Final Project: Construct a Learning Environment
Mental Health Awareness Project: MindSpace

Samantha, Susan, Stella

EDUC 6139 Design of Learning Environments

Professor. Duvall

December 14, 2025

Design overview

Background

In many middle schools today, students and educators face rising emotional, social, and academic pressures, yet access to timely and specialized mental health support remains limited. Schools often lack sufficient counseling resources, while teachers may not have adequate training to respond to students' psychological needs. This gap has created an urgent demand for safe, accessible, and personalized mental health services within the school ecosystem.

MindSpace was created to address this need. As a secure and reliable online platform, MindSpace provides comprehensive mental health support for students, educators, and school staff. By integrating professional guidance, curated wellness resources, and community-oriented tools, MindSpace aims to embed mental-health awareness into daily school life and promote long-term well-being across the campus community.

Goals

MindSpace is designed with the following core goals:

1. Provide accessible and personalized mental health support.
   Deliver confidential counseling, self-guided wellness tools, and adaptive resources that respond to each user's unique emotional, social, and academic needs.

2. Promote equity in mental health services.
   Ensure that students and educators from diverse backgrounds, including those traditionally underserved, have equal access to high-quality psychological support.

3. Integrate AI responsibly into school-based mental health.
   Use artificial intelligence to enhance early detection, personalized recommendations, and user engagement while ensuring safety, transparency, and ethical oversight.

4. Strengthen SEL (Social-Emotional Learning) within school environments.
   Support the development of empathy, communication, emotional regulation, and resilience through structured SEL activities and community engagement strategies.

5. Foster a culture of care, understanding, and resilience.
   Build school communities where mental health is openly supported, reducing stigma and empowering students and staff to thrive academically and emotionally.

Target Learners

1. Middle School Students

- Students from diverse cultural, linguistic, and socioeconomic backgrounds.

- Learners experiencing varying degrees of emotional or academic stress.

- Students who need confidential support, self-paced learning tools, or crisis-prevention resources.

- Youth seeking a safe, judgment-free space to explore mental health topics and build SEL competencies.

2. Educators & School Staff

- Teachers seeking guidance to better support students experiencing emotional distress.
- Counselors, social workers, and administrators who require professional tools, data-informed insights, and ongoing mental-health training.
- Staff members managing their own wellbeing and work-related stress, who benefit from accessible wellness resources and supportive programs.

Learning needs and problemsTheoretical foundations
Problem Statment
Across many middle schools, students and educators face a widening gap between their mental health needs and the support systems available to them. Students frequently experience stress, anxiety, social-emotional challenges, and academic pressure, yet schools—especially those with limited resources—often cannot provide continuous, specialized guidance. Teachers and staff, meanwhile, are expected to respond to students' emotional needs without having access to flexible, relevant, and practice-oriented professional development.

Systemic barriers such as unequal resource allocation, limited counseling staff, high student-to-counselor ratios, and insufficient time for professional training further exacerbate these challenges. As a result, both students and educators often find themselves without the tools, knowledge, or sustained support necessary to foster emotional resilience and create a healthy learning environment.

Learning Needs
1. Students' Learning Needs

Middle school students require opportunities to:

- Build emotional awareness and regulation skills
  Understand and identify emotions, develop coping strategies, and manage stress or anxiety in healthy ways.
- Access safe, confidential guidance
  Seek support without stigma and receive tailored recommendations based on their experiences and developmental stage.
- Develop self-efficacy and help-seeking behaviors
  Learn when and how to ask for support, recognize signs of distress, and engage in healthy routines.

2. Educators' & Staff Learning Needs

Teachers and school staff require learning pathways that help them:

- Identify early signs of student distress
  Recognize emotional, behavioral, or academic indicators that may signal deeper issues.

- Apply practical, flexible SEL strategies in classrooms
  Implement activities or routines that strengthen students' social-emotional resilience within daily teaching.

- Strengthen their own emotional resilience
  Manage stress, burnout, and workload through accessible wellness resources.

Theoretical foundations

Universal Design for Learning (UDL):

Erin Stapleton-Corcoran defined Universal Design for Learning (UDL) as an instructional framework designed to create environments that accommodate the needs of diverse learners, providing flexible access, participation, and expression for students.

We aim for our designs to uphold the three core principles of UDL:

1. Multiple Means of Engagement: Focusing on "learning motivation/affective networks," we provide diverse options to spark interest, sustain engagement, and support self-regulation.
2. Multiple Means of Representation: Corresponding to the "recognition network," content is delivered through diverse formats (visual, auditory, text, images, etc.) to enhance information accessibility.
3. Multiple Means of Action & Expression: Corresponding to the "strategy network," students are provided multiple avenues to express understanding (writing, oral, drawing, video, etc.) and implement thinking processes.

Cognitive Theory of Multimedia Learning (CTML):

Castro-Alonso et al. reviewed five strategies for optimizing instructional materials based on **Cognitive Load Theory (CLT)** and **Cognitive Theory of Multimedia Learning (CTML)**, proposing that these strategies can be implemented not only by instructors (instructor-managed) but also by learners themselves (learner-managed):

1. **Multimedia Principle**
   - Teachers: Supplement text with images or visualizations.
   - Students: Draw images or concept maps to help construct mental models.
2. **Split-Attention Effect / Spatial Contiguity**
   - Teachers: Integrate text with images.
   - Students: Connect text and images through movement, tracing, or visualization.
3. **Redundancy Effect / Coherence**
   - Teacher: Remove unnecessary or repetitive information.
   - Student: Generate concise textual or visual summaries.
4. **Signaling Principle**
   - Teacher: Highlight key information using arrows, color, focus, etc.
   - Student: Emphasize important points by underlining, annotating, or highlighting.
5. **Transient Information Effect / Segmenting**
   - Teacher: Segment animations or videos.
   - Student: Control learning pace autonomously through pausing, rewinding, and adjusting speed.

