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Mentoring for Students with Learning and Attention Issues: From Vygotsky to AI Models

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Supporting adolescents and young adults with learning and attention issues continues to challenge traditional approaches to cognition and education. Drawing on foundational theories from Vygotsky's sociocultural perspective to contemporary frameworks of distributed cognition, this article examines how learning is fundamentally social, situated, and mediated by cultural tools, social interactions, and technology. The application of these theories is explored in the context of a mentoring program at Beacon College, a pioneering institution exclusively serving students with learning and attention issues. By integrating scaffolding, offloading, translation, and stepwise mental action formation, alongside emerging AI technologies, the program creates accessible learning environments and sustainable academic progress while preserving academic rigor. Program outcomes reveal promising improvements in retention and engagement, highlighting the potential benefits and challenges of combining classical cognitive theories with modern educational technologies. This synthesis invites a renewed focus on clarifying tasks' learning objectives and component activities, appropriately delegating lower-level cognitive tasks, and designing equitable learning environments that leverage both human and technological partnerships for enhanced educational outcomes.

Keywords: Distributed cognition, adolescents and young adults, learning and attention issues, mentoring, scaffolding, offloading, translation, skills

Introduction

Understanding and supporting individuals with learning and attention challenges has prompted educators to explore a range of approaches to cognition. One such approach views cognition not as an isolated, internal process, but as something shaped by and extended to social and cultural contexts. Lev Vygotsky was a foundational figure in this shift, emphasizing that cognitive development is deeply rooted in social interactions, cultural tools, and environmental supports. His key concepts – such as scaffolding, the Zone of Proximal Development, and guided learning through collaboration – highlight that higher cognitive functioning emerges not solely through maturation, but through meaningful engagement with more knowledgeable others and the tools or signs that they have created. This sociocultural perspective laid the groundwork for later theories of distributed cognition, which further expand the idea of learning to include interactions with people, artifacts, and technologies.

Building on this rich lineage, contemporary educational research and practice increasingly recognize cognition as a system distributed across individuals, their social contexts, and mediating cultural tools. Scholars such as Cole, Engeström, Pea, Perkins, and Salomon have each elaborated on how learning emerges through collaborative problem-solving, cognitive partnerships, and the active use of external supports ranging from language and symbols to digital technologies. More recent contributions, including Annie Murphy Paul's extended mind perspective and the emerging application of AI tools, continue to underscore the importance of designing learning environments that integrate internal and external cognitive resources dynamically.

Literature Review

Lev Vygotsky was among the first researchers to focus on special education, guided learning, and collaborative dialogue. He challenged the idea that cognition is an isolated process, arguing instead that individuals, including those with special needs, can achieve success by leveraging social relationships, cultural tools, and environmental scaffolds. Vygotsky's work highlights the importance of stepping beyond the boundaries of the brain to tap into the potential of social collaboration (Hedegaard & Daniels, 2011).

Cole and Engeström (1993) build on the cultural-historical tradition, integrating it with the theory of distributed cognition. Like Vygotsky, they view all learning as fundamentally social—not simply because of the physical presence of others, but because cognition is shaped through dialogue with people and human-made artifacts. The authors propose activity (task) – rather than the individual mind – as the unit of analysis for understanding cognition. In this framework, cultural tools such as language, symbols, and technology are not merely

external aids; they are essential to the cognitive process, influencing how people interact with each other and their environment within specific historical and cultural contexts.

Pea (1993) also views cognition as a system involving people, tools, and environments, which allows going beyond individual capacity and "stretches" intelligence over social groups, technologies, and symbolic systems like maps.
In this paradigm, the success of problem-solving is viewed as dependent on interactions between individuals and external resources, shifting the focus from "unaided" (individual, tool-free) intelligence/cognition. Pea explores six component activities of the problem-solving process (problem finding, problem representation, planning a problem solution, executing the plan, and error checks of solutions) and provides examples of aids that can be used with any of them (from alarms at the problem finding component, to "completion" sentences that help compose (plan out) texts, to error-blocking systems in error-prone activities).

In his most recent work (Siddiqui et al., 2025), Pea and colleagues apply the process-tool framework to the exploration of the writing process facilitation, concluding that process-oriented AI tools (as opposed to linear exchanges with chat-based LLMs) produce greater writer's agency than even completely autonomous (no AI assistance) writing.

