Learning Theory Matrix

Definitive Questions for Learning Theories	Behaviorist Theory	Cognitive Theory	Constructivist Theory	Social Learning Theory	Connectivism	Adult Learning
How does learning occur?	**Behaviorist theory states learning happens during a process of stimulus-response associations, where behavior is shaped by external reinforcements such as rewards and punishments**. Learning is viewed as a change in behavior due to repeated exposure to stimuli, reinforced through practice and feedback (Ertmer & Newby, 2013). **The role of the learners is mainly passive, responding to environmental stimuli, while the instructor plays an active role in structuring reinforcement schedule to ensure behavioral outcomes** (Reiser & Dempsey, 2018).	**Cognitive theory states that learning occurs through active metal processing.** Individuals will construct knowledge by organizing and integrating new information with prior knowledge. Unlike behaviorism, which focuses on external reinforcements, **cognitive theory emphasizes internal processes such as attention, perception, encoding, and retrieval** (Ertmer & Newby, 2013). Learning happens when information is effectively stored in memory and can be retrieved when needed. Reiser and Dempsey (2018) describes learning as a process of actively making sense of information rather than passively responding to stimuli.	**Constructivist theory, in its unique approach, suggests that learning is a result of active learning.** Learners construct their own understanding by interacting with their environment, engage in social interaction, and integrate new knowledge with prior experience. (Ertmer & Newby, 2013). Unlike behaviorism and constructivism, which emphasize structured instruction and internal processing. **Constructivism focuses on experiential learning, problem-solving and authentic tasks that promote deep understanding (**Reiser & Dempsey, 2018). **In a learning environment the educator's role shifts from knowledge provider to facilitator of learning experiences. The educator guides students by exploring their own understanding, encouraging collaboration and providing opportunities for reflection.**	**Social learning theory highlights the importance of observing, imitating, and modeling behaviors in the learning processes.** Unlike behaviorists theories that stress reinforcement, this theory views learning as a cognitive process that unfolds in social setting and can occur without direct reinforcement (Ertmer & Newby, 213). **Central to this theory is observational learning, where individuals acquire new knowledge and behaviors by watching others and interpreting the consequences of this actions** (Rieser & Dempsey, 2018).	**Connectivism is a learning theory developed by Siemens (2005) and Downes (2008), suggests that learning occurs through creating and navigating information networks.** Unlike traditional learning theories that focus on individual cognition, connectivism emphasizes: • **The role of digital and social connections:** Learning is the process of connecting nodes of information across networks (Ertmer &Newby, 2013). • **Knowledge is fluid and constantly changing:** Learners must continuously update their understanding through digital interaction (Reiser & Dempsey, 2018). • **Decision-making as a learning process:** Choosing what information is relevant is a key skill in the digital age. **Learning is not simply about what one knows but about one's ability to connect (e.g., people, databases, social media, AI Systems) and apply that information effectively.**	**Adult learning, also known as androgyny, is based on Malcom Knowles's principles, which suggest that adults learn differently from children.** Learning in adults occurs when adults: • **Are Self-Directed:** They take the responsibility for their own learning rather than relying solely on an instructor, who acts more as a facilitator or guide in the learning process. • **Use of Prior Experience:** They build upon previous knowledge and real-world experiences to make sense of new information (Reiser & Dempsey, 2018). • **Intrinsic Motivation:** Personal and professional goals often drive learning. • **Are Problem-Centered:** Adults prefer learning that is immediately applicable to real-world challenges, such as workplace issues or personal development, rather than abstract concepts (Ertmer & Newby, 2013). Adult learning is an active and experiential process. Adults seek to solve problems and apply knowledge in a meaningful way.

