

Shifting Mindsets: Designing Lessons for Learner Variability

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Introduction

Teachers across the country recognize the potential that exists in their students. In a 2021 Digital Promise national [survey](#), the vast majority (84 percent) of the 530 U.S. public school teachers surveyed endorsed that given the right environment and support, most students are capable of high levels of educational achievement. At the same time, teachers (88 percent) also agree that learners vary and have different challenges and abilities that they bring to their learning environment. These can include aspects of their personal background and knowledge, their health and psychological well-being, and how they learn and think. Once this variability is recognized, the challenge becomes determining what resources and strategies teachers need to create an environment that allows each learner to reach their potential.

We have consistently heard that time is a critically needed resource for teachers to allow them to consider the many factors that might affect learners. The time crunch is amplified when sorting through appropriate strategies to customize the learning experience. The teachers surveyed noted that their time is limited (77 percent) but also endorsed that they have limited support (58 percent) to work with each student's individual learner variability in the classroom. Training is also key to understanding the myriad factors, often beneath the surface, that can have a critical effect on learners. For educators to effectively apply what is known from research to their classrooms, they must first become aware of the many experiences, strengths, and challenges that their students might have and how these play out in the learning environment. Through a recognition of learner variability, educators can be equipped to build upon learners' strengths to empower them to reach their potential.

Shifting mindsets toward understanding a broad and informed definition of variability is the starting point. For example, many educators may think only of learning differences, such as dyslexia, when they consider variability. And while this is an example of variability—for instance, learners may have strong oral comprehension but struggle with decoding—it is important for educators to understand that each and every student has individual variability across the many dimensions of learning. Or learner variability may be confused with learning styles, a [misconception](#) that people consistently learn best from one particular modality, such as visual or auditory, that has not been supported by research (Furey, 2020). Learning sciences research does show, however, how children differ in their skill levels, cognitive abilities, social-emotional needs, and backgrounds, which are all tightly interwoven with each other. The related strengths and struggles can also differ greatly in different contexts, such as when students are learning different subjects or in different environments. Considering the whole child means acknowledging these individual differences among learners and how they can be supported in the classroom and beyond. Providing educators with the time, tools, and professional support they need to navigate the complex science of learning gives students their best shot at being understood and supported.

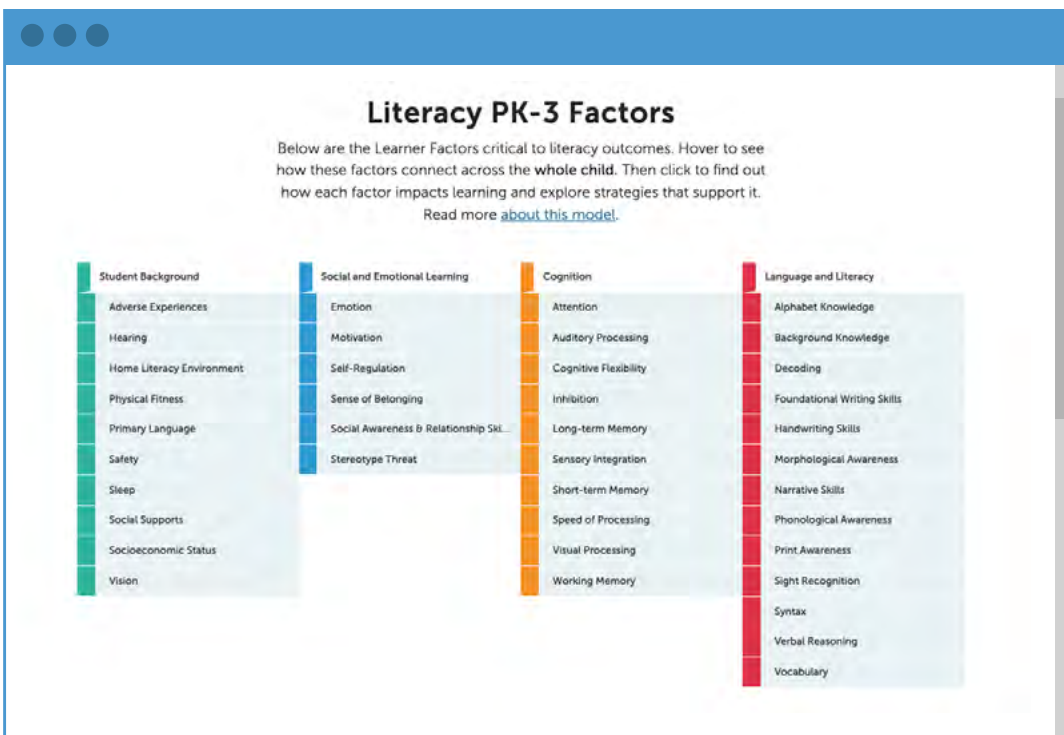
Supporting educators' training in this area is also beneficial to their long-term well-being in the profession. Studies of teacher self-efficacy show that feeling more able to adapt education to individual students' needs is related to greater job satisfaction and less teacher burnout. Teachers vary in their certainty that they can adapt instruction and assignments to individual needs and provide realistic challenges for students with mixed abilities. The greater their certainty in their ability, the greater their reported satisfaction with their job and the less they report fatigue and frustration with their work (Avanzi et al., 2013).

One way to bolster teachers’ understanding of how to personalize learning effectively is to share the vast amount of learning sciences research in an accessible way. Supporting educators in making connections between how people learn and the practices they use in their own classroom empowers them to teach with a true understanding of how learning can best happen across students and contexts. Research has shown that even brief professional development for educators on the science of learning and memory, and how it connects to classroom practices, can have significant benefits for teachers’ confidence and understanding of instructional approaches, including showing an increase in student-centered approaches and improvements to lesson plans (Howard-Jones et al., 2020; Schwartz et al., 2019).

