

Small Habits, Big Gains: Exploring Atomic Habits in Learning Mathematics among Bachelor of Secondary Education Major in Mathematics Students

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Abstract: *This study explored the narratives of second to fourth year Bachelor of Secondary Education (BSEd) Mathematics student, focusing on how they develop and sustain effective learning habits in mathematics. Using a qualitative narrative inquiry approach framed by Appreciative Inquiry and guided by Riessman's (2008) narrative analysis and Braun and Clarke's (2006) thematic analysis, the research aimed to understand how atomic habits—small, consistent changes—contribute to students' long-term academic growth. Data were collected through narrative interviews with five purposively selected participants. The 4D cycle of Appreciative Inquiry (Discovery, Dream, Design, Destiny) is structured by a semi-structured interview guide and the thematic presentation of findings. Six themes emerged: small, consistent practice; structured time management; strategic use of study spaces; collaborative learning as a motivational and cognitive anchor; empowering learning through self-regulated strategies; and overcoming barriers. These themes revealed that BSEd Mathematics students sustain their learning habits through intentional effort, peer support, and adaptive strategies rooted in personal values and intrinsic motivation. The study concludes that cultivating atomic habits among future mathematics educators can strengthen academic performance and lifelong learning. Recommendations include integrating habit-formation strategies into the teacher education curriculum and fostering a learning environment that encourages self-regulation, collaboration, and reflective practice.*

Keywords— *Atomic habits, Appreciative Inquiry, Narrative Inquiry, Bachelor of Secondary Education (BSEd) Major in Mathematics*

INTRODUCTION

Success in mathematics requires more than memorizing formulas; it demands sustained effort, conceptual understanding, and disciplined engagement with problem-solving processes (Crowe, 2024). For Bachelor of Secondary Education (BSE) Mathematics students, mastery of mathematical concepts is not only essential for academic achievement but also foundational for their future professional roles as educators. Research on expertise development emphasizes that mastery emerges from deliberate, structured, and goal-oriented practice rather than from passive exposure alone (Ericsson, Krampe, & Tesch-Römer, 1993). However, many students struggle to maintain consistent and effective study routines, often becoming overwhelmed by abstract concepts, competing demands, and fluctuating motivation. While deliberate practice has been shown to enhance performance, its long-term implementation frequently lacks the structured habit systems necessary for sustainability.

One promising framework for sustaining deliberate practice lies in the application of James Clear's (2018) Atomic Habits model, which emphasizes small, incremental behavioral changes that accumulate into significant long-term outcomes. Clear proposes that habits become sustainable when they are made obvious, attractive, easy, and satisfying. Empirical evidence suggests that cultivating consistent study habits is significantly associated with improved mathematics performance (Odori, 2015), while small, systematic routines contribute to enhanced time management and academic outcomes (TALS, 2023). By embedding micro-practices into daily routines, students can transform effortful study behaviors into automatic systems that reduce cognitive overload and promote gradual mastery. When integrated with principles of deliberate practice, atomic habits provide a structured approach to sustaining engagement in mathematics learning.

Despite its potential, habit-based learning is influenced by contextual and individual factors, including variations in motivation, learning styles, and environmental conditions (Tossavainen et al., 2020). Moreover, the application of atomic habits in subject-specific contexts such as mathematics remains underexplored. Grounded in Self-Regulated Learning (SRL) theory (Zimmerman, 1989, 2002), this study examines how BSE-Mathematics students develop and sustain atomic habits in learning

mathematics. Using Appreciative Inquiry as a strengths-based framework, the research explores how small, consistent study behaviors contribute to mathematical understanding, problem-solving skills, and sustained academic performance. By synthesizing atomic habit formation with self-regulated learning processes, this study aims to provide insight into how structured, repeatable routines can support long-term success in mathematics education.

Statement of the Problem

Using the Appreciative Inquiry (AI) approach, the study answers the following questions:

1. Discovery – What existing atomic habits contribute to the mathematical success of BSE-Mathematics students?
2. Dream – How do students envision an ideal study routine that integrates atomic habits for long-term mathematical mastery?
3. Design – What strategies can be developed to reinforce and optimize effective habit formation in learning mathematics?
4. Destiny – How can students and educators collaboratively sustain and institutionalize effective atomic habits in mathematics learning?

