive processing, and visible fatigue during problem-solving sessions. These manifestations indicate the fragility of students' adaptive mechanisms when confronted with continuous, complex, and high-stakes academic expectations, particularly in technical fields that do not allow prolonged cognitive pauses (Kayo, 2024; She et al., 2023).

Learners must oscillate between solving intricate mathematical problems, developing digital outputs, conducting structured experiments, and completing competency-based tasks that require precision and speed (Hidayat et al., 2025; Torres-Peña et al , 2025). Evidence suggests that these rapid cognitive transitions exhaust working memory, limit executive functioning, and hinder adaptive thinking, particularly when instruction does not provide sufficient scaffolding or pacing adjustments (Alyssa & Richard, 2024). As a result, students may fail to mentally recalibrate when simultaneously encountering multiple academic demands. This cycle of inadequate adaptation and cumulative cognitive load indicates a deeper systemic need to examine how learning environments either support or obstruct students' ability to think flexibly under pressure.

Given the intensity of these academic tasks, instructors emerge as pivotal agents in shaping cognitive conditions that influence learners' mental adaptability. Frenzel et al. (2021) demonstrated that educators' real-time decisions regarding pacing, task structuring, expectations, and emotional cues significantly determine how students respond to academically stressful situations. In settings where learning demands are inherently heavy, the perceptiveness of instructors becomes essential not only for academic guidance but also for sustaining students' psychological stability and cognitive endurance (Zhang et al., 2025).

Instructor-mediated support strategies further influence whether students rebound from cognitive strain or succumb to escalating academic pressures. Córdova et al. (2023) emphasized that pedagogical adjustments such as chunking complex lessons, providing strategic feedback, and modifying workload distribution have measurable effects on learners' cognitive flexibility and emotional resilience. Classroom realities demonstrate how adaptive teaching behaviors either strengthen or weaken learners' capacity to navigate heavy academic expectations, making instructional practices a central determinant of student adaptability (Rebecca & Andrew, 2016).

Despite existing studies on academic stress, there remains insufficient empirical understanding of how instructors interpret learners' adaptive behaviors and what specific strategies they rely on when mental overload becomes visible. Mutanga (2024) and Amerstorfer et al. (2021) addressed that student perspectives on academic pressure but overlook the nuanced, experience-based judgments that instructors develop through continuous classroom interaction. Furthermore, limited research explores how teachers discern when to intensify academic rigor or when to moderate demands to protect learners' cognitive resources. This gap is critical because misaligned instructional decisions whether too strict or too lenient may either hinder adaptability development or exacerbate overload. Thus, the absence of instructor-centered evidence in high-demand fields constitutes a meaningful research void.

2. LITERATURE

2.1. Academic Overwhelm in High-Demand Courses

Foreign literature consistently emphasizes that cognitive load intensifies when learners engage with complex, multi-layered academic tasks requiring simultaneous information processing, analytical reasoning, and extended concentration (Udita & Robert, 2020). Khurshid et al. (2025) emphasized that in disciplines, students frequently encounter intricate problem sets, rapid content transitions, and strict deadlines that overload working memory and impair adaptive reasoning capacity. When mental demands exceed cognitive thresholds, learners demonstrate decreased task accuracy, slower processing, and reduced resilience in solving unfamiliar tasks. Such findings highlight the vulnerability of students in high-intensity learning contexts.

In the Philippines, the students in Science, Mathematics, ICT, and TechVoc courses experience significant cognitive fatigue due to dense curricula, heavy assessment cycles, and limited instructional scaffolding. Bustillo and Aguilos (2022) highlighted that Filipino learners struggle with task overload during laboratory activities, computational tasks, and modular worksheets, often resulting in mental strain, frustration, and impaired comprehension. Macaspac et al. (2025) showed that the accelerated pacing common in Philippine higher education leaves insufficient time for cognitive recovery, which exacerbates mental overload and reduces adaptability among students handling consecutive academic tasks.

Cognitive overload disrupts learning efficiency by impairing working memory, increasing error rates, and triggering mental shutdown when tasks become excessively demanding. Learners alike exhibit difficulty shifting strategies, sustaining attention, and processing new information under cumulative academic pressure (Abd & Andi, 2021). This convergence of evidence underscores the universal impact of heavy academic workloads on adaptability and reinforces the need to examine how instructional design affects cognitive functioning across diverse educational settings.

2.2. Mental Adaptability under Pressure

International research conceptualizes mental adaptability as a learner's capacity to reorganize cognitive strategies, shift between mental frameworks, and modify learning approaches in response to complex or rapidly changing academic demands. Scholars describe adaptability as a dynamic interaction of cognitive flexibility, self-regulation, and metacognitive awareness, enabling students to withstand instructional pressures and sustain performance even under stressful conditions (Nakhostin-Khayyat et al., 2024). Foreign studies show that in high-stakes STEM environments, adaptability predicts problem-solving efficiency, conceptual transfer, and successful navigation of unfamiliar tasks. Students with strong adaptability recalibrate their thinking during difficult computations, experiments, and coding tasks, thereby maintaining cognitive momentum even when overwhelmed. Conversely, students with low adaptability demonstrate rigid thinking, delayed mental shifting, and impaired task-switching, all of which increase the likelihood of failure or withdrawal when facing consecutive academic challenges (Chen et al., 2023; Parpottas et al., 2023).

