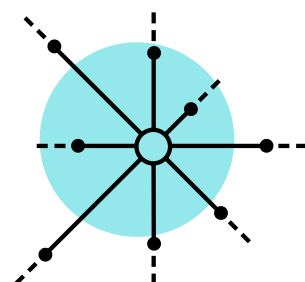




Learning Design Principles
Learn Anywhere

Digital & Virtual Learning



Summary

What are Pearson's Learning Design Principles?



Our Learning Foundations describe the optimal conditions for learning and reflect the learner experience we hope our products will create. We do this by incorporating our Learning Design Principles.

Each of our Learning Design Principles goes into detail about a key principle, supporting product design and marketing by describing:

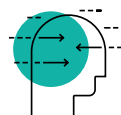
- the research that informs the principle
- why it matters in learning
- how we can apply it in practice

Our portfolio of Learning Design Principles will continue to grow over time.



Welcoming Experience

- Motivation & Mindset
- Social & Collaborative Learning



Minds in Mind

- Developing Understanding
- Attention & Cognitive Load
- Active Learning, Memory & Practice
- Desirable Difficulty & Scaffolding
- Feedback for Learning



Learning Behavior

- Self-Regulated Learning & Metacognition



Purposeful Design

- Objective Design
- Assessment & Evidence-Centered Design
- Personalized Learning & Adaptive Systems
- Authentic Learning



Learn Anywhere

- English Performance Standards
- Digital & Virtual Learning

Digital & Virtual Learning

Technology can be a powerful delivery method for high quality learning. Each tool has a unique set of affordances that can be leveraged to contribute to the creation of a well-designed learning experience.

How do we thoughtfully align learning goals and how digital or virtual tools might help learners achieve those goals?

Digital learning is any learning facilitated by technology. Each technological tool has specific advantages that can contribute to a well-designed learning experience.

The SAMR (substitution, augmentation, modification, redefinition) model helps us think about how much a use of technology adds to a learning experience, as opposed to just replicating the analog experience.

EXAMPLE

TRANSFORMATION	R	Redefinition Digital technology enables an entirely new experience	Students work on an interactive simulation to build a nuclear reactor
	M	Modification Digital technology is used to redesign an existing experience	Instead of studying a static diagram of a physics concept, students watch a video and predict what happens next
	A	Augmentation Digital technology substitutes for analog technology, but with a functional improvement	A diagram on a digital computer displays labels when students click its various parts
	S	Substitution Digital technology substitutes directly for analog technology, with no functional improvement	Displaying a diagram on a digital projector instead of an overhead projector
ENHANCEMENT			

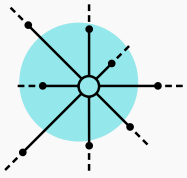
Why it matters

- Integrating digital tools in the classroom can provide new ways to learn, foster more autonomous learning, facilitate access to information, and promote collaborative efforts among students
 - Well designed digital and virtual learning can be more flexible, cost-effective, targeted and personalized, accessible, and inclusive of varying learner types
 - Technology can remove time and location constraints on learning
 - When well-designed, digital learning experiences can have a positive impact on learning gains and other important outcomes such as motivation, intellectual openness, work ethic, conscientiousness, and positive core self-evaluation
 - Learning that interacts with the learner, allowing them to define the parameters of the experience and track progress, enables successful goal-directed behavior
- learners perceive content as relevant to the real-world because immersive environments allow authentic practice
 - learners experience intellectual openness because they can observe, interact with, and build trust with peers
 - learners build a more robust understanding of the concept because they engage multiple sensory modalities

Impact

When we successfully incorporate this principle into learning experiences, we can have an impact on these learner outcomes:

- learners can more easily access learning materials on the go
- learners are motivated to continue learning because digital technologies feel engaging, game-like, and fun



The big ideas

1

Delivering information as **audio** can support learning by freeing up learners' working memory.

I can listen to my material on any device, on the go.

2

Videos can support learning as long as they are closely aligned with objectives.

Videos let me see and hear my learning experiences.

3

Ebooks can support learning by using interactivity and multimedia to encourage active learning.

While I read on my digital device, I can interact with content to look up info and take notes.

4

Games and virtual worlds can support learners and learning in many ways, especially when combined with traditional instruction.

