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Genio Notes 2024-2025 Efficacy Study

Report of Mixed-Method Findings

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PROMISING

LXD Research Recognition for Genio Notes

Genio
formerly Glean

This product has been rigorously evaluated and is hereby acknowledged for meeting the educational impact criteria of the Every Student Succeeds Act (ESSA), warranting a Level III for "Promising." This recognition is based on its proven effectiveness in enhancing grade-level learning outcomes.

REVIEWED BY THE LXD RESEARCH EXPERT REVIEW PANEL

Rachel Schechter, Ph.D.
Founder of LXD Research

July 2025

DATE

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The Impact of Genio's Note Taking Platform on Student Success and Retention in Higher Education

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Abstract

This mixed-methods efficacy study examined the relationship between Genio Notes (formerly Glean) platform use and post-secondary student outcomes during the 2024-2025 academic year. The research employed a pre-post survey design with 1,418 students who completed both winter and spring assessments, supplemented by grade data from 733 students participating in Fall-Winter 2024 Learner Impact Report Surveys.

Findings indicated statistically significant improvement for Genio Notes users across several key metrics. Students demonstrated a reduction in dropout intentions from 7% to 5% ($p = .01$) and increased self-reported grade point average from 3.34 to 3.46 ($p < .001$, Cohen's $d = .14$). Academic engagement measures showed significant differences between high-usage and low-usage groups ($p < .05$, Cohen's $d = .16$), with students logging more than 50 Genio Notes events per semester demonstrating higher engagement scores after controlling for baseline responses. Note taking confidence showed significant growth among users ($p < .001$).

Qualitative analysis revealed four primary themes characterizing student experiences with the platform. Students consistently described Genio Notes as essential infrastructure for managing academic demands, particularly those balancing multiple responsibilities or managing learning differences. Qualitative responses suggested that reduced stress and improved note taking capabilities served as mechanisms through which the platform influenced broader academic outcomes such as retention and engagement. These findings indicate that post-secondary students using Genio Notes regularly demonstrate improvement in several key academic outcomes, with specific effects on student subgroups such as students with learning accommodations and new majority learners.

Keywords: Note taking technology, student retention, new majority learners, academic engagement, GPA

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Introduction

Background & Context of the Problem

Traditional higher education models struggle to serve the students who now comprise **74% of all undergraduate enrollment**—working adults juggling careers and coursework, parents managing childcare responsibilities, first-generation students navigating unfamiliar systems, veterans transitioning to civilian academic life, and learners with disabilities seeking accessible pathways to success. Research from 2020-2025 reveals that these "new majority learners" require comprehensive institutional transformation rather than add-on programs designed around outdated assumptions about who belongs in college.

The COVID-19 pandemic accelerated existing challenges while simultaneously demonstrating that flexible, technology-enabled models can effectively serve diverse populations when institutions commit to meaningful change. This literature review synthesizes recent publicly available research across academic journals, government data, foundation reports, and institutional studies to understand how educational institutions must evolve to serve 21st-century learners.

The Evolving Landscape of Academic Support Technology

Higher education institutions face a perfect storm of challenges that expose the inadequacy of traditional support models. McNaughton (2025) identifies twelve critical threats confronting colleges in 2025, from enrollment declines and rising costs to AI disruption and shifting public perception. For smaller institutions with limited endowments, technology infrastructure demands create existential financial strain while student expectations for comprehensive support services continue to escalate.

Current support limitations reflect systems designed for students who no longer represent the majority. Traditional models assume students can access in-person support on residential campuses during standard business hours, and navigate complex bureaucratic processes without assistance. The 2024 EDUCAUSE Higher Education Trend Watch documents institutions struggling with "*rising costs, uncertainty in funding, staff resignations, and increasing security threats*" while attempting to provide expanded wraparound services including mental health support, career counseling, and basic needs assistance (EDUCAUSE, 2024).

Accessibility barriers compound these systemic failures. Despite 21% of undergraduates reporting disabilities that would warrant a learning accommodation, federal data indicates that only 34% of students with disabilities actually register with their institution's disability services office (NCES, 2022). This gap is further exacerbated by the fact that only 8.8% of faculty receive training in

online disability accommodations (NASPA, 2024). The United Educators 2024 Top Risks Survey found that 71% of institutions identified enrollment concerns as their most pressing challenge, up from 67% the previous year, while cybersecurity and regulatory compliance emerged as growing concerns that institutions struggle to address with limited resources (Diverse Education, 2024).

Technology offers transformative potential for democratizing academic support, but implementation of such tools requires strategic vision and sustained commitment. Deloitte's 2024 higher education trends analysis highlighted Arizona State University's collaboration with OpenAI as exemplary of how institutions can leverage artificial intelligence to enhance educational accessibility and affordability (Deloitte, 2024). However, rushed implementations often exacerbate existing inequities rather than solving them. Successful technology integration demands comprehensive planning, adequate resources, and systematic professional development to ensure all students benefit from innovation.

Genio's Position in the Learning Technology Ecosystem

The transformation from disability accommodation to comprehensive learning technology reflects a fundamental shift in understanding how diverse learners access information. Traditional accommodation models treated disability support as specialized, separate services— often stigmatizing differences rather than celebrating cognitive diversity. Modern learning technology ecosystems recognize that tools originally developed for students with disabilities often benefit all learners, exemplifying the “curb-cut effect” where accessibility improvements enhance usability for everyone.

Universal Design for Learning (UDL) principles provide the theoretical foundation for this evolution. CAST's 2024 release of UDL Guidelines 3.0 directly addresses "critical barriers rooted in biases and systems of exclusion," emphasizing learner agency that is "purposeful & reflective, resourceful & authentic, strategic & action-oriented" (CAST, 2024). Recent systematic literature reviews demonstrate that UDL implementation in higher education significantly improves learning outcomes for all students while reducing barriers for those with disabilities (Bray et al., 2024).