Sociocultural Theory：
Sociocultural theory explains that learning happens *with* people, not alone. Developed by Lev Vygotsky, it emphasizes that culture, communication, and social interaction shape how we think and grow. We learn best through shared activities with those who have more knowledge and experience.

Key ideas include:

- **Learning is social.** Growth comes from conversations, group work, modeling, and collaboration—not solitary study.
- **Culture shapes learning.** Our ways of speaking, acting, and thinking come from the cultural worlds we inhabit.
- **Language is a tool for thinking.** We use it to plan, reason, problem-solve, and reflect. Tools—both physical and symbolic—guide our thinking.
- **Support leads to independence.** With guidance, learners gradually gain the ability to do tasks on their own.
- **Learners are not blank slates.** Everyone brings prior ideas and experiences; new learning builds on what is already there.

Detailed design
MindSpace LINK:
https://www.canva.com/design/DAG680wsiNM/in_pLzaEPz8a3QUlHXv9RA/edit?utm_content=DAG680wsiNM&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton

Interactive Support for Students

https://mindspacestudentonly.lovable.app/

This website serves as an interactive psychological support space for middle school students. Through visual room scenes and intuitive click-based interactions, it helps students express emotions, regulate their mental state, and establish positive self-dialogue. Users can write self-reflections in the room, listen to music to express their mood, schedule appointments with counselors, and release negative thoughts. These interactive designs aim to create a safe, intuitive, and symbolically meaningful learning space for psychological support.

Universal Design for Learning (UDL) is a learner-centered framework that emphasizes supporting learners' participation, understanding, and expression through *multiple entry points*, rather than requiring learners to conform to fixed patterns. This framework encompasses three core principles:

1. Multiple Engagement Methods

- The environment employs an edutainment-style room metaphor and interactions to soften the perceived stiffness of psychological support content, encouraging students to *actively explore* (e.g., clicking to meditate on the bed, writing journals, sketching the weather outside the window).

- Music recording and sharing features enable students to express themselves through *emotion-music connections rather* than relying solely on text. These elements help students engage with the experience in ways that interest them, moving beyond passive text reading.

2. Diverse Representation

- Visuals, symbolic scenes, and concise text support understanding of psychological concepts through visual and interactive means, complementing textual information.
- Enhances information delivery through animations, click feedback, and visual elements (e.g., weather sketching, music players), creating accessible entry points for students with diverse sensory preferences. This combined visual-text strategy aligns with the principle of making content accessible “in multiple forms.”

3. Diverse Action & Expression Methods

- Students can express themselves through **writing, doodling, music selection, or scheduling**, rather than being confined to a single mode of expression.
- Different interactive modules allow students to choose feedback methods aligned with their expression preferences, such as journal writing, drawing, or sound listening. This expands students' options for expression and engagement, reducing barriers that might arise from a single format.

R. E. Mayer's Multimedia Learning Theory posits that learners process information more effectively through *dual-channel visual and auditory processing*, emphasizing that cognitive load management and active processing (selecting, organizing, and integrating information) are essential for promoting understanding.

1. Dual-channel design for visual and auditory experiences

- Scene illustrations, icons, and text are presented in combination (e.g., music player image + song title, symbolic diary view) to help users understand content through both visual and reading methods simultaneously.

2. Simplification and Burden Reduction Strategy

- The overall interface adopts a clean line art style, ensuring cognitive focus remains undistracted by excessive visual details, thereby reducing cognitive load (in accordance with Mayer's Coherence principle).

3. Encourage Active Processing

- All interactions go beyond mere “reading content” and require users to *actively engage* (writing, drawing, selecting music, scheduling time). These “generative activities” require students to select, organize, and connect information with their personal experiences. This fosters deeper cognitive and reflective connections, aligning with Mayer's emphasis on deep learning processes and supporting cognitive-affective theory.

