

# Designing for the Future of Research: Putting Equity-Relevant Research into Practice with Scenarios and Personas

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## Table of Contents

Abstract . . . . .	.3
Using Scenarios and Personas to Design the Future of Research on DLPs . . . . .	.4
Considerations When Using Scenarios and Personas . . . . .	.5
Beyond Scenarios and Personas: Centering Equity in Educational Research . . . . .	.6
Get Involved. . . . .	.8
Further Reading. . . . .	.8
Citations . . . . .	.9
Appendix. . . . .	.10

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## Abstract

SEERNet, a hub of five digital learning platforms (DLPs), either in K-12 or higher education, are enabling researchers with capabilities to conduct research and collect data on large numbers of students. Based on the new Standard for Excellence in Education Research ([SEER Standards](#)) around Equity, we propose that researchers should consider future-oriented approaches and methodologies to conduct equity-relevant research using DLPs. Taking a future-oriented approach, we created scenarios and personas to help us envision an equitable and inclusive future. Scenarios and personas are tools that may help center equity in research. We make three additional recommendations to bring new perspectives into future-oriented, equity-relevant research practices. First, include diverse research perspectives. Second, engage teachers, students, and families as partners in research. Third, minimize bias. In SEERNet, we invite the research community to join in future conversations as we continue to consider personas and future-oriented scenarios and see what they can help us understand and do.

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Recently the Institute for Education Sciences (IES) added a new Standard for Excellence in Education Research ([SEER Standards](#)) around Equity, phrased as, “address inequities in learners’ opportunities, access to resources, and outcomes.” SEERNet envisions building a diverse community of researchers, practitioners, and industry partners to imagine the future of digital learning platforms that support education research. Today, five Digital Learning Platforms (DLPs), which are part of the [SEERNet](#) hub, are doing work framed by the SEER Standards. In particular, they are working to provide researchers with capabilities to conduct research and collect data on large numbers of students. With the five DLPs, we consider the SEER standard focused on equity: How can the field go beyond what is possible today with regard to conducting equity-relevant research using DLPs? What might be possible in 5–10 years?

## Using Scenarios and Personas to Design the Future of Research on DLPs

As the DLPs consider how to develop their platforms to better support education research, we took a step to focus on the creation of systems that address bias and center equity and facilitate inclusiveness. In the short-term, the DLPs have pressing development schedules and cannot immediately do more. Taking a future-oriented approach, we created scenarios to help us envision an equitable and inclusive future to guide longer-term plans. Although we conceptualized several scenarios with our DLPs, including ones they created, we’re only going to share one scenario here.

Let’s focus on one scenario with a female STEM researcher employed at a Midwestern school district who wants to explore if teachers of color bring specific practices and mindsets into the classroom that benefit all students. The researcher is interested in understanding what practices are occurring to enhance academic performance and support social emotional learning.

The researcher works with a cohort of teachers of color to modify their districts’ digital curriculum and is interested in investigating its impact on student performance. During past classroom visits the researcher observed great variability between what different teachers do to support student work on the learning platform and wants to understand how this relates to how students are doing. In addition to the progress of the students, the researcher is particularly interested in feelings of belonging among students. The DLP she is interested in exploring for her research is used to deliver the curriculum and to provide a dashboard and recommendations to teachers. It allows researchers to evaluate the content, timing, and mode of learning activities. The researcher decides to conduct her study by combining indicators from the platform such as content and mode of learning activities with indicators not yet automatically provided by the platform. She will collect variables relating to social belonging, academic belonging, and perceived institutional support by a survey delivered via the platform.

This scenario is centered in the practices of the teachers, requires an understanding of context, and investigates outcomes that involve some automatically collected data as well as other data that might not currently be collected by a [DLP](#). While the researcher could choose a sample of classrooms to do this kind of work in, she would like to do it in all the classrooms in the district; conducting the research via a platform would help the researcher scale her study districtwide.

For example, in considering this scenario relative to the most relevant SEERNet DLP, Terracotta, we learned the following:

- Researchers may need awareness of how they can add additional measures to the system to measure what matters to them.
- Direct human observation is likely to remain an important component of research, and researchers will need ways to connect their observational data to platform-collected data.
- Platforms provide a valuable tool to equity-minded researchers so they can study variation across a district, where they support the data collection necessary to make a districtwide study. This essentially would provide insights to practice and the education research field overall.