David Perkins's "person-plus" framework (1993) also emphasizes that cognition extends beyond the individual, incorporating external supports such as technology and social resources. According to Perkins, notes taken by the student constitute what the student "knows" as much as what the student can retrieve from memory as a result of taking these notes. He introduces the "equivalent access hypothesis," which suggests that cognitive performance depends more on the availability of knowledge, the accessibility of its representation, the efficiency of retrieval paths, and the presence of "constructive arenas" (such as something as simple as a scratch pad), than on whether the knowledge is stored internally in the brain or externally in the environment.

This perspective underscores the importance of designing educational settings that recognize and cultivate distributed cognition – encouraging collaboration between learners and their environments, rather than isolating cognition within individuals. Perkins suggests that a pencil should be seen not merely as a tool for transferring knowledge from the head to the paper, but as a thinking aid that helps construct knowledge. He further argues that this distributed approach to cognition more accurately reflects real-world thinking and learning, and that schools should adopt it deliberately to help learners engage effectively with their environment and the tools available to them.

Salomon's concept of cognitive partnerships (1993) centers on how individuals work in intellectual partnership with tools, technology, or other people to achieve cognitive outcomes that would be difficult or impossible to reach alone. This idea is closely tied to distributed cognition and emphasizes the dynamic, interactive nature of thinking and learning. The author distinguishes the effects with and of technology: effects with technology occur when people use tools to augment their cognitive performance in the moment and effects of technology are the lasting cognitive changes or improved skills that persist even after the tool is no longer present. He further explores mindful engagement emphasizing that the benefits of cognitive partnerships depend on active, mindful engagement with tools or partners, rather than passive use. Intelligence in this framework becomes systemic: seen as a property of the entire system (person plus technology or person plus people), not just the individual. Cognitive partnerships challenge traditional views of learning and ability, suggesting that educational environments should foster collaboration with tools and peers. More than 30 years ago, Salomon predicted that one of the most crucial skills for modern learners will be the ability to offload intellectual tasks to the environment or technology.

Lave and Wenger's theory of situated learning and legitimate peripheral participation (Lave & Wenger, 2003) asserts that learning is fundamentally rooted in authentic, real-world contexts and embedded within communities of practice. New learners enter these communities as legitimate peripheral participants, gradually moving from observation and minor involvement toward full, active engagement as they learn alongside more experienced members. Rather than focusing on abstract knowledge transfer, this approach emphasizes that learning is a social and collaborative process, shaped by ongoing participation and the negotiation of meaning and identity. Ultimately, learning is best understood as a dynamic process of becoming a full member of a community through situated, meaningful activity.
In line with the approach described above, Young & Bunting (2024) introduces the concept of "productive peripherality" as a form of appropriate support and gradual integration into the academic community, which closely parallels the idea of scaffolding—providing just enough support for students to engage with new challenges while gradually fostering independence.

Russell Barkley (2012) uses the concept of the "extended phenotype" to frame the understanding of executive functions. He argues that these higher-order mental activities should be conceptualized not just as internal cognitive processes, but as outwardly directed, functionally meaningful behaviors and capacities that use external tools to supplement the brain's internal capacity, especially when this capacity is impaired or insufficient for the demands of a given task. He emphasizes that executive functions are essentially a set of functions that enable individuals to achieve goals across time and in social settings – both requiring tools mostly found outside of the individual.

Annie Murphy Paul's *The Extended Mind* (2021) further challenges the conventional view that

thinking and intelligence are limited to the brain, arguing instead that cognition extends into the body, environment, and social relationships. Paul demonstrates how bodily sensations, physical spaces, and social interactions all play vital roles in shaping thought and decision-making. She also emphasizes situated cognition, highlighting how well-designed environments and tools can improve learning and performance, and socially distributed cognition, where collaborative thinking and group problem-solving lead to deeper understanding and innovation. Practical strategies from Paul's work include offloading information into the world (such as through writing or using tools), transforming abstract ideas into concrete artifacts, altering one's mental state or surroundings to support thinking, engaging the body in thought processes, and designing situations that foster desired learning behaviors.

Program

Beacon College, the first accredited college specifically for students with learning and attention issues, adopted ideas of distributed cognition early on (often serendipitously). In doing so, it sought to move beyond the traditional medical models of disability, which view individuals as limited rather than unique. By embracing constructivist principles, Beacon emphasizes that learning is a process of transformation, where socially mediated (external) activities become internalized as mental processes. This transformation highlights the importance of participation, apprenticeship, and mentoring, all of which are supported (mediated) by various tools and artifacts.

In collaboration with faculty, disability services and support staff, the Beacon College team focuses on the development of an accessible, student-centered practice that teaches students how to leverage relationships with mentors and use technology tools while increasing their self-awareness around the foundational challenges that often prevent them from engaging in higher-level cognitive tasks. This practice seeks to eliminate the false tension between accessibility and academic rigor, affirming that both can—and must—coexist in higher education.