Philippine literature reinforces that mental adaptability is crucial for learners in Science, Mathematics, ICT, and TechVoc programs, where academic tasks require persistent concentration, conceptual absorption, and strategic flexibility. Studies in Philippine universities show that adaptable learners exhibit stronger perseverance, faster mental recovery after errors, and more effective self-regulation when confronted with dense workloads and complex assessments (Abou Hashish et al., 2023). Filipino students with higher adaptability tend to employ alternative methods during problem-solving, adjust study techniques when lessons intensify, and sustain engagement even when

instructions shift unexpectedly. On the other hand, those with limited adaptability commonly resort to avoidance behaviors, passive engagement, and emotional withdrawal behaviors exacerbated by cultural expectations of academic performance and fear of disappointing instructors or family members (Eunice & Kususanto, 2021). Local findings highlight the interplay between cognitive flexibility and socio-cultural pressures that shape how Filipino students navigate challenging academic environments.

Global and Philippine research reveals that adaptability is a multidimensional construct involving cognitive, emotional, and behavioral components that determine how learners endure academic pressures. Across contexts, adaptable students demonstrate emotional resilience, quicker recovery from setbacks, and more effective management of academic uncertainties, enabling them to sustain performance under heavy workloads (Shan et al., 2025). Both local and international studies agree that when adaptability is low, students struggle to reorganize thought processes, leading to heightened stress reactions, poor task persistence, and diminished capacity for complex reasoning. Moreover, the combined evidence emphasizes that adaptability is not innate but shaped by instructional conditions, socio-cultural expectations, and personal coping mechanisms (Yin et al., 2025). This convergence underscores the importance of understanding adaptability as a central psychological factor in academic success within demanding educational contexts.

2.3. Academic Stress, Burnout, and Student Behavioral Indicators

Foreign studies show that academic stress is one of the strongest predictors of cognitive fatigue, emotional exhaustion, and declining academic performance, especially in intensive learning environments such as STEM and technical fields. Research demonstrates that stress impairs information retention, slows cognitive processing, and reduces executive functioning, thereby limiting students' ability to meet instructional expectations (Almarzouki, 2024). Chronic exposure to academic pressure contributes to burnout, which manifests through emotional depletion, diminished motivation, and reduced productivity in demanding tasks. In high-stakes educational systems abroad, students frequently show early behavioral signs such as hesitation, task avoidance, emotional volatility, and impaired problem-solving all of which indicate weakening adaptability and difficulty coping with workload intensification (Von der Embse et al., 2012).

Philippine studies mirror these findings, highlighting that Filipino learners in Science, Mathematics, ICT, and TechVoc disciplines often experience substantial academic stress due to heavy coursework, dense syllabi, and rapid assessment cycles. Local researchers observe that Filipino students frequently display stress-induced behaviors such as late submissions, decreased participation, irritability, and sudden mental block during tasks requiring sustained concentration (Dy et al., 2015; Serrano et al., 2025). These behaviors are compounded by environmental factors common in Philippine institutions, including large class sizes, limited academic support systems, and inconsistent access to instructional resources. The socio-cultural value placed on academic excellence and familial expectations further heighten stress levels, making Filipino learners particularly vulnerable to burnout, emotional exhaustion, and motivational decline when workloads escalate (Deng et al., 2022).

When viewed collectively, both local and foreign evidence demonstrates that academic stress profoundly disrupts mental adaptability by impairing cognitive efficiency, weakening emotional regulation, and increasing susceptibility to mental shutdown. Across global and Philippine contexts, burnout produces similar behavioral indicators such as avoidance, disengagement, diminished problem-solving accuracy, and reduced tolerance for academic uncertainty (Grace, 2022). These patterns reveal that stress does not merely affect academic output but fundamentally alters cognitive functioning, making it increasingly difficult for learners to recalibrate their thinking during challenging tasks. This alignment of findings underscores the urgent need for instructional strategies that mitigate

stress and prevent burnout, thereby enabling students to maintain adaptable, resilient learning behaviors under heavy academic demands.

2.4. Teacher-Led Interventions Supporting Mental Adaptability

Teacher-led interventions serves a significant role in strengthening students' mental adaptability by reducing cognitive overload, enhancing strategic thinking, and supporting emotional resilience. Effective interventions include instructional scaffolding, chunking of complex tasks, differentiated support, and timely feedback practices shown to improve cognitive flexibility and workload management in rigorous courses (Elsadig et al., 2021). Teachers who strategically adjust task difficulty, sequence learning tasks, and provide targeted feedback significantly enhance student persistence and readiness to tackle complex challenges. These interventions prevent the accumulation of mental strain and enable learners to maintain adaptive functioning even during peak academic pressure (Blindheim et al., 2025; Sankalaite et al., 2023).

A teacher-led strategies such as pacing adjustments, simplified task progression, guided practice, and motivational reinforcement help Filipino learners manage heavy academic workloads more effectively. Local research also notes that students respond positively to empathetic instructional behavior, culturally sensitive encouragement, and flexible deadlines when appropriate, which collectively strengthen resilience and reduce stress-induced disengagement (Ampofo et al., 2025). These findings reinforce the critical role of Filipino instructors in mediating academic stress and supporting cognitive wellness.

