Guide Overview

This guide is designed to support your own professional learning around learner variability as well as ideas and resources for sharing with other educators.

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What Is Learner Variability?

Did you know that there is no such thing as an average learner? In fact, each and every learner is different across a whole child spectrum—from the content they know, cognitive abilities, social and emotional factors, and background. Our experiences and our environment shape the way we think and feel about learning and our readiness to process new information. Understanding the research behind learner variability helps us disrupt the inequities of a one-size-fits-all education.

What is learner variability? It is a recognition that each and every student has a unique set of strengths and challenges that impact the way we learn. Learning science research supports the concept of learner variability and provides pathways and strategies for student success in school and beyond. For example, a factor of learning such as working memory, critical to learning new information, can be affected by emotions or sleep. Additionally, it helps us understand how factors can be affected by context. How students learn in person versus virtually or from one subject to the next can be very different. Students may respond positively to different strategies in different situations or work better with different people in different classes. It also helps us understand important social and emotional connections like how a Sense of Belonging can affect students’ readiness and Motivation to engage in learning.

Did you know that learning styles is a myth? Learning styles is a popular idea that many people learned in school. It says that we are either auditory, visual, or kinesthetic learners. But, that is not what research tells us. Research says we learn best when all three options are present and that which modality we rely on may change according to the task. For instance, the way you remember a phone number may be different from the way you learn about a historical event or a math formula. Furthermore, people who think of themselves as only learning one way, (e.g., I am a visual) learner, can close themselves off from other learning experiences.

Activity 1: Read

Here is an overview of the key research that defines learner variability.

Activity 2: Watch a video

David Rose describes learner variability with eloquent analogies. (~3 min.)

Experience learner variability from different points of view in this 360-degree video. (~11 min.)

See Todd Rose’s Ted Talk on the Myth of Average. (~18 min.)
Meet the Learner Variability Navigator

The Learner Variability Navigator (LVN) is a free online tool that translates the science of learner variability into easily accessible learner factor maps and strategies.

What are factor maps?

Factors are variables that have been found to predict student outcomes in a specific content area and age group. We arrange these factors across four domains (student background, social and emotional learning, cognition and content knowledge) that comprise a whole child framework. Hover over a factor to see what factors are connected. Click on a factor to get a summary of the research, explore factor connections, and see what strategies support that factor. Check out the measures and references link at the end of each factor summary to see what assessments are associated with this factor and view the research references.

What are factor connections?

When you click on a factor and view the summary, you can explore the factor connection wheel. Factor connections are noted when there is empirical research that shows a correlation between two factors. If you hover over the connected factor on the connection wheel, an example of how these factors have been shown to connect will be explained. Understanding factor connections can give you deeper insight into what factors can be strengths or challenges for students beyond academics.

How do I find strategies on the LVN?

Once you’ve considered some of the factors at play for your learners, you can find research backed strategies to support them. The strategies on the LVN can be found in two places. They are listed at the end of factor summaries in order to show strategies that support or mitigate the negative impact of a particular factor. You can also go to the strategies tab and filter by multiple factors to identify strategies that support several factors you are interested in. Each strategy page provides a summary of research and resources to support that strategy. Most pages also include a video depicting that strategy in action. One of the most powerful aspects of the LVN is the ability for educators to select strategies that intentionally address certain factors.

Activity 3: Explore

Explore our Learner Variability Navigator and take the tour

Select from seven different learner models (Math, PK–2, Math 3–6, Math 7–10, Literacy PK–3, Literacy 4–6, Literacy 7–12, and Adult Learners) to learn more about how factors and strategies are connected and get summaries of research.
Designing for Learner Variability

- Design for the whole learner
- Design at the margins
- Design based on evidence
- Design with context in mind
- Design for powerful learning
Design for the whole learner

Designing for the whole learner means considering how a student’s background, academic learning, social and emotional learning, and cognitive factors are interconnected and vary across contexts. For example, understanding factor connections between Stereotype Threat and Working Memory can help you understand why addressing a student’s social and emotional needs may include taking mindfulness breaks, affirming their strengths, and completing expressive writing activities before big summative assessments. In short, it helps you understand how to integrate social and emotional learning and culturally responsive practices more strategically.