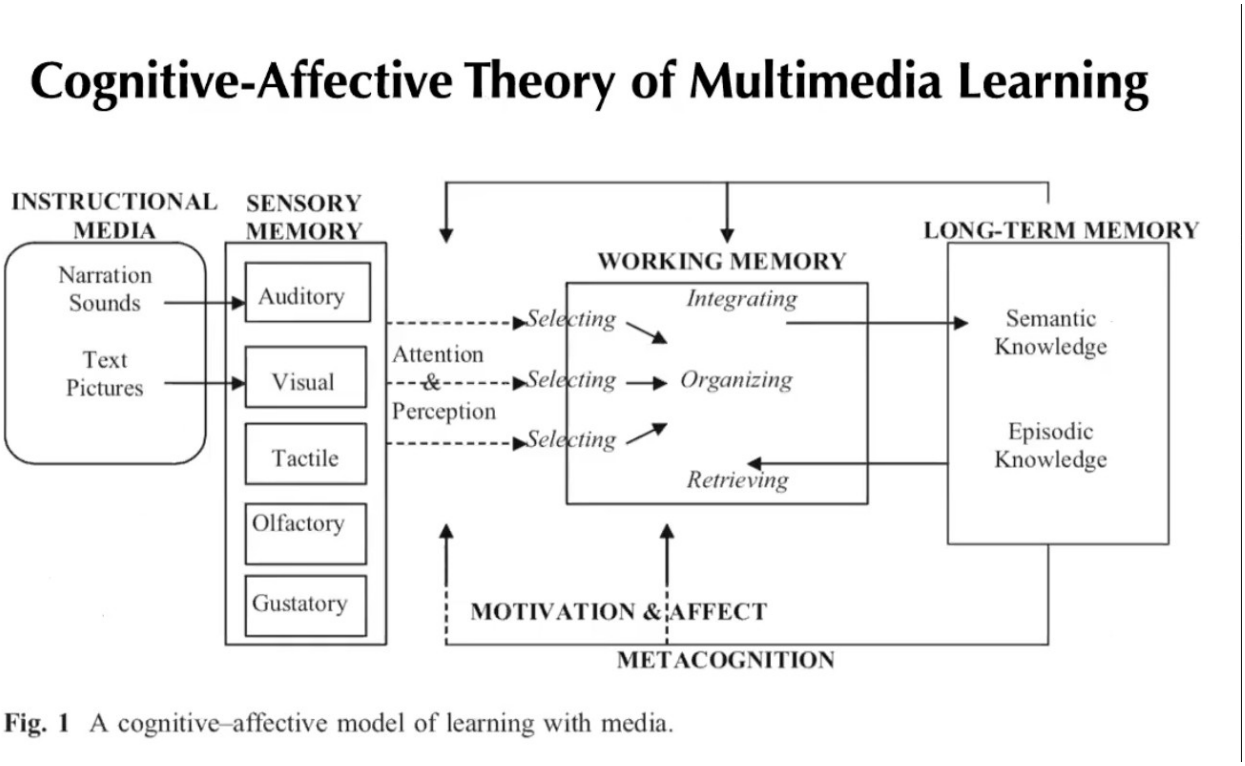


Fig. 1 A cognitive–affective model of learning with media.

On our website, the Notebook serves as a space for students to document their emotions, reflections, and mental states. We plan to integrate **AI detection of high-risk vocabulary** (such as self-harm cues, violent threats, or severe emotional distress) into this module, notifying teachers or counselors for intervention when necessary. We got our inspiration from *Artificial intelligence and the future of teaching and learning: Insights and recommendations*.

(1) Personalized & Adaptive Support

AI instantly identifies students' emotional distress, enabling teachers to promptly understand student needs and shift from passive waiting to proactive care. Teachers will only be notified when AI identifies “highly dangerous vocabulary.”Students will be informed in advance of the scope and purpose of AI monitoring.

For example:

- A student repeatedly writes “I'm exhausted and don't want to continue”
- AI flags this as moderate risk and alerts counselors → Delivering psychological support more timely and tailored to individual student circumstances.

(2) Addressing Post-Pandemic Inequities

Many students find it difficult to proactively seek help from teachers.

AI “emotional monitoring patterns” make silent students equally visible, helping to reduce disparities in mental health support resources.

(3) Teacher Augmentation

Notebook's AI features do not diagnose or draw conclusions; they only provide “risk signals,” leaving it to the teacher to decide whether to engage with the student. AI serves as an intelligence augmentation, not a substitute for the teacher's judgment.

Interactive Support for Educators and Staff

Understanding Adolescent Mental Health

The multimedia lesson reflects core principles of andragogy and adult-learning design by giving teachers flexible, self-directed access to content. Rather than being *spoon-fed* information, adult learners engage with concise videos and infographics at their own pace, allowing them to take ownership of the learning process. The design also aligns with **Chametzky**'s emphasis on fostering trust and autonomy in online learning environments for adults, ensuring that teachers feel respected as capable, self-regulated learners.

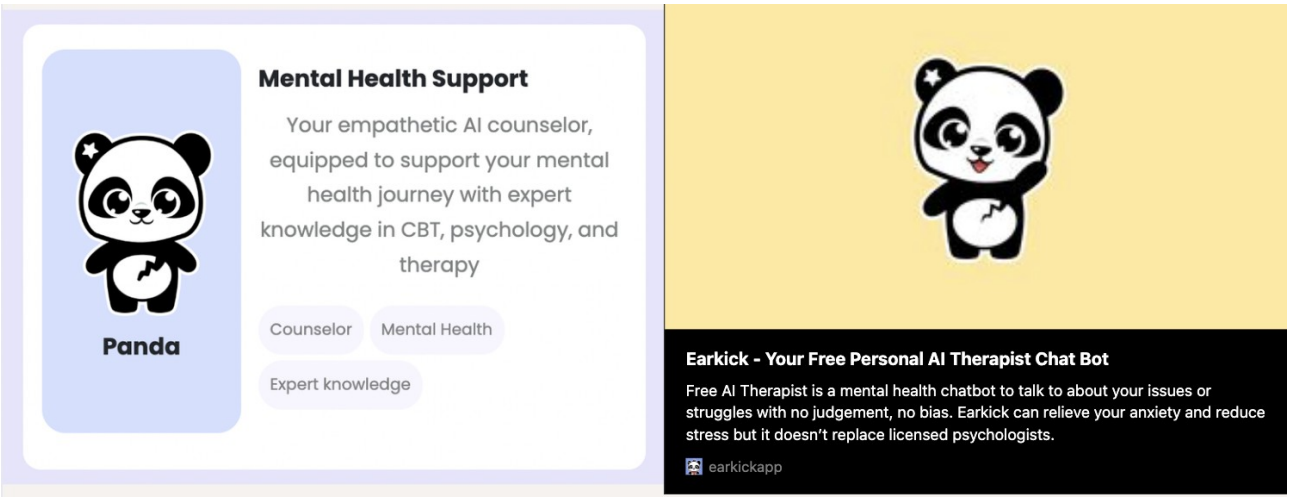
Additionally, the activity is intentionally structured to minimize unnecessary cognitive load and support teachers in processing complex concepts such as trauma. Through the use of short videos, simplified infographics, and clearly segmented modules, the lesson applies **Mayer's multimedia learning principles**—including segmenting, coherence, signaling, and the multimedia principle—to reduce extraneous processing and protect teachers' limited working memory from overload.