Across global and Philippine literature, there is strong consensus that teacher-led interventions significantly enhance mental adaptability by promoting cognitive regulation, encouraging emotional stability, and improving academic confidence under heavy workloads. Supportive instructional environments those marked by structure, clarity, responsiveness, and compassion enable students to regain cognitive momentum after setbacks and remain engaged in difficult tasks (Norozi, 2025). Effective teacher interventions serve as protective factors against overload-induced burnout, allowing students to rebuild adaptability and persist despite challenging academic trajectories. This unified evidence positions instructors as central architects of adaptive learning environments that sustain student performance in demanding academic conditions.

3. METHODOLOGY

3.1. Research Design

This study employed a qualitative exploratory research design, which is appropriate for investigating complex human experiences that require depth, contextual understanding, and interpretive analysis (Saka et al., 2023). Mental adaptability, as a cognitive and behavioral phenomenon, is not directly observable through quantitative measures; rather, it emerges through instructors' perceptions, interpretations, and experiences with students navigating heavy academic demands. A qualitative approach therefore enables the researcher to capture the richness of instructors' narratives, including the nuances of how they recognize cognitive overload, interpret behavioral signals, and implement strategies to support students experiencing academic strain.

The exploratory nature of the study is justified by the scarcity of existing literature on mental adaptability within the Philippine context, particularly in high-demand programs such as Science, Mathematics, ICT, and TechVoc. This design allowed flexibility in uncovering emerging themes grounded in real instructional settings rather than predetermined theoretical assumptions. It also facilitated the discovery of subtle yet meaningful patterns in how instructors understand and respond

to students' adaptability challenges. Through qualitative inquiry, the study generated a detailed, experience-based perspective that reflects authentic teaching environments in Mindanao, Philippines.

3.2. Participants

The participants consisted of twelve (12) college instructors from various universities and colleges in Mindanao, Philippines. All participants were actively teaching Science, Mathematics, ICT, or TechVoc subjects at the tertiary level. They were selected based on clearly defined criteria ensuring that they possessed firsthand, authentic experience with students handling heavy academic tasks. Specifically, each participant:

a) Had direct experience teaching high-demand subjects involving extensive cognitive processing, analytical reasoning, and time-pressured activities.
b) Frequently interacted with students displaying academic stress, burnout, or difficulty adjusting, such as late submissions, mental fatigue, reduced motivation, and moments of cognitive shutdown.
c) Carried substantial teaching loads (multiple preparations, several class sections, and continuous assessment cycles).
d) Regularly implemented classroom management strategies like pacing adjustments, task differentiation, and student assistance when overload indicators appeared.
e) Worked with students showing diverse motivational profiles and adaptability levels, including those who cope well and those who mentally freeze under pressure.

These criteria ensured that participants offered grounded, experience-based perspectives rather than hypothetical descriptions. Their daily exposure to real student struggles provided rich insights into the phenomenon of mental adaptability under academically demanding conditions.

3.3. Data Collection Procedure

Data collection was conducted through semi-structured interviews administered via phone call. This method ensured accessibility and flexibility for instructors who had busy schedules and substantial teaching loads. Phone-call interviews were particularly suitable given the participants' varying availability and the logistical challenges of in-person meetings. The semi-structured format allowed the researcher to follow a prepared set of questions while also probing spontaneously based on participants' responses, ensuring depth and richness of data.

Each phone interview lasted approximately 30 to 60 minutes, depending on the flow of the conversation and the amount of detail participants shared. With the participants' informed consent, all calls were audio-recorded to ensure accurate transcription. Immediately after each interview, the researcher prepared verbatim transcripts and reflective notes capturing relevant contextual cues such as tone, pauses, hesitations, and emotional expression elements that enrich qualitative interpretation. These procedures ensured that the data remained authentic, comprehensive, and grounded in real instructor experiences.

Ethical protocols were carefully followed. Participants were briefed about the study's purpose, their rights, confidentiality measures, and the voluntary nature of participation prior to the interview. They were free to pause or end the phone call at any time. All recordings and transcripts were securely stored and accessible only to the researcher. Coded identifiers were used to protect the anonymity of the participants.

3.4. Sampling Technique

The study utilized purposive sampling, a non-probability sampling technique that allows the deliberate selection of participants who possess specific characteristics relevant to the research focus (Tajik et al., 2024). This method ensured the inclusion of instructors with substantial exposure to student

workloads and firsthand knowledge of cognitive overload indicators. Since the aim was not to generalize but to obtain in-depth insights, purposive sampling was the most appropriate choice.

A criterion-based purposive approach was applied, wherein participants had to meet all predetermined qualifications before inclusion. This enhanced the study's methodological rigor by ensuring that all participants provided meaningful, contextually grounded data. The diverse institutional affiliations of participants across Mindanao, Philippines further strengthened the representativeness of experiences captured in the study.

3.5. Research Instrument

The primary research instrument used in this study was a semi-structured interview guide, specifically designed to gather in-depth insights from instructors regarding students' mental adaptability under heavy academic tasks. The instrument consisted of open-ended questions that allowed participants to describe their real experiences, observable behavioral indicators of student overload, and the instructional adjustments they make when mental strain becomes evident. This format provided flexibility for probing questions, enabling richer and more comprehensive responses that would not be possible through fixed-response tools. The interview guide was validated to ensure clarity, relevance, and alignment with the study objectives. A summary of the interview questions is presented in Table 1: Instrument of the Study, which outlines the specific areas explored during data collection and reflects the structured yet flexible nature of the instrument.