I get to learn via a playful medium of games that have clear goals, feedback, and simulations of problems to solve.

5

Simulations can support learning by providing authentic experiences of tasks and environments that learners could not experience otherwise.

I get to engage with an environment rooted in my physical reality, but include parameters of a different world.

6

Mobile devices can support learning by empowering learners to learn when and where they want.

I can access many types of services on the go from my mobile device.

7

Immersive virtual environments can support learning in many of the same ways as games, but with more complete suspension of disbelief.

I get to experience a new environment, be fully present in it, and interact with it in a variety of ways that removes me from physical reality.

Audio

Delivering information as audio can support learning by freeing up learners' working memory.

What it feels like for learners

I can listen to my material on any device, on the go.

Audio-based learning tools include podcasts and audiobooks, usually focused on specific topics supplemental to learning goals.

Learners process audio information through their auditory-verbal "channel", leaving the visual-pictorial channel free or able to attend to complementary information. Each channel can only take in and process so much information, so leaving one of them free can be beneficial for a learner's working memory capacity.

Audio can support learning by offering:

- **ubiquitous and easy access:** many portable devices support audio, so learning is not constrained to one location
- **low cognitive load:** audio can supplement and reinforce traditional reading; and free up working memory, so learners can engage in deeper thinking and cognitive processing of the material
- **cost effectiveness:** audio learning tools are not very expensive to create
- **static content:** learners can listen to learning audio as often as needed

This means audio technology may be best suited for:

- supplemental instruction to let learners review material they missed or did not understand in class

- language learning, since most of the tasks needed for success focus on auditory discrimination elements

Evidence of effectiveness

- Including podcasts in education materials improves learners' perceptions of their learning gains (Taylor, 2009; Anzai, 2007)
- Podcasts can foster a sense of community among learners and encourage dialogue in remote online courses (Nie, Armellini, Harrington, Barklamb, & Randall, 2010; Lee, McLoughlin & Tynan 2011)
- Learning from a screen can reduce learning and comprehension. Ebooks activate both the auditory-verbal and visual-pictorial channels, while audiobooks and podcasts, which activate only one channel at once, have seen positive results

Drawbacks and considerations

- Most research about podcasts in learning has only been with learners in high schools and beyond
- Learners are less likely to treat a podcast as a "real" reading assignment; they may listen passively as they engage in other tasks, which could dilute its effectiveness
- It can be hard to know where one is in an audiobook or to go to a location easily, compared to a physical book
- Since audiobooks have no visual breaks at the end of pages, it is harder to stay focused for a long amount of time



See this Learning Design Principle:
Attention & Cognitive Load

What it means for designing learning experiences

- Include prompts that engage the learner and help focus attention, such as “Let’s recap the key points...”
- Use audio as a supplemental tool and clearly convey how it can help learners comprehend and review other material
- Consider using audio controls (rewind, fast-forward, pause) to increase user control
- Make sure content is available on a versatile platform to allow for ubiquitous access

Video

Videos can support learning as long as they are closely aligned with objectives.

What it feels like for learners

Videos let me see and hear my learning experiences.

Videos combine elements such as music, graphics, and narration, to communicate information in an engaging, representative, and meaningful way.

In learning, videos are usually:

- recordings of lessons
- live video calls
- recordings of supplemental events

One of the main ways humans learn is through the visual-pictorial “channel”. To support learning, videos should be visually appealing and intuitive to understand, but remain focused on the concepts to be learned, rather than trying too much to entertain.

Learning is more effective if corresponding visual and verbal representations are in working memory at the same time, as when watching a video.



Video can support learning by offering:

- **representational fidelity:** dynamic visualizations can present content that is difficult to verbalize, making it easier for learners to see step by step details of a

procedure, observe others' perspectives, see an event from the start to finish, or view events and scenarios that they could not experience in life

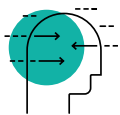
- **ubiquitous and easy access:** almost any device with a screen supports video, so learning is not constrained to one location
- **social connection:** discussing a video in the comments or discussing topics over videoconference can connect learners. Learning communities can form quickly and collaboratively
- **attentional & motivational engagement:** videos can capture attention and focus, increasing interest in the topic, and energizing action