In terms of educators’ engagement with learning sciences research, a 2020 Digital Promise national [survey](#) showed that time is once again a limiting factor; 94 percent of teachers reported lack of time as a barrier to reading more education research that could deepen their own understanding and contribute to their practice. The survey also found that other barriers to reading research included paywalls to accessing journal articles and the perceived limited applicability of research to teachers’ real-world setting. The Learner Variability Project (LVP) works to remove these barriers by building a free and open-source web app, the [Learner Variability Navigator](#) (LVN). This app synthesizes peer-reviewed research and provides tools to scaffold educators’ knowledge about the evidence-based factors that contribute to learning and practical strategies that support different learner needs.

The LVN presents Learner Models that concretely present whole-child frameworks for pre-K–grade 12 learning. Our theory of change proposes that by synthesizing the learning sciences research into factors critical to learner outcomes (see Figure 1) and showing how they are connected across the whole child, we can help generate a mental model for educators. This will allow them to identify the strengths and needs of different learners and apply evidence-based strategies to their classrooms that not only support individual learners but benefit the class broadly.

Figure 1. Whole child framework presented in the Learner Variability Navigator



Through partnerships on the ground, we are able to test our theory of change and contribute to our broader goal of shifting mindsets and supporting learning. Partnering with educators and educator-facing organizations allows us to share the tool and determine whether engaging with these resources can support the mindset shift needed to better understand and apply the concept of learner variability. Providing actionable information in the form of research-based strategies allows educators to also test whether and how this framework can be applied to their instructional settings. To further distribute the knowledge, we propose that encouraging educators to share these resources with their peers may extend our reach while also promoting deeper engagement with the work. While many educators do not regularly engage with academic research, [65 percent](#) reported that they look to their educator colleagues in deciding what instructional strategies to use. Therefore, having educators engage with each other around evidence-based practices may provide an effective model for building capacity to address learner variability.

With these goals in mind, LVP partnered with [DonorsChoose](#), a national nonprofit connecting public school teachers with donors across the country. After a promising [pilot](#) conducted in early 2020 with 106 U.S.-based educators, LVP aimed to expand the engagement to include more teachers and home in on how the experience supported their and their students' learning. Specifically, we assessed educators' awareness and understanding of the factors and strategies that influence their students' learning, and the effectiveness of the project's research translation tool, the LVN, in addressing their students' unique learning needs. We further aimed to understand how educators shared the tools with their colleagues as a form of peer professional development.

In order to achieve these aims, we structured the partnership with DonorsChoose around two tiered tasks:

Task 1

Engage a large sample of educators to learn about and apply LVP resources to their learning contexts

Task 2

Engage a subset of educators from Task 1 to share the resources and their learnings with colleagues in the context of peer professional development

Below, we describe the methods and results of these two tasks and the implications of the findings.

Task 1: Educators' Exploration of Learner-Centered Design

The goals of Task 1 included replicating the positive results of the pilot program with a larger number of educators from across the country. We additionally wanted to deepen our understanding of their process in how they used the LVN to select, learn about, and apply strategies that address learner variability, and how much it changed their practice. Finally, we wanted to determine if the process increased teachers' confidence in designing for learner variability in their classroom.

Participants

In January 2021, the DonorsChoose team sent a recruitment message to K–12 educators through their platform that offered a \$100 gift code toward classroom supply purchases for completing our task related to learner variability. From this effort, 837 K–12 educators from 48 states participated. This group included teachers who self-reported working with students at different levels: 82 percent elementary, 17 percent middle school, and 12 percent high school. The teachers represented a diverse set of schools with 77 percent coming from schools with greater than half of students in low-income households. Additionally, 42 percent of educators were from schools in urban areas, 36 percent from suburban, and 14 percent from rural. At the time of the engagement, which occurred during the coronavirus pandemic, 46 percent of educators were teaching fully virtual, 36 percent hybrid, and 18 percent fully in-person.

Procedure

Teachers received brief self-guided instructions on how they should use the web application, the LVN, to identify research-based factors and strategies that would support their different learners (see [Appendix I](#)). For the task, the teachers engaged with a particular tool, the [Learner Centered Design Tool](#) (formerly called the Learning Needs Explorer), which asks teachers to select learner factors from across the whole child that are relevant to the needs of their students. These include math or literacy content for early elementary, middle grade, or high school, as well as cognitive, social emotional (SEL), and background factors. The tool then suggests other factors to consider that are related to their selected factors according to empirical research. For example, if a teacher selected working memory, the adverse experiences factor may be suggested, as research shows that children who are abused or witness abuse in their homes are at greater risk for having working memory challenges (DePrince et al., 2009). Finally, the tool recommends research-based strategies that support the selected factors; for working memory and adverse experiences, strategies such as mindfulness breaks and using wait time after asking a question both support the selected factors. In this task, teachers were asked to: 1) curate the learner factors and instructional strategies of interest to them in a digital workspace; 2) implement a recommended strategy in their physical or virtual classrooms; and 3) complete a follow-up survey reflecting on their experience.

Measures

An online survey was distributed through the survey software Qualtrics. The survey was designed to capture educators' thought processes and reasons for selecting evidence-based factors and strategies that were relevant to their students' needs. It also assessed educators' reactions to trying a new strategy in their learning environment and how it may have supported their students and their own practice. Finally, the survey probed how the resources supported their understanding of learner variability and their confidence and ability to support the whole child. See [Appendix II](#) for complete survey items.