Addressing new majority learner needs requires technology solutions that accommodate the full spectrum of student experiences. Working adults need platforms that function across mobile devices. Parents require tools that pause and resume for childcare interruptions. First-generation students benefit from intuitive interfaces. Veterans need systems that recognize their experience while supporting academic transitions. Students with disabilities require accessible platforms that provide multiple engagement options without stigma.

The most effective learning technologies anticipate variability rather than treating it as an exception requiring special handling. When platforms are designed with flexibility as a core

feature, they create inclusive environments where all students can focus on learning rather than navigating barriers.

Demographic Landscape Reveals Fundamental Shift

Government data from the National Center for Education Statistics confirms that non-traditional characteristics have remained consistently high across decades, with 70-74% of undergraduates demonstrating at least one non-traditional trait, including delayed enrollment, part-time attendance, financial independence, having dependents, or working full-time while enrolled (NCES, 2015). This isn't a temporary trend—it represents the new reality of higher education enrollment patterns that institutions can no longer ignore.

The 2024 Race and Ethnicity in Higher Education Status Report documents continuing diversification, with white students comprising only 52% of undergraduate enrollment compared to historical majorities. First-generation college students constitute approximately one-third of undergraduate enrollment but face significant completion challenges, with 33% leaving postsecondary education without credentials after three years versus 14% of continuing-generation students (NCES, 2018). These statistics reveal students who don't fit traditional models of college attendance. They're not living in residence halls, attending classes during standard daytime hours, or following prescribed four-year degree paths. Instead, they're creating complex schedules around work shifts, family responsibilities, and financial constraints while attempting to navigate institutional systems designed for students with very different lived experiences.

Ko, Bartoszuk, Peek, and Hurley's (2025) research identifies distinct profiles among first-generation students, revealing that those with multiple intersecting barriers report substantially higher rates of stress, anxiety, and depression. Veterans represent 6.1% of undergraduate and 6.7% of graduate enrollment, with Student Veterans of America research demonstrating 62% are first-generation college students despite achieving higher academic performance than civilian peers (3.34 vs 2.94 GPA average). Students with disabilities comprise 21% of undergraduates and 11% of graduate students, though only 37% inform their institutions of their disability status, creating significant gaps in support service delivery.

U.S. Government Data Confirms Urgent Demographic Imperative

U.S. federal statistics reveal that educational institutions face a demographic cliff that makes serving new majority learners an economic imperative rather than merely a social good. Census Bureau data shows educational attainment growth has plateaued since 2020 at 37.7% of adults holding bachelor's degrees or higher, while Bureau of Labor Statistics research demonstrates persistent employment and earnings gaps across educational levels and demographic groups.

Veterans Administration data indicate that only 40% of eligible veterans utilize available education benefits, representing significant untapped potential for institutional enrollment growth. The Western Interstate Commission for Higher Education's "Knocking at the College Door" projections show traditional high school graduates will peak in 2025 then decline 13% through 2041—creating institutional urgency to strengthen adult learner recruitment and retention strategies.

This so-called 'demographic cliff' means that institutions cannot survive by competing for a shrinking pool of traditional students. Rather, those that thrive will be the institutions that successfully recruit, retain, and graduate working adults, parents, veterans, first-generation students, and learners with disabilities—populations that have been underserved by traditional higher education models.

The Genio Notes Platform

Genio Notes represents an integrated approach to supporting student learning through technology-enhanced note taking and study capabilities. The platform enables students to record audio and visual content from lectures while simultaneously creating notes, which are then synchronized with transcripts. This multi-modal capture system allows students to revisit specific moments in lectures, review content at their own pace, and enhance their notes with additional annotations and organizational structures. The platform's design philosophy centers on reducing cognitive load during initial content exposure while providing robust tools for subsequent review and study.

The theoretical framework underlying Genio Notes aligns with established models of student retention and success, such as Tinto's model of student integration (Tinto & Cullen, 1973). This model posits that student persistence is influenced by both academic and social integration within the institutional environment. Academic integration encompasses factors such as academic performance, intellectual development, and engagement with course content, while social integration involves connections with peers, faculty, and the broader campus community. By potentially improving academic performance and reducing stress, tools like Genio Notes may influence both dimensions of integration.

Study Purpose and Research Questions

This investigation evaluated Genio Notes's efficacy in supporting student success in post-secondary education settings. The study addressed four primary research questions aligned with institutional priorities for student success:

1. To what extent is Genio Notes use related to changes in student dropout intentions?

2. What is the relationship between Genio Notes use and changes in GPA?
3. How does platform use predict academic engagement?
4. How does the platform influence student perceptions of academic stress and well-being?

Additionally, the study examined whether effects varied across student subgroups, particularly for new majority learners who may face unique challenges in their academic pursuits. Understanding differential impacts is crucial for institutions seeking to address equity gaps and support diverse student populations. The research also investigated the relationship between specific usage patterns and outcomes to identify optimal implementation strategies.

Literature Review

Recent Academic Literature on Learning Technology and Student Success

The landscape of educational research has evolved significantly since 2020, driven by pandemic-induced digital transformation and growing recognition of diverse student needs. Recent meta-analyses and systematic reviews reveal that technology's educational impact depends heavily on implementation quality rather than the technology itself, with particular attention needed for supporting non-traditional student populations who now comprise the majority of higher education enrollments.

This literature review synthesizes findings from recent peer-reviewed research across three interconnected domains that shape modern educational outcomes: note taking effectiveness, technology-enhanced learning, and student retention factors.

Note taking and academic performance show consistent patterns despite digital disruption

Recent meta-analytic research has resolved longstanding debates about digital versus handwritten note taking while revealing critical gaps in supporting diverse learners. Flanigan et al.'s 2024 meta-analysis of 24 studies with over 3,000 participants found that handwritten note takers achieved A grades at nearly 60% higher rates than their digital counterparts (9.5% vs 6%), with benefits persisting across both immediate and delayed assessments.