Table 1. Instrument of the study

Objectives	Interview questions
1. Identify how instructors perceive students' mental adaptability under heavy academic tasks.	1. When your students face multiple difficult tasks at once, what specific behaviors or reactions tell you they're mentally struggling or shutting down? 2. Can you describe a moment when you personally had to adjust your expectations because you realized your students' mental capacity was already overwhelmed? 3. What patterns have you noticed between the type of workload you assign and how quickly students mentally adapt or fail to adapt to it?
2. Determine instructor-led practices that directly support or improve students' mental adaptability.	1. What specific actions or adjustments do you personally make when you notice students mentally withdrawing due to heavy academic demands? 2. Which strategy have you found most effective in helping students "bounce back" mentally, and why do you think it works in your class setup? 3. How do you decide when to push students to adjust and when to slow down to protect their mental capacity?

3.6. Data Analysis

The data were analyzed using thematic analysis, following the systematic procedures. The analysis began with repeated reading of the transcripts to achieve deep familiarization with the data (Rosairo, 2023). Initial codes were generated to identify meaningful segments related to instructors' perceptions, student behaviors, indicators of overload, and teaching strategies supporting mental adaptability. These codes were then organized into broader categories that reflected patterns across participants' responses.

The researcher reviewed, refined, and Integrated these categories to form coherent themes that accurately represented the core findings. Throughout the process, Cross-verification of themes across participants helped ensure consistency and credibility. Thematic analysis allowed the study to highlight recurring instructional experiences and contextual factors shaping student adaptability, generating a structured yet flexible representation of complex qualitative data.

3.7. Ethical Considerations

The study observed strict ethical standards. Participants received full disclosure of the study's aims, procedures, and confidentiality safeguards. Informed consent was obtained prior to each phone interview. Participants were assured that responses would remain anonymous, with pseudonyms or coded labels used in all documentation. All audio recordings, transcripts, and related files were securely stored. Moreover, participants were informed that they could withdraw at any point without any consequences. These procedures ensured respect for participants' rights and upheld ethical integrity throughout the research process.

4. RESULTS

Objective 1. Identify how instructors perceive students' mental adaptability under heavy academic tasks.

Question 1. When your students face multiple difficult tasks at once, what specific behaviors or reactions tell you they're mentally struggling or shutting down?

1.1. Disengagement and Loss of Focus

Eight (8) participants repeatedly emphasized that one of the strongest indicators of mental struggle is when students begin to "disconnect" from the task even if they are physically present. They explained that cognitive overload reduces a learner's ability to sustain attention, making it harder to absorb instructions or follow logical sequences. This disengagement manifests when previously participative students suddenly become quiet or when their eyes remain fixed on the task without any real processing happening. Teachers noted that this shift is not random but is a direct response to excessive academic pressure when the brain can no longer keep up, it automatically withdraws to conserve mental energy. As a result, students lose their problem-solving flow, struggle to link concepts, and appear mentally "frozen," signaling that their adaptability is hitting its limit.

> *"Usually, the first sign is misplaced confidence turning into silence the one who used to be loud in recitation suddenly loses their voice."*
>
> *"You can see them staring at the solution steps but not really processing, as if they are frozen."*
>
> *"Looking at the board as if listening hey understanding nothing."*

1.2. Disrupted Workflow and Task Sequencing Errors

Six (6) participants described a strong correlation between mental overload and the breakdown of students' usual workflow patterns. Under normal circumstances, learners follow a clear sequence measure first, prepare materials, apply procedures, and execute the task with proper order. However, when overwhelmed, students begin to lose this structured thinking. They repeatedly redo simple steps, forget standard procedures, or perform actions out of sequence, indicating that their cognitive system

is struggling to organize information. Instructors stressed that these errors do not reflect lack of skill; rather, they demonstrate how heavy academic demands interfere with students' ability to maintain operational clarity. Once the mental load becomes too heavy, even instinctive technical routines become disrupted, making mistakes more frequent and slowing down overall task performance.

> *"They keep rechecking the tape measure even though it's already the maybe a 10th time"*
>
> *"They also tend to pin garments incorrectly, or they forget the order of operations — drafting first before cutting, or marking first before pressing."*
>
> *"They start jumping between windows, opening too many tabs, or trying random command lines without understanding what they're doing."*

1.3. Physical Manifestations of Mental Fatigue

Four (4) participants underscored that mental struggle often reveals itself through physical cues that students may not consciously notice. Instructors noted that cognitive fatigue impacts the body, causing students to display signs such as sighing, slowing down, rubbing their temples, or remaining motionless while staring at tools or screens. These physical manifestations reflect internal exhaustion the mind is overloaded and the body responds by slowing movement, minimizing effort, or expressing discomfort. Teachers explained that these cues serve as early warnings that a learner's mental adaptability is declining. When students begin to rely more on reflexive movements than active thinking, it becomes clear that their cognitive resources are depleted, and they need time to reset before they can re-engage effectively.

> *"Heavy sighing, rubbing their foreheads, resting their head on the desk, or turning their calculators on and off even though nothing is being done."*
>
> *"The cursor stays still for a long time, and they stare at the screen like they're waiting for the code to fix itself."*

1.4. Mental Overload

Five (5) participants also noted that students experiencing mental overload tend to shift into behaviors meant to escape or reduce the cognitive burden. Some become overly dependent on instructors, asking questions they would normally answer on their own because their mental energy is already drained. Others go in the opposite direction talking excessively, making jokes, or stalling on simple tasks as a way to avoid confronting the difficulty of the task. Instructors explained that these behaviors are not signs of laziness but are coping mechanisms students unconsciously use when their adaptability is compromised. When thinking becomes too taxing, students either seek immediate support or mentally distance themselves from the task, both of which reveal that their cognitive threshold has been exceeded.