Crisis Response Simulation

The activity cultivates teachers' professional vision by guiding them through the core cycle of *noticing, interpreting, and responding* described in the readings. By first requiring teachers to document only observable behaviors, the activity strengthens their capacity to notice without prematurely assuming intentions or causes. The subsequent step—considering what those behaviors might signify—mirrors the interpretive work emphasized in professional-vision research, where teachers learn to reason about underlying needs or causes. Finally, interacting with the AI chatbot to explore possible de-escalation strategies enables teachers to actively practice the response phase in a low-stakes environment.

This crisis-response simulation also embodies computational scaffolding through the use of the AI chatbot as a supportive tool. The chatbot helps teachers break down a challenging, high-pressure task by providing prompts, trauma-informed interpretations, guiding questions, and potential de-escalation strategies. These supports reduce cognitive load, keep teachers within their **Zone of Proximal Development**, and incrementally build their internalized expertise in crisis-response decision-making.

Finally, the AI-mediated activity promotes critical digital literacy by requiring teachers to evaluate, question, and interpret the chatbot's suggestions rather than accept them uncritically. In doing so, teachers practice discerning the strengths and limitations of AI-generated guidance while sharpening their own professional judgment.



Building Identity-Affirming SEL Classrooms

This activity aligns with **Motivation Theory** by intentionally fostering the sense of belonging students need to experience emotional safety. By establishing identity-affirming SEL norms and inviting students to share meaningful artifacts, the activity communicates that who students are—culturally, emotionally, and personally—matters in the classroom. Motivation research demonstrates that when students feel valued and connected, their anxiety decreases, their working memory expands, and they become more willing to participate, take risks, and engage authentically in learning.

This activity also reflects **Sociocultural Theory** by positioning identity, culture, and community as central to how students learn and express emotions. From a Vygotskian perspective, learning and development are mediated through cultural tools, social interaction, and shared practices—precisely what occurs when students upload identity artifacts such as photos, music, or drawings. These artifacts function as mediating tools that help teachers access students' emotional worlds, enrich classroom dialogue, and support more culturally grounded SEL conversations.

MindSpace Design and Structure for Students, Staff, and Faculty

MindSpace is designed to provide a safe, accessible online space where middle school students, educators, and staff can access meaningful mental health resources. The platform's overarching goals are to provide personalized, equitable, and comprehensive mental health support, foster **social-emotional learning (SEL)** and community engagement, and integrate AI responsibly to tailor experiences to individual needs. While the platform addresses overall well-being, its core instructional design is guided by the **Cognitive Theory of Multimedia Learning (CTML)**, ensuring that both students and faculty engage with content in ways that optimize comprehension, retention, and application. **CTML** emphasizes that people learn more effectively when instructional materials integrate words and visuals in ways that reduce cognitive load and promote mental model construction, and MindSpace operationalizes this principle in every aspect of its platform—from AI-personalized exercises to visual dashboards and interactive SEL modules. These goals, coupled with **CTML-informed design**, allow MindSpace to bridge gaps in mental health support, foster

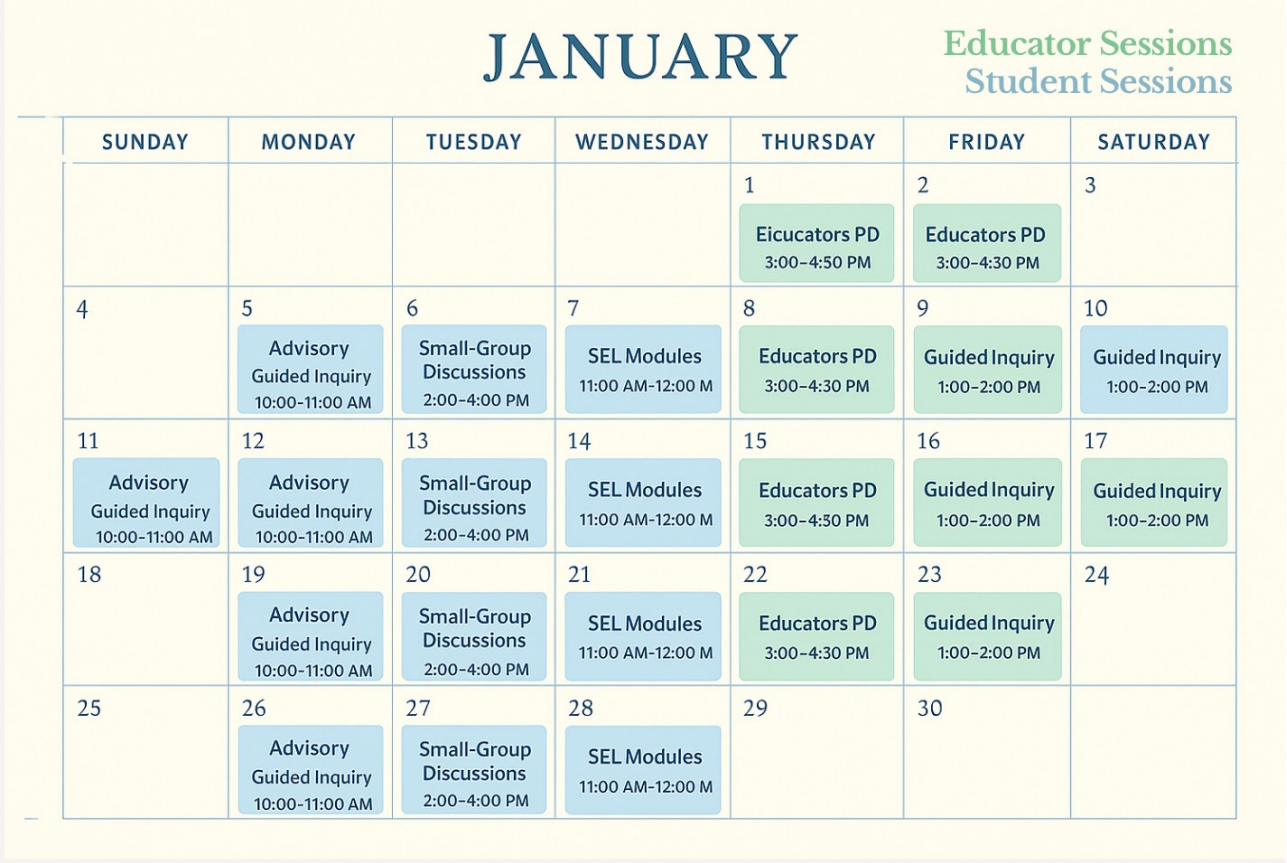
emotional resilience, and empower both students and educators to thrive in the school environment.