Results

Educator use of the Learner Variability Navigator

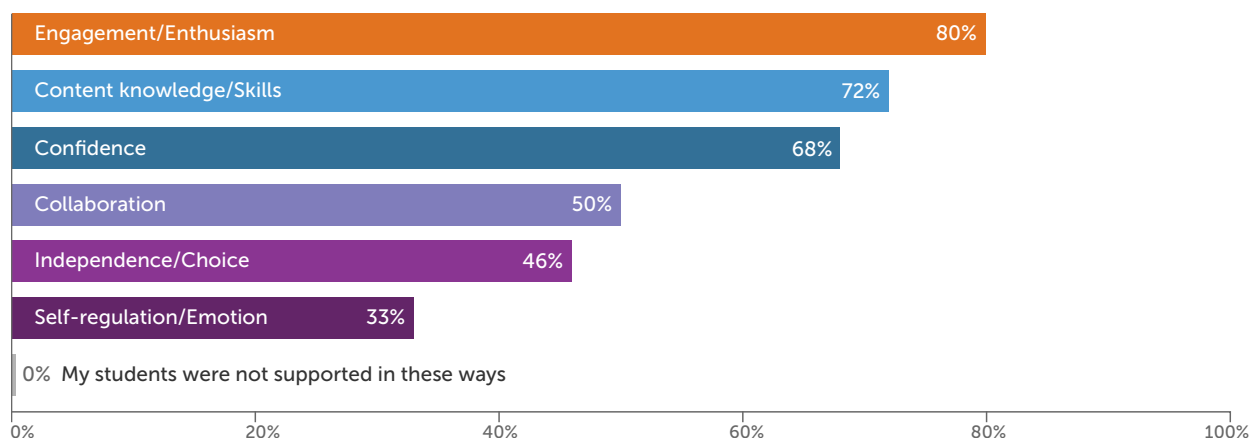
For the task, educators' average session duration on the LVN website reached nine minutes, 40 seconds. Collectively, they viewed seven to eight pages per visit. During those visits, educators viewed 196 different factor summary pages and 417 different strategy summary pages in total.

In selecting which Learner Model to examine more closely, the majority of educators chose the two early elementary models (Reading PK–3: 26 percent; Math PK–2: 22 percent) with the Math 7–9 model being selected the least (4 percent), which aligns to the fact that most participants were elementary school teachers. Educators selected a wide range of factors to consider when tailoring instruction, with 53 percent of teachers selecting cognitive factors (e.g., working memory, attention); 48 percent selecting social-emotional learning factors (e.g., motivation, social awareness); 48 percent selecting literacy content factors (e.g., decoding, vocabulary); 41 percent selecting math content factors (e.g., arithmetic fact retrieval, operations); and 35 percent selecting learner background factors (e.g., adverse experiences, socioeconomic status). The factors selected did not differ according to the educators' teaching model (i.e., fully in-person, fully virtual, or hybrid of in-person and virtual instruction). Educators selected at least three, and often more, evidence-based strategies to add to their workspaces.

Educator report on how students were supported

After curating their workspace, educators were asked to implement a research-based strategy, such as an active learning, cooperative, multisensory, or metacognitive approach. They were asked to report on how the experience of designing for learner variability supported their students and their own practice. Teachers reported that the evidence-based strategies they found and tried supported students from low socioeconomic backgrounds (reported by 73 percent of teachers), English language learners (59 percent), and learners in special education programs (58 percent), as well as learners in general education classrooms (73 percent). In terms of how students were supported, 80 percent of educators reported that the strategies supported learners' engagement and enthusiasm for the material while 72 percent of educators felt that the strategies supported content knowledge and skills (see Figure 2). Educators also reported that students' confidence (68 percent) and collaboration skills (50 percent) were engaged through use of these strategies.

Figure 2. Percent of educators reporting each type of student support



Educator report on how their understanding and practice were supported

When asked how much using the tool changed their perception of the importance of learner variability in their students' learning, 81 percent of educators reported that it changed a good amount or a lot. In addition, 74 percent of teachers reported that the resources supported planning for future lessons, 72 percent felt that they helped them identify research-based strategies to support specific student needs, and 70 percent of educators reported that the exercise supported their own learning and reflection on their practice.

Related to their knowledge and self-efficacy in addressing learner variability, 62 percent of educators reported that the LVN content supported their understanding of students and differentiation, and 64 percent of educators reported it supported their confidence and enthusiasm in using strategies. More specifically, in considering the factors, educators reported how the tool increased their confidence across the four pillars of our whole-child model. The majority of educators reported that their confidence increased a good amount or a lot for these areas: content area skills (81 percent); cognitive factors (86 percent); social emotional factors (77 percent); and learner background factors (70 percent). In addition, when asked to consider how the strategy bank affected their current teaching, a large majority of educators reported positive improvements to their knowledge, use, and understanding of strategies (see Table 1).

Table 1. Educator report of the impact of LVN strategies on their current practice

| Survey Item | Percent of Educators who Responded "Yes" |
|--------------------------------------------------------------------------------|------------------------------------------|
| Did you gain a better understanding of strategies you already use? | 100% |
| Did you make any changes to your implementation of a strategy you already use? | 91% |
| Did you identify new strategies to implement? | 97% |

Finally, when asked if they had the tools, training, and time to implement the strategies they selected, 91 percent, 83 percent, and 75 percent of educators said they had some or all of the tools, training, and time they needed, respectively. This suggests that, of the three, time to plan may be the biggest barrier to effective implementation.

Educators' user experience with the Learner Variability Navigator

Overall, educators' reactions to the Learner Variability Navigator's interface and content were very positive. On a scale of 1–10, 84 percent responded with an 8, 9, or 10 on how likely they were to recommend LVN to a colleague. In particular, educators provided comments such as these:

"It was helpful to be reminded of some of the strategies and have access to them all in one space. Will share this with my colleagues."

"This was the best DC [DonorsChoose] activity I've seen and rivals many PDs and graduate course materials."

"This is a great resource to continue reflecting back on my practices. There are also so many different articles that aid in learning more about the strategies that I may have never found researching on my own."

Understanding educator application of strategies

Educators responded to open-ended questions about the task and their process after implementing a strategy in their classroom. These qualitative responses provide insight into their understanding of learner variability and potential mindset shift after accessing the research and tools that can support students. The questions included the following: "How did you choose the factors?" and "What strategy or strategies did you try implementing in your learning context? Briefly describe how it went. What changes, if any, did you make to your lesson?".

For example, in commenting on their experience during the intervention, one teacher explained their thought process, identifying both social-emotional and academic factors they focused on and the subsequent strategy they chose to implement. In addition, as these data were collected during the coronavirus pandemic, this teacher, among many teachers who were teaching virtually found ways to apply these strategies online:

*"I know my students well and I know where they struggle...academic struggles as well [as] social-emotional struggles. My students generally are below grade level benchmarks for argumentative writing... I implemented the **Gallery Walk** strategy in my lessons today. I have used Gallery Walks in my classroom previously, but I was worried about how to do it virtually. With virtual learning, it is hard enough to get students to engage and participate with me, so engaging with peers and commenting on each others' comments seemed daunting. But [the] workspace gave me some great ideas. I looked into the app iBrainstorm and loved it! Because it was new technology to all of us, the kids really got into it. They were engaged and participating with one another. The comments I read and saw were insightful! Students were interacting with each other, answering peers' questions or agreeing or disagreeing with their ideas. Best of all, after the activity, the students saved the screen and*

I was able to really examine all of the screens later when I had more time. This allowed me to see the levels of participation from every student, the questions students still had, and gauge their interest and background knowledge in these areas.”