In addition to creating scenarios, we also considered who the researchers are that use DLPs by considering personas, another design method. We are defining personas as profiles that are grounded in the lived experiences of the end-users. Personas describe the race and gender of the researchers, how they spend their days, the things that motivate and challenge them, and how they make decisions, which can facilitate inclusive product design thinking.

Our personas described researchers who don't yet work with DLPs and were intended to provoke thinking about what different researchers bring to their work. This can help make apparent new features or capabilities that might be needed.

[In the appendix, you can see the three example personas](#) of scholars that don't yet use DLPs for research purposes. Please note, the personas and the starting scenarios are examples of researchers and their research questions who could potentially use a DLP and not exhaustive of the possibilities.

In a short exercise, we asked our DLP partners to start thinking and working to develop different personas that might guide future development of their support for third party researchers. In their early thinking, the DLPs engaged in conversations around a broad range of social and environmental issues in learning and centered their thoughts around gender, race and ethnicity, socioeconomic status, and ability groups. The DLPs created additional example personas and scenarios that are future-oriented and equity-driven. We plan to continue to use the design methods of personas and scenarios over the next four years in the project to continue to frame conversations and help us work toward equity-relevant research.

## Considerations When Using Scenarios and Personas

The SEERNet team, in consultation with a researcher who focuses on equity, thoughtfully considered lived experiences of real educators and researchers in the development of our personas that could influence equitable future designs (Constanza-Chock, 2020). If not developed carefully and with empathy, personas can cause problems as they could create stereotypes. For example, the three personas of researchers or practitioners interested in research were developed to start a future-oriented discussion. We worked to bring them to life by thinking about their lived experiences and background situations that informed who they were to help avoid narrow typing of groups of people. We wanted to ensure that we were considering gender, race and ethnicity, socioeconomic status, and ability groups. In addition, we wanted to be inclusive of supporting researchers who are asking different kinds of research questions (NASEM, 2022).

## Beyond Scenarios and Personas: Centering Equity in Educational Research

Scenarios and personas are just one tool to center equity as SEERNet builds a community that connects equity-oriented researchers with widely used Digital Learning Platforms. In closing, we discuss the more general challenge.

In the last few years, we have seen equity become more central in education. The COVID-19 pandemic dramatically shifted the K-12 education landscape, and [research is showing inequitable and significant negative effects](#) on the most vulnerable populations that include those in poverty and historically and systemically excluded students. We include the Executive Order 13985 (2021) on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government of President Biden to show their [definition of equity in Section 2](#). As mentioned earlier, IES added a new SEER principle focused on equity. Additionally, a recent report of the [National Academies of Sciences, Engineering, and Medicine](#) (2022), also framed and informed by the Executive Order, calls for a priority of equity in the research funded by IES. With this context in mind, ensuring that equity is included in the work is paramount.

Since its founding, IES prioritized efficacy research, and now, the relationship between efficacy and equity in science and for the public good needs to be explored and considered. We brought in the design methods of personas and future oriented scenarios to help frame and start conversations centering equity. As a little more background that will also inform our work and future work, the National Academies of Science report suggests two ways to approach the work methodologically: 1) to look at differences between groups and 2) to design conditions that can enhance the performance of historically and systemically excluded groups (6–9). The National Academies of Science (2022) report devotes a chapter to considering what kinds of measures may be necessary as we move to more equitable research. They consider the need for validated measures beyond just student outcomes to “measures of the structural and contextual factors that shape student outcomes” (6–11). These include measures of teacher development, practice, and effectiveness; and measures to understand equity and inequity.

The DLPs hold promise for supporting the design of conditions to study the impact of work that focuses on historically and systematically excluded individuals. Because the DLPs collect data and are already used by large numbers of students, they are a powerful tool that might help illuminate issues. They bring the power of Randomized Control Trials (RCTs) and can potentially connect interested researchers to large numbers of students to perform experimental work. With all of the data, one of the important concerns of the DLPs, that they are actively working to solve, is determining how to protect the identity, privacy, and data of the students involved.

Below we make three additional recommendations for ways to increase the potential of bringing new perspectives into the research to move toward future-oriented, equity-relevant practices. We are inspired by our experiences thinking with personas and scenarios that are different from where the field currently is and feel they will help us continue to have important conversations. We also know we must take additional steps.