However, methodological sophistication has revealed important nuances in these findings. Voyer et al.'s 2022 systematic review of 77 effect sizes found *no meaningful difference* between note taking methods when digital distractions were properly controlled, suggesting that other research studies may conflate the cognitive benefits of handwriting with the attention costs of digital multitasking. This finding has significant implications for classroom technology policies and study design.

The mechanism driving handwritten note advantages appears to be cognitive rather than technological. Research consistently shows that handwritten notes promote deeper processing through paraphrasing and synthesis, while digital note taking often encourages verbatim transcription. Salame et al.'s 2024 empirical study of 200 diverse college students found positive correlations between structured note taking methods and GPA, with students reporting that organized note taking systems improved both memory retention and conceptual understanding.

Despite these advances, critical research gaps remain for diverse student populations. Multiple studies explicitly acknowledge the absence of research on note taking effectiveness for students with disabilities, despite handwritten methods potentially being inaccessible for many learners. Flanigan et al. (2024) directly addressed this limitation in their meta-analysis, noting that "no studies included in our meta-analysis—or in any other known meta-analyses on note taking medium—accounted for the needs of students with disabilities. As such, the findings and implications drawn from the research could be unintentionally influenced by ableist assumptions." Similarly, research on English as a Second Language (ESL) students' note taking challenges remains limited, even as these populations grow within higher education.

The emerging research on audio-synchronized note taking systems and shows promise but lacks rigorous academic evaluation. These hybrid approaches may offer pathways to combine the cognitive benefits of handwritten notes with the accessibility and searchability of digital systems.

Technology-enhanced learning produces mixed results requiring careful implementation

The post-pandemic surge in educational technology adoption has generated substantial research on implementation effectiveness, revealing that success depends on institutional factors rather than technological sophistication. Huang et al.'s 2025 systematic review of 63 studies found that AI-based learning tools generally improved cognitive knowledge acquisition, but with mixed effectiveness for skill development and concerning gaps in serving diverse populations.

Universal Design for Learning (UDL) implementation with technology shows particular promise for inclusive education. Beck Wells' 2022 study found that virtual study groups achieved significantly higher UDL compliance than traditional online courses, with clear feedback mechanisms and collaborative learning opportunities emerging as critical success factors. Students emphasized the importance of detailed rubrics and real-life content connections, suggesting that pedagogical design matters more than platform selection.

The pandemic provided an unintended natural experiment in digital learning effectiveness. Meng et al.'s 2024 systematic review of 25 empirical studies revealed that only 36% reported online learning as effective during 2020-2023, with infrastructure factors serving as the primary

determinant of success. Developed countries showed more positive results than developing countries, highlighting persistent digital equity challenges.

Research consistently identifies five critical success factors for educational technology: institutional leadership commitment, comprehensive faculty training, adequate technical infrastructure, inclusive design considering diverse learner needs, and maintenance of social interaction opportunities. Conversely, failures typically stem from insufficient preparation time, poor integration with existing systems, and neglect of equity considerations.

The field has moved beyond simple adoption studies toward understanding implementation complexity. Technology effectiveness varies significantly across academic disciplines, student demographics, and institutional contexts, requiring nuanced evaluation frameworks rather than broad generalizations about digital learning benefits.

Student retention patterns reflect complex interactions between technology access and academic integration

Current retention statistics show a gradual recovery from pandemic-era declines, but persistent disparities across student populations remain concerning. National persistence rates in post-secondary institutions are 77.6% for second fall enrollment, with stark differences between full-time students (84.4%) and part-time students (53.2%) - a gap that has widened as more students balance work and family responsibilities (National Student Clearinghouse, 2025).

Traditional retention frameworks require updating to address contemporary student realities. While Tinto's academic integration model remains predictive, with first-semester GPA explaining 24% of persistence variance, recent research emphasizes financial integration and technological access as equally critical factors. An analysis of over 3,000 students found that students receiving financial aid showed significantly higher persistence, highlighting the intersection of economic and academic factors (Stewart et al., 2016).

First-generation college students face particular retention challenges that technology alone cannot address. Recent analysis by FirstGen Forward shows that first-generation students represent 54% of undergraduates but achieve degree completion at less than half the rate of continuing-generation students (26% vs 59%). These students demonstrate lower utilization of academic support services despite higher need, suggesting that technological solutions must be coupled with culturally responsive outreach and family engagement strategies.

The role of technology in academic integration shows both promise and limitations. Early warning systems using engagement analytics can identify at-risk students, but effectiveness depends on high-touch interventions rather than automated responses. Research indicates that instructor

presence remains critical in digital environments, with absence of meaningful faculty interaction identified as a significant persistence barrier.

Adult learners and working students represent the new majority requiring different support approaches. With 60% of current students working and one-third having children, flexible learning modalities and family-supportive policies become retention factors rather than convenience features. Technology can enable access, but institutions must address structural barriers including childcare, work schedule conflicts, and financial constraints.

Method

Research Design

This investigation employed a mixed-methods research design to provide insights into Genio Notes's effectiveness. The quantitative component utilized pre-post surveys, designed by LXD Research to measure changes in academic and psychosocial outcomes over the Spring 2025 semester, in addition to analysis of a Genio-developed Learner Impact Report survey of academic outcomes and perceptions of the Genio Notes platform. This design allowed for examination of within-person changes while controlling for baseline differences among students. Additionally, survey takers' responses were linked to their Genio Notes usage, allowing for quantitative analyses to explore relationships between platform usage levels and key learning outcomes.