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What factors influence learning?	**Several factors influence learning in a behavior theory framework:** • **Reinforcement:** Positive and negative reinforcement strengthens behavior, while punishment weakens undesirable behaviors (Ertmer & Newby, 2013). • **Practicing and Repetition:** Learning occurs through repeated exposure to stimuli, reinforcing conditioned responses (Reiser & Dempsey, 2018). • **Immediate Feedback:** Learners benefit from timely reinforced or correction to solidify behavioral changes. • **External Environment:** Structured instruction, controlled settings, and well-defined learning objectives influence learning.	**Several cognitive factors that influence learning:** • **Prior knowledge:** Learners build on existing schemas, making meaningful connections with new information (Ermer & Newby, 2013). • **Attention and Perception:** Information must be attended to and processed effectively to enter working memory (Reiser & Dempsey, 2018). • **Cognitive Load:** Learning is influenced by the capacity of working memory. If the cognitive load is too high, learning may be ineffective. • **Encoding Strategies:** Techniques such as chucking, elaborating and mnemonics enhance retention (Reiser & Dempsey, 2018). • **Motivation and Metacognition:** Learners who regulate their learning (e.g., setting goals and monitoring processes) retain information better (Ertmer & Newby, 2013).	**Several factors influence learning from a constructivism perspective:** • **Prior knowledge and Experience:** Learners build new knowledge upon exciting schemas, making connections between prior experiences and new concepts (Ertmer & Newby, 2013). • **Social Interaction:** Learning is not a solitary endeavor. It occurs through vibrant collaboration, discussions, and shared experiences with peers and mentors, fostering and shared growth (Reiser & Demspey,2018). • **Context and Authenticity:** Learning is more meaningful when it occurs in real-world or relevant context (Lemay & Doleck,2020). • **Active Engagement:** Hands-on exploration, inquiry-based learning, and problem-solving tasks enhance understanding. • **Reflection and Metacognition:** Encouraging learners to reflect on their experiences and thought process is not just a pedagogical tool but a powerful strategy that empowers them to deepen their comprehension and take control of their learning journey (Reiser & Dempsey, 2018).	**Social Learning Theories that influence learning:** • **Attention:** Learners must focus on the model's behavior and its consequences. • **Retention:** Information must be encoded and stored in memory for future use (Ertmer & Newby, 2013). • **Reproduction:** Learners must be able to reproduce observation behavior. • **Motivation:** Reinforcement (direct, vicarious, or self-reinforcement) influences whether a learner's behavior is performed. • **Social Environment:** Learning is heavily influenced by cultural and social factors, including interaction with peers, mentors and societal norms (Reiser & Dempsey, 2018).	**Connectivism factors that influence learning:** • **Access to digital networks**: The availability of online resources, forums, and communities affect learning. • **Technology proficiency:** Digital literacy and ability to use learning management systems, search engines and AI tools are crucial (An & Oliver, 2021). • **Social Connections:** Interactions with peers, experts, and online communities enhance knowledge-building. • **Speed of information flow:** Knowledge changes rapidly, requiring learners to continuously update their understanding (Reiser & Dempsey, 2018). • **Self-directed learning:** Individuals must actively curate, filter, and apply knowledge from different sources.	**Several key factors impact adult learning:** • **Relevance and Practicality:** Adults need learning to be directly applicable to their personal or professional lives. • **Autonomy and Control:** They prefer control over their learning process (Reiser & Dempsey, 2018). • **Prior Knowledge and Experience:** Learning is more effective when it connects to existing knowledge and experiences. • **Social and collaborative Learning:** Interaction with peers and experts enhances understanding (Lemay & Doleck, 2020). • **Cognitive Load and Time Constraints:** Many adult learners balance work, family and education making flexible learning essential. Cognitive load, which refers to the mental effort to process information, is important in designing effective adult learning experiences. • **Motivation and Readiness:** Adults learn best when they see immediate value in the content (Ertmer & Newby, 2013).

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What is the role of memory?	**Memory in behaviorism is not explicitly pointed out as an internal cognitive process.** Instead, it is seen as a repertoire of learned responses to environmental stimuli (Ertmer & Newby, 2013). **Learning is demonstrated through observable behavior rather than the recall of stored information.** Habits and conditioned responses are strengthened through reinforcement, meaning **memory is essentially a collection of acquired behaviors rather than consciously retrieved knowledge.**	**Memory plays a central role in cognitive learning theory.** Learning involves three stages of memory processing: • **Sensory Memory:** Information is initially perceived but must be attended to for further processing. • **Working Memory:** Information is temporarily held and actively processed. Strategies such as chunking and rehearsal help retain information (Reiser & Dempsey, 2018). • **Long-Term Memory:** Information that is meaningfully encoded and stored for further retrieval. According to Ertmer and Newby, effective learning occurs when knowledge is organized into schemas that facilitate recall (Ertmer & Newby, 2013).	**Memory, in the constructivist theory, is viewed as an active reconstruction of knowledge rather than a passive storage system. Learners organize and make sense of information by creating mental models that are continually revised and explained through experiences** (Ertmer & Newby, 2013). Long-term memory is strengthened when learners actively engage with content, apply knowledge in meaningful ways, and reflect on their learning process (Reiser & Dempsey, 2018). **Constructivist approaches often de-emphasize rote memorization and instead focus on deep understanding and conceptional application.**	**Memory plays a pivotal role in Social Learning Theory, enabling individuals to store observed behaviors and retrieve them when needed** (Ertmer & Newby, 2013). Learning occurs when a person encodes and retains modeled behaviors in long-term memory and can later reproduce them in different contexts. The effectiveness of memory retention is influenced by the clarity of the modeled behavior, the learner's cognitive engagement, and repeated exposure to the behavior (Reiser & Dempsey, 2018).	**In connectivism, memory is externalized rather than stored solely in the brain instead of relying on role memorization, learners use digital tools and apply knowledge.** Key aspects of memory in this theory include: • **Distributed cognition:** Information is stored across networks, databases, social platforms and cloud systems (Ertmer & Newby, 2013). • **Pattern Recognition:** Learners develop the ability to recognize relevant connections and filter information effectively. • **Searchability over recall:** Instead of remembering specific details, learners develop skills to find and apply information as needed quickly (Reiser & Dempsey, 2018).	**Memory is fundamental in adult learning, enabling adult learners to bridge existing and integrate it into new experiences.** • **Encoding:** New information is processed and organized based on existing schemas. • **Retrieval:** Learning is reinforced when adults actively recall and use information in real-life scenarios (Reiser & Dempsey, 2018). • **Reflection:** Adults often engage in metacognition, reviewing and reflecting their understanding through practice and discussion. Because memory retention is higher when learning is contextual and experiential, adult learning strategies often involve case studies, real-world projects and interactive discussions (Ertmer & Newby, 2013).