> *"Others begin to ask very basic questions they normally wouldn't ask, like forgetting formula structures or second-guessing simple arithmetic."*
>
> *"For others, it's the opposite — they talk too much as a way to avoid focusing."*
>
> *"They suddenly become overly dependent even for a simple step, asking questions immediately… not because they don't know, but because their mental energy is already drained."*

Question 2. Can you describe a moment when you personally had to adjust your expectations because you realized your students' mental capacity was already overwhelmed?

2.1 Shifting Instructional Strategy

Seven (7) participants emphasized that moments of cognitive overload force them to reassess whether students still have the mental capacity to engage meaningfully with the lesson. They realized that even well-designed activities lose effectiveness when learners' cognitive bandwidth is already consumed by simultaneous academic demands. These situations required them to make immediate instructional shifts from independent problem-solving to guided scaffolding, from full outputs to reduced or micro-tasks. The adjustment was not about lowering rigor but aligning expectations with students' actual cognitive readiness. Teachers recognized that meaningful learning only happens when students have enough mental space to process, reason, and connect ideas; otherwise, pushing through simply reinforces frustration and disengagement.

> *"While solving, I noticed that almost all of them were just looking at the paper, not even attempting the first step"*
>
> *"One student quietly approached me and said that their brain was no longer processing."*
>
> *"So instead of pushing through, I paused the activity and converted the session into a guided walkthrough, breaking each problem into micro-steps."*

2.2 Scaling Down Workload

Five (5) participants revealed another dominant pattern, the deliberate decision to reduce or restructure workloads once instructors detected unusual hesitations, excessive corrections, or disrupted workflow even among typically competent students. They recognized that when mental exhaustion reaches a threshold, productivity declines sharply, resulting in errors, slow progress, and anxiety-driven second-guessing. Instead of forcing students to meet ambitious deadlines, instructors recalibrated the day's targets to protect the integrity of learning. Whether it meant completing only one component instead of three or postponing technical tasks for the next session, these adjustments were strategic interventions to ensure that students produced quality work rather than rushed, depleted outputs. Restructuring activities ultimately allowed learners to regain clarity, confidence, and technical accuracy.

> *"They made so many erasures, so much double-checking."*
>
> *"Even students who usually work confidently were unusually hesitant."*
>
> *"Instead of pushing them to complete everything, I cut the task in half and focused only on creating a precise bodice for that day."*

2.3 Recalibrating Class Demands

Six (6) participants also described situations where an entire class exhibited signs of mental drain, prompting them to scale back requirements to avoid overwhelming students further. They noted that stacked deadlines from other subjects, combined with high-level tasks, resulted in slower comprehension, increased basic errors, and an overall decline in participation. These moments revealed that even high-performing students reach cognitive saturation, especially during peak academic seasons. To maintain learning integrity, teachers removed or simplified assessments, extended deadlines, and shifted to more guided formats allowing students to "reset" their cognitive state. These adjustments showed how responsive teaching can prevent burnout, revive engagement, and restore the class's ability to absorb complex concepts.

> *"It was just a simple recall question, but their flow felt so slow."*
>
> *"There were so many errors in the basic steps, like they couldn't interpret the data properly."*

"I removed one quiz, I converted the lab report into a shorter guided worksheet, And I gave them an extended deadline for the proposal."

Question 3. What patterns have you noticed between the type of workload you assign and how quickly students mentally adapt or fail to adapt to it?

3.1 Structured and Predictable Tasks

Ten (10) participants consistently observed that students adapt more quickly when the workload is structured, repetitive, and follows a predictable sequence. These tasks allow learners to rely on familiar routines and procedural memory, reducing cognitive load and boosting confidence. Because the steps are clear and linear, students can settle into a steady rhythm and maintain mental stamina longer. Predictability essentially acts as cognitive scaffolding it lowers uncertainty and enables students to perform efficiently even under moderate pressure. This pattern is visible where routine tasks were completed with ease, while more open-ended or unpredictable tasks triggered slower adaptation.

"I observe that students adapt faster when the tasks involve predictable patterns like solving equations or applying formulas because those rely on routine skills."

"When the workload involves clear, linear steps like sewing straight seams, practicing stitches, or tracing simple patterns."

"Students adapt faster when the tasks are predictable, like typing basic HTML tags, configuring simple connections, or running familiar code structures."

"When the workload is structured with clear steps, sample outputs, and a pacing guide they adapt more quickly."

3.2 Slower Adaptation

Seven (7) participants noticed that students take significantly longer to adapt when tasks require deeper reasoning, interpretation, or strategic decision-making. These tasks demand higher-order thinking translating contexts, analyzing data, debugging logic, or integrating multiple skills which quickly exhausts students' mental bandwidth. Unlike predictable tasks, concept-heavy work triggers uncertainty, hesitation, and cognitive overload, making adaptability noticeably slower. Teachers emphasized that complexity is a more powerful barrier than workload volume; even one complex task can overwhelm students if it requires too many mental processes at once.