The qualitative component involved thematic analysis of open-ended survey responses to understand students' experiences with the platform. This approach provided rich contextual information about how students integrated Genio Notes into their learning processes and the perceived benefits and challenges of platform use. The combination of quantitative and qualitative analysis enabled triangulation of findings and a deeper understanding of the mechanisms through which Genio Notes may impact student outcomes.

Participants and Data Collection

Study participants were 18 years old and above, attending post-secondary institutions in the USA, UK, Ireland, Australia, and Canada during the 2024-2025 academic year with Genio Notes access provided. Over 64% of participants self-identified as having one or more learning accommodations. Table 1 presents demographic and enrollment characteristics of study participants.

The study employed parallel quantitative and qualitative data collection strategies across multiple timepoints during the 2024-2025 academic year to capture both measurable outcomes and subjective experiences. Two distinct surveys were administered at pre- and post-timepoints: the

LXD Research Survey (conducted in January and April 2025) yielded 1,418 matched responses, while the Learner Impact Report survey (administered at the beginning and end of Fall 2024) produced 733 matched responses with self-reported GPA data. Platform usage analytics were collected continuously throughout the study period, enabling analysis of engagement patterns and their relationship to outcomes. The primary analytic sample consisted of students with active Genio Notes accounts who completed both survey administrations, while qualitative analysis drew from open-ended responses embedded within these surveys, providing rich contextual data about students' experiences with the platform.

Table 1. Participant Characteristics Across Study Samples

Characteristic	LXD Survey Sample (n=1,418)	Learner Impact Report Survey Sample (n=733)
Gender		
Female	62.3%	64.1%
Male	35.8%	34.2%
Non-binary/Other	1.9%	1.7%
Enrollment Status		
Full-time	78.4%	81.2%
Part-time	21.6%	18.8%
Class Standing		
First-year	31.2%	29.8%
Second-year	27.6%	28.4%
Third-year	23.1%	24.2%
Fourth-year+	18.1%	17.6%
New Majority Indicators		
First-generation	42.7%	41.3%
Working 20+ hrs/week	38.9%	37.2%
Parenting	14.2%	13.8%
English as second language	22.1%	21.4%
Race/Ethnicity		
Asian	6.9%	n/a
Black	6.1%	n/a
Hispanic/Latino	4.9%	n/a
White	61.8%	n/a
Multiracial/Other	15.1%	n/a
Prefer not to say	5.2%	n/a

Measures

The LXD Research survey adapted a series of validated measures to assess academic outcomes, and relevant psychosocial predictors of academic success. These included:

- Academic Self-Efficacy
- Academic Engagement
- Academic Preparedness (note taking skills & study skills)
- Social integration (with peers & faculty)
- Well-being and stress

In addition to the LXD Research survey, the Learner Impact Report was designed by Genio Notes to capture metrics including GPA changes, study confidence, stress levels, work-life balance, and students' perceptions of how Genio Notes may have influenced their academic performance. The Learner Impact Report survey consisted of scaled items and open-ended feedback components, allowing students to describe their experiences with specific Genio Notes features and explain if and how the platform supported their learning processes throughout the semester.

Usage data were extracted from the Genio Notes platform analytics system by Genio and merged with the outcome data, providing objective measures of student engagement with the platform. Key usage metrics included total events (instances of recording or note taking), events with screen and microphone recordings, total note annotations, completion of practice quizzes, and days active on the platform. These metrics enabled examination of both quantity and quality of platform engagement.

Analysis Plan

Quantitative analyses proceeded through multiple stages to address the research questions comprehensively. The primary analyses employed several statistical approaches to examine changes in outcomes and relationships with usage. Paired-samples t-tests examined pre-post changes in continuous outcomes such as GPA and scale scores. McNemar's tests assessed changes in dichotomous outcomes, specifically dropout intentions. Analysis of covariance (ANCOVA) models compared continuous outcomes between usage groups while controlling for baseline scores, providing more rigorous tests of usage effects and overall impacts of Genio Notes use.

To examine effects of usage, students were categorized into usage groups based on the distribution of platform engagement metrics. The primary categorization used total events, with low usage defined as fewer than 20 events, moderate usage as 20-49 events, and high usage as 50 or more events during the semester. These thresholds were determined through examination of the distribution and natural breakpoints in the data. Sensitivity analyses using alternative categorizations and continuous usage measures tested the robustness of findings.

Qualitative data analysis employed a thematic analysis approach. Initial coding of open-ended responses identified recurring concepts and experiences. These codes were refined through an iterative process, with similar codes grouped into broader themes. The research team reviewed theme definitions and supporting quotes to ensure accurate representation of student experiences. Special attention was paid to responses from new majority learners to understand their unique experiences and needs.