For students, CTML informs the scheduling and delivery of learning activities:

- ***Advisory (1 hr/week):*** Guided exercises using emotion mapping and mindfulness, supported by visualizations and interactive dashboards to help students connect text with mental models.
- ***SEL Modules (1 hr/week):*** AI-personalized exercises that integrate text, audio, and graphics in ways that adhere to **multimedia principles**, helping students process information without overload.
- ***Small-Group Discussions (2 hrs/week):*** Teacher-facilitated sessions, both online and in-person, where students collaborate and apply knowledge, consistent with CTML's emphasis

on **active learning and learner-managed strategies**.



Key CTML strategies used in MindSpace include:

Multimedia Principle: Combining text with images to enhance understanding.

Split-Attention / Spatial Contiguity: Aligning visual and textual information so students can process content more efficiently.

Redundancy / Coherence: Streamlining content to avoid unnecessary or distracting information.

Signaling: Highlighting important points through color, arrows, or emphasis cues.

Segmenting / Transient Information: Presenting content in chunks and allowing students to control the pace through pausing, rewinding, or replaying exercises.

For **faculty**, CTML principles guide professional development by offering **bichronous (asynchronous + synchronous)** learning opportunities, immersive simulations, and scaffolded scenarios for practicing de-escalation strategies and mental health support. Teachers can observe how multimedia approaches enhance student engagement, while also modeling effective learning strategies themselves.

While MindSpace centers on **CTML**, it also draws on **UDL and Sociocultural Theory** to ensure inclusivity and social engagement. UDL principles provide multiple means of engagement, representation, and expression, allowing students to interact with content in ways that match their learning preferences and strengths. For example, some students might engage more deeply with

visual dashboards, while others prefer writing reflections or participating in discussions. Sociocultural Theory emphasizes that learning is social, and MindSpace reflects this by structuring small-group discussions and advisory sessions where students build knowledge through collaboration with peers and guidance from teachers. These interactions not only help students process and apply what they are learning, but also model healthy social-emotional skills in a supportive environment. Faculty benefit from these structures as well, gaining confidence and practical strategies for implementing **SEL** and mental health support while learning from one another's experiences.

MindSpace demonstrates how **CTML** can be applied to both student learning and teacher development, creating a platform where cognitive, social, and emotional growth are intertwined. Students develop mental models, self-regulation skills, and collaboration abilities, while educators gain practical tools, data-informed insights, and experiential learning opportunities. The system is intentionally designed to reduce cognitive overload, make learning manageable, and encourage active participation, ensuring that both students and teachers can engage meaningfully with content. Ultimately, MindSpace shows that when theory and thoughtful design come together, an online platform can support the full school community, helping students thrive academically and emotionally while empowering educators to confidently guide and sustain that growth.

Weekly design reflections

Week 8 (Susan)

Project task: Review the project proposal for population and context
Reflection prompt: Why did you choose this context? What kinds of disciplinary learning are you designing for? What challenges do your learners face?

Why This Context

We chose the context of seventh-grade students in Philadelphia because this age marks a critical transition between childhood and adolescence, when identity formation, emotional regulation, and peer relationships intensify. Yet in many Philadelphia public schools, mental health services are minimal, leaving both students and teachers unequipped to manage rising stress, anxiety, and trauma. This issue reflects a broader urban education challenge—how systemic inequities in funding and resources directly affect students' emotional and academic well-being. By focusing on this local, tangible need, the project aims to bridge a real gap between educational policy and students' lived experience.

Disciplinary Learning Design

The learning design integrates principles from social-emotional learning (SEL), psychology, and educator professional development. The goal is twofold: to help teachers build trauma-informed classroom practices and to help students develop self-awareness, empathy, and coping strategies. Learning activities might include teacher-facing modules on early signs of emotional distress and student workshops combining reflective journaling, peer dialogue, and mindfulness practices.

Learner Challenges

Students face complex socio-emotional stressors—community violence, poverty, family instability, and the pressures of adolescence—often without safe spaces to process them. Teachers, meanwhile, struggle with burnout, lack of training, and institutional constraints that make it difficult to provide individualized support. Together, these factors create a cycle of emotional exhaustion and disengagement. The primary challenge is thus not a lack of motivation but a lack of systemic capacity—a need for structures that humanize learning and foster collective care.

Week 9 (Sam)

Project task: Add or adjust design goals and activities based on the readings for AI
Reflection prompt: How do the insights from the readings inform or shape the selection of tools and solutions in your design?

The assigned readings collectively address how AI, hybrid learning, and skill development research can assist our SEL and student mental health support plan. Yusuf et al. (2024) shows that AI can enhance engagement along with personalized, adaptive learning. A continuous set of feedback can be provided but cannot replace in-person development and support through collaboration, communication, and community. This supports our blended design, where AI modules are paired with biweekly small group meetings to educate on socio-emotional skills and mental health.The Deloitte/WSJ (2025) article highlights the importance of ethical and responsible AI use. In our program, AI tools can help track engagement, suggest interventions, and provide additional resources, while maintaining student privacy and confidentiality. Rios et al. addresses communication, collaboration, and problem-solving as critical skills in real-world contexts. Incorporating these findings, our modules and group activities explicitly target these skills, with AI personalizing support groups/meetings, and teachers facilitating social interactions and dialogue surrounding mental health. Together, these insights support a hybrid approach. While AI enhances personalization and efficiency, human facilitation and interactions ensure relational and whole child development. This design balances technology with human connection, helping students navigate social media and other online forums safely, while simultaneously building valuable socio-emotional and 21st-century skills.