Evidence of effectiveness

- Videos can enhance learners' skills (Kay, 2012). However, it is important to decide whether the learning outcome needs a video component, and to avoid overloading learners with extraneous information (Brame, 2016)
- Making videos allows learners to accommodate their prior understanding and change it to fit new information, solidifying comprehension and surface gaps in knowledge (Nikitina, 2009)
- Videos can work as feedback and discussion tools as long as there is a psychologically safe culture in the group
- Video can help learners transfer existing knowledge into a new context by allowing them to observe demonstrations, receive repeated feedback, and make iterations (Reed, Andrews & Phillips, 2013)

Drawbacks and considerations

- Videos cannot produce visual mental representations — which are optimal for information integration — if the content does not match the learning goals, or if the videos give the learner extraneous information
- Videos are easy to consume passively, so educators need to be trained to use videos not just to substitute other forms of learning, but to enhance it in some way
- Videos can give learners a mistaken belief that they have understood a topic



See these Learning Design Principles:
Developing Understanding
Attention & Cognitive Load

What it means for designing learning experiences

- Use videos that are clearly aligned with the topic at hand, and ideally with learning objectives, not ones that are tangential or “just for fun”
- Use videos to provide examples of learning concepts in real-world contexts
- Embed videos in active learning experiences by using guiding questions, interactive elements, or associated homework assignments
- Keep cognitive load low by:
 - using signaling to highlight information
 - weeding out unnecessary stimulations
 - using conversational language
 - segmenting and packaging videos into short clips

Digital reading (ebooks)

Ebooks can support learning by using interactivity and multimedia to encourage active learning.

What it feels like for learners

While I read on my digital device, I can interact with content to look up info and take notes.

Ebooks are digital texts that can include interactive and multimedia features, such as embedded video, interactive tables of contents, and the option to have the reading device read the text aloud.

Ebooks can support learning by offering:

- **ubiquitous and easy access:** ebook platforms can contain thousands of texts and be accessed on most mobile devices, so learning is not constrained to one location
- **cost effective:** ebooks are not very expensive to produce or obtain. They can also update periodically, rather than requiring learners to buy updated textbooks each year
- **interactivity:** interactive ebook features can help make sure learners actively process the information. Interactivity can also create a better experience for learners who need more motivation to engage with reading

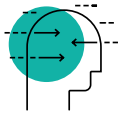
Evidence of effectiveness

- Ebooks that include notetaking and sharing options can promote slower, more intentional reading that results in deeper thinking and better comprehension (Lim, Whitehead, & Choi, 2021)
- Ebooks that allow highlighting, writing keywords, notetaking, writing summaries, and reflection can help to improve comprehension (Dunlosky, Rawson, Marsh, Nathan & Willingham, 2013)
- Ebooks that allow learners to share notes, annotate texts together, and share statistics on reading can create feelings of adaptive social comparison (Coiro, 2021)

Drawbacks and considerations

- Learners who have not used ebooks prefer print texts. Adolescent readers report enjoying the tactile feel of books and the sense of progression as they make their way through a book. 75% of college students would opt for a print textbook over a digital one. However, once learners use well-designed ebooks, they prefer them over print
- When learners are not trained to use ebooks effectively, and the visuals are over-stimulating, or there are time constraints on learning, digital media encourages quick and shallow processing

- When ebooks are designed without their potential added value in mind, they can become digital copies of print texts, and lose the support they could potentially provide
- Learners who use digital texts report spending more time reading but show poorer outcomes on tasks, suggesting that this form of media might undermine efficient, focused processing



**See this Learning
Design Principle:**

Active Learning, Memory
& Practice



**See this Learning
Design Principle:**

Self-Regulated Learning
& Metacognition

What it means for designing learning experiences

- Train learners to use digital texts and their features
- Leverage the interactivity of e-books to encourage collaboration
- For accessibility, when designing the text itself, make features operable for both laptop and e-reading formats
- Keep animations and visuals congruent to the content
- In e-books, include highlighting, outlines, and graphic organizers such as maps

Games & virtual worlds

Games and virtual worlds can support learners and learning in many ways, especially when combined with traditional instruction.

What it feels like for learners

I get to learn via a playful medium of games that have clear goals, feedback, and simulations of problems to solve.

In games, learners can engage in a playful form of learning that has clear goals and feedback, and simulates a problem to solve.