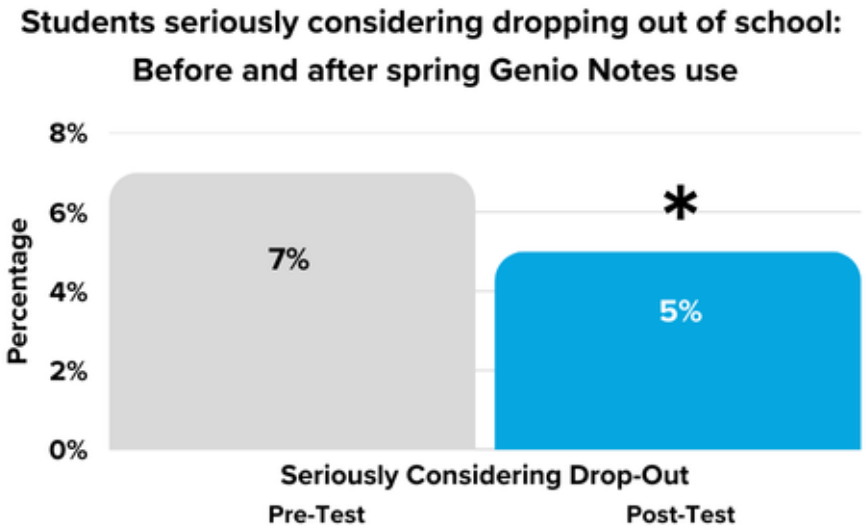
Results

Quantitative Findings

Evidence of Efficacy: Reduced Dropout Risk

Examination of dropout intentions revealed a significant reduction in the proportion of students seriously considering leaving their institution. At the winter baseline assessment, 99 students (7.0%) indicated they were seriously considering dropping out of college. By the spring follow-up, this number had decreased to 71 students (5.0%). McNemar's test for paired categorical data confirmed this change was statistically significant, $\chi^2(1, N=1,418) = 6.38$, $p = .012$, representing a 29% reduction in the proportion of students at risk of departure. This effect was consistent across Genio Notes usage levels. For full details, see Figure 1, below.

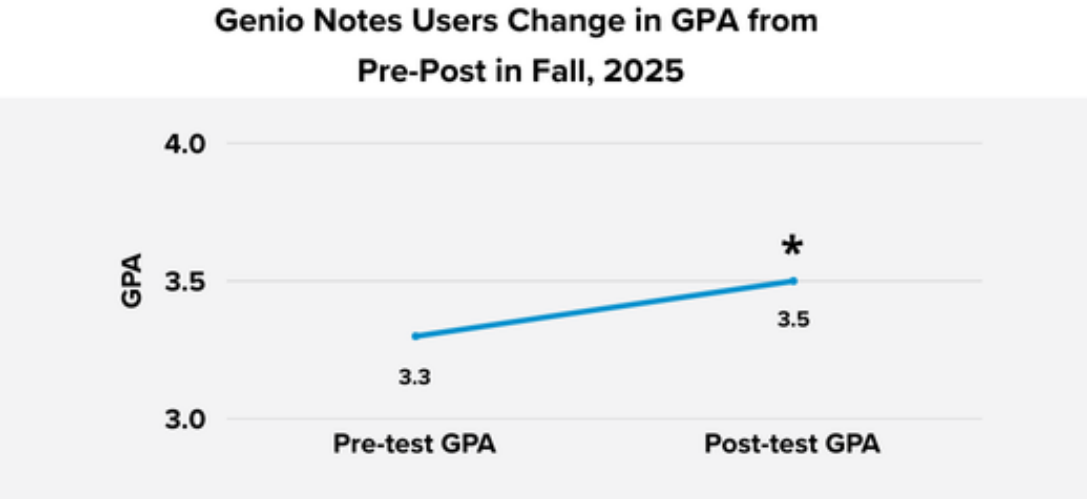
Figure 1. Fall to Winter Drop-out Risk



Evidence of Efficacy: GPA Growth

Analysis of grade point average (GPA) from the Learner Impact Report sample revealed significant improvements in GPA for Genio Notes users over the course of the Fall 2024 semester. Average GPA increased from 3.34 (SD = 0.54) to 3.46 (SD = 0.52) from pre- to post-test. A paired-samples t-test confirmed this difference was statistically significant ($t(732) = 3.79$, $p < .001$, Cohen's d ES = .14; see Figure 2). This significant improvement in GPA represents a meaningful average increase, which could have substantial implications for students near academic probation thresholds or seeking to qualify for selective programs.

Figure 2. GPA change from pre-post test (Fall 2024).



Further analysis examined whether GPA improvements varied by usage intensity. Although all usage groups showed increases in GPA over the course of the semester, the high-usage group showed more than twice the growth of the low-usage group. For full details of GPA changes stratified by usage groups, see Table 2 below.

Table 2. GPA Changes by Usage Group

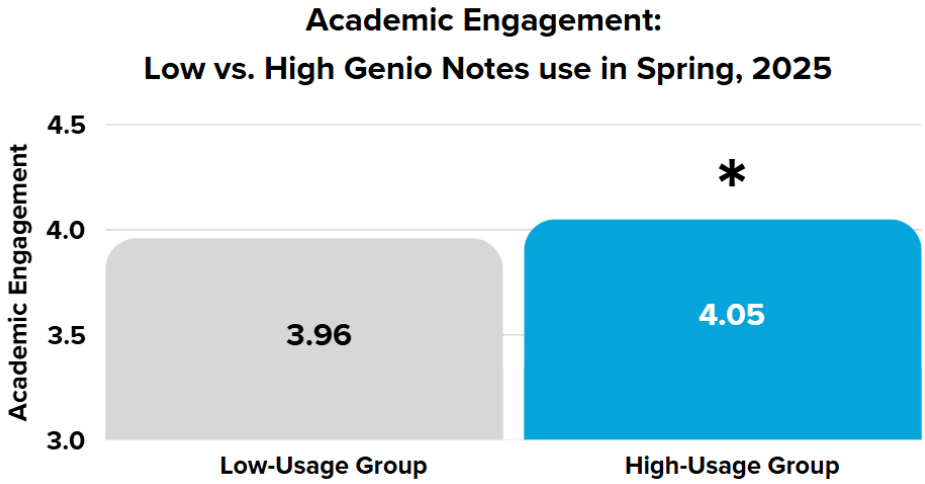
Usage Group	n	Pre-test GPA (SD)	Post-test GPA (SD)	Change	Effect Size (d)
Low (<20 events)	187	3.31 (0.56)	3.38 (0.54)	+0.07	0.13
Moderate (20-49 events)	342	3.33 (0.53)	3.44 (0.51)	+0.11	0.21

High (50+ events)	204	3.38 (0.52)	3.54 (0.49)	+0.16	0.32

Evidence of Efficacy: Increased Academic Engagement

An ANCOVA analysis was conducted to determine whether post-test academic engagement scores significantly differed by usage group, after controlling for pre-test scores. The analysis found that the high-usage group had significantly higher academic engagement (M=4.05) than low-usage students (M = 3.91) ($F(2, 1415) = 3.84$, $p = .022$, partial $\eta^2 = .006$). For full details, see Figure 3, below.