– Middle school teacher (Danbury, CT, teaching virtually)

The educator’s response suggests that using this type of activity, including trying new technology, not only motivates students, but can also cultivate their ability to support their peers and work both creatively and collaboratively on projects. Another educator who teaches kindergarten inclusion reported finding a new method to better enable some of their students to express their thoughts:

*“I wanted to implement a strategy that would be successful and helpful to all of my students—but especially my **students with disabilities**. I chose to implement the strategy of [creating visuals](#). Many of my students receive services for speech and language, so I try to balance additional language practice opportunities with activities that allow students to express themselves without language. My class read a MLK, Jr. biography and then I asked them to do a retelling activity where they drew a picture of something they learned from the story. My students who really struggle with retelling through language had fewer problems articulating their thoughts through pictures than they had previously.”*

– Elementary school teacher (Norfolk, VA, teaching virtually)

Another educator commented that the tool also helped them navigate and surface ideas to support their students and parents as well as remove barriers through technology:

*“I applied the **socioeconomic status** resources when delivering a parent night on literacy skills. It went really well, and helped me understand ways that I can engage parents of the population I serve. I also pulled the information on [graphic organizers](#) with my remediation groups. Sometimes, you know about things but can not think to use them with all of the other things available. It went really well, even in the virtual world using Google Classroom. Students can be held responsible for their work and it helped to differentiate. I also enjoyed the section on [text to speech](#) software. I did further research and was able to walk some students through using it. This will help immensely with students who have dyslexia and dysgraphia, but need ways to share their thoughts quickly.”*

– Elementary school teacher (Hampton, VA, teaching virtually)

Educators even commented on the impact of a strategy on a particular student, showing how individual variability can be supported through general approaches.

*“A strategy that I implemented in my learning context was **“free choice.”** Children are so often told what to do, and they are not often given choices about what they want to do. This can lead to the student feeling frustrated and not motivated to learn. I have a student who can be very resistant to reading and writing during our virtual lessons. So instead of telling him what we were going to read, I offered him choices about what he would read. And instead of telling him what we would write, I offered him choices about what he wanted to write about. This changed his whole attitude and he was much more motivated to participate in the lesson. He actually produces more than he typically does, without the usual negative behavior. It is amazing how something so simple, such as giving students choices, can make such a big difference.”*

– Elementary school teacher (New York City, NY, teaching virtually)

These examples show how educators were able to intentionally choose evidence-based strategies that aligned to factors of learning, both through increasing knowledge on why certain known strategies are valuable for student success, and by finding new strategies to support the whole child. For more detailed case studies of how educators chose relevant factors and strategies to implement and their reactions, see [Appendix III](#).

Discussion

Task 1 was designed to gain a broader understanding of educators' current teaching contexts, deepen their knowledge of learner variability, and introduce them to tools to support their practice. Overall, the task enabled educators' engagement with the learner variability tools and supported them in making connections between their students' specific strengths and needs and strategies they could try to implement. While every strategy may not work as expected across students and contexts, the tool provides a bank of evidence-based approaches that educators can have at their fingertips and are intended to address different needs. An unintended result of the study also showed how effective many of the strategies can be in virtual classrooms, supporting educators' confidence in trying new strategies in a different teaching format. Designing educational environments and activities can support the whole child in learning, not just through teaching academic skills but also through fostering children's social-emotional engagement and confidence. These are stepping stones to characteristics needed for success in school, work, and life beyond academics.

The survey results suggest the task had a strong influence on educators' perception of the importance of learner variability as well as increased confidence in supporting aspects of the whole child, in particular content skills and cognitive factors.

Overall, the study shows the positive effect of a brief intervention in encouraging greater awareness and intentionality around learner variability through increased access to knowledge and resources. As such, it shows promise as a tool that can expedite learning about, and applying research on, learner variability to circumvent the lack of time teachers have, and provides a blueprint for continuing to help learners reach their full potential.

Task 2: Educator-led Professional Development

Task 1 showed positive responses to the LVN resources and tools from teachers across the country. The goals of Task 2 involved capitalizing on educators' interest and enthusiasm in the LVP resources and requesting their assistance in disseminating the knowledge to colleagues who may be interested and could benefit from the resource. Our national [survey](#) has shown that educators often rely on their teacher peers to decide about instructional strategies (65 percent said a great deal or good amount; 29 percent said some), suggesting that this may be a fruitful follow-up task.

In addition to understanding the benefits of evidence-based practices for their students, educators can also employ evidence-based collaborative learning practices such as peer discussion that support their own learning, while also sharing their knowledge (Boud & Middleton, 2003). In a report on educator communities of practice, the [U.S. Department of Education](#) outlined the key types of value created for educators from participating in peer-organized professional development. These included engaging in professional conversations with other teachers with whom they identify; deepening knowledge through structured processes of engagement; accessing resources and tools; and applying new knowledge and resources by using lessons or ideas from the community in their classrooms (Office of Educational Technology, p. 2). The second DonorsChoose task was designed to employ these principles to empower educators to engage their colleagues in learning about learner variability, how it connects to their teaching contexts, and how the resources and tools could be applied immediately.

Participants

In February 2021, participants who had received credit for Task 1 and indicated they would be interested in a follow-up task were sent a recruitment message that offered a \$500 gift code toward classroom supply purchases for completing our professional development task. From this effort, 163 K–12 educators from 38 states participated. This group included teachers who self-reported working with students at different levels: 56 percent elementary, 12 percent middle school, 9 percent high school, and 23 percent unknown. The teachers represented a diverse set of schools with 76 percent coming from schools with greater than half of students from low-income households. Additionally, 42 percent of educators were from schools in urban areas, 33 percent from suburban, 14 percent from rural, and 11 percent unclassified.