The framework also offers a way to reframe disability in higher education, shifting from an individualized, compliance-driven model to a more community-based approach to accessibility. This model emphasizes collective access and shared responsibility, rather than relying solely on isolated accommodations. In doing so, this shift redirects the focus from merely meeting legal obligations to advancing broader educational equity.

The first concept that underpins Beacon's approach is scaffolding. Scaffolding provides structured support—such as prompts, models, and guided feedback—that helps learners interpret new experiences and assign meaning to otherwise neutral or ambiguous objects and situations. These meanings create the fabric of the mental representations of complex real-world tasks, which are essential for navigating them through planning, monitoring, and decision-making—even before any action is taken (Jonassen et al., 2012).

However, the meaning of an object (Pea (1993) talks about "affordance" in similar contexts) does not arise solely from an individual's internal resources or from the object's physical environment. For example, something "bright" (a physical quality) will naturally attract attention, while something "important" (an abstract quality) must be introduced or highlighted—explicitly and intentionally – by a mentor or a tool. Pea (1993) provides several examples of how the affordance of the same object can shift depending on the context in which it is used.

Exploring the meaning/affordance(s) of objects is the central idea of scaffolding, which enables individuals to successfully understand, plan, and complete tasks. Vygotsky believed that scaffolding is especially important in working with students with special needs because they require sufficient external support that helps them accomplish tasks beyond their current independent abilities (Hedegaard & Daniels, 2011).

To achieve this, Beacon College mentors apply a model rooted in the works of Piotr Galperin (1992), known as the stepwise (stage-by-stage) formation of mental actions. This approach breaks down complex learning into a series of scaffolded steps:

1. Orientation: the process begins by presenting students with a sample of the intended outcome and a clear, explicit description of the task structure (rubric). Students see what needs to be done and how, but they cannot yet verbalize the process—they have only a vague sense of the task. This step relies heavily on material supports (rubrics, guidelines, samples) and social interactions with mentors, and it would be erroneous to think that just presence of the samples or rubric will be sufficient for students to successfully complete the task (Perkins (1993) talks about the "fingertips effect" in this regard).
2. Materialized Action with Scaffolding: students attempt to perform the action with extensive support from the mentor and using material objects (rubrics) as scaffolding. The action may be successful, but only because of this external support; students still cannot explain or perform the task independently. This step solidifies the perceptual image of the action.
3. Overt Social Speech (Thinking Aloud): as students practice, they begin to verbalize their actions while performing them, still needing help but now able to name and describe the process. Material supports and social interactions remain important but become more supportive than defining. This marks the beginning of forming an audible image of the action.
4. Theoretical Thinking and Independent Performance: students can now perform the action independently and describe it in a way others can understand. The mentor's role is minimal, mostly monitoring rather than

correcting. Material supports are available but rarely needed.

5. Automation and Internalization: the mental action becomes fully internalized and automated. Students can perform the task independently, often without material aids or mentor support. At this point, explaining the process may again be difficult because the action has become automatic—an indicator of true mastery.

Each completed cycle expands the student's cognitive repertoire. Recent research on neural plasticity confirms that the brain can change in response to activity, highlighting the importance of appropriate scaffolding. Conversely, missed opportunities can lead to secondary deficits (Hedegaard & Daniels, 2011). Paul (2021) describes a similar process of rotating thinking between internal and external modes to gain new insights, also emphasizing the dynamic interplay between external supports and internal cognitive development.

Other concepts include "offloading" [in Salomon's (1993) and Paul's (2021) terms]. To reduce cognitive load, students are taught to

- Use text-to-speech and speech-to-text technology to mitigate reading or writing fluency challenges and improve reading comprehension and written expression (one of the ways to achieve "accessible representations" (Perkins, 1993)),
- Write things down – including active note-taking techniques – which helps create "working memory surrogates" serving as "constructive arenas" that reduce "cognitive bottlenecks" and support higher-level thinking (Perkins, 1993), and/or
- Write things out "in your own words", among the cognitive benefits of which are enhanced memory and retention as well as improved clarity and organization.

There is also a set of tools that can be viewed as more advanced, or even intrusive, as they do more than simply change how knowledge is represented – they actively transform it. Haber (2020), for example, identifies several translational transformations required for effective critical thinking at the stage of problem representation. The first—and often a gatekeeping skill for students with learning and attention issues—is the ability to distill clear and concise statements from vague or complex human discourse. Without this essential "translation" step, Haber argues, critical thinking becomes difficult, if not impossible.