1. What factor connections are important for your students?

2. How can you integrate strategies that support social and emotional learning throughout your lessons?
Design at the margins

Learner variability disrupts the idea of a one-size-fits-all education. It can be overwhelming at times to consider all the different needs of each student. Instead, by designing solutions that center on those who have been most excluded or marginalized, those solutions often uplift everyone. This concept is related to targeted universalism or the curb cut effect, which was demonstrated well by disability activists in the 1970s advocating to add curb cut inserts into public sidewalks to make crossing the street more accessible to those using wheelchairs. When these curb cuts were inserted, they quickly proved helpful for many other groups, such as those with strollers, bikes, luggage, or wheeled deliveries, and directed the flow of traffic for safer crossing conditions for all. In a learning context, designing at the margins means considering how students may have been historically or systematically excluded based on aspects of their identity such as race, class, language, or disability. It includes making adjustments not just to the physical environment but the curriculum and classroom culture. Often whatever adjustments and supports are to serve historically excluded students will benefit everyone and build empathy for learning and cultural differences. Using frameworks like Universal Design for Learning (UDL) along with the Learner Variability Navigator can help you pinpoint what factors and strategies might work best for different students.

1. **Who are your students at the margins?** Which students have been historically excluded based on race, class, primary language, or disabilities?

2. **When might your most marginalized students feel like they belong in school?** Do they feel like they can be successful?

3. **What changes to lesson design, curriculum content, and/or classroom environment could you make to ensure students' interests and cultural identity are represented?**

4. **Where can you provide opportunities for incorporating excluded students' voice and choice in lesson design to empower students to have ownership over their learning?**

5. **What accommodations do any of your students who are multilingual, have 504 plans, or IEP's have?** How might these accommodations be shared as options with other students to reduce the stigma these students may feel and increase differentiation for all students.
Design based on evidence

How do you know which learner factors affect your learners? There is no one assessment that addresses every factor, and it’s important to remember that many factors will vary depending on context. For example, Background Knowledge can be a strength or challenge depending on the topic. So, when considering evidence, it’s important to collect multiple data points that paint the picture of the whole learner and to consider how context impacts these data points. When considering a students’ strengths and challenges, it’s important to identify students’ strengths beyond academics.

Here are a few different ways you can learn more about your students:

**Student surveys:** Conducting surveys on a wide range of aspects related to learning, interests, and social experiences can provide a lot of insight into what students experience in school and whether or not they feel a Sense of Belonging. (See sample survey.)

**Expressive writing prompts:** Asking students things like, “What is one thing you wish your teacher knew about you?” or providing opportunities for students to affirm their values and expertise can provide insightful responses and also help students develop their own awareness over the learning process.

**Observation:** Noticing students’ patterns of engagement in different subjects, lesson types, and opportunities for collaboration can help identify ways context may be impacting student learning.

**Student feedback:** Embedding opportunities for students to provide feedback on lessons can bring a wealth of understanding into their Motivation and interests.

**Parents and families:** Connecting with caregivers, parents, and families can help you understand what students are like outside of school.
Design with context in mind

An important part of understanding learner variability is recognizing how context can affect the way we learn. For instance, whether the class is in person or online can affect how students experience and engage in the learning process. How they feel about a subject or topic can impact their Motivation. Building trusting relationships with students can be helpful in understanding how different contexts impact students’ Sense of Belonging. Incorporating students’ cultural practices and emphasizing multiple perspectives allows students to connect to content in ways that provide mirrors, windows, and sliding doors. It’s important to understand that factors that influence learning are not fixed and may impact students differently depending on a variety of other connected factors.

1. What messages do students receive from the learning environment?

2. What messages do students receive from the curriculum?

3. How do students engage or learn differently in different subjects?
   With different teachers? Or in different settings (e.g. virtual versus in person)?

4. How do students respond to collaborative versus independent learning opportunities?

5. When this student is perceived as an expert or offered a leadership role, how does that change their engagement?

6. What opportunities are there to build flexibility into the way the learning environment is designed (i.e. flexible seating, mindfulness break areas, sensory and non-sensory spaces)?
Design for powerful learning