"They struggle longer when the task involves multi-step reasoning, especially word problems requiring translation from context to algebraic form."

"Students adapt slower when multiple skills must be combined in one output drafting, cutting, sewing, pressing especially if they're transitioning from theory to application within the same period."

"I noticed when moment of the tasks involve logic building, such as debugging nested loops or solving algorithm-based problems, their adaptability slows dramatically."

"When the tasks are concept-heavy, like theoretical explanations, data interpretation, or multi-part lab work, the adjustment takes longer."

3.3 Student's Adaptation

Nine (9) participants emphasized that students' adaptability is not solely determined by task difficulty but by when, why, and how the tasks are delivered. Heavy academic weeks, clustered deadlines, and sudden difficulty jumps all worsen mental adaptability, even if the workload seems manageable on paper. Conversely, when tasks are paced gradually alternating heavy and light activities students adapt more consistently and maintain better engagement. Teachers also observed that students adapt faster when tasks have clear purpose or relevance; meaningful tasks boost mental investment, while compliance-based requirements drain motivation quickly. This highlights that adaptability is shaped not just by ability but also by emotional energy, timing, and cognitive pacing.

> *"If the difficulty jumps too fast even if the number of tasks is small—most students experience mental freezing. So it's not just about workload volume; it's the complexity, timing, and cumulative pressure that dictate how fast or slow they adapt."*
>
> *"The biggest indicator is task layering too many layers at once, and their adaptability dips sharply."*
>
> *"When deadlines in other subjects also pile up at the same time, coding becomes their biggest struggle; mental adaptability decreases because logic work requires a fresh, focused mind."*
>
> *"Students adapt faster when they know why they're doing something… but when tasks are purely compliance-based, that's when they burn out faster."*

Objective 2. Determine instructor-led practices that directly support or improve students' mental adaptability.

Question 1. What specific actions or adjustments do you personally make when you notice students mentally withdrawing due to heavy academic demands?

1.1 Slowing Down Instructional pace

Seven (7) participants consistently emphasized that when students begin to mentally withdraw, one of the first adjustments they make is to slow down the instructional pace. They intentionally break tasks into smaller, clearer segments so students can re-engage without feeling overwhelmed. This approach allows learners to rebuild confidence through manageable steps rather than forcing them to push through complex material in a fatigued cognitive state. Participants describe this strategy as essential for helping students transition from shutdown back to active processing, especially during heavy academic periods.

> "*I slow down the pacing and reframe the problem into simpler chunks so that they don't completely shut down."*
>
> *"I break the lesson into micro tasks like 'Fix this line first' so that they don't get confused."*
>
> *"I chunk the tasks into small, doable checkpoints so they can have small wins even when they're tired."*
>
> *"I shift the class into short guided intervals instead of one long, mentally draining task."*

1.2 Mental Breaks

Nine (9) participants highlight that emotional regulation is just as important as academic support when students begin to withdraw mentally. To address this, they incorporate short mental breaks stretching, breathing, quick activities or shift to lighter tasks. Emotional reassurance also plays a key role, as participants intentionally validate students' struggles and reduce pressure through an empathetic tone. These actions help students reset both mentally and emotionally, making it easier for them to return to demanding tasks with renewed capacity.

"I reassure them that it's natural to struggle and give short mental breaks so they can reset."

"When the room feels heavy, I shift to lighter tasks like quick logic drills to refresh their mind."

"I let them stand, stretch, or watch short clips, and I speak to them with empathy so they feel that I understand them."

"I slow my voice and instructions to help them pace their thinking and calm down."

Question 2. Which strategy have you found most effective in helping students "bounce back" mentally, and why do you think it works in your class setup?

2.1 Progress Checkpoints

Five (5) participants highlighted that structuring tasks around intermediate checkpoints encourages students to feel a sense of accomplishment regularly. Completing each mini-goal signals progress, reduces anxiety, and motivates continuation. In mentally taxing tasks, seeing tangible results even small ones helps students regain focus and rebuild cognitive momentum. Participants often combine this with rescheduling larger outputs when mental fatigue is too high, acknowledging that adapting to students' mental state is as important as completing the task itself. This approach nurtures intrinsic motivation and reinforces the idea that learning is a series of achievable steps rather than one overwhelming hurdle.

"Students feel accomplished every time they finish a checkpoint, and that progress motivates them to continue."

"Tailoring becomes manageable again when broken into checkpoints."

"When I break the complexity into layers, students regain confidence. They bounce back quickly because they are not immediately overwhelmed."

2.2 Emotional Support and Confidence Building

Six (6) participants stressed that combining structure with reassurance fosters a safe learning environment where students feel encouraged rather than judged. Verbal encouragement, empathy, and reassurance normalize the experience of struggling under cognitive load, reducing stress and promoting mental recovery. Participants explained that confidence-building is not separate from academic guidance; it is intertwined. By explicitly acknowledging students' challenges while highlighting achievable steps, participants help learners rebuild self-efficacy and approach tasks with renewed energy. This emotional scaffolding, combined with practical strategies, supports both mental and cognitive adaptability.

"Another reason it works is because students feel supported, not judged; kindness and structure together make it easier for them to bounce back."

"Guidance doesn't make them weak it actually trains their mind to adapt progressively."

"Seeing that they've already accomplished several steps helps them mentally return to the task with less anxiety and more confidence."