Learners who used well-designed, serious games have showed higher cognitive gains and reported more positive attitudes towards learning than those who received traditional instruction.

Games can support learning by offering:

- **active learning:** games require the learner to take an active role in the environment, which can foster active learning if well-designed
- **cognitive development support:** using intermittent reinforcement, rewards, characters, and narratives, games allow children to play with new concepts, symbols, and schemas
- **motivation:** games fulfil basic psychological needs such as autonomy and competence, which motivates

learning. Their incentive structures help foster high situational interest, which also increases motivation

- **social connection:** gaming environments include chats, message boards, or blogs where players can discuss strategies and share experiences. This type of 'collective cognitive responsibility' is associated with better learning outcomes
- **global connection:** the opportunity to interact with users from around the world can promote cultural sensitivity and awareness of global issues. Translation technology available in some games can overcome language barriers, increasing communication options
- **competition and collaboration:** using leaderboards and peer ratings, games can foster a healthy sense of social comparison, which can spur motivation and performance in some individuals
- **personalization:** games can collect data about the learner as they progress and give them individualized feedback. Adapting and scaffolding to the learner lets them feel in control of their learning, have confidence in mastery over the material, and foster autonomy
- **identity exploration:** learners can choose avatars that are unlike themselves to communicate with other collaborators. These extended options for self-expression can foster creative activities and interaction
- **authentic learning:** games and virtual worlds provide an almost endless variety of virtual contexts that give learners a

sense of “being there,” and the ability to apply learning in a plausible, unique context

- **innovative assessment:** games can make sure learners always have the information they need to perform the task at hand, continually updating them so that the various phases of assessing their understanding are independent, not interdependent

Evidence of effectiveness

- Digital games have been found to significantly enhance student learning relative to non-game conditions ($g = 0.33$)
- Augmented game designs were associated with a 0.34 standard deviation improvement in learning relative to standard games (Clark, Tanner-Smith & Killingsworth, 2016)
- Analyses show that game-based learning can be especially effective in combination with traditional instruction; when learners have some control over how and when to use them; when they include intelligent, explanatory feedback; when learners have training and support to use them; when visual/narrative elements are kept simple and in line with learning goals; and when they include task-oriented active learning components

Drawbacks and considerations

- Game-based learning needs to strike a balance between covering the subject matter and the learner’s desire to prioritize game play
- There are not many randomized controlled trials of game-based learning for the K–12 age group



See these Learning Design Principles:
Social & Collaborative Learning
Motivation & Mindset



See this Learning Design Principle:
Personalized Learning & Adaptive Systems

What it means for designing learning experiences

- Game conditions involving multiple gameplay sessions provide significantly better effects
- Single-player games without competition and collaborative team competition games outperform other forms of game
- Games with intelligent agents or that adapt scaffolding to past performance are better than those just indicate success/failure with points
- Simple, schematic, symbolic graphics are more effective
- Simple narratives with shallow content that only involve setting, scenery etc., are better than those with complicated narratives that change over the course of the game
- Rudimentary games that involve adding points and/or badges can be just as effective as those with scaffolding prompts, hotspots, and so on

Simulations

Simulations can support learning by providing authentic experiences of tasks and environments that learners could not experience otherwise.