In order to prepare students to be successful lifelong learners in the 21st century, they need powerful learning experiences. Powerful learning is a student-driven approach and helps students take ownership of the learning process. When students are aware of their own learner variability, they can become expert learners who know how to advocate for their own needs. There are many strategies that support powerful learning, starting with building students’ curiosity and using inquiry for learning. Set goals with students so they can develop a growth mindset and engage in learning that is challenging and matters authentically to them. Show them how to leverage their strengths so that learning is both personal and accessible. Regularly practice giving feedback and providing choices about what and how they learn so their learning is connected and collaborative. Designing powerful learning calls on teachers to reconsider their role as content experts and shift to one where they become partners in learning, modeling the skills and mindsets necessary as they empower students to explore their passions and interests. Fundamental to this process is the need for educators to develop their own cultural awareness and build trusting relationships. Reflecting on your own learner variability can provide valuable insights into how your learning process and experiences influence the way you teach. This can be helpful in identifying patterns and also building empathy for students. Designing for powerful learning requires that educators become experts in knowing and understanding their students.

1. How often do you engage your students in powerful learning experiences?

2. How could you design discussions or collaborative activities that engage all students?

3. How can you get and apply student feedback into your lesson design?

4. How are you identifying and communicating students’ strengths?

5. How does your learner variability show up in your teaching?

6. How often do you reflect or consider how your cultural awareness may impact certain students’ experiences in your class?
Self Reflection for Teachers

Bringing awareness to how our learning varies by context can help us build empathy with our students and have more insight into ways we might think about approaching learning differently for different students.

Discussion/reflection questions:

**Reflect on yourself as a learner.**
What are your challenges? Identify a recent challenge you had as a learner. How did certain factors show up as strengths or challenges?

What are your strengths? Identify a recent success you had as a learner. What factors showed up as strengths and challenges?

What is your ideal learning environment? How did context affect your recent learning success or challenge?

**Explore the factors and strategies in the adult learner model:**
Which factors are related to your strengths and challenges as a learner? How are they connected to other factors?

What strategies do you prefer to use when learning something on your own?

What strategies are helpful to you when you feel challenged?

How does your experience as a learner impact your teaching?

**Select a learner model on the Learner Variability Navigator that most closely relates to your teaching:**
What are some factors that impact your students? What other factors are connected to them?

What strategies could you use to address the learner variability in your classroom?

How is this similar or different from your own experience as a learner?

How can you support your students to advocate for themselves?
Activity 5: Self-assessment for addressing learner variability

This self-assessment is intended to be a tool for your own personal growth and development. It is not intended to be a formal assessment or evaluation of others. As you consider each item, use a scale of 1–5 to rate yourself on how effectively, consistently, and frequently you do the following for each learner. Consider assessing yourself at different points throughout the year.

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<th>Use the following scale to rate yourself for each item:</th>
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<td><strong>1</strong></td>
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<td>This is a new or unfamiliar idea that you need additional tools to support.</td>
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**Design for the whole learner**

1. I regularly consider how factors across all four domains impact my students: student background, social and emotional learning, cognition, and content knowledge.

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2. I use the Learner Variability Navigator weekly to reflect on factors’ connections that are influencing my students’ learning and identify strategies to support specific factors.

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3. I can identify strengths, beyond academics, that support learning for each student.

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**Design at the margins**

4. I am aware of how Sense of Belonging can impact my students, and I specifically incorporate ways for my students who have historically been excluded by traditional education practices to feel like they belong and can be successful in school.

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5. I design for and with students who have been historically excluded based on race, language, disability or other factors to co-design instructional activities and classroom routines that fit their needs.

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6. I regularly design lessons that include all three UDL Principles, multiple means of engagement, multiple means of representation, and multiple means of expressions.

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7. I make accommodations and modifications that support my most vulnerable students available to all.

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8. I design learning so that it is accessible by learners with diverse interests and varied abilities.

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### Design with evidence in mind

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<td>9.</td>
<td>I conduct surveys several times a year to get a sense of students’ interests, motivations, and school climate.</td>
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<td>10.</td>
<td>I use writing prompts and other strategies to learn more about my students beyond academics.</td>
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<td>11.</td>
<td>I provide opportunities for students to give feedback on how they are experiencing learning and what sorts of resources work best for them and incorporate their feedback into future lesson design.</td>
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<td>12.</td>
<td>I connect with students’ families and try to understand what their lives are like outside of school.</td>
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<td>13.</td>
<td>I observe my students’ engagement with peers and different subjects to understand their preferences and interests.</td>
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<td>14.</td>
<td>I use evidence-based resources to design learning activities.</td>
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### Design with context in mind