Figure 3. Academic Engagement post-test scores by usage level.

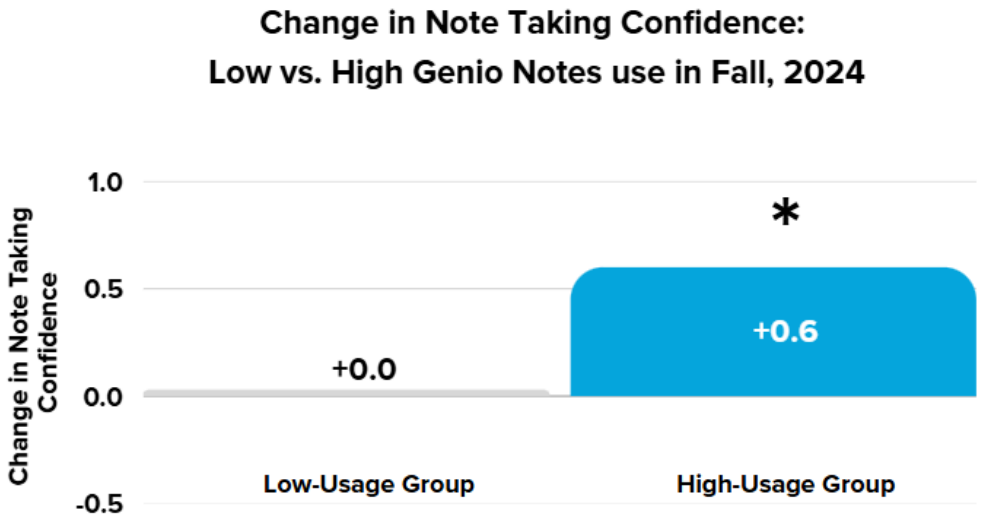


Note: The above are estimated marginal means after controlling for baseline school engagement.

Evidence of Efficacy: Improved Note Taking Confidence

Note taking ability represented the most proximal outcomes to the Genio Notes platform's core functionality. Therefore, we compared the change in students' scoring of the statement "I am confident in my note taking" over the course of the spring 2025 semester. Among the subset of 198 students who began using Genio Notes in Spring 2025 with no prior fall usage, thereby providing a true baseline, the improvement in note taking confidence was substantial. Participants with low Genio Notes usage (i.e., fewer than 20 events) showed virtually no change in confidence in note taking (+ 0.0). In contrast, high-usage participants (i.e., students with at least 50 events) showed significant growth (+0.6; $t(140) = 3.9$, $p < .001$, Cohen's d effect size = .29). For full details, see Figure 4 below.

Figure 4. Change in Note Taking Confidence by Usage Level



Qualitative Findings

Thematic analysis of open-ended survey responses from the LXD Survey and Learner Impact Report revealed four primary themes characterizing students' experiences with Genio Notes. These qualitative insights illuminate the mechanisms through which the platform influences academic outcomes and reveal transformative benefits particularly pronounced for new majority learners. The themes align with Tinto's model of student integration, demonstrating how Genio Notes supports both academic and social integration pathways critical to student persistence.

Theme 1: Academic Integration Supporting New Majority Learners

Building on Tinto and Cullen's (1973) findings that academic integration strengthens goal commitment and counters external obligations, new majority learners in this study described Genio Notes as important infrastructure for their academic engagement. These students, who comprise 42% of the study sample with new majority characteristics, reported how the platform enables them to navigate the competing demands of work, family, and education that traditionally affect persistence.

Working students emphasized how asynchronous access to complete lecture content changed their educational experience. A working student explained: *"I'm working 30 hours a week while taking 15 credits. Without Genio Notes, I'd have to choose between my job and my education. Now I can actually do both successfully."* A student working night shifts noted: *"I work nights and sometimes struggle to stay focused in morning classes. Being able to review the recording helps me catch what I missed when I was exhausted."* The platform's capacity to time-shift engagement with academic content addresses structural barriers that have historically disadvantaged working learners.

Parent students described how Genio Notes accommodated the unpredictability inherent in balancing education with caregiving responsibilities. One parent stated: *"As a working parent, I can't always give full attention in class. Genio Notes lets me capture everything and review when my kids are asleep. It's the difference between passing and failing for me."* Another parent detailed how fragmented study time became productive: *"My study time happens in fragments—10 minutes while my kids eat breakfast, 20 minutes during naptime. Genio Notes lets me use those fragments productively. I can review one concept, pause, handle what I need to handle, then return exactly where I left off."*

First-generation students, representing 43% of the qualitative sample, described how Genio Notes provided necessary scaffolding for academic skills they had not developed through family educational experience. One first-generation student reflected: *"I didn't know how to take 'good' notes because no one in my family had been to college to teach me. Genio Notes showed me what matters—I could see patterns in what I highlighted during review, understand what professors emphasized through repetition. It taught me how to learn at this level."* This development of academic skills addresses inequities in educational preparation.

Theme 2: Reduction in Academic Stress Leading to Engagement

Students' responses indicated that Genio Notes facilitated a change in their emotional relationship with academic work, supporting the shift from anxiety and avoidance to confidence and engagement observed in the quantitative data. The platform's ability to guarantee complete

capture of lecture content emerged as an anxiety reducer, with subsequent effects on study behaviors and academic performance.