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How does transfer occur?	**In behaviorism theory, learning is transferred through stimulus generalized and discrimination.** When learners encounter similar stimuli in different contexts, they apply previously reinforced behaviors. (Reiser & Dempsey, 2018). For example, a student trained to solve math problems step-by-step approaches may transfer this skill to similar problem-solving tasks in science. However, transfer is limited to situations where the stimulus closely matches the learning context (Ertmer & Newby, 2013).	**Transfer happens when skills or knowledge acquired in one situation are used in a different context.** Cognitive theory suggests that transfer is more effective when: • **Learning is meaningful and well-organized within the existing schema.** • **Learning to develop problem solving skills that generalize across situations.** • **Knowledge is contextualized but practiced in multiple settings to facilitate flexible thinking** (Reiser & Dempsey, 2018). For example, learning mathematical problem-solving strategy can be transferred to science or finance if the learner understands the underlying principles rather than memorizing procedures.	**Transfer takes place when learners use their acquired knowledge and problem-solving abilities in different and unfamiliar situations.** Constructivist learning environments facilitate transfer by: • **Encouraging situated learning, where knowledge is acquired in realistic and meaningful contexts** (Reiser & Dempsey, 2018). • **Encouraging higher order thinking skills, including evaluation, synthesis and analysis, gives the learners the opportunity and ability to apply their knowledge flexibly in new contexts** (Ertmer & Newby, 2013). • **Supporting collaboration learning, where students share diverse perspectives and develop adaptable problem-solving approaches.** • **Utilizing reflection and self-regulation allows learners to monitor their understanding and adjust strategies accordingly.** (Lemay & Doleck, 2020).	**Transfer occurs when learners apply observed behaviors to new situations.** Social learning Theory facilitates the transfer through: • **Vicarious Learning:** Watching others and understanding the consequences of their actions (Ertmer & Newby, 2013). • **Self-Regulation:** Learners internalize behavior and adapt them to different situations. • **Role Model and** Mentorship: Seeing successful individual performance certain behaviors increases the likelihood of learners applying similar behaviors in new contexts (Reiser & Dempsey, 2018). • **Social Norms and Cultural Influence:** Learning transfers behavior that aligns with societal expectations and peer group dynamics.	**Transfer occurs when learners apply knowledge from one's network to a new context.** In connectivism, the transfer is facilitated by: • **Exploring and strengthening learning networks:** Learners access different communities, platforms, and technology to apply their knowledge. • **Interdisciplinary connections:** Knowledge from one field can be applied to another through cross-disciplinary collaboration (An & Oliver, 2021). • **Updating and adapting knowledge:** Because information evolves rapidly, learners must be comfortable with consistent learning and adaptation (Reiser & Dempsey, 2018). **Transfer is most effective when learners are actively engaged in networked learning environments that provide sources of knowledge.**	**Adult learning transfers when knowledge and skills acquire in one setting are applied in another.** Key mechanisms for successful transfer include: • **Real-World Application:** Learning is designed to solve real world problems, making it more transferable. • **Collaborative Learning:** Interaction with peers allows learners to refine and test ideas. • **Experiential Learning:** Hands-on-projects, simulation and workplace training encourage application. (Rieser & Dempsey, 2018). • **Reflection and Self-Assessment:** Adults reinforce learning by evaluating their progress and adjusting their strategies accordingly (Lemay & Doleck, 2020). **The transfer is most effective when learning is situated in a relevant context, and learners actively engage in critical thinking and problem-solving tasks.**