METHODOLOGY

This study employed a qualitative narrative inquiry to examine the lived experiences of BSEd Mathematics students, focusing on how effective learning habits are developed and sustained. Riessman's (2008) Narrative inquiry, which emphasizes how individuals construct meaning through storytelling, was complemented by thematic analysis following Braun and Clarke's (2006) framework to identify recurring patterns within participants' accounts. The interpretation was guided by James Clear's Atomic Habits (2018), particularly the concepts of identity-based habits, environmental influences, and cue–routine–reward systems in shaping consistent learning behaviors. Semi-structured interviews encouraged participants to reflect on turning points, challenges, and strategies in developing effective mathematics learning habits, allowing for a nuanced understanding of how small, consistent actions contribute to long-term academic success.

A sample of five participants is appropriate for narrative inquiry, as this research design prioritizes in-depth exploration of lived experiences rather than large sample sizes. Narrative studies typically involve a small number of participants to generate rich and detailed accounts (Creswell & Poth, 2018). The five students were purposively selected based on specific inclusion criteria: (a) second- to fourth-year enrollment, (b) consistent Dean's List recognition for two consecutive semesters, (c) representation of diverse genders, and (d) active involvement in organizational or leadership roles. Students who did not meet these criteria were excluded. These parameters ensured that participants demonstrated both sustained academic excellence and leadership experience, enabling them to provide meaningful and information-rich insights into habits that support continued achievement.

Ethical standards were strictly observed throughout the research process. Participants were informed about the study's purpose, procedures, and potential outcomes and were assured of voluntary participation and their right to withdraw at any time without consequence. Written informed consent was obtained, including consent for audio recording. To ensure confidentiality, unique identifiers were assigned, and personal information was separated from research data. All data were stored in an encrypted database accessible only to the research team, analyzed in anonymized and aggregated form, and handled in compliance with the Data Privacy Act of 2012. Upon completion of the study, identifiable data were securely destroyed. Participants received small tokens of appreciation that did not influence their decision to participate.

RESULTS AND DISCUSSION

This section presents the findings derived from the narratives of five BSEd Mathematics students. Guided by the Appreciative Inquiry (AI) 4D framework and interpreted through the lens of Atomic Habit (Clear, 2018), four major themes emerged: Small, Consistent Practice; Intentional Learning Structures; Strategic Learning Regulation; and Overcoming Barriers.

These themes illustrate how atomic habits function as an interconnected systems that sustain mathematics learning over time. Across Discovery, Dream, Design, and Destiny phases, students revealed how incremental routines, environmental design, self-regulation strategies, and adaptive resilience collectively shape long-term mathematical development.

Discovery

The Discovery phase centers on identifying existing strengths and successful experiences. In this study, it captures the effective study habits that students have already developed in learning mathematics. Through reflective narratives, participants describe the routines and strategies that have proven meaningful and impactful in their academic journey.

Theme 1. Small, Consistent Practice

Across participants, mastery in mathematics was grounded in repeated, small-scale actions embedded into daily routines. Rather than depending on cramming, students emphasized rewriting, daily problem-solving, repetition, and incremental accumulation of knowledge.

Participant 1 shared:

“Personally, I prefer rewriting my notes as part of my study routine. One specific study habit that I find very effective is repetition... That’s why I find it helpful to rewrite and repeatedly go over my notes.”

She further reflected on her transition from passive to active learning:

“Before I developed my current study habits, I used to simply read my notes without truly understanding them... To fix this, I shifted to active rewriting and solving different types of equations daily.”

Similarly, Participant 4 described a parallel rewriting routine rooted in personal experiences:

“What I usually do is, I only take notes in the boarding house right after I took pictures in lectures in school... When I get home, this is where I write because when I rewrite, I’m also studying at the same time.”

Daily micro-practice was also emphasized by Participant 2:

“I try to solve one problem a day... maybe three problems daily to keep it interesting.”

Meanwhile, Participant 3 articulated the cumulative logic of atomic learning:

“Learning mathematics in an atomic way... You learn something the next day, the next day, the next day... There’s a way for us to accumulate knowledge.”