The reduction of note taking concerns improved classroom experiences. A psychology major described: *"Before Genio Notes, studying felt overwhelming. Now I actually look forward to reviewing because I know everything is there. My stress has gone from a 9 to maybe a 4."* This stress reduction enabled fuller participation for some students, with a nursing student explaining: *"The anxiety of missing something important used to consume me during lectures. Now I can actually listen and participate because I know Genio Notes has my back."*

Students described how reduced anxiety enabled more substantial engagement with content. An engineering student shared: *"I used to avoid studying because my notes were so incomplete. Now I'm more engaged because I can actually understand what happened in class."* This transformation from avoidance to engagement was supported by usage data showing students with 50+ events demonstrated significantly higher academic engagement.

The platform's stress-reduction benefits extended beyond individual study sessions, with students reporting that Genio Notes affected their perception of their own academic preparedness. One student reflected: *"Before Genio Notes, I avoided reviewing. Now I'm more willing to sit down and do it because I have comprehensive notes."* Another suggested the compound benefits of Genio Notes use: *"Because I was able to go back and listen to the notes better and go through it more thoroughly, it gave me more confidence about what I was hearing from the professor."* These responses illustrate the pathway from stress reduction through improved study behaviors to enhanced academic outcomes observed in the quantitative findings.

Theme 3: Accessibility as Equity

For students with learning differences and disabilities, Genio Notes provided additional support beyond traditional accommodations. Over 64% of study participants self-identified as having a need for learning accommodation, and their feedback indicated how the platform addressed barriers that have historically limited their academic participation.

Students with ADHD, for example, described how Genio Notes addressed the challenge of balancing engagement with documentation. One student explained: *"Having ADHD means I'm either hyperfocused on one thing or distracted by everything. Genio Notes lets me be present in class without worrying about capturing every detail."* Another student with attention challenges noted: *"My mind naturally wanders, and by the time I refocus, I've missed important information. With traditional notes, those gaps were permanent. Now, when I realize I've zoned out, I can mark the timestamp and know I can return to fill in what I missed."*

Processing differences, whether related to dyslexia, auditory processing disorders, or language barriers, were addressed through the platform's flexibility. A student with dyslexia shared: *"Handwritten notes didn't work for me. When I was introduced to Genio Notes it really helped. Now I can listen to my teachers fully while Genio Notes is recording my class."* An ESL student emphasized the importance of pace control: *"Professors speak so quickly, especially when explaining complex concepts. Being able to slow down those explanations or replay them multiple times means I can better understand everything."*

Students with less visible disabilities found particular value in the discrete nature of the support. A student with Tourette's syndrome expressed: *"I have Tourette's and Genio Notes helps me flag key moments without interrupting my note taking. It's the first time I've felt like my disability doesn't define my academic experience."* A student with a processing disorder added: *"My processing disorder makes real-time note taking nearly difficult. Genio Notes gives me the time I need to actually understand the material."* These varied responses to a wide variety of learning challenges demonstrate how universal design principles, when effectively implemented, can create more inclusive learning environments where diverse learners can participate more fully.

Theme 4: Building Academic Confidence

Students consistently described how Genio Notes restored their sense of academic agency and self-efficacy, changing their experience from that of passive recipients of information to active participants in their learning. This increased confidence emerged as an important mediator between platform use and improved academic outcomes, with students reporting shifts in how they conceptualized themselves as learners.

The ability to control learning pace proved valuable for student confidence. A first-generation student explained: *"For the first time in my college career, I feel in control. I can pause, rewind, and really understand concepts at my own pace."* This sense of control extended to classroom participation, with an international student sharing: *"I went from being the student who never spoke up to actively participating in discussions because I'm confident I can review anything I miss. It's changed how I see myself as a learner."*

Transfer students and those returning to education after time away found the platform particularly useful for building confidence. One transfer student noted: *"Genio Notes makes me feel like I'm not behind anymore. I can keep up with my classmates even though I learn differently."* The platform's role in addressing academic disparities emerged repeatedly, with students describing feeling like ‘real college students’ for the first time.

The effect of increased confidence on academic behaviors aligned with quantitative findings of improved engagement and performance. Students described a positive feedback loop where

successful use of Genio Notes for one course led to increased confidence in tackling more challenging material. One student summarized: *"It's like having a second brain that remembers the lecture for you. I feel capable of succeeding in courses I would have avoided before."* This transformation of academic self-concept represents a critical pathway through which Genio Notes influences the retention and success outcomes documented in this study.

Discussion

Theoretical Implications

The results show Genio Notes both aligns with and extends Tinto's model of student integration by identifying potential technology-mediated pathways for supporting both academic and social integration. The quantitative findings of improved GPA and academic engagement, along with reduced dropout intentions, align with traditional indicators of academic integration. However, the qualitative data reveal additional mechanisms through which the platform supports integration. The reduction in academic anxiety and increase in classroom participation described by students suggest that tools addressing learning challenges may indirectly enhance social integration by increasing students' capacity for peer and faculty interaction.

The differential impacts observed for new majority learners raise important questions about the role of educational technology in promoting equity. Traditional support services often require students to seek help during specific hours, potentially stigmatizing those who seek formal assistance. Genio Notes's universal availability and non-stigmatizing implementation may represent a more inclusive model of academic support. The stronger effects observed for first-generation students, working students, and those with disabilities suggest that universal design principles, when properly implemented through technology, can meaningfully reduce achievement gaps.

Practical Implications

The findings indicate several important considerations for institutional implementation of note taking support technologies. The threshold effects observed in usage patterns suggest that encouraging consistent use rather than occasional engagement should be a priority. The study showed minimal benefits for students creating fewer than five events per semester, with optimal outcomes emerging at 50 or more events. This suggests that implementation strategies should focus on habit formation and regular use rather than simply making the technology available.

The underutilization by many Genio Notes users of more advanced features such as quiz creation and collaborative note-sharing suggests an opportunity for enhanced student training and

support to encourage usage with fidelity. Although basic recording and note taking functions showed relatively high rates of adoption, features that could provide deeper learning benefits remained largely undiscovered by many users. Institutions implementing Genio Notes or similar platforms should consider structured training programs and learning modules that progressively introduce features as students become comfortable with core functions.