Procedure

Teachers received instructions to complete a short professional development workshop (30 minutes–one hour; virtually or in person) with at least three colleagues (see [Appendix IV](#) for task). Teachers were provided with a number of resources including a [self-study guide](#) on learner variability and examples of tasks that would work well for the professional development session, such as having their peers explore a problem of practice using LVN, design a workspace around a topic of interest or school-wide goal, or engage in a structured brainstorming session using the explorer tools on the LVN. They were asked to choose a method to share LVN with their colleagues that they thought would be successful in building understanding and interest in learner variability. Participants were asked to complete a survey via the online survey software Qualtrics after leading the professional development workshop. The colleagues did not complete the survey or receive a DonorsChoose gift card.

Measures

The survey was designed to capture how educators shared LVN, including how they explained the concept of learner variability and which resources they used. It also assessed educators' thoughts about which parts of the workshop were most helpful to their colleagues and what connections they made to their existing practices or new practices they could implement. Finally, the survey probed whether and how educators would use LVN again or on a more regular basis. See [Appendix V](#) for complete survey items.

Results

How educators explained learner variability to peers

Many educators used the provided resources and definition when first explaining learner variability to their peers, namely that, "Each learner has a unique constellation of strengths and challenges that impact their learning. Additionally, these strengths and challenges can vary, depending on context." However, educators also elaborated on the materials with their own understanding or reactions to the concept:

*"Every learner in our classroom is unique. ... However, it's more complex than that. Depending on the circumstances presented, students can display **different strengths**. When students have the ability to display their knowledge in ways that work for them, everyone benefits. For example, at the end of a culminating unit, you might offer a writing assignment, an opportunity for students to create a podcast or work of art, or even perform a play. This is another way to empower students."*

– Middle school teacher (Poland, OH, teaching hybrid)

*"I started off by talking about our school's demographics and statistics. Our city of El Paso, Texas is about 90 percent Hispanic but the Northeast area where our school is located has one of the highest rates of **diversity** ... That makes our school unique in our city and we need unique tools and strategies that adapt to our specific students. That's what learner variability is in essence, is that all students are unique in how they learn. Each of them brings a different learner profile to our classroom environment."*

– Middle school teacher (El Paso, TX, teaching virtually)

*"The concept of learning styles was very en vogue when I started teaching but always rubbed me the wrong way. ... This idea of **"learner variability"** just made so much sense and I was excited to share it with my colleagues... There were a couple hold-outs, but most were on board with this concept, and were, honestly, a bit annoyed at their grad programs for pushing the much **more rigid learning style** model of thinking."*

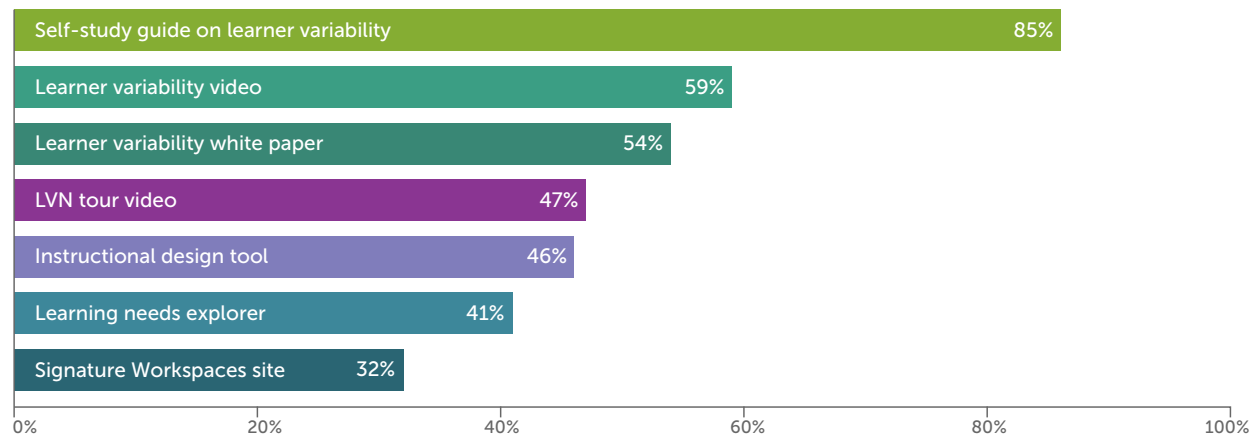
– Elementary school teacher (Beaverton, OR, teaching virtually)

*"The idea of learner variability is nothing new to me or the colleagues on my team, as we are all **special education** teachers. We probably understand learners' differences better than any of our general education counterparts. However, once I began to dig deeper into the resources provided and read more research on learner variability, it highlighted that learner variability applies to everyone and can even change depending on how life's circumstances change ... that "learner variability" and working to meet all students' needs (not just those that are average) truly is the definition of an inclusive classroom that we all strive for as no two people learn in the same way."*

– Middle school teacher (Cameron Park, CA, teaching hybrid)

The educators used a variety of resources provided by LVP to share the concept of learner variability, with the self-study guide being most widely used (see Figure 3). Importantly, 100 percent of participants reported that explaining the idea of learner variability helped them to understand it better themselves, supporting the idea that explaining ideas to others is a valuable learning approach.

Figure 3. Resources used by educators in their peer professional development



The parts of the workshops that educators thought were particularly helpful for their colleagues included time for discussion and self-reflection, walkthroughs of the LVN design tools and workspaces, and exploration of different elements of the LVN such as factor connections and strategy videos.

