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One Size Doesn't Fit All in Adult Learning: *Let's be Mindful about Learner Variability*

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Abstract: We live in a diverse world where our learners come from various backgrounds and possess varied knowledge and skills. Additionally, the number of adult learners in higher education has increased. Meeting diverse learning requires an informed and intentional selection of strategies. This article presents an approach to addressing diverse adult learning needs by considering learner variability and using the Learner Variability Navigator, a tool rooted in research, as well as implementation, success, and plan to enhance a future class.

Keywords: adult learning, diverse learning needs, instructional strategy, learner variability.

Learners with diverse backgrounds, perspectives, skills, and interests characterize today's educational landscape (Dalton et al., 2017). In addition, the number of adult learners in higher education has increased (Bellare et al., 2023; Fensie et al., 2024) with a range of backgrounds, life experiences and goals, and life and work responsibilities (Kara et al., 2019; Lindeman, 2015; Todd et al., 2017; Yin & Lim, 2020). While adult learners are generally above 24 years old (Osam et al., 2016), some younger learners may already be parents or hold adult responsibilities (Yin & Lim, 2020). Adult learners must balance their life, work, and educational responsibilities as they juggle multiple roles. Additionally, each adult learner may face challenges, such as financial, time, and resource limitations, potentially hindering learning persistence (Cacicio et al., 2022; Bellare et al., 2023; Osam et al., 2016).

Truly understanding and designing instructions for each adult learner can be challenging because of these complexities and unique backgrounds. Simply considering the typical/average learners when designing instructions can cause misalignment with diverse learning needs (Gronseth, 2018). Educators designing their courses using an instructional design process typically start with learner analysis to understand their students' contexts. They can then select suitable instructional strategies aligned with the learners' needs. We present an approach to addressing diverse adult learning needs by considering learner variability in each learner and using an innovative tool, Learner Variability Navigator (LVN), to explore, discover, and understand various factors impacting learning and the strategies to support learners across these factors.

Learner Variability and LVN

Every learner is unique, and each brings a distinctive set of interrelated strengths and challenges to the learning process (Pape, 2018; Rose, 2015). They differ in their cognitive abilities, social-emotional development, and backgrounds (Cacicio et al., 2022; Tare et al., 2020). Being cognizant of this diversity, we agree that "learner variability is the rule, not the exception" (Pape, 2018, p. 1). Instructional strategies need to be suitably selected to provide learning challenges to each learner and, therefore, educators may want to consider their learners' unique sets of "strengths, weaknesses, abilities, prior knowledge, and motivation for participating in the learning activity" (Vazquez & Marino, 2021, p. 183).

To truly embrace and address learner variability, there is a need for educators and instructional designers to understand the science of learning and memory and link it to practice (Cacicio et al., 2022; Howard-Jones et al., 2020; Swartz et al., 2019). However, finding research-based methods and strategies for facilitating the needs of diverse learners can be challenging (Digital Promise, 2020). This is where the LVN can support. The LVN is a free and open-source web-based tool developed by Digital Promise's Learner Variability Project team through an iterative process and collaboration with researchers and practitioners (Tare et al., 2020). It curates the research on key learning factors across the whole learner and provides evidence-based strategies for responding to learner variability. Using the LVN, educators can find multiple ways for learners to demonstrate their learning, offering choices in learning activities and creating a supportive learning environment. By designing instruction for the whole learner, educators can create learning experiences that are more inclusive and equitable (Cacicio et al., 2022; Vazquez & Marino, 2021).

The LVN offers several models, reflecting the science of learner variability within the context of a developmental group and learning outcomes (e.g., literacy model for grades PK to 3, math model for grades 3 to 6, adult learner model, etc.). Each model consists of four domains of the whole learner: *Learner Background*, *Social-emotional Learning* (SEL), and *Cognition*, all intertwined with the learning outcome—in this case, we can focus on *Adult Literacies* (Figure 1). The *Learner Background* domain includes factors such as *Adverse Experiences*, *Physical Well-being*, *Socioeconomic Status* (SES), etc. Factors within the *SEL* domain are *Motivation* and *Self-regulation*, among others. The *Cognition* domain includes *Attention* and *Short-* and *Long-term Memory*, to mention a few. *Adult Literacies*

comprises factors related to essential adult skills, such as *Oral Communication Skills*, *Problem-solving*, etc.