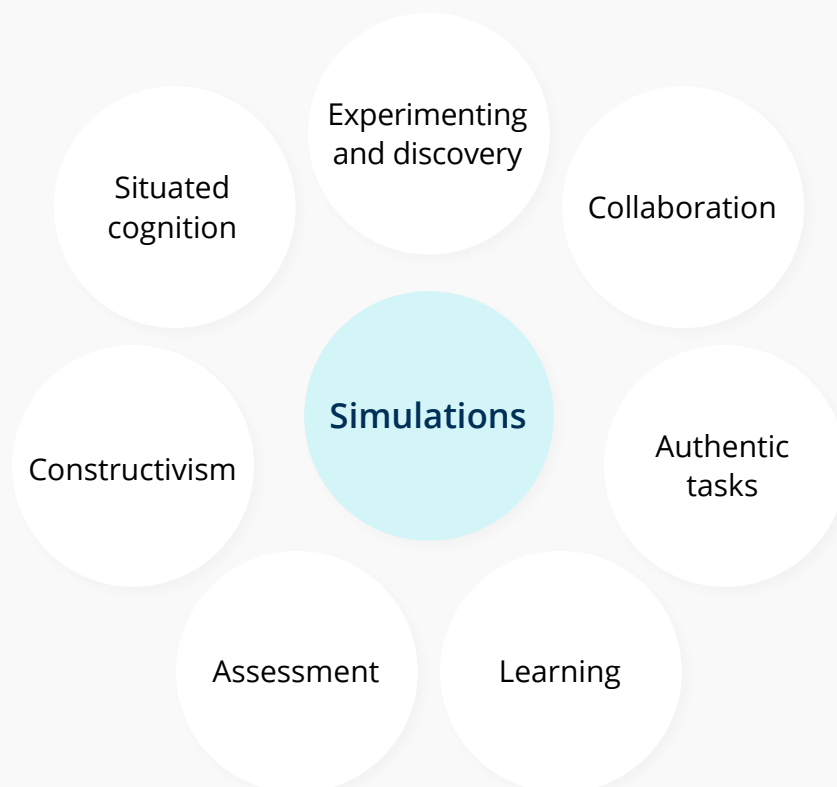
What it feels like for learners

I get to engage with an environment rooted in my physical reality, but include parameters of a different world.

Simulations can allow medical students to practice operative techniques, trainee pilots to learn to fly a plane, and other educational purposes. Simulations are thought to be effective because they allow the learner to learn by doing.

Simulations can support learning by offering:

- **active learning:** simulations require learners to think more creatively, use more collaborative problem-solving skills, and engage in more hands-on work than traditional methods
- **authentic learning:** learners can use simulations to explore phenomena they could not normally observe or manipulate. Since the environment of the simulation is simplified, teachers can focus learners' attention on the objectives
- **personalization:** simulation software can automate individual learner feedback, provide appropriate scaffolding, and generate progress and proficiency reports for teachers and learners. In procedural skills training, receiving immediate individual feedback from multiple sources allows for iterative processing



- **authentic stealth assessment:** simulations serve up challenges based on what the learner is doing, using all actions as assessments rather than ending with a final test
- **attentional and motivational engagement:** simulations allow learners to suspect disbelief and become absorbed in tasks as if they were doing them for real. When students are absorbed in this way, they engage, use higher-order thinking skills, and put more effort into studying

- If a simulation does not allow learners to interact in significant and meaningful ways, it is difficult to make inferences about what learners know and can do



See these Learning Design Principles:
Assessment &
Evidence-Centered Design
Authentic Learning

Evidence of effectiveness

- Business school students exposed to business simulator games are more engaged; use more creativity, critical thinking, collaboration, and problem-solving; and perform better on the simulated task outside the simulation (Buil, Catalan & Martinez, 2019; Huang, Silitonga & Wu, 2022)
- Simulations were found to be most effective in conjunction with traditional instruction; when instructional support is provided; and when they challenge preconceptions (Smetana & Bell, 2012)

Drawbacks and considerations

- Simulations can be costly, both financially (for the equipment and infrastructure) and in terms of time to set up the program and integrate it into the lesson plan
- Use of simulations in learning is constrained by space and materials, time, teachers' knowledge, class sizes, learner and teacher mobility, instructional freedom, and internet connectivity
- Simulations need to include as many relevant aspects of the environment as possible to be authentic, but if they contain too many details that are not germane to the problem at hand, cognitive load can introduce construct-irrelevant variance

What it means for designing learning experiences

- Match games and simulations to learning goals
- Build in guidance, scaffolding, and structure
- Incorporate instructional examples that state the principles and concepts being illustrated in the simulation, to set the context for the learner and provide a reference for reflection and explanation
- Keep graphics simple
- Allow the user to guide/manage complexity. Moving from simple to complex goals and simulations as learners progress to advanced stages of training can be useful as well

Mobile devices

Mobile devices can support learning by empowering learners to learn when and where they want.

What it feels like for learners

I can access many types of services on the go from my mobile device.

With the help of a mobile communication device, learning can take place anywhere. Learning on mobile devices is commonly delivered via mobile apps.