How educators and their colleagues connected LVN to their practice

When asked if the educator and their colleagues were able to make connections between the LVN and existing practices at their school, 98 percent of educators said they could. This supports the idea that addressing learner variability is not a new undertaking but rather connects to many aspects of the whole child and education systems. Some examples of these connections across a variety of topic areas include the following:

*"We have made a huge effort to work on our **anti-bias** and anti-racist practices in our school and instruction. The learner variability was another tool we can use to make sure that our instruction is as culturally relevant as possible."*

– Elementary school teacher (Beaverton, OR, teaching virtually)

*"We have always noticed that our textbooks have been written and made with a few students' backgrounds in mind. In the latest round of professional development, **social emotional learning** has been the biggest push and if we take care of that first, everything else will fall into place. With the LVN, we are able to look at SEL with a fine tooth comb, instead of throwing buzz words into rhetoric."*

– Elementary school teacher (Pasadena, CA, teaching virtually)

*"We recognized how many of our students do not get proper sleep or nutrition and how it affects their learning. We are in a **high poverty** area and so many of the kids have a rough home life. It's hard to learn when you are tired, hungry, or worse have been going through trauma at home. Many of them are too busy trying to survive every day to worry about homework or reading."*

– Elementary school teacher (Buffalo, NY, teaching virtually)

*"The Learner Variability Navigator is a valuable platform that supports our district's **Multi-Tiered Systems of Support (MTSS)** framework. In the last three years, our district has emphasized a thorough consideration of all factors that could impact a child's academic and **social emotional learning**. The LVN now provides resources of additional factors and corresponding strategies to consider."*

– Elementary school teacher (Salinas, CA, teaching virtually)

*"Our district has been focusing on how to **personalize learning** for students. We were able to discuss how each teacher is including choice in their lessons to support individual learning needs. We also talked about how we can offer choice during distance learning and then switching to the hybrid model."*

– High school teacher (Brooklyn Center, MN, teaching virtually)

*"Our district has paid an individual a good deal of money to come in and aid in our **math instruction**. To try and open our eyes to other ways of approaching math for our students. Some kids do not just need to be given the formula and an answer of "because it is" when solving. They need the buy in, the understanding. She told us to start in the real world, stepping into the abstract only in the last step. . . LVN said the same thing!"*

– Elementary school teacher (Grain Valley, MO, teaching in person)

These responses show a sample of the types of connections that educators could make between many different aspects of the LVN whole child framework and particular areas of focus or initiatives at their schools.

How educators anticipate applying learner variability in their contexts

Educators and their colleagues suggested many interesting ways to use the LVN in their contexts, showing the breadth and depth of its application.

*"I expect that my colleagues and I who teach **older students** will have our students take the self-reflection tool. We will ask our students to vocalize (or write) what it is that they see are their strengths and needs. Students are the experts about what they know and how they learn and with the right tools, like the LVN, they are able to have the confidence to express that."*

– Elementary school teacher (Beaverton, OR, teaching virtually)

*"I shared some of the information with our **literacy coach**. Too many teachers are just using assessments that are driven by standardized tests. While this needs to be considered it is not the end all be all. Students need opportunities to display their knowledge in a variety of ways."*

– Middle school teacher (Poland, OH, teaching hybrid)

*"We all reflected and agreed that learner variability makes that connection with the learning gaps we encounter on a daily basis. They would use this when elaborating **lesson plans** and delivering new strategies. The domains used are contributing factors that we, as educators, are aware [of] how they impact student's academic success. My colleagues also mentioned this is also an excellent resource to reflect and **self evaluate** how learning is delivered and how students [are] retaining information presented."*

– Elementary school teacher (El Paso, TX, teaching hybrid)

When asked if they would use the LVN again, 100 percent of educators responded yes.

In response to a question about what would make them use LVN on a regular basis, several educators noted that time is something they need in order to support more collaborative use of the tool and resources:

*"We agreed we need to set a time to **meet, talk, and plan**. Time is always something we do not have enough of—but if we schedule it, we will increase our collaboration and use of the site. Setting meetings will also allow us to show each other what we have discovered and what is working and what needs adjusted."*

– Elementary school teacher (Des Moines, IA, teaching in person)

*"I would honestly say if we had more time as a school; we are completely online and our schedules are made for us. Each year we are always in a time crunch and unable to finish everything we want to. I think watching the videos and having open discussion with students is the easiest way to introduce it. Making it a weekly thing is something that makes the most sense. I would also say that if parents were aware of some of the resources and willing to use them at home with their students, it would make teachers more likely to use Learner Variability Navigator. Having **parent support** is huge!"*

– Elementary school teacher (Phoenix, AZ, teaching virtually)

Discussion

Task 2 was designed to promote broader knowledge of learner variability through peer professional development; in this case, 163 participants engaged at least three colleagues, ultimately reaching about 500 more educators in the field. From the survey results of the second task, we saw that, with relatively minimal guidance—that is, no direct consultation with LVP staff—educators were able to engage their colleagues in a productive discussion around the concept of learner variability, how it connected to their practice, and use of the LVN resources. The educators' responses indicated that the task held value similar to those outlined in the literature. Educators appreciated taking the time to engage in conversations with professional colleagues to whom they were personally connected. The semi-structured nature of the workshops (e.g., viewing videos to discuss, trying the self-reflection or learner-centered design tools) seemed to support their engagement with the resources. Finally, the sessions created space for coming up with new ideas for how to apply the strategies in their classrooms. While we did not gather feedback from the colleagues involved in the professional development, we can infer from the educator feedback that they were engaged in the conversations, gaining knowledge of the concept of learner variability and access to resources and tools to support their own teaching and learning.

General Discussion

One of the most important aspects of supporting students is to first understand who they are, including their background and their strengths. In presenting educators with the learner variability tools and resources, modeled on a whole child framework, we aim to help broaden the lens through which educators see their students, while providing them the resources they need to support them. A common theme we hear from educators is a lack of time to attend to the needs of their students. Through a brief introduction to the tool, we found that educators gained a better understanding of the importance of learner variability, were supported in their own learning, gained confidence in their knowledge across the pillars of learning science, and were given access to useful resources to support their work.

In addition, they reported that through application of select strategies, they were better able to support their students—particularly their enthusiasm, confidence, and engagement, which are critical foundations of successful learning.

Figure 4 shows the components of this theory of change and how building out and providing training on resources such as LVN can shift educators' mindsets and lead to more powerful learning experiences for students. In this case, mindset shifts included processes such as expanding educators' understanding of what learner variability encompasses, correcting misconceptions, making connections between learner factors, re-thinking the use of existing strategies, being able and willing to try new strategies or classroom routines, and developing ownership of making those changes. The reflections on subsequent effects on students demonstrated that different learner populations, such as those who are below-grade level or from lower socioeconomic backgrounds were supported along with learners in general education classrooms more broadly.