Week 10 (Stella)
Project task: Rework environment or interactions to address inclusion and equity
Reflection prompt: How are you designing for equitable participation?

Nasir (2024) reimagines an equitable learning environment to support a multicultural democracy. The frameworks she introduces, including the BELE Network, which emphasizes cultural affirmation, and the SOLD Alliance, which focuses on identity and belonging, offer a strong foundation for designing equitable participation. These models remind me that equity requires changing beliefs, not just structures. It involves rethinking what learning looks like when every student's identity is recognized as valuable.

The two other readings provided powerful examples of how these ideas can take shape in practice. Vakil (2018) shows how equity in computer science education must move beyond access or workforce preparation to embrace freedom. Instead of just preparing students for tech careers, learning should empower them to question and transform structures of power. Similarly, Stornaiuolo et al. (2018) describe the creation of the Literacy Lab, where equity emerges through co-design. The Literacy Lab became an example of equitable learning by inviting students to collaboratively build their own literacy space.Through mapping how the lab was used, students' voices and cultural experiences shaped and expanded what counted as literacy and participation.

Week 11 (Susan)
Project task: Engage with AI solutions
Reflection prompt: How does the use of AI show up in your environment?

The mental health support gap faced by seventh-grade students and teachers in Philadelphia truly requires a multi-tiered, innovative, and sustainable solution. While artificial intelligence (AI) cannot replace human care in this field, it can serve as a powerful "enabler" and "amplifier." By addressing prevention, identification, intervention, and support, AI can help build a safer, more supportive learning environment. For example, maybe we could use AI to develop a simple, user-friendly

mobile or web application for students. They can record their moods using text, emojis, or voice messages. The AI analyzes anonymized aggregated data from these inputs (not tied to individuals) to identify overall emotional trends across the school (e.g., “The keyword ‘anxiety’ has increased by 20% this week”). This enables the school counseling team to proactively implement group interventions, such as hosting lectures on managing exam anxiety. Or provide a platform where AI can translate school mental health notices and resource articles into languages parents use (such as Spanish, Chinese, etc.). AI chatbots can answer parents' common questions about adolescent mental health and guide them to localized support services, breaking down information and cultural barriers.

Week 12 (Susan)
Project task: Incorporate ways in which learners might engage with or interpret data
Reflection prompt: How does data literacy show up in your design?
In this intervention, data is positioned not only as a diagnostic tool for school systems but as a learning resource that empowers seventh-grade students and teachers to understand and respond to the mental-health inequities they experience. Data becomes a medium through which learners interpret their environment, question structural gaps, and co-design supports.

For students, engagement with data begins in advisory or health-education periods through guided inquiry activities using age-appropriate datasets. These may include anonymized schoolwide wellness-survey results, patterns of counselor availability, or aggregated statistics on sleep, stress, bullying, and school climate. Students explore questions such as: *How many students report high stress? When are support services available? Which support formats do students prefer?* Using visual tools—charts, dashboards, and concept maps—they identify trends and compare their own experiences to broader patterns.

Teachers engage with data through professional learning communities centered on interpreting mental-health indicators. They examine referral patterns, attendance records, incident data, and student-wellness surveys to identify early warning signs, inequitable access across groups, and calendar periods when support needs intensify.

Week 13 (Stella)
Project task: Consider ways in which your design encourages engagement and participation
Reflection prompt: In what ways are your learners engaging or participating in your environment? How can you optimize engagement and participation?
I am impressed by how coherently online learning demonstrates its ability to support the full educational ecosystem, from expanding students’ access to learning resources to strengthening teachers’ professional development. Greenhow et al. (2022) show that well-designed online environments can reduce long-standing equity gaps by providing flexible access to education support. This finding can become especially important when we consider how equity gaps often translate directly into mental-health gaps for students. Online platforms have the potential to deliver mental-health education and social-emotional learning to seventh graders who might otherwise receive little support in under-resourced schools.

At the same time, Martin et al. (2023) highlight how flexible, bichronous online PD can help teachers develop complex skills in ways that fit their demanding schedules. This model can be leveraged to provide teachers with the mental-health training they currently lack, while still ensuring opportunities for work at schools. One of the biggest barriers to effective mental-health training is that teachers are already overwhelmed by workload. Traditional professional development formats like workshops or after-school sessions are rarely feasible for educators who are managing large classes. This is why the model described by Martin et al. (2023) is so relevant

that their research shows that bichronous PD, which integrates asynchronous self-paced learning with synchronous live support, creates the flexibility teachers need.

Week 14 (Susan)
Project task: If applicable, incorporate or reflect on immersive or embodied features
Reflection prompt: How might embodiment or immersion influence your learning design, if at all?

I believe that rather than treating mental health as an abstract curriculum topic, the design intentionally incorporates experiential modes of learning that allow students and teachers to "feel" and "sense" the impact of stress, regulation, and support.

For students, embodiment appears through guided mindfulness and emotion-mapping activities. These short, structured exercises invite learners to identify where stress or anxiety manifests in their bodies, map emotional intensities using colors or movement, or engage in grounding practices that simulate real-time coping strategies.

For teachers, immersion is integrated into professional development through simulated crisis-response scenarios. Instead of only reading protocols, teachers participate in structured role-plays that mimic high-stress classroom situations—such as a student experiencing panic, emotional withdrawal, or escalating conflict. These simulations allow teachers to practice de-escalation strategies, observe their own physical responses, and receive guided coaching.