Mobile devices can support learning by offering:

- **seamless and authentic learning:** learners are empowered and supported to learn wherever and whenever they are stimulated to learn, switching between devices, interweaving formal and informal learning, and always remaining connected to peers and teachers
- **ubiquitous and easy access:** learning can occur on almost any mobile and even switch between devices
- **attentional & motivational engagement:** mobile learning often uses game-like elements to make interactions more active and context specific. These elements have been shown to increase engagement, motivation, and creative problem-solving, encouraging imagination and helping learners feel a sense of mastery of the subject

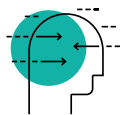
- **multimodal learning:** mobile devices offer a dynamic range of touch, voice, visuals, and audio. Cameras, microphones, accelerometers, and GPS can enable new experiences and interactions as well as lessen the learner's workload
- **informal learning:** most studies show that learners prefer on-demand, informal learning, such as listening to a lecture as they drive, or looking something up at the moment it occurs to them

Evidence of effectiveness

- 69.95% of learners using a mobile device performed significantly better in dependent variables related to cognitive achievement than those not using mobile devices. The effect was larger when the devices were used in informal learning settings (such as museums and zoos) than when in formal settings such as classrooms (Sung, Chang & Lui 2016)
- Students perceive mobile learning material in a very positive light thanks to its game-like elements and flexibility of use (El-Sofany & Hagggar, 2020; Evans, 2008)
- Mobile learning has a positive impact on how learners interact with their peers, including increased cooperation, feelings of shared responsibility for learning, and asking for and offering help to others (Lan, Sung, & Chang, 2007)

Drawbacks and considerations

- Compared to reading on a full-size monitor, reading on a mobile device is slower and often decreases comprehension
- Many learners multitask when using their mobile devices for learning. Research shows that multi-tasking overloads the cognitive system and does not allow the learner to fully pay attention to one task, with detrimental effects on learning
- Mobile devices can only keep learners connected with a secure, reliable network connection. Public networks have created new potential targets for third parties to obtain sensitive data
- Different devices have different limitations. For example, older phones have limited storage space; some newer devices have short battery lives; and it can be challenging to input information on small devices that lack a keyboard and mouse



See this Learning Design Principle:
Attention & Cognitive Load

What it means for designing learning experiences

- Start with the learning objectives. Instead of thinking of mobile device use as the outcome, focus on the way devices can enable learning experiences that are not otherwise possible
- Make sure the device being mobile is necessary and meaningful for the learning task
- Leverage the capability of devices to foster social connection, such as through groups or message boards
- Ensure privacy and security for learners by using licensed software, blocking unnecessary pop-ups/ads, and following data use guidelines

Immersive learning

Immersive virtual environments can support learning in many of the same ways as games, but with more complete suspension of disbelief.

What it feels like for learners

I get to experience a new environment, be fully present in it, and interact with it in a variety of ways that removes me from physical reality.

When a learner is fully immersed in a virtual environment, they can suspend disbelief and fully inhabit the new context. This empowers learners with a greater sense of agency, supporting intentional exploration and actions.

Immersive media can be:

- **augmented reality:** imagery overlaid onto the real world (e.g., Snapchat and Instagram filters)
- **mixed reality:** similar to augmented reality, but users can interact with imagery in real time
- **virtual reality:** uses sensory output like sounds and images to create an imaginary world or one that mirrors a real environment, often using a specialized headset
- **cross-reality:** any system that combines the hardware and software of the three above

Immersion can support learning by offering:

- **empathy building:** virtual reality can allow learners to take on another person's role, such as being in a wheelchair or being a different age or race
- **embodied cognition:** feeling fully present in the virtual environment helps learners to effectively interact and construct knowledge
- **personalization:** immersive learning environments allow learners to choose their own path. Personalized goals can improve motivation and engagement with the content
- **identity exploration:** immersive platforms allow learners to create identities separate from their real-world appearance and experiences and to express themselves in the way they want to be perceived
- **active learning:** virtual environments require learners to take an active role in the environment, which can foster active learning if well-designed

Many of the ways games and virtual worlds support learning also apply to immersive environments.