Figure 4. Theoretical framework for impact of LVP on learners



Through Task 2, educators were given the opportunity to share this knowledge with colleagues. Through peer-teaching, these educators were able to build upon their own knowledge and support their colleagues. One topic that emerged from the survey responses was a need for continued collaboration to support educators in using the tools provided.

This study showed the immediate impact of a brief intervention with educators in the field who work in a variety of contexts. Future research should examine the longer-term impact on educators' mindsets, practice, and self-efficacy, including whether they adopt LVN as a regular tool to explore how to work with new and different students they have in their classrooms.

By encouraging educators to share their positive experiences through interactions and peer professional development around learner variability, we are hopeful that there will be broader enthusiasm for the concept and tool. Increased excitement and opportunities for collaboration among educators and districts can translate to support for their students through the whole child lens of learner variability.

Key Takeaways

- Making learning sciences research accessible through research translation supports educators who may not have the time or access to broaden their understanding of evidence-based factors and learning strategies.
- Showing how strategies can be best used to support all learners, the LVN equips educators to confidently identify and apply strategies that meet the needs of the whole child.
- Peer learning among educators can encourage educators to engage and discuss the application of learner variability to their learning contexts.
- Building upon educators' understanding of their own students while providing access to learning sciences research across the whole child can encourage a mindset shift toward learner variability.

Appendix I: Task 1 Participant Instructions

Instructions for using the LVN

Watch [this video](#) on how to create a workspace using the Learner Variability Navigator OR follow the steps below:

- Identify an upcoming lesson that you'd like to adapt to address the [learner variability](#) needs in your classroom. Decide if you want to focus on one student or a group of students.
- Log in to the [learning needs explorer](#). Your email will only be used to set up an account to save your workspace. Do not worry—we will not email you!
 - Choose a learner model that most closely matches what you teach. If you teach in another content area, choose a literacy model aligned to your grade level.
- Explore the factor map
 - Hover over different factors to see how they are connected.
 - Click on a factor to see the definition and more information about how it is connected.
 - Select factors that you want to address, which can be either strengths or challenges, in an upcoming lesson by toggling the button.
 - We recommend selecting a minimum of 3 factors to get the full benefits of the LVN.
- The tool will recommend additional factors that are highly connected to your chosen factors. You can choose to add some of them, or click "Next" to skip this step.
- Now you will see suggested strategies that address your chosen factors. They appear in a prioritized order, so strategies that improve or support all of your factors will be listed in the first group.
 - You can explore each strategy by clicking on it to read more. To access the full strategy page, which includes videos and additional resource links, click "Learn more." From a strategy page, you can click the "Back" button on your browser to get back to your filtered strategy list.
- Select 2–3 strategies that you plan to try in an upcoming lesson by clicking on the plus sign to add them to your workspace. You can select as many strategies as you like depending on the purpose of your workspace.
- Click "explore selections in workspace." You can click on the pencil icon to edit your workspace.
 - Update your title to include your first name and lesson title.
 - Add a brief explanation in the "Add workspace notes" section, describing why you chose these factors and strategies.
 - Please do **not** include any students' names or personal information.
 - See example workspace [here](#).
 - You can share your workspace with a colleague by clicking on the "share" button in the top right of your workspace.
 - To see more examples of workspaces, check out our [signature workspaces](#).
- Try implementing at least one recommended strategy from LVN in your class before completing the survey.

Appendix II: Task 1 Participant Survey

Survey Questions

1. What grade do you currently teach? (Check all that apply.)
 - Early elementary (PK–2)
 - Upper elementary (3–5)
 - Middle school (6–8)
 - High school (9–12)

2. What is your current teaching context?
 - Fully in-person
 - Fully virtual
 - Hybrid of in-person and virtual

3. a. Which model did you use?
 - Reading PK–3 Math PK–2
 - Literacy 4–6 Math 3–6
 - Literacy 7–12 Math 7–9

b. Which three (or more) factors did you consider in your workspace for your students?
[Options depend on the model selected in question 3.a.]

4. How did you choose those factors? [Open-ended 100 character minimum]

5. Which three (or more) strategies did you consider in your workspace for your students? Please provide the strategy names used in LVN (e.g., Gallery Walk). [Open-ended 100 character minimum]

6. Did you gain a better understanding of strategies you already use? [Y/N]

7. Did you make any changes to your implementation of a strategy you already use? [Y/N]

8. Did you identify new strategies to implement? [Y/N]

9. Please answer this question only after you have created a workspace and implemented at least one recommended strategy in your classroom, and keep in mind you cannot re-take this survey later. What strategy or strategies did you try implementing in your learning context? Briefly describe how it went. What changes, if any, did you make to your lesson? [500 character minimum]

10. What student populations did the new strategy support? (Check all that apply.)
 - English language learners General education
 - Low socioeconomic status Below-grade level
 - Special education Above-grade level
 - Other: _____

11. How were students supported by the LVN strategies? (Check all that apply.)

- Support to student content knowledge/skills
- Support to student independence/choice/input
- Support to student collaboration
- Support to student self-regulation, emotion
- Support to student engagement/enthusiasm
- Support to student confidence
- My students were not supported in these ways

12. How was your practice as an educator supported by using the LVN content? (Check all that apply.)

- Supported your existing programs/initiatives
- Supported your planning/future lessons
- Supported your confidence/enthusiasm in using strategies
- Supported your learning/reflection on your practice
- Supported your understanding of students/differentiation
- Supported your classroom management
- My practice was not supported in these ways

“Learner variability” refers to the abilities students have and the challenges they bring to the learning environment in the context of whole child learning. Factors include their personal background and knowledge, their health and psychological well-being, and how they think, among other things.

13. How much, if at all, did your use of this tool change how you see the importance of learner variability in your students’ learning?