### **1. Include diverse research perspectives**

Our design thinking using personas and future-oriented scenarios was done thoughtfully, but it was only a start toward equity-relevant work. We also need to bring in researchers from diverse backgrounds and those using diverse research methods. We need researchers from communities most targeted by intersectional structural inequality to guide this work (Benjamin, 2019). These lived experiences give insights about issues of equity that those without the experiences cannot easily see or always keep at the forefront of their thinking. We need research that enables active, equitable, and real participation of historically excluded groups to help envision pathways that make learning accessible for all groups of students. If we're not intentionally including diverse perspectives, it is too easy to only include dominant ones. It is important to have diversity in the people on the team and in the development process (Constanza-Chock, 2020). In fact, it's important to include teachers, students, and families in the design process—see recommendation 2.

### **2. Engage teachers, students, and families as partners in research**

While this project has focused on researchers who might use DLPs to do new kinds of research, we also need to consider participants in the research as well. To improve equity in research, participatory design research (PDR) and community-engaged research can be used to include more voices (Cornwall & Jewkes, 1995; Mikesell et.al., 2013). Engaging teachers, students, and families presents opportunities for higher engagement with historically excluded groups. This work should be done throughout the development process and not just at the end. These interactions will enable platform developers to acknowledge students' cultural diversity and accommodate multiple modes of learning. "Cultural responsiveness is not a practice; it's what informs our practice so that we can make better teaching choices for eliciting, engaging, motivating, supporting, and expanding the intellectual capacity of ALL our students" (Hammond, 2014). Engaging with teachers, students, and families as partners will also help platforms interpret learners' preconceptions and experiences. Including them in the development process also leads to buy-in and increases the relevance of the work (Balazs & Morello-Frosch, 2013). Working to include community members in the process does take time and resources to support, and it is important to acknowledge and compensate them for their work. Also, note that PDR work needs to pay careful attention to the traditional roles of power in research as it works to create new roles and relations to accomplish new possibilities (Bang & Vossoughi, 2016).

### **3. Minimize bias**

Developing any digital platform to support learning and teaching requires significant algorithmic and engineering work. Any algorithm has the potential to be biased as they reflect the biases of the humans who develop and validate them (Noble, 2018). The importance of minimizing bias relates to the first and second recommendations of who is part of the team informing, developing, and validating the algorithms. It is important to ensure that both the algorithms and the training data used represent diverse learners by including developers with diverse backgrounds and perspectives who use their own lived experiences to shape the algorithms in terms of race, ethnicity, gender, and nationality. In addition, including feedback from parents, students, and teachers who represent communities where the algorithm will be used is also important.

We also note that artificial intelligence (AI) is becoming more prevalent in learning tools and if not yet in DLPs, it may be incorporated soon. From the work with AI, we see very clear examples of

problems with bias. Studies on educational AI technologies have reflected on origins of AI bias and their potential harms in education including how algorithms make decisions that could influence student learner performance and behavior (Baker & Hawn, 2021; Kizilcec & Lee, 2020). Machine learning (ML) systems that work with student and learning data can learn biases due to technical design errors and by picking up on existing patterns of inequality and discrimination in training data (Baker & Hawn, 2021; Prinsloo & Slade, 2017). Oftentimes, people are gathering information or data that is readily available, which leads to overrepresentation of specific subsets of the population. What people consider as credible data is shaped by social, political, and cultural factors (and is biased as all data sets are biased). We come back to our original point that to help minimize bias, it is important that we represent and gather data from diverse personas and their lived experiences so it can inform the entire product development cycle.

## Get Involved

Join us in future conversations as we continue to consider personas and future-oriented scenarios and see what they help us understand and do. Additionally, please fill out our [interest list](#) form to participate in upcoming opportunities for practitioners, emerging scholars, and researchers. Think with us about how this research and SEERNet can better support educators, students, and the future of learning.

## Further Reading

Also see SEERNet paper, “Navigating the tensions: How could equity-relevant research also be agile, open, and scalable?,” that suggests ways to move toward equity-relevant research (Zacamy & Roschelle, 2022).

See [this related curated reading list](#) about focusing on promoting equity and accountability in Artificial Intelligence (AI).