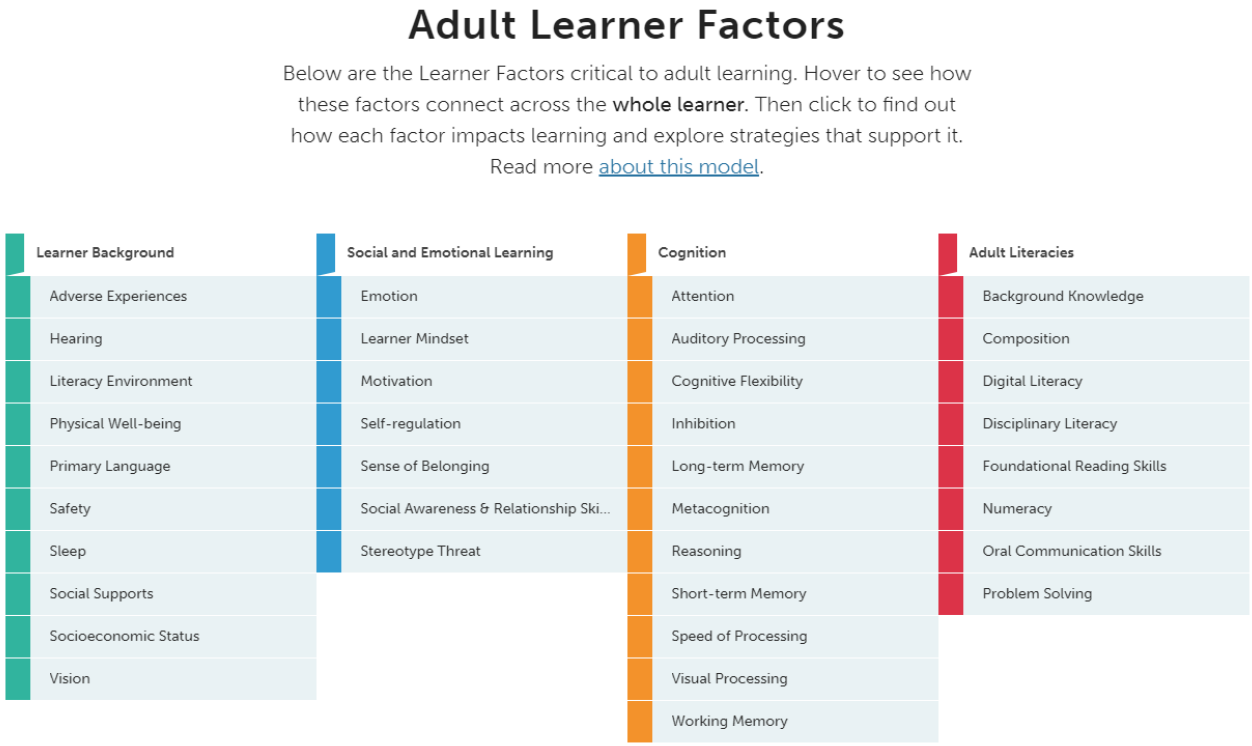

Figure 1. The Adult Learner model consists of four domains (i.e., Learner Background, SEL, Cognition, and Adult Literacies) and interrelated factors across the model that influence learning.

The Steps Using LVN

Considering and Identifying Factors Influencing Adult Learning

Undeniably, all learners have unique backgrounds with factors tightly connected to each other. A learner may have had an *Adverse Experience,* which could contribute to challenges with their *Working Memory* (Majer et al., 2010; Tare et al., 2020). Learners from a low *SES* background may live in poor housing conditions and experience sleeping difficulties, influencing their learning performance (Bellare et al., 2023; Simonelli et al., 2013; Tare et al., 2020).

The SEL domain holds key factors for learning, including related factors, *Sense of Belonging* and *Stereotype Threat*. Learners who feel a stronger sense of belonging will likely be more self-efficacious and engaged (Allen et al., 2018; Cai et al., 2022; Maestas et al., 2017). Promoting a sense of belonging can be conducted by providing a supportive learning environment that makes learners feel included, giving them opportunities to take challenges and engage in learning (Cacicio et al., 2022). *Stereotype Threat* may be experienced among the minoritized learners and affect their self-efficacy. For example, women experiencing a gender-biased stereotype threat about their numeracy skills will likely

have lower math self-efficacy (Muljana et al., 2023). They may lose the motivation to learn, impacting their achievement and persistence in quantitative-related subjects (Casad et al., 2019; Dabas et al., 2023; Muljana et al., 2023).