This type of translational transformation has traditionally been supported through mentor interactions. However, in recent months, platforms such as ChatGPT and Goblin Tools have begun to serve a similar role. Students are encouraged to use these tools to summarize texts, extract keywords, and identify main ideas—creating clearer, more concise versions of complex source material for accessibility and study purposes. These "translations" are presented as a starting point, not a substitute, for deeper engagement. Students are then guided to perform a close reading of the original text, allowing them to think critically and move into higher-order processes such as analysis, synthesis, evaluation, and creation.

While some may argue that using such tools may limit a learner's understanding of the foundations of the activity, Pea (1993) suggests that this trade-off may be acceptable. He points out to the fact that requiring learners to achieve a tool-independent level of access can create unnecessary barriers, preventing many from participating in meaningful, whole-task problem solving due to the steep learning curve. For individuals with learning and attention challenges—who often struggle with efficiency and automaticity in skills like reading, writing, or other academic tasks (Mather & Goldstein, 2015)—these tools may not only be beneficial but essential for access and success.

According to McMurtrie (2025), while most college educators believe AI can enhance learning, nearly all express concerns about its impact on academic integrity. We suggest that adopting clearer definitions can help address fears about the "effects with" or "effects of" technology as discussed by Salomon (1993). While some critics, such as Warner (2025), argue that AI tools provide shortcuts and may cause students to miss out on important learning experiences, terms like scaffolding (Vygotsky, Galperin), offloading (Salomon, Paul), and translation (Haber) allow for more informed decisions about which tasks can be delegated to AI, other educational technology, or tutors/mentors and which should remain with students. These tools can be contextualized through learning outcomes and task analysis, where unaided cognition is expected for the core learning outcomes—those that students must demonstrate independently, while aided learning could apply to non-essential elements, such as reading instructions or formatting.

This approach enables Beacon to calibrate support in a way that preserves the integrity of essential learning outcomes while allowing flexibility in areas that are more peripheral or "secretarial" in nature (Mather & Goldstein, 2015). By focusing on the task – as advocated by Cole and Engeström (1993) – and conducting a thorough task analysis (rather than concentrating solely on an individual's functional limitations and viewing the task only through the lens of barriers), educators can identify lower-level skills that may be delegated. This, in turn, allows support to be directed toward helping students engage in more complex "expert cognitive moves" (Siddiqui et al., 2025). Delegating mechanical or foundational aspects of learning is especially appropriate for adolescents and young adults, who are typically beyond the stage of acquiring basic academic skills and are instead expected to practice and refine them (Grigorenko, 2020). In this context, the use of educational tools—particularly technology-based aids—is both timely and effective.

Results

The implementation of the mentoring program at Beacon College has proven beneficial for students with learning and attention issues. It has enabled the College to enhance student engagement while reducing reliance on formal accommodations. Instead, the focus has shifted toward providing proactive services and building students' capacity to ensure that their academic progress is both meaningful and sustainable.

During the 2023-24 academic year, Beacon College achieved a retention rate of 91%—significantly higher than the national average of 68.2% for students with learning and attention challenges. Overall student persistence at Beacon across academic years typically ranges between 78% and 83% (National Student Clearinghouse Research Center, 2024).

Discussion

While the Beacon College mentoring program appears to produce positive outcomes for students with learning and attention issues, the evidence should be considered promising but non-definitive: data on long-term effectiveness, implementation strategies, and overall impact are limited due to the nature of the program (there is no control group). Additionally, because AI technology is evolving rapidly, best practices and use cases continue to shift. As institutions experiment with these tools, both the technology and our understanding of its role in education will continue to develop.

In this context, the reported outcomes should be seen as an invitation to revisit longstanding educational concepts. The renewed interest in distributed cognition—driven in part by the integration of AI platforms—underscores the importance of task analysis, clearly defined learning objectives, and the distinction between core academic goals and more peripheral or "secretarial" skills. These developments call for fresh attention to critical questions, such as: What are the true goals of learning? Which aspects can be delegated to external tools without compromising the integrity of the learning process? And how can we reconcile tensions between access to activity and understanding its foundations (Pea, 1993), or between the goals of productivity and deeper learning (Vyse, 2024)?

Conclusion

This renewed focus is particularly valuable for redefining how we conceptualize ability, disability, and the scaffolding of complex learning tasks—especially for students with learning and attention differences. Continued research, critical evaluation, and thoughtful adaptation will be essential for realizing the full potential of available tools (including AI) to enhance educational equity and effectiveness for all learners.

References

Barkley, R. A. (2012). *Executive functions: What they are, how they work, and why they evolved.* Guilford Press.