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<td>15.</td>
<td>I incorporate my students’ cultural practices into our curriculum and classroom design.</td>
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<td>16.</td>
<td>I allow for flexible seating and room arrangements that support different learning preferences.</td>
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<td>17.</td>
<td>I provide each student with an opportunity to take different roles in classroom projects or classroom leadership roles.</td>
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<td>18.</td>
<td>I ask students about how their lives outside of school may be influencing their learning.</td>
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<td>19.</td>
<td>My learning design connects to the lived experiences of the students, connects them with other people inside or outside of the school, and builds their authentic purpose for learning.</td>
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### Design for powerful learning

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<td>I am familiar with the four pillars of powerful learning: personal and accessible, authentic and challenging, collaborative and connected, and inquisitive and reflective.</td>
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<td>21.</td>
<td>I create a learning environment that is a safe space where all learners can succeed.</td>
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<td>22.</td>
<td>Students have voice, choice, and decision-making power in their learning.</td>
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<td>23.</td>
<td>I design learning that helps students engage in productive struggle.</td>
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<td>24.</td>
<td>I design learning in which students collaboratively problem solve and learn from one another.</td>
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<td>25.</td>
<td>Students have the opportunity to ask questions that will guide their learning of the topic.</td>
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<td>26.</td>
<td>Students reflect on their learning and the learning process both during and after the experience.</td>
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<td>27.</td>
<td>I regularly reflect on my teaching practice and consider new ways to meet the needs of my students.</td>
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Apply it to your practice

The Learner Variability Navigator is designed to put the science of learning at teachers’ fingertips and to highlight connections between factors and strategies that can help teachers make more strategic decisions about how to address the learner variability they see in their classroom. See how other educators have used the Learner Variability Navigator to support their practice by exploring our signature workspaces and case studies.

Activity 6: Explore and create a workspace

Our signature workspaces highlight different use cases where educators and coaches have used the LVN to identify certain factors and strategies they want to focus on for different purposes. Some used this to support SEL instruction, and some used it to support parents during remote learning. Other educators used this to plan out a unit with a focus on critical literacy skills, and still others used it to highlight strategies that support students with disabilities. Explore the workspaces and design your own workspace.

Select one–two signature workspaces to explore. Consider the topics and the way they organized these. Consider what resources, links, and videos are helpful to include.

Activity 7: Review a case study

Read one of the case studies below and consider ways you can use the LVN to support the learner variability in your classroom.

Case Study 1
Working with eighth grade LGBTQ+ students

Case Study 2
Implementing book clubs in sixth grade ELA class

Case Study 3
Math fluency for fourth graders

Case Study 1:

Middle school counselor using the Literacy 7–12 model; teaching hybrid format in a rural area of Illinois

- School is 90 percent White
- More than half of students from low-income households

Who: Student characteristics

When implementing this lesson, I chose to focus it on a group of 8th graders who currently identify as LGBTQ+.

What: Factors to address

- Emotion
- Motivation
- Self-regulation
- Social Awareness & Relationship Skills

Why: Factor Selection

Living in a rural area and being a part of a small school with minimal diversity makes it difficult for this group to find social supports within the academic arena, in addition to understanding their emotions and identifying coping strategies. I felt like they would most benefit from the four aforementioned focus areas. I also anticipated emotionality, but not to the level that was encountered during the lesson. Some got so caught up in their feelings that they were unable to continue participating on an emotional level, though they voiced that they knew they would think of things later on (during private reflection) that they would have wanted to share with the group.

How: Strategy Choice

- Building Trusting Relationships
- Mindfulness Breaks
- Positive Self-talk
- Acting/Role Play
- Journaling

How: Strategy Implementation

I did this by ensuring that all students were comfortable and felt “safe” with the meeting taking place. We began the group by practicing mindfulness, and throughout the duration of the 45-minute lesson (mindfulness breaks were allowed whenever the students were feeling emotionally “drained” and/or overwhelmed). During the lesson, we allotted a time for personal sharing, practiced positive self-talk by reframing negative thoughts (whether in response to feelings elicited from parents, peers, or self), and participated in acting/role-plays in regard to coming out/discussing their orientation.

Journaling was assigned as homework and to be shared at a follow-up meeting. This is what prompted the journaling “homework assignment,” with me telling them to write down the things they wish they would have brought to the table and we could explore during another group lesson.