- 0 - did not change at all
- 1 - changed very little
- 2 - changed a fair amount
- 3 - changed very much

14. How much, if at all, did your use of this tool change how you address learner variability in your instruction?

- 0 - did not change at all
- 1 - changed very little
- 2 - changed a fair amount
- 3 - changed very much

15. How much, if at all, did your use of this tool impact your confidence in supporting the whole child across: [0-did not change at all; 1 - changed very little; 2 - changed a fair amount; 3 - changed very much]

- Content
- Cognition
- Social-Emotional Learning
- Background Factors

16. Which of the following best describes how the LVN was most helpful to you? (Check all that apply.)

- To learn more about the research on how learners vary
- To understand how factors of learning are connected
- To identify research-based strategies to support specific students with their needs
- To find resources, such as activities or edtech products, to incorporate into my lessons
- It wasn't helpful
- Other

17. Do you have the tools, training, and time necessary to implement the LVN strategies you selected?

• Tools:

- 0 - Not at all
- 1 - Have some of the tools I need
- 2 - Have most of the tools I need
- 3- Have all the tools I need

• Training:

- 0 - Not at all
- 1 - Have some of the training I need
- 2 - Have most of the training I need
- 3 - Have all the training I need

• Time:

- 0 - Not at all
- 1 - Need much more time
- 2 - Need some more time
- 3 - Have all the time I need

18. Is there any other feedback you would like to give us? [Open response–optional]

19. How likely are you to recommend the Learner Variability Navigator to a colleague? [1–10]

20. Who might you share the Learner Variability Navigator with? (Check all that apply.)

- Counselors
- Peers
- Coaches
- Principals
- Parents
- Students
- Would not share with others

21. What type of support would most interest you? (Check all that apply.)

- Professional learning courses or workshops
- Micro-credentials
- Professional community of peers (virtual or in-person)
- School leadership support

Would you be interested in leading a professional development workshop about some of your learnings from the Learner Variability Navigator? A workshop would include at least three colleagues and could unlock additional rewards.

DonorsChoose may email you more information if you select "yes," reaching out to teachers in the order their surveys were submitted.

Appendix III: Task 1 Case Studies of Educator Application

Excerpts From Educators' Responses



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.

Appendix IV: Task 2 Participant Instructions

Now that you've used the Learner Variability Navigator (LVN), you can inform other teachers at your school about what you've learned about learner variability. Teachers who lead a professional development workshop with three or more colleagues at their school will receive a \$500 DonorsChoose gift code while funds last.

Your Professional Development Workshop

1. Start by reviewing the [self-study guide](#) on learner variability.
 - a) Consider the ways the navigator connects to your practice and school-based initiatives.
 - b) Decide which tools and resources would be most helpful to your colleagues.
 - c) Design a PD workshop that actively engages your peers in a discussion and a task using the LVN. See more examples below.
2. You'll need to gather three or more colleagues from your school to lead a professional development workshop (in-person or virtually). You'll be reporting the workshop attendees' emails to DonorsChoose, and we may reach out to them for verification.
3. Your workshop should be 30 minutes to one hour. An example of what that workshop could look like is in the "Example PD" section below.

What You'll Submit

Once you complete your professional development workshop, you'll need to submit a few details to receive a \$500 DonorsChoose gift code.

1. Go to our [Submission Center](#)
2. You'll need to share the resources and tools you selected from the self-study guide, any additional resources you added, and attendee emails. Additionally, you'll answer a few questions about the experience, such as:
 - a) Please describe the parts of your workshop that were most helpful to your colleagues.
 - b) Were you and your colleagues able to make connections between the LVN and existing practices at your school?
 - c) How do you anticipate you and your colleagues will apply these new skills in your school?

Examples of a teacher PD session

Using the resources in this [self-study guide](#), design a PD to explore different ways the Learner Variability Navigator can support the work you and your peers are doing. Here are some examples of how you can use the LVN and self study guide resources to facilitate a PD:

- Provide an overview of learner variability: Read the white paper and watch the video in the self-study guide and facilitate a discussion on how this shows up in your current environment. Then explore the navigator and discuss how this might help your current practice.

- Explore a problem of practice: Start with a larger question in mind and focus on a few factors and their connections as they relate to your question, “How does stereotype threat impact our students, and how can we address it in our academic content?” Then identify and discuss which strategies would be best to address these factors and why.
- Design a workspace exploring factors and strategies that connects to a school-wide initiative or goal (e.g., Social and Emotional Learning, Culturally Responsive Teaching, Student Agency). Facilitate a group discussion exploring ways to incorporate your learnings into an upcoming unit of study.
- Lead a structured brainstorm on ways to apply LVN strategies in the classroom. Then host a group lesson planning session where each teacher uses the [Instructional Design Tool](#) to evaluate their lesson plan and determine if they want to add new strategies.

Above are examples to show what kind of PD this reward is intended to help encourage. Pick a method of your own choosing and share the LVN with colleagues in a way that you think would be most successful at driving understanding and interest in learner variability among your school community!

Appendix V: Task 2 Participant Survey

Survey Questions

1. How did you explain the idea of “learner variability” to your colleagues? [500 character minimum]
2. Did explaining it help you understand it better?
 - a) Yes
 - b) No
3. Which of the following resources and tools did you use in your professional development workshop? (Check all that apply.)
 - Self-study guide on learner variability
 - Learning needs explorer
 - Instructional design tool
 - Learner Variability white paper
 - Learner Variability video
 - LV Navigator tour video
 - Signature Workspaces site
4. Did you supplement your workshop with other resources? [Y/N]
 - a) [if yes] Which additional resources did you use?
5. Please list out the email addresses of the colleagues who attended your workshop.
6. Please describe the parts of your workshop that were most helpful to your colleagues. [300 character minimum]
7. Were you and your colleagues able to make connections between the LVN and existing practices at your school? [Y/N]
 - a) [if yes] Please describe the connections you and your colleagues were able to make between the LVN and existing practices at your school. [100 character minimum]
8. How do you anticipate you and your colleagues will implement these new skills in your school? [300 character minimum]
9. Will you use the Learner Variability Navigator again? [Y/N]
10. What would make you use the Learner Variability Navigator on a more regular basis? [100 character minimum]

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