When considering populations that may benefit from Genio Notes use, the particular benefits related by new majority learners suggest that note taking support technologies should be positioned as mainstream academic tools rather than specialized accommodations. The stigma associated with seeking help represents a barrier for many students – by implementing Genio Notes as a universal resource, institutions can provide important support to vulnerable populations that otherwise do not receive any support.

Mechanisms of Impact

The consistent pattern of results across quantitative and qualitative findings suggests multiple interconnected pathways through which Genio Notes can influence student outcomes. The most proximal effects appear in note taking confidence, which showed meaningful improvement. These effects on note taking are likely to contribute to improved study behaviors, as students become more willing to engage with course material when they have comprehensive resources available.

The emotional and psychological benefits identified in qualitative analysis appear to play a mediating role in academic outcomes. Reduced anxiety and increased confidence may enhance classroom participation and peer interaction, contributing to social integration. Similarly, decreased stress about missing information may free cognitive and emotional resources for deeper engagement with content, supporting academic integration. These psychological benefits may be particularly important for students with anxiety disorders or those facing multiple stressors.

The platform's support for varied approaches to learning appears important for its effectiveness with diverse populations. The ability to control playback speed, review specific segments multiple times, and engage with content asynchronously accommodates natural variation in processing speed and learning preferences. This flexibility may explain why benefits were observed across diverse student populations rather than being limited to specific subgroups.

Limitations

Several limitations should be considered when interpreting these findings. The pre-post design included all students with access to Genio Notes. Although such a naturalistic approach has the

advantage of being a realistic rollout of such a platform, lack of a randomized control group does limit the causal inferences that can be made from this study regarding Genio Notes's effects. In addition, the study relied on self-reported GPA, and other key outcomes. Although this is a common research practice, self-report introduces some potential for measurement error.

Although the improvements observed in the study were encouraging, the analysis could not control for potential effects of historical context, or concurrent interventions. Future research comparing outcomes with randomly selected non-users may provide additional evidence for causal relationships. Likewise, the study's timing during a single academic year may limit generalizability to other contexts or student populations. Additionally, the relatively short time between assessments prevented observation of longer-term impacts on degree completion or post-graduation outcomes. However, these limitations were mitigated in part by the triangulation (i.e., agreement) of quantitative and qualitative findings, and the wide range of institutions represented in the study.

Future Directions

Several promising directions for future research emerge from this study's findings. Longitudinal studies tracking students across multiple semesters could examine whether benefits persist or accumulate over time, and may provide greater insights into various usage patterns. Such studies could also investigate whether early exposure to note taking support technology influences the development of independent study skills that could lead to lifelong skills.

Investigation of optimal training and support models represents another important research direction. Research examining variation in training approaches, from brief orientations to semester-long scaffolded instruction, could identify effective methods for promoting comprehensive platform utilization.

Conclusion

This mixed-methods investigation provided evidence that Genio Notes supports student success across multiple dimensions critical to higher education outcomes. The quantitative findings demonstrate statistically significant improvements in GPA, reductions in dropout intentions, enhanced academic engagement, and increased note taking confidence among platform users. These measurable outcomes are complemented by qualitative insights revealing how Genio Notes transforms students' cognitive, emotional, and behavioral relationships with learning.

The triangulation of evidence across methodologies strengthens confidence in the findings. The significant reduction in dropout intentions, coupled with significant improvements in GPA, represents meaningful impacts on core institutional metrics. In addition to overall effects, the

significant relationship between platform usage levels and student outcomes provides additional indicators of platform impact. The particularly strong benefits for new majority learners—including first-generation students, working students, and those with learning differences—suggest that the Genio Notes platform addresses systemic barriers to academic success that traditional support services may not adequately address.

The theoretical contributions of this work extend understanding of how educational technology can support student success. The findings suggest that addressing cognitive challenges in learning, such as the split-attention problem inherent in traditional note taking, can cascade into broader academic and psychosocial benefits. The Genio Notes platform's role in reducing academic anxiety and enabling flexible engagement with content appears to create conditions conducive to both academic and social integration; key factors in student persistence.

From a practical perspective, the study provided actionable insights for institutions considering implementation of note taking support technologies. The importance of promoting consistent usage, the value of progressive feature introduction, and the benefits of universal rather than targeted implementation emerged as key considerations. The finding that optimal benefits emerge at approximately 50 events per semester provides a concrete target for usage goals.

The implications extend beyond the specific platform evaluated to broader questions about supporting diverse learners in higher education. As student populations become increasingly diverse in their backgrounds, responsibilities, and learning needs, traditional one-size-fits-all approaches to academic support become increasingly inadequate. Technologies that provide flexible, stigma-free, always-available support aligned with Universal Design for Learning principles may represent important infrastructure for equitable education.

The evidence presented in this report positions Genio Notes as an effective intervention for supporting student success in higher education. The platform's demonstrated impacts on retention, academic performance, engagement, and well-being, particularly for vulnerable student populations, align with institutional priorities for student success and equity. As higher education continues to evolve to serve diverse student populations, tools that address barriers to learning while promoting engagement and persistence will play increasingly important roles in ensuring all students have opportunities to succeed.

This investigation contributes to the growing body of evidence regarding educational technology effectiveness while highlighting the importance of rigorous evaluation in identifying beneficial interventions. The mixed-methods approach employed here, combining quantitative outcome measurement with qualitative exploration of student experiences, provides a model for comprehensive assessment that captures both the magnitude and meaning of educational interventions. As institutions continue to invest in technologies to support student success, such

evidence-based approaches to evaluation will be important for distinguishing well-intentioned but ultimately ineffective solutions from truly effective innovations.

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