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Definitive Questions for Learning Theories	Behaviorist Theory	Cognitive Theory	Constructivist Theory	Social Learning Theory	Connectivism	Adult Learning
What types of learning are best explained by this theory?	**Behaviorism is particularly effective in explaining:** • **Skill-based and Rote Learning:** Reinforcement-based learning benefits from memorization of facts, vocabulary acquisition, and procedural tasks. • **Behavioral Training:** Behavioralist principles are used in workplace training programs that focus on compliance, safety protocols, and procedural knowledge. • **Basic Literacy and Numeracy Skills:** Phonics-based reading instruction and multiplication drills rely on repetition and reinforcement.	**Cognitive theory is well suited for:** • **Conceptual Learning:** Understanding abstract concepts like mathematical reasoning and science principles. • **Critical Thinking and Problem Solving:** Encouraging learners to analyze, evaluate, and synthesize information. • **Language Acquisition:** Learning new languages by recognizing patterns, applying rules, and integrating prior knowledge. • **Self-Regulated Learning:** Encourages learners to monitor their learning process and adjust strategies accordingly (Ertmer & Newby, 2013).	**Constructivism is particularly effective for:** • **Inquiry-Based Learning:** Students explore questions, conduct experiments, and discover principles independently. • **Problem-Based Learning:** Learners tackle real-world challenges that foster collaboration, critical thinking, and problem-solving skills. • **Project-Based Learning:** Students create and complete projects where they can use their knowledge in meaningful ways. • **Collaborative Learning:** Group discussions, peer teaching, and cooperative problem-solving activities. • **Experiential and Hands-On Learning:** Simulations, case studies, and role-playing activities enhance understanding.	**Social Learning Theory is particularly effective in explaining:** • **Collaborative Learning:** Peer-to-peer interaction enhances learning through discussion and shared experiences. • **Behavioral and Emotional Development:** Children and adults learn appropriate behaviors by observing societal role models. • **Professional Training and Workplace Learning:** Employees model the behaviors of mentors and colleagues to develop skills. • **Media and Digital Learning:** Learners acquire knowledge and behavior through television, social media, and online influencers (Reiser & Dempsey, 2018).	**Connectivism is particularly effective for:** • **Digital and Online Learning:** MOOCs. webinars, and digital courses rely on learners forming connections with content and communities. • **Social Media-Based Learning:** Platforms like Twitter, LinkedIn, and online forums facilitate professional development. • **Collaborative Knowledge Building:** Wikis, blogs, and shared documents allow collective knowledge construction (Lemay & Doleck, 2020). • **AI-Driven learning and adaptive systems**: Personalized learning, experiences powered by AI align with Connectivism principles. • **Workplace learning and knowledge management:** Employees use digital repositories, collaborative platforms and peer networks to acquire skills (Reiser & Dempsey, 2018).	**Adult learning Theory is particularly effective for:** • **Workplace Training and Professional Development:** • Employees acquire new skills and knowledge that enhances job performance. • **Self-Paced Online Learning:** • Many adults prefer asynchronous learning to balance education with work and family. • **Higher Education and Continuing Education:** • Universities and certification programs apply adults learning principles to accommodate working professionals. • **Project-Based and Experiential Learning:** • Adults learn through hands-on experiences, real-world problem-solving, and reflection (Ertmer & Newby, 2013).