By incorporating these immersive and embodied components, the design moves beyond cognitive understanding to cultivate felt knowledge, emotional attunement, and practical skill-building.

Week 15 (Stella)
Project task: Submit final portfolio and present in class
Reflection prompt: What did you learn about designing for learning? What changed most in your project and why?

As AI continues to evolve, I've realized that the central question is no longer whether AI will replace educators, but how we can integrate it in ways that genuinely improve learning spaces. Throughout this project, I learned to shift away from the common fear-based narrative and toward a design perspective that sees AI as a partner in creating more supportive environments. Rather than imagining AI as a substitute for human connection, we treated it as a tool that can extend teachers' capacity.

Designing MindSpace pushed me to think critically about what AI should and should not do. The scenarios and chatbot, for example, do not make decisions for teachers or diagnose students; instead, they offer structured scaffolds that help teachers rehearse de-escalation strategies. This reinforced for me that AI is most powerful when it supports human judgment rather than replacing it. I began to see AI not as a threat, but as a tool for building better learning ecologies.

Ultimately, integrating AI into our design taught me to approach technology with nuance. It's not about embracing AI uncritically or rejecting it out of fear, but about asking how it can enhance the conditions for learning. When used thoughtfully, AI opens new possibilities for supporting both teachers and students, helping us create learning spaces that are more responsive with the complex realities of school life today.

Final reflection

Sam: Working on MindSpace has been a really meaningful experience because it gave me the chance to think deeply about how students and educators can be supported in ways that actually meet their needs. From the start, our team wanted to create a safe, welcoming, and accessible space where middle school students, teachers, and staff could access mental health resources. For me, one of the most important parts of this project was making sure that it wasn't just about providing information, but about creating a platform where people could interact with content, reflect on their experiences, and use what they learn in their daily lives.
A big part of how we approached this was through the Cognitive Theory of Multimedia Learning (CTML). I saw CTML as a way to make sure the learning experiences on MindSpace were actually manageable and meaningful. For example, when designing the SEL modules, we combined visuals, text, and interactive exercises so that students could build mental models without feeling overwhelmed. Advisory sessions and small-group discussions were also structured to allow students to process information at their own pace and apply it in collaborative ways. I could see how strategies like segmenting content, highlighting key information, and combining visuals with text would help students stay engaged and actually understand what they're learning. For teachers, the same principles applied to professional development. The immersive scenarios and mixed asynchronous/synchronous sessions gave faculty a chance to practice skills in realistic situations while managing the amount of information they had to process.

We also kept Universal Design for Learning in mind, making sure that MindSpace was flexible enough for different types of learners. Giving students multiple ways to engage with material, represent their understanding, and express themselves felt really important. I liked thinking about how this flexibility doesn't just help students—it also supports teachers, who might be working with students with very different needs and learning styles.

Sociocultural theory also shaped how we designed MindSpace. I realized how important it is for learning and growth to happen with other people, not alone. The small-group discussions and advisory sessions were designed so students could talk about their experiences, hear from peers, and get guidance from teachers. At the same time, teachers could learn from each other's experiences and see how strategies worked in practice. I think this kind of interaction really helps both students and teachers feel supported and connected.

Looking back, I feel like this project pushed me to think carefully about design, accessibility, and real-world application. Each week, we revised parts of the platform based on what we learned, whether it was improving AI personalization, reorganizing modules, or making sure teachers had the tools they needed to facilitate SEL effectively. I've learned a lot about how research-based frameworks like CTML, UDL, and sociocultural theory can be brought together to create something that actually helps people, not just something that looks good on paper. Working on MindSpace has reminded me how important it is to approach design thoughtfully, test ideas, and always keep the people you're designing for at the center.

Susan:

This course has been deeply valuable in helping me understand how learning theories, design frameworks, and methodological considerations can be translated into the design of online learning environments. Through the MindSpace project, I was able to move beyond abstract discussions of theory and actively apply concepts such as Cognitive Theory of Multimedia Learning (CTML), Universal Design for Learning (UDL), Sociocultural Theory, and motivation theory to a concrete design challenge centered on student and educator mental health needs.

One of the most important lessons I learned as a creator was how to more thoughtfully understand the lived needs, constraints, and challenges of both students and teachers as participants in learning and practice-based activities. Rather than designing from a purely idealized perspective, our project required us to consider real systemic barriers—such as limited counseling resources,

stigma around help-seeking, and teachers' lack of time for professional development—that shape how learning environments are actually experienced in schools. This shifted my design mindset from "what should exist" to "what can meaningfully support users within their realities."

Throughout the project, we intentionally explored and applied multiple learning theories to guide our design decisions. CTML influenced how we structured multimedia elements to reduce cognitive load and promote active processing, ensuring that visuals, text, and interactions worked together rather than competing for attention. UDL pushed us to design multiple entry points for engagement, representation, and expression, allowing students to reflect through writing, drawing, music, or interaction instead of relying on a single mode. Sociocultural theory further reminded us that learning is not an isolated cognitive process but is mediated through tools, social interaction, and shared practices—an idea reflected in our emphasis on identity-affirming SEL activities and small-group discussions

At the same time, this course consistently encouraged us to critically examine the learning environments created by technology itself. Rather than treating AI and digital tools as neutral or purely beneficial, we reflected on how design choices shape power, visibility, and care. This was especially important in our consideration of AI-assisted emotional risk detection, where transparency, teacher judgment, and ethical boundaries became central design concerns. The process helped me better understand how technology can function as cognitive and emotional scaffolding without replacing human responsibility.