Discovering and Selecting Strategies

Using LVN, we can review the above factors influencing adult learning (Figure 1). On the LVN website, when we hover over a factor's cell using a cursor, it highlights its connections with the other factors across the whole learner framework. To learn more about a factor, we can click on it, opening a page that summarizes the key research and a factor wheel that gives more detail about how research shows connections with other factors in the framework. At the bottom of this page, a bank of research-based strategies supporting this factor. From the Strategy page, we can narrow down which strategies will best meet our learners' needs by selecting the multiple factors we want to focus on. For example, suppose our goal is to promote learners' *Numeracy Skills* and *Sense of Belonging*, and our learners may come from a low *SES* background; we can select the *Numeracy*, *Sense of Belonging*, and *Socioeconomic Status* factors on the left side (Figure 2). A list of instructional strategies to support these factors or to mitigate some of the challenges that may occur around these factors is provided—in this case, these include *Flexible Grouping*, *Foster Growth Mindset*, *Goal Setting and Monitoring*, *Purposeful Reflection*, etc. Clicking on a strategy takes us to a research summary, considerations on how to apply it in the classroom, how it can be embedded in an educational technology tool, additional resources, and other related factors and strategies.

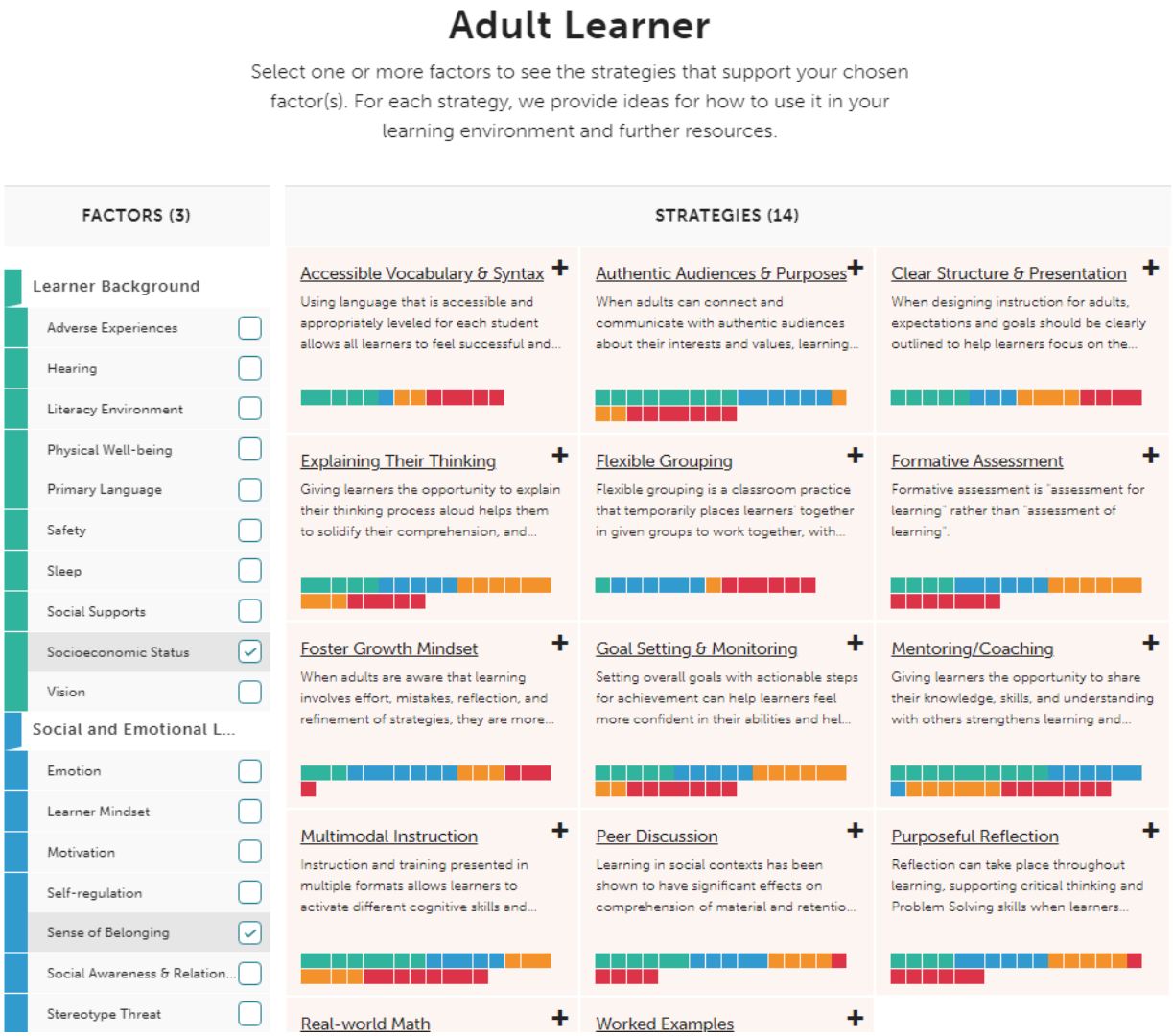

Figure 2. Strategies corresponding to the selected factors. Factors *SES* and *Sense of Belonging* are selected. The *Numeracy* factor is selected, but not shown.