Successes/Barriers

The lesson went *incredibly* well. I knew that the students would be supportive of one another; what I wasn’t prepared for was the level of peer feedback that took place! When one student would share his/her experience, the others were supportive and empathetic, but also provided a level of responsiveness that I didn’t realize I lacked until the lesson began.

Takeaways

As a heterosexual woman, it is difficult for me to empathize/understand exactly where they were coming from as homosexual students (as my orientation is widely accepted as the “norm”). I have never been a part of a marginalized population the way the other students have, so it was wonderful to have their input and feedback. It was a wonderful experience, all in all!
Case Study 2:  
Middle school teacher using the Literacy 4–6 model; teaching hybrid format in a suburban area of New York  
- School is 32 percent White  
- More than half of students from low-income households

Who: Student characteristics  
I implemented the book clubs strategy this morning in my 6th grade ELA/ESL class.

What: Factors to address  
- Background Knowledge  
- Vocabulary  
- Foundational Writing Skills

Why: Factor Selection  
I chose these three factors because these are some of the top factors that my English language learners struggle with. Background knowledge is especially challenging. I find that when my ELLs are provided with sufficient background knowledge they are much better able to comprehend what they are reading. Vocabulary also helps them understand what they are reading (and writing). Foundational writing skills is also something else that I work on every day. Background knowledge and vocabulary helps strengthen their writing because if they understand what they read, then they can better write about it.

How: Strategy Choice  
I chose to implement the book clubs strategies. To be frank, I’ve always been a bit afraid of running a book club because I thought it would be too much work for me. However, after I read the resources and watched the video of the students running their own book club, I see that I don’t really do any of the work. I provide guidance and structure. The kids do the rest!

How: Strategy Implementation  
I decided to ask the class if they wanted to create a book club and if they wanted to read the sequel to New Kid called Class Act. I let the students pick their own books to read and ALL the kids were really interested in reading the same book! They engaged in a book walk, which was rather simple because they had all the background knowledge they needed since they had read the first book. I did provide some guidance. After they explored the front and back of the book and after they made some inferences as to what the book might be about, I provided the students with 20 minutes of time to read. Then, I provided them [with] a guiding question that will help them with their written assignment about New Kid. I asked them to discuss one favorite character and to explore how much (or how little) this character changed in the first two chapters of the book. (I have read Class Act so I knew this would be an engaging and fun question). The discussion went really well. I stayed away from the group but kept an ear on the discussion.

Successes/Barriers  
I have never implemented a book club strategy before, but now I’m going to keep this going because I see how much the kids enjoyed themselves and how excited they seemed to be guiding their own learning.
Case Study 3:
Elementary school teacher using the Math 3–6 model; teaching virtually in a suburban area of California

- School is 65 percent White
- Less than one third of students from low-income households

Who: Student characteristics
This year, I moved from teaching kindergarten to Fourth grade.

What: Factors to address
- Arithmetic Fact Retrieval
- Number Sense

Why: Factor Selection
I chose factors like Arithmetic Fact Retrieval to learn more about it and find strategies to help my students with this factor. Many of my students did not memorize their multiplication facts in 3rd grade, so I've been trying to find ways to help with their facts and teach them concepts that are deeper. Another factor I chose was Number Sense. I have just begun teaching decimals and I wanted to read more about place value through guided inquiry.

How: Strategy Choice
- Error Analysis

How: Strategy Implementation
My students are currently learning about hundredths and tenths in decimal form. I gave them the problem: Marlin says 0.04 and 0.4 are equal. Is he correct? Explain.

While I typically lead the conversation, as we are virtual, I had students discuss and lead the conversation. I asked them to decide and type in the chat bar if he was correct or not. Then they were able to have a conversation, adding onto each other’s answers, to describe the error Marlin made. At the end, we wrote a constructed response together. The class wrote four sentences, each contributed by a new person.

Successes/Barriers
They did a great job of looking at the error and explaining how it would have been fixed. Many of my students explained that 4/10 and 4/100 were different. One student contributed the fact that 4/10=40/100 and then the conversation took off.
Meet the Guide Creators

This guide was created by Jessica Jackson with support from the Learner Variability Project and larger Digital Promise Team. Special thanks to Kyla Haimovitz, Alison Shell, Barbara Pape, and Megan Pattenhouse for their thought partnership and feedback.

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