"Sometimes, I reschedule their supposed tasks if I can really see a big effect of mental dryness or exhaustion."

2.3 Step-by-Step Scaffolding

Ten (10) participants emphasized that breaking tasks into smaller, manageable steps is the most effective strategy to help students recover mentally. Instead of presenting the entire problem at once,

participants guide students to focus on the first achievable action, gradually building momentum toward completing the whole task. This incremental approach not only reduces anxiety but also restores a sense of control, helping students regain confidence in their abilities. Scaffolding also encourages perseverance once learners experience small successes, they are more willing to attempt the next steps, creating a positive feedback loop that counteracts mental fatigue.

> *"When students are overwhelmed, they don't need the entire problem at once they just need the first doable step. Once they accomplish that small step, they become more willing to attempt the next."*
>
> *"When I give them a step-by-step guide while still letting them explore, they return to 'learning mode' more quickly."*
>
> *"Instead of overwhelming them with one big output, I divide the work into checkpoints setup, logic, debugging, polishing."*
>
> *"I guide them to focus on one action at a time: mark first… press next… baste later. It works because it removes the overwhelming feeling of 'there's so much that needs to be finished.'"*

Question 3. How do you decide when to push students to adjust and when to slow down to protect their mental capacity?

3.1 Reading Mental Cues

Eight (8) participants consistently highlighted that deciding whether to push or slow down depends on careful observation of students' cognitive and emotional signals. They monitor responsiveness, curiosity, engagement, and progress to determine when students are still in the "stretch zone," where gentle pushing promotes growth. Conversely, signs such as blank stares, emotional withdrawal, irritability, or repeated basic mistakes indicate that mental capacity is reaching its limit, signaling the need to pause or simplify tasks. This approach emphasizes that pacing must be dynamic and student-centered, rather than strictly adhering to a lesson plan. Participants balance maintaining high standards with safeguarding mental well-being by actively interpreting these subtle cues.

> *"If I see that students are still responsive, curious, and making small progress despite difficulty, I push them gently because that's the zone where growth happens. But if I notice signs of cognitive shutdown such as blank stares, emotional withdrawal, irritability, or inability to perform basic steps, I know it's time to slow down."*
>
> *"When they still recover from small mistakes and their hands remain steady, then it's safe to push a bit because they're still mentally engaged. However, if I notice repeated errors in basic tasks… that's a sign their mental energy is dropping and pushing further will only lead to frustration."*
>
> *"Students are still analyzing errors carefully, testing different solutions, and asking deeper questions, I push them a bit because growth happens there. But if they start submitting empty files, randomly guessing syntax, or repeating the same wrong step without reflection, that means their mental capacity is dropping. That's when I slow down."*
>
> *"I push them when I see they can manage, with signs like active engagement, curious questions, or steady output quality. I slow down when students cannot recall previous lessons, become unusually quiet or emotionally drained, or make many errors on simple tasks."*

3.2 Mental Capacity

Nine (9) participants acknowledged that mental capacity is influenced not only by the task at hand but also by external pressures such as exam weeks, overlapping deadlines, and unexpected requirements from other subjects. They integrate these contextual factors into their decision-making,

recognizing that students' ability to adapt fluctuates depending on cumulative workload. By evaluating both internal classroom signals and external academic pressures, participants ensure that pushing for growth does not inadvertently trigger cognitive overload or burnout. This holistic perspective reflects a balance between academic expectations and the reality of students' mental bandwidth.

> *"I also consider external factors exam weeks, overlapping deadlines, unexpected disruptions in their other subjects because these affect their mental capacity."*
>
> *"I also check the overall atmosphere of the room. When the class is collectively slow, quiet, or overly cautious, that's my cue to slow down and lighten the load."*
>
> *"Or when they directly tell me that requirements are piling up at the same time. Sometimes Science can be boring, so pushing makes sense only if it leads to growth. But if the push leads to shutdown, that's the moment I pull back."*
>
> *"In computing, clarity is essential, so I push only when their minds are still engaged and I pause when the mental fatigue starts to compromise their learning."*

3.4 Push or Pause

Six (6) participants emphasized that the decision to push or pause is a deliberate balance between fostering growth and protecting mental capacity. Pushing is reserved for moments when students are cognitively ready to stretch, promoting resilience, problem-solving, and deeper learning. Pausing occurs when continuing would risk frustration, disengagement, or shutdown. Participants frame this balance as essential for effective teaching, highlighting that high standards should never compromise well-being. They also describe using intuition and human judgment combining observation, empathy, and experience to dynamically adjust instruction in response to students' collective and individual readiness.

> *"The guiding principle is: Push when the mind is stretched, pause when the mind is breaking."*
>
> *"For me, pushing them makes sense only if it leads to growth. But when the push leads to shutdown, that's the moment I pull back. You need to be human before you can be an instructor."*
>
> *"I push only when they're in a state where learning can happen, and I pause when I can see the mental fatigue outweighing the benefit of continuing."*
>
> *"I decide based on their problem-solving behavior… I push only when their minds are still engaged and I pause when the mental fatigue starts to compromise their learning."*

5. DISCUSSION

The findings of the study illuminate the intricate and dynamic nature of mental adaptability among learners in Science, Mathematics, ICT, and TechVoc programs, emphasizing that adaptability is shaped not only by cognitive resources but also by instructional structures, emotional climates, and workload ecosystems. Consistent with contemporary models of cognitive flexibility, mental adaptability emerges as a fluctuating construct that responds to context-sensitive triggers such as task complexity, motivational strain, and cumulative academic pressure (Siqi-Liu et al., 2020). The behavioral indicators identified by instructors disengagement, workflow disruption, repetitive errors, and physical manifestations of fatigue align with the assertion that cognitive saturation weakens executive functioning and limits students' capacity to recalibrate thinking during demanding tasks (Watson, 2016). These manifestations reinforce that learners' adaptability deteriorates most sharply when internal cognitive load exceeds available mental bandwidth.