Evidence of effectiveness

- Immersive experiences are associated with longer memory retention, improved physical task performance, increased collaboration among students, and increased student motivation (Henderson and Feiner, 2009)
- Virtual and augmented reality programs are used for various forms of medical training, and analyses show that they can have positive effects on skill acquisition and performance improvement (Chen et al., 2020; Guedes et al., 2019; Haque & Srinivasan, 2006; Jin et al., 2020; Kyaw et al., 2019; Portelli et al., 2020; Woon et al., 2021; Zhao, Xu, et al., 2020)
- For children with disabilities, especially those with a deficiency in social skills, augmented, virtual and mixed reality interventions were useful in 65% of the results on domains such as emotion recognition, relationship skills, social awareness, cooperation, and executive functioning (Mosher & Carreon, 2021)

Drawbacks and considerations

- Implementing immersive learning technologies at scale is expensive. Advanced virtual spaces using CAVE technology or motion platforms, although useful and effective in promoting learning, are not accessible to the general population
- Most research that shows positive effects of immersive learning has been done with higher end technologies, leaving it unclear whether proposed low-end versions are as effective
- Reviews of immersive media interventions since 2013 found that few studies explicitly used a predetermined learning theory to advise the characteristics or methods



See this Learning Design Principle:
Attention & Cognitive Load



See this Learning Design Principle:
Social & Collaborative Learning



See these Learning Design Principles:
Authentic Learning
Personalized Learning
& Adaptive Systems

What it means for designing learning experiences

- Focus on the tools and software already available to many learners: smartphones and tablets
- Consider designing apps for all versions of devices
- Provide meaningful tutorials and online support for navigating the software
- Consider learners' needs and safety
- Consider whether immersive worlds are the correct medium for the learning goals

Making it inclusive

We aim to design a great learning experience *for everyone*. These considerations will help you get closer to designing a truly inclusive experience.

Accessibility

Accommodations provided to allow learners with specific needs to participate in a learning experience

- Work to balance over and under-stimulation. Match the features of digital tools to the learning goals, while implementing supports whenever possible to reduce extraneous working memory and cognitive load constraints to support relevant learning processes
- Include opportunities for learners to reflect upon information to determine if they understand or need to revisit certain content. Examples include feedback, summarization exercises, etc.

Availability and access

Barriers — often external and systemic — that affect whether the tools and resources needed for learning are available to learners

- Consider that learners have varied levels of access to technology. Focus on tools and software that are available to most users, such as smartphones and tablets. A variety of mediums and app/device versions to access digital learning tools should also be provided
- Provide meaningful tutorials and online support to support varied levels of familiarity and background knowledge with certain digital tools and their features

Identity

The combination of dimensions that define who learners are to themselves and others

- Make sure content and customization features (when relevant) are inclusive of all learners (i.e., inclusive pronouns, race and body type customization). Engage with diverse communities and subject-matter experts to review and create content

Culture

Shared patterns of behaviors and interactions, cognitive constructs, and affective understanding that learners acquire through socialization

- Include projects and experiences where possible to provide opportunities for learners to engage in different world experiences, such as participating and connecting with people from different cultures and lived experiences. This can foster inclusion and alternative points of view

In partnership with  **CAST**

CAST is a nonprofit education research and development organization that created the Universal Design for Learning framework and UDL Guidelines, now used the world over to make learning more inclusive.

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Mamatha Chary earned her Ph.D. in developmental psychology from the University of Massachusetts–Amherst. She currently works as a learning and curriculum designer at BEGiN, an early learning company, where she runs formative and summative research on their products and works with cross-functional stakeholders to design age-appropriate and impactful content. She also freelances as a data analyst and research writer for Pearson and the Charles River Media Foundation, and has worked with kids' media organizations Sesame Workshop and OKPlay.



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Katherine McEldoon is a research-to-practice connector. After earning her Ph.D. in cognitive and learning sciences at Vanderbilt University and a post at Arizona State University's Learning Sciences Institute, she has worked in academia, government, and industry to ensure the best scientific insights support student learning, no matter the context. Katherine has most recently worked as Lead Learning Scientist on Pearson's Efficacy & Learning team, bringing evidence-based insights to Pearson's world of learners.



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Tanya Churaman is a researcher and expert programmer that turns data challenges into practical solutions. She earned a bachelor's and master's in Computer Science at Georgia Tech. Her experiences and skillsets span across ML, HCI, XR, Psychology, and Education, which has played a significant role in researching how technology can revolutionize how people learn and work. Tanya has worked as a Quantitative Research Scientist and Psychometric Data Manager to develop evidence-based metrics on learner outcomes and test design at Pearson.

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