Learning Theory Matrix

Definitive Questions for Learning Theories	Behaviorist Theory	Cognitive Theory	Constructivist Theory	Social Learning Theory	Connectivism	Adult Learning
How is technology used for learning in your industry?	**Behaviorism is often applied in:** • **Computer-Assisted Instruction (CAI):** Drill-and-practice programs use reinforcement to strengthen skills (Lemay & Doleck, 2020). • **Learning Management Systems (LMS):** Quizzes, automated feedback, and badges reward desired behaviors (An & Oliver, 2021). • **Gamification:** Points, Leaderboards, and badges serve as reinforcement to motivate learners. • **Adaptive Learning Technologies:** AI-driven platforms provide immediate feedback and adjust difficulty based on learners' responses.	**Cognitive theory informs the development of digital tools and supports learning.** • **Multimedia Learning:** Videos, animations, and simulation help learners visualize abstracts concepts, reducing the cognitive load (Lemay & Doleck, 2020). • **Adaptive Learning System:** AI-driven platforms dynamically modify content difficulty in response to a learner's performance, enhancing engagement and maximizing learning efficiency. • **Interactive E-Learning Modules:** These digital environments scaffold learning through structured activities and feedback (An & Oliver, 2021). • **Metacognition Tools:** Online self-assessment quizzes, reflection journals, and strategy guides encourage learners to monitor their progress.	**In instructional design and educational technology, we see an exciting integration of constructivist principles through innovative tools and platforms. These include digital exploration, discussions and personalized learning paths (An & Oliver, 2021).** • **Online Learning Platforms:** Digitak environments that encourage exploration, discussion and personalized learning paths (An & Oliver, 2021). • **Virtual and Augmented Reality (VR/AR):** Interactive technologies create immersive environments, allowing learners to engage in realistic, hands-on experiences for deeper understanding and skill development (Lemay & Doleck, 2020). • **Collaborative Tools:** Discussion forums, wikis, and shared workspaces facilitate peer interaction and knowledge construction. • **Game-Based Learning:** Educational games promote problem-solving, decision-making, and creativity. • **Inquiry-Based Simulations:** Interactive software and AI-driven platforms allow learners to experiment, analyze data and draw conclusions.	**In instructional design and education technology, Social Learning Theory is applied to:** • **Social Media and Online Communities:** Platforms like discussions forums, wikis, and social networking sites facilitate knowledge sharing and collaborative learning (An & Oliver, 2021). • **Video-Based Learning:** Instructional videos, webinars, and online tutorials provide models for learners to observe and imitate. • **Gamification and Virtual Stimulation:** Digital environments allow learners to experiment with behaviors in simulated social context (Lemay & Doleck, 2020). • **Peer Review and Feedback Systems:** Collaborative learning environments encourage interaction and knowledge exchange among learners. • **Mentorship and Online Coaching:** Virtual mentoring platforms enable learners to observe experts and gain skills through guided practice (Reiser & Dempsey, 2018).	**Technology is central to connectivism learning, enabling individuals to create and navigate information networks.** • **Online Learning Platforms and MOOCs:** Coursera, Udemy, and Khan Academy allow learners to connect with global experts. • **Social and collaborative Tools:** Platforms like Slack, Microsoft Teams and Google Docs enable real-time collaboration (An & Oliver, 2021). • **AI and Personalized Learning Systems:** Adaptive learning technologies customize content based on learners' needs. • **Social Media for Professional Learning:** LinkedIn Learning, Twitter chats, and Facebook groups support peer-to-peer knowledge sharing. • **Open Educational Resources (OERs):** Free-access digital libraries and repositories expand learning networks. (Reiser & Dempsey,2018).	**Technology is critical in adult learning enabling flexibility and engaging learning experiences.** • **Learning Management Systems (LMS):** Platforms like Blackboard facilitate self-paced learning by providing access to discussion forums, assessments and instructional materials. • **Webinars and Virtual Classrooms:** Online synchronous learning enables live interaction with instructors and peers. • **Microlearning and Mobile Learning:** Short, focused lessons (e.g., videos, podcast) help busy professionals learn efficiently. • **Gamification:** Badges leaderboards and rewards enhance motivation and engagements (An & Oliver, 2021). • **AI-Powered Adaptive Learning:** Intelligent platforms personalize content by analyzing a learner's progress, enhancing engagement and improving knowledge retention (Lemay & Doleck,2020). • **Collaborative and Social Learning Tools**: Discussion board, wikis, and peer review tools encourage interaction and knowledge sharing (Reiser & Dempsey, 2018).

References:

- An, T., & Oliver, M. (2021). What in the world is educational technology? Rethinking the field from the perspective of the philosophy of technology. Learning, Media and Technology, 46(1), 6–19. https://doi.org/10.1080/17439884.2020.1810066

- Ertmer, P. A., & Newby, T. J. (2013). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, *26*(2), 43–71. https://doi.org/10.1002/piq.21143

- Lemay, D. J., & Doleck, T. (2020). Constructivist educational technology: Re-examining the foundations and state of the literature. British Journal of Educational Technology, 51(6), 1905–1906. http://dx.doi.org/10.1111/bjet.13042

- Reiser, R. A., & Dempsey, J. V. (Eds.). (2018). *Trends and issues in instructional design and technology* (4th ed.). Pearson Education.