Beacon College. (2024). Beacon by the numbers. https://www.beaconcollege.edu/about/beacon-by-the-numbers/

Cole, M. & Engeström, Y. (1993). A cultural-historical approach to distributed cognition. In Salomon, G. (Ed.). *Distributed cognitions: Psychological and educational considerations* (pp. 47-87). Cambridge University Press.

Galperin, P. Ia. (1992). Stage-by-stage formation as a method of psychological investigation. *Journal of Russian & East European Psychology, 30*(4), 60–80. https://doi.org/10.2753/RPO1061-0405300460

Grigorenko, E. L., Compton, D. L., Fuchs, L. S., Wagner, R. K., Willcutt, E. G., & Fletcher, J. M. (2020). Understanding, educating, and supporting children with specific learning disabilities: 50 years of science and practice. *American Psychologist, 75*(1), 37–51. https://doi.org/10.1037/amp0000452

Haber, J. (2020). *Critical thinking.* The MIT Press.

Hagerty, O. (2017). Scaffolding as a model for academic assistance. In Nesbitt, W. (Ed.). *Teaching students with learning disabilities at Beacon College: Lessons from inside* (pp. 27–34). Peter Lang Publishing.

Hedegaard, M., & Daniels, H. (Eds.). (2011). *Vygotsky and special needs education: Rethinking support for children and schools.* Bloomsbury Academic.

Jonassen, D., Land, S., & Hannafin, M. (2012). *Theoretical foundations of learning environments* (2nd ed.). Routledge.

Lave, J., & Wenger, E. (2003). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.

Mather, N., & Goldstein, S. (2015). *Learning disabilities and challenging behaviors: Using the Building Blocks Model to guide intervention and classroom management* (3rd ed.). Brookes Publishing.

McMurtrie, B. (2025, January 23). College leaders are divided on the risks and benefits of generative AI. *The Chronicle of Higher Education.* https://www.chronicle.com/article/college-leaders-are-divided-on-the-risks-and-benefits-of-generative-ai?utm_source=Iterable&utm_medium=email&utm_campaign=campaign_12385881_nl_Academe-Today_date_20250123

National Student Clearinghouse Research Center. (2024, June 6). First-year persistence and retention rates reach 10-year high. https://www.studentclearinghouse.org/nscblog/

first-year-persistence-and-retention-rates-reach-10-year-high/

Paul, A. M. (2021). *The extended mind: The power of thinking outside the brain*. Houghton Mifflin Harcourt.

Pea, R. (1993). Practices of distributed intelligence and designs for education. In Salomon, G. (Ed.). *Distributed cognitions: Psychological and educational c*onsiderations (pp. 47-87). Cambridge University Press.

Perkins, D. (1993). Person-plus: a distributed view of thinking and learning. In Salomon, G. (Ed.). *Distributed cognitions: Psychological and educational considerations* (pp. 88-110). Cambridge University Press.

Salomon, G. (1993). No distribution without individuals' cognition: A dynamic interactional view. In Salomon, G. (Ed.). *Distributed cognitions: Psychological and educational considerations* (pp. 111-138). Cambridge University Press.

Siddiqui, M.N., Feliciano, V., Pea, R., Subramonyam, H. (2025). AI in the writing process: How purposeful AI support fosters student writing. In Cristea, A.I., Walker, E., Lu, Y., Santos, O.C., Isotani, S. (Eds.). *Artificial intelligence in education*. AIED 2025. Lecture Notes in Computer Science, vol 15880. Springer, Cham. https://doi.org/10.1007/978-3-031-98459-4_14

Vyse, G. (2024). AI as an efficiency engine: How the technology is affecting campus outside the classroom (Insights report). *The Chronicle of Higher Education.* https://connect.chronicle.com/rs/931-EKA-218/images/Insights-Report_AI-Engine.pdf?version=1

Warner, J. (2025, January 23). *Give me unique intelligences, not probabilities: If I want thoughts of my own, I need thoughts of others. Inside Higher Education.* https://www.insidehighered.com/opinion/blogs/just-visiting/2025/01/23/probabilities-generative-ai-pale-next-individual-ideas?utm_source=Inside+Higher+Ed&utm_campaign=e355e44d4e-DNU_2021_COPY_02&utm_medium=email&utm_term=0_1fc-bc04421-e355e44d4e-237884717&mc_cid=e355e44d4e&mc_eid=37c790869a

Young, D. G., & Bunting, B. (2024). *Rethinking student transitions: How community, participation, and becoming can help higher education deliver on its promise.* Stylus Publishing