One limitation of our project, however, was the lack of time to conduct meaningful evaluation of how the MindSpace platform actually supports learning and well-being outcomes. While we grounded our design decisions in theory and research, we were unable to observe real user interaction, measure learning impact, or iteratively refine the platform based on feedback. This gap made me more aware of how essential evaluation and iteration are to learning design, not as an afterthought but as a core component of responsible educational innovation.

Overall, this experience strengthened my ability to design learning environments that are theory-informed, human-centered, and ethically reflective. More importantly, it reshaped how I understand my role as a creator—not simply as someone who builds tools, but as someone who designs conditions for learning, care, and participation.

Stella: Working on MindSpace has been a deeply meaningful experience for everyone in our group. Although we come from different cultural and educational backgrounds, we all recognized a shared absence of mental-health awareness in our own schooling experiences. This realization became the grounding purpose of our project: to design a system we wish we had growing up, which provides accessible support and builds a more inclusive learning environment. MindSpace ultimately could become a learning ecosystem where students and teachers support each other in understanding mental health, not as an add-on, but as a core part of schooling.

My individual focus in MindSpace centered on Professional Development (PD) for teachers. I learned that supporting teacher learning requires thoughtful attention to both adult learning theory and cognitive design principles. In the foundational PD modules, I intentionally used multimedia principles, such as coherence, signaling, and segmenting, to reduce cognitive load and help teachers process complex concepts without overwhelming them (Mayer, R.E., 2017). More importantly, the PD was designed following principles of andragogy (Chametzky, B., 2019), which emphasizes adults' need for autonomy, relevance, and self-direction. Instead of one-size-fits-all training, teachers in MindSpace can move through the modules at their own pace. This flexibility reflects the realities of teachers' limited time while also respecting their professionalism. Designing PD with trust and autonomy in mind made me rethink what effective online learning for adults should look like.

The most transformative component I designed was the AI-supported Crisis Simulation and Chatbot. This feature intentionally integrates professional vision, the cycle of noticing, interpreting, responding that teachers use to make sense of classroom situations (Gomoll et al., 2022). The AI presents teachers with realistic student scenarios and prompts them first to identify observable behaviors, then to interpret what these behaviors might signify emotionally. The chatbot acts as a computational scaffold, guiding teachers through trauma-informed reasoning, offering alternative responses, and explaining why certain actions promote emotional safety while others escalate stress. Rather than giving teachers answers, the AI helps them practice thinking through emotionally complex moments, which is often missing in traditional PD.

Finally, I worked on the Identity-Affirming SEL Classroom component, which pushed my understanding of sociocultural learning theory. This activity is grounded in the idea that identity, culture, and community are central to how students learn and express emotions. Drawing from Vygotsky and Sociocultural Theory, I learned that learning is mediated through cultural tools, social interactions, and shared practices (National Academies of Sciences, Engineering, and Medicine, 2018). When students upload identity artifacts, such as photos, music, family traditions, or drawings, these artifacts become mediating tools that help teachers understand students' emotional worlds and support more meaningful SEL conversations. This aligns closely with Cultural-Historical Activity Theory (CHAT), which views the classroom as a social system shaped by tools, norms, histories, and roles (Gutiérrez, K. D., 2016). In this system, identity artifacts mediate communication, and the identity-affirming SEL norms function as the rules that ensure equitable participation. Designing this activity helped me see how SEL becomes more powerful and inclusive when it affirms who students are, rather than asking them to fit into a narrow conception of emotional expression.

Across all components, the biggest shift for me was realizing that designing for learning means designing for people, their identities, emotions and needs. Technology, including AI, is valuable only when it strengthens human connection and supports reflective practice. MindSpace ultimately taught me how learning design can create spaces that feel safer, more equitable for both students and teachers.

References

Cardona, M. A., Rodríguez, R. J., & Ishmael, K. (2023). Artificial intelligence and the future of teaching and learning: Insights and recommendations. U.S. Department of Education, Office of Educational Technology.

Castro-Alonso, J.C., de Koning, B.B., Fiorella, L., & Paas, F. (2021) Five Strategies for Optimizing Instructional Materials: Instructor- and Learner-Managed Cognitive Load. Educational Psychology Review (33), 1379–1407.

Chamestzky, B. (2018). Interconnectedness of learning: How andragogy can improve the online learning experience. American Journal of Educational Science, 4(4), 93–99.

Collaborative for Academic, Social, and Emotional Learning. (2025). *Fundamentals of SEL*. CASEL. https://casel.org/fundamentals-of-sel/

Gutiérrez, K. D. (2016). 2011 AERA Presidential Address: Designing Resilient Ecologies: Social Design Experiments and a New Social Imagination: Social Design Experiments and a New Social Imagination. *Educational Researcher*, *45*(3), 187-196. https://doi-org.proxy.library.upenn.edu/10.3102/0013189X16645430

Gomoll, A., Hmelo-Silver, C. E., & Šabanović, S. (2022). Co-constructing Professional Vision: Teacher and Researcher Learning in Co-Design. *Cognition and Instruction*, *40*(1), 7–26. https://doi-org.proxy.library.upenn.edu/10.1080/07370008.2021.2010210

Mayer, R.E. (2017). Using multimedia for e-learning. Journal of Computer Assisted Learning, 33(5), 403-423.

National Academies of Sciences, Engineering, and Medicine (2018). How People Learn II: Learners, Contexts, and Cultures. Washington, DC: The National Academies Press. https://doi.org/10.17226/24783. Chapter 6.

Sancar, R., Atal, D., & Deryakulu, D. (2021). A new framework for teachers' professional development. Teaching and Teacher Education, 101, 103305.

Stapleton-Corcoran (2022, February 12). Universal Design for Learning (UDL). University of Illinois Chicago. https://teaching.uic.edu/cate-teaching-guides/inclusive-equity- minded-teaching-practices/universal-design-for-learning-udl/