The findings demonstrate that small, repeated learning actions serve as foundational mechanisms for mathematics mastery. Participants’ emphasis on rewriting notes, solving one problem daily, and reviewing concepts incrementally reflects Clear’s (2018) principle that habits become sustainable when reduced to manageable actions. Rather than engaging in episodic cramming, students distributed effort across time, which strengthens long-term retention and reduces cognitive overload. This pattern aligns with Sison and Valencia (2024), who found that short, consistent study intervals enhance mathematical retention and procedural fluency. Similarly, Bloom (2020) explains that repetition combined with reflection reinforces memory pathways, while Lotfali (2020) notes that manageable study routines facilitate deeper conceptual internalization.

More importantly, the participants’ narratives shift the discourse from innate mathematical ability to structured behavioral consistency. Their micro-practices function as cognitive anchors that gradually build automaticity, confidence, and problem-solving flexibility. In this sense, small, consistent practice is not merely a study technique but a habit-based learning system that supports cumulative knowledge construction over time.

Dream

The Dream phase explores students’ aspirations and envisioned improvements. It reflects how participants imagine ideal study routines, environments, and systems that would further enhance their mathematical understanding and engagement. This stage reveals their goals for refining and expanding effective habits.

Theme 2. Intentional Learning Structures

Students deliberately structured both time and environment to optimize focus and minimize distractions. Intentional scheduling and environmental design emerged as enabling systems for habit formation.

Participant 1 explained her preferred schedule:

"I usually study around 9:00 p.m. because the environment is quieter, and for some reason, I feel more active and focused during that time."

In contrast, Participant 2 described the benefits of early morning study:

"If you sleep early and get enough rest, you'll be able to wake up early and study more effectively... My mind feels fresh, and the environment is quiet."

Task prioritization was emphasized by Participant 5:

"I start with the subjects that are needed first or that are scheduled first... this helps me avoid feeling overwhelmed."

Environmental cues also played a significant role. Participant 1 stated:

"Before studying, I always clean my desk. I believe that having a clean and quiet study space is essential for concentration and focus."

Similarly, Participant 5 noted:

"I try to study or write on the table in my room... It's peaceful. There are no distractions."

Beyond micro-environmental changes, Participant 4 described a major environmental shift:

"I transferred to a school far away... my board mates were good at studying, and it challenged me to study."

The students' deliberate structuring of time and environment illustrates how habit sustainability depends on contextual design. Whether studying during quiet evenings or early mornings, organizing tasks by priority, or maintaining a clean desk, participants intentionally engineered environments that reduced distractions and decision fatigue. This reflects time-blocking principles (Newport, 2016) and executive self-regulation theory (Zimmerman, 2002), which emphasize proactive control over when and how cognitive effort is deployed. Clear (2018) similarly argues that behavior is strongly shaped by environmental cues; thus, structured study times and designated spaces act as automatic triggers for focused engagement.

Empirical support further strengthens this interpretation. Swargiary and Roy (2023) found that organized study environments enhance concentration and academic performance, while Huangfu et al. (2024) highlight the motivational impact of disciplined peer contexts. The findings suggest that effective mathematics learning is not sustained by willpower alone but by thoughtfully constructed physical and temporal systems that support consistent cognitive engagement.

Design

The Design phase focuses on the intentional construction of systems that support sustained learning. Here, students describe how they structure their routines, regulate motivation, and implement strategies that make productive habits more automatic, consistent, and aligned with their academic goals.

Theme 3. Strategic Learning Regulation

Students implemented deliberate self-regulation systems to reinforce motivation, monitor progress, and sustain engagement.

Self-reward mechanisms were frequently mentioned. Participant 1 stated:

"After finishing two lessons, I allow myself to play games. It serves as motivation."

Participant 5 shared:

"For every 45 minutes or 1 hour study, I take a 15 to 20 minute break..."

and

"If required, I also reward myself with snacks... it makes me more motivated."

Progress monitoring was also evident. Participant 1 explained:

"I track my progress using quiz results."

Participant 3 described structured tracking:

"I tend to have my to-do list or accomplishment list that I list down the tasks that I need to accomplish..."

Accountability was strongly articulated by Participant 4:

"I will always say that you're accountable for your own scores."

Collaborative learning reinforced regulation. Participant 1 stated:

"When you study with classmates, you can brainstorm together and solve problems more efficiently."

Similarly, Participant 5 noted that teaching peers deepened understanding.

"So a big part of my ideal routine would be teaching my classmates or circle of friends... Then I share with them what I have learned. So these habits help me a lot, not just in remembering the lesson better, but also in being able to help others understand. So I feel more confident and fulfilled knowing that I can support my friend also while improving myself too."