Implementation and Success

One of us taught online classes in a university setting to students who are primarily working professionals, parents and/or bilinguals. Some basics found in the literature about adult learners are: their learning motivation is best sustained when the learning materials and activities align with their learning goals and contexts (Knowles, 1984); they tend to take ownership of their learning process due to their autonomy (Diep et al., 2019); and they need to feel a sense of belonging and accepted (McMillan & Chavis, 1986). Given such knowledge and the course context, the author used the LVN to discover strategies and deepen understanding of how to use such strategies to focus on the learning factors in the areas of *Motivation*, *Self-regulation*, *Sense of Belonging*, and *Primary Language*. Some strategies used to support these factors were *Multimodal Instruction* (e.g., incorporating videos, audio, texts, and visuals into the instructional materials), *Multimedia Projects* (e.g., completing assignments

in multi-formats such as infographics, concept maps, videos, and text narratives), *Peer Discussion* (e.g., online discussions with thought-provoking prompts), and *Fostering Growth Mindset* (e.g., allowing learners to revise assignments and improve their work and providing feedback highlighting progress and reflection). Table 1 lists detailed strategy examples that address the aforementioned factors.

Table 1. Strategy Examples.

Strategy	Description
Sequenced modules based on the topic difficulty level, including an introduction, learning objectives (LOs), learning activities, multimodal learning materials, and assessment(s) in each module	It is to foster a growth mindset by implying that they can do it. Topics chunked into smaller units are more digestible and likely to promote a sense of competence. The LOs, learning activities, and assessment(s) align, helping learners set their goals and study plans. Through clear, measurable LOs, learners can better understand what will be assessed.
Multimodal learning materials (e.g., readings with audio and recorded lectures with audio narration, visual representations, and close captions). A PDF copy and transcript of each lecture are provided.	Learners are busy working adults and/or parents and may interact with learning materials in different ways, e.g., they can listen to the audio while commuting or read the text at their child's soccer game.
Multimedia assignments/project (e.g., learners choose how to summarize readings , such as via infographics, concept/mind maps, short video, and text, and select their own project's delivery platform).	Using various multimedia tools they prefer enables learners to express and position their ideas more strongly in various ways (Bloch, 2018).
Peer discussions using a thought-provoking prompt, allowing learners to share perspectives based on their experiences.	Learners bring their own perspectives and consider others, providing an opportunity to value and respect diverse perspectives and promote sense of belonging.

Instructor growth-mindset infused feedback, highlighting improvement since the last assignment and encouraging reflection to monitor learning strategies.	Instructor feedback provides practice opportunities for learners to reflect on their progress and areas for improvement, encouraging continuous improvement.

At the end of the semester, the students expressed that the course topics were challenging and had a steep learning curve. However, the clear LOs, various modalities, and peer interactions promoted their sense of competence, the achievement of learning goals, and deep engagement with the content. They felt comfortable sharing perspectives in peer discussions. Instructor feedback infusing a growth mindset was perceived positively. They reported focusing on believing in their potential, discovering suitable strategies, monitoring their progress, reflecting on their achievements and failures, and persisting beyond aiming for good grades. With the early success, future plans include identifying opportunities to enhance the instructional practice for the next class. For example, if we can go back to the LVN Adult Learner model and identify additional adult learning factors that could be further supported in the future.

Conclusion

Educators in higher education commonly interact with adult learners with diverse backgrounds, perspectives, skills, and interests. A one-size-fits-all instructional practice may lead to irrelevance to the learners and their diverse learning needs. However, identifying and implementing research-based strategies for engaging diverse learners is not simple. Using the LVN helps transform research about evidence-based strategies into actionable insights that inform instructional practices, embrace the variability across a whole learner, and support this diversity. We invite the readers to embrace learner variability and engage with the LVN as a source to support the design of relevant and effective strategies for the full diversity of learners.

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