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## Appendix

Name & Professional Title	<p>Minseo Lee</p> <p>Learning Scientist Researcher and Assistant Professor in the School of Education</p> <p>Former high school mathematics teacher (Algebra 1 and Precalculus)</p>
Race	South Korean woman who came to the US at age 14 and learned English in high school.
Gender	
Relevant Info	She graduated near the top of her class from a public high school.
Fears, Goals, & Values	<p>That children in public school don't always get the best attention and can be forgotten.</p> <p>As a product of public education herself, she is a champion for it.</p>
What drives the person's decision making process?	Dr. Lee works hard to see both sides of the issue and seeks to understand causes. She likes to look at systems and not small pieces, take as much as she can into account, as she makes decisions.
What institutional challenges might they face?	Dr. Lee works to bring the practical into research and often feels looked down on by colleagues who did not teach. She feels she is caught between two worlds (research and teaching) with different values.
What challenges might they face based on their identity?	<p>Dr. Lee faces the issues that an immigrant woman who teaches mathematics faces such as, language barriers, cultural barriers and gender discrimination.</p> <p>Dr. Lee has experienced how important it is to feel belonging.</p>
Research Issue & / or Research Questions	Wants to investigate classrooms and the effects of teacher feedback on students' feelings of belonging and their performance in math classes.
What tools do they need (do the tools exist yet?)	<p>She needs tools to tie together research done in the classroom, in the DLP, and from teachers. She has many different instruments and protocols and finds managing them all to be difficult at best.</p> <p>She is new to using a DLP.</p>
Broadening Issue	Wants to see if the feedback that a DLP gives to a teacher about a student is actionable, how often the actions are undertaken by teachers, what those actions are, and if there is an impact on student performance.

Name & Professional Title	<p>Luis Carlos Martinez</p> <p>Higher Education</p> <p>Statistics and Data Sciences</p>
Race	Latino
Gender	Male
Relevant Info	Has a brother with dyslexia and has watched the challenges his brother has to overcome using screen readers and separate tools to help his writing. With the right tools, his brother is successful. He's also seen students who are ELLs with similar issues.
Fears, Goals, & Values	He fears we may leave students who aren't considered "normal" out of the thinking when we design new systems. He has seen his brother struggle in existing systems and wants to make a difference for the future.
What drives the person's decision making process?	<p>He passionately advocates for inclusion and creating equitable access. He doesn't want gaps to widen.</p> <p>He uses Open Access materials in his courses and doesn't want students to have to buy textbooks.</p>
What institutional challenges might they face?	He finds that rules about solutions for students who think and perceive differently don't go far enough to support students as they sometimes don't know how to access supports provided by the institution.
What challenges might they face based on their identity?	As a Latino man, he feels he has often been looked down upon and has worked hard to show he is as good as others. He has worked hard to make connections with colleagues. Sometimes he knows he holds back because he doesn't like what he thinks others think about him.
Research Issue & / or Research Questions	<p>He uses UDL principles to guide his teaching and includes drawing, writing, and speaking, to allow students to show their understanding in his courses.</p> <p>He wants to have materials created by students in the class and then he wants to determine which ones are most helpful.</p>
What tools do they need (do the tools exist yet?)	
Broadening Issue	He wants to ensure that students who have issues processing text are included and able to use and fully participate in DLPs.

Name & Professional Title	Renee Johnson  Director, STEM Research in Jackson County School District, Alabama.
Race	African-American
Gender	Identifies as Woman
Relevant Info	She wants to see if her work can be inclusive of historically excluded student groups. Being a woman she deeply cares about empowering young women.
Fears, Goals, & Values	Her goal is to bring in accessible and inclusive learning platforms and specifically improvements that consider historically excluded students at the district level. She fears that current designs don't center a range of perspectives.
What drives the persona's decision making process?	She is well aware of the subtle advantages given to the long standing majority White population, and doesn't want students who are Black or African-American to be excluded.
What institutional challenges might they face?	She has been asked to create a project plan on research-based classroom interventions to improve academic performance of historically excluded students. She has limited resources and budget. She has been allocated two teachers of color to pilot her study.
What challenges might they face based on their identity?	As an African-American woman in her 30s, she feels that people are wary of her ideas and proposals. She feels she has to break the "glass ceiling" every time she wants to implement her project ideas.
Research Issue & / or Research Questions	After her literature search, Renee learned teachers of color bring specific practices and mindsets into the classroom that benefit all students including, positive academic performance and social-emotional behavior. She wants to test this hypothesis with focus on historically excluded students using a DLP.
What tools do they need (do the tools exist yet?)	She is new to using a DLP to conduct research.  She is curious about the tools in the system and if they can answer her questions.
Broadening Issue	She wants to understand how teachers of color support students.  And she wants to build partnerships with nearby researchers who share her values and contribute productively to her goals.