Participants demonstrated deliberate use of self-regulatory strategies, including reward systems, progress tracking, peer teaching, and accountability, to transform effort into sustained academic behavior. These strategies illustrate what Zhou and Wang (2021) describe as micro-habit integration, where small reinforcement mechanisms strengthen long-term consistency. Rewarding progress, setting structured breaks, and using to-do lists reflect behavioral reinforcement principles that increase the likelihood of habit repetition. Ragusa, Garcia-Fernandez, and Ferrandiz (2023) emphasize that academic self-regulation strategies, including structured monitoring and goal tracking, significantly reduce procrastination and strengthen academic resilience and performance.

Collaborative elements also strengthened regulation. Studies by Ul-Hassan et al. (2023) and Siller and Ahmad (2023) confirm that peer interaction enhances both self-regulation and mathematics achievement by reinforcing accountability and conceptual clarification. Thus, strategic learning regulation in this study functions as a feedback-driven system where motivation is sustained through monitoring, reinforcement, and social engagement rather than relying solely on intrinsic drive.

Destiny

The Destiny phase highlights the sustainability and institutionalization of effective habits. It examines how students maintain, adapt, and reinforce their routines when confronted with real-world challenges. This phase emphasizes resilience, flexibility, and long-term commitment to continuous improvement in mathematics learning.

Theme 4. Overcoming Barriers

Students demonstrated adaptive resilience in responding to burnout, procrastination, workload, and digital distractions.

Participant 1 shared:

"Of course, there are times when I experience burnout... I break my study sessions into shorter chunks and ensure I get enough rest."

Participant 2 described work–study tension:

“Sometimes... my free time is often consumed by my work duties.”

Digital distraction emerged from Participant 5:

“Phone distractions... I set an alarm or a timer for 15 minutes so that I can be aware of the time.”

Meanwhile, Participant 3 acknowledged procrastination:

“Number one challenge is laziness... seeing the result motivates me to do it.”

The narratives reveal that sustaining atomic habits requires adaptive resilience rather than rigid consistency. Participants confronted burnout, competing responsibilities, procrastination, and digital distractions through strategies such as chunking study sessions, setting timers, reflecting on results, and recalibrating routines. This adaptive flexibility reflects Duckworth and Gross’s (2020) concept of situational grit, which posits that persistence is maintained through context-sensitive adjustments rather than inflexible endurance. Similarly, Liu et al. (2022) argue that proactive environmental regulation enables learners to recover from setbacks and maintain motivation.

Supporting literature further affirms these adaptive strategies. García-Ros et al. (2023) demonstrate that breaking study into manageable segments reduces stress and improves sustained attention during high-demand periods, while Abulfaraj et al. (2024) highlight the effectiveness of digital boundary-setting in protecting cognitive focus. The findings suggest that habit durability in mathematics learning depends not only on formation but on continuous recalibration in response to real-world pressures.

CONCLUSION

This study concludes that the development and sustainability of atomic habits among BSE-Mathematics students are shaped by the interplay of small, consistent practice, intentional learning structures, strategic self-regulation, and adaptive resilience. Students who align their study behaviors with clear academic goals and professional aspirations demonstrate stronger motivation and persistence in mastering mathematical concepts. Structured routines, environmental management, collaborative learning, and reflective self-monitoring enhance self-regulated learning and promote steady academic growth. Moreover, the ability to adapt habits in response to challenges such as workload, distractions, and fatigue, that strengthens long-term consistency. Overall, habit formation in mathematics learning is not a single strategy but a dynamic system influenced by personal discipline, social support, and contextual structures, highlighting the importance of integrating habit-based and self-regulated learning approaches in teacher education programs.

RECOMMENDATIONS

In light of the findings, it is recommended that students intentionally cultivate small, consistent study routines such as daily problem-solving, structured review sessions, progress monitoring, and distraction management to transform effort into sustainable learning habits. Teachers may reinforce these practices by modeling effective study strategies, embedding metacognitive reflection and time management within instruction, and promoting collaborative learning environments that strengthen accountability and conceptual understanding. Academic institutions can further support habit sustainability by providing structured peer mentoring, study workshops, and accessible academic support systems that encourage self-regulated learning. Future research may expand this inquiry across broader populations and contexts to examine how atomic habit formation can be systematically integrated into mathematics education for long-term academic success.

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