A prominent insight from the results is that task structure serves as a critical determinant of adaptive performance. Learners demonstrated stronger adaptability when tasks followed predictable, linear, and routine sequences, which reduce extraneous cognitive load and encourage automaticity (Feber et al., 2024). Conversely, open-ended, multi-step, or concept-heavy tasks were associated with slower adjustment, cognitive hesitations, and increased error frequency, affirming literature suggesting that high-complexity academic activities amplify intrinsic load and inhibit mental shifting (Zeitlhofer et al., 2024). This finding underscores that adaptability is impaired not merely by task volume but by the depth and novelty of mental processing required.

Another salient theme is the central role of instructors in detecting early markers of overload. The participants' ability to interpret subtle behavioral cues corresponds with research positing that educators' situational awareness significantly influences cognitive endurance and emotional resilience in high-demand environments (Salvo-Garrido et al., 2025; Bagdžiūnienė et al., 2023). The instructors' observations ranging from blank stares to emotional withdrawal mirror empirical descriptions of adaptive fatigue, where students exhibit passive compliance rather than active reasoning. These findings affirm that instructors' perceptual acuity serves as a frontline mechanism in preventing cognitive shutdown.

The results further reveal that teacher-led interventions act as pivotal stabilizers of mental adaptability. Strategies such as pacing adjustments, chunking complex tasks, cognitive micro-breaks, guided scaffolding, and emotional reassurance were consistently effective in restoring students' cognitive momentum. These align with literature showing that structured scaffolding enhances cognitive resilience by redistributing processing demands into sequential, manageable units (Shao et al., 2023). Emotional validation, highlighted repeatedly by participants, parallels studies showing that psychological safety reduces stress-induced cognitive interference and strengthens learners' capacity to re-engage (Wouters-Soomers et al., 2022). The effectiveness of these interventions reinforces that adaptability is both a cognitive and emotional process requiring responsive, compassionate pedagogy.

A compelling dimension of the findings involves the delicate balance instructors maintain between pushing learners and pausing instruction. This judgment-based process reflects principles of optimal challenge, where growth occurs within a cognitive "stretch zone" but declines when demands exceed functional limits. Participants' decisions to extend deadlines, reduce task layers, or simplify assessments align with theoretical models stating that adaptability can only develop under conditions where cognitive challenge remains tolerable and meaningful. These insights affirm that effective teaching is not merely content delivery but a dynamic calibration of academic rigor and psychological sustainability.

The study highlights that adaptability is deeply influenced by broader workload ecosystems, including overlapping assessments, peak academic seasons, and simultaneous task demands from multiple subjects. Research similarly shows that cumulative pressure, rather than isolated tasks, is the strongest predictor of adaptive breakdown (Sosnowski & Brosnan, 2023). The participants' experiences confirm that mental adaptability is not an isolated student trait but a systemic outcome shaped by institutional pacing, curricular design, and alignment across subject areas. These findings reinforce that mental adaptability in high-demand programs is a relational, responsive, and environmentally contingent phenomenon. It thrives when instructional designs are intentional, when educators intervene with precision and empathy, and when academic ecosystems allow cognitive recovery. Instructors, therefore, are not merely transmitters of disciplinary knowledge they are architects of adaptive learning conditions that profoundly influence students' cognitive resilience.

6. CONCLUSION

The study concludes that mental adaptability among Science, Mathematics, ICT, and TechVoc learners is not a passive cognitive response but an actively shaped process that emerges through the instructional judgment, perceptual sensitivity, and adaptive interventions of instructors thereby

addressing the research gap concerning the limited instructor-centered investigations in this domain. By identifying concrete behavioral indicators of cognitive overload and documenting how teachers interpret these signals in real time, the study fulfills its aim of understanding how instructors perceive mental adaptability under heavy academic demands. Equally, the study demonstrates that teacher-led interventions particularly pacing calibration, stepwise scaffolding, structured task segmentation, and emotional reassurance play a decisive role in restoring cognitive stability and enabling learners to re-engage with complex tasks, thus achieving the objective of determining practices that directly support adaptability. The findings reveal that adaptability is not merely a function of individual learner capacity but is profoundly conditioned by instructional design choices and the broader ecology of academic workload, underscoring the necessity for responsive and context-aware pedagogy. Importantly, the study clarifies that unresolved overload signals and unmoderated task sequences intensify cognitive strain, highlighting the need for institutions to consider workload coordination and pacing alignment across subjects. Overall, the study contributes a nuanced, instructor-informed understanding of mental adaptability, offering empirical grounding for pedagogical models that balance rigor with cognitive sustainability. It affirms that cultivating adaptability in high-demand programs requires not only strong content expertise but also an instructional stance that is observant, calibrated, and humane one that recognizes students' cognitive thresholds as integral to academic performance and long-term resilience.

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