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EDCI 531
Designing with the Theories

Behaviorism

Primary Theorists: B.F. Skinner, John Watson, John Carroll, Thorndike, Pavlov, Guthrie

Definition of Theory:

Behaviorism is a learning theory that focuses on observable changes in behavior as a result of learning, which are measured before and after an intervention (Driscoll, 2006). Behaviorism is especially effective in contexts where objectives are clear, measurable, and there is a distinct difference in expertise between the teacher and learner (Conner, 2002). In behaviorist pedagogy, learning is demonstrated through repetitive "drill-and-practice" exercises. Correct responses are rewarded, while incorrect ones are corrected, reinforcing desired behaviors (Behaviorism - EdTech Wiki).

The behaviorist approach breaks down knowledge into small, manageable steps and requires frequent responses from learners, ensuring they achieve "errorless performance" through immediate feedback after each task (Driscoll, 2006, p. 54). Behaviorism focuses on observable behaviors, with success determined by whether new behavior is acquired and reinforced through practice. When a learner successfully applies a new strategy and it is positively reinforced, they are more likely to continue using it, indicating that the knowledge has been effectively integrated into their behavior.

Mastery Learning Approach with H5P on WordPress

Learning Activity Scenario Description

My goal is to work in AI education at my friend's startup or another company to create interactive learning modules for his newly developed Sapient Clinician. These modules will educate doctoral students and teachers on how to use the AI-driven tool effectively. Each module is designed to help learners master specific tasks related to the platform.

Promotion

Learning will be promoted through sequential, interactive modules requiring mastery of each task before moving on. Through research, I found the H5P plugin on WordPress to be a viable solution for creating these modules, which include embedded quizzes, practice activities, and immediate feedback to reinforce learning. The modules are hosted on my WordPress website, eliminating the need for external subscription services for a separate learning management system.

Example Learning Activity Steps

1. **Understanding the Platform**: Learners are introduced to the basic features of Sapient Clinician through an interactive H5P presentation in small steps. By clicking on the items in the interactive presentation they will be more active, and the information will sink in better than if they are passively listening to a demonstration without interactions. Feedback will be given immediately after answering the interactive test questions through the module and learners will move through the module at their own pace, but they must correctly identify and explain 100% of the features before progressing.
2. **Practicing Basic Operations**: In this module there will be behavioral objectives that will be specific to the basic operations of inputting data and setting up a patient in the AI-tool. By incorporating H5P's quiz and interactive video tools, learners will practice entering patient details, selecting diagnoses, and generating treatment plans. Mastery will be demonstrated by achieving high scores on embedded quizzes.
3. **Scenarios that use Programmed Instruction**: Learners will engage with the content and multiple-choice tests and will have supplementary instruction if they provide an incorrect answer. The module will have questions that gradually increase with difficulty so the students are challenged and will move as a linear program to help minimize errors. The module will cover the same material in more than one slide as a form of drill-and-practice, and the students must achieve 100% accuracy to progress forward.
4. **Applying Skills in Meaningful Simulations**: The module will allow the student to practice skills after shaping the learning with corrective feedback during the interactive tests. They will then pick out a diagnosis that is meaningful to them to work on and attempt to follow the sub-steps to properly enter the data in a sequential order.
5. **Mastering Simple Cases and Complex Cases**: The module will use the behaviorist concept of chaining where the student will practice two simple cases of input and then follow up with one more complex case so they can build off each lesson and become more honed in with their skills by completing the simpler cases.

Rationale

Once the learning objectives are clearly defined, the use of H5P on WordPress is ideal for this behaviorist approach because it allows for a more structured, step-by-step learning module with drill-and-practice techniques. By using reinforcement throughout the tests in the module, learners must master each small task before moving on to help modify their behavior to develop a strong foundation for using Sapient Clinician. By incorporating immediate feedback and requiring demonstrated mastery, the learning process aligns with behavioral learning theory, which focuses on observable changes in behavior and skill acquisition. This method is particularly effective for preparing learners to apply their skills in real-world scenarios because of the drill-and-practice technique used in the module. The behaviorist techniques ensure that both teachers and students understand how to use the platform for assessments and what the expectations are.

Where This Theory Is Helpful in My Professional Context

- **Mastery Learning:** Teaching doctors and educators specific tasks within Sapient Clinician in a computer-based learning environment where repetitive practice and immediate feedback are essential to help them progress at their own rates.
- **Compliance Training:** In my current job designing curriculum for a sailing school, I will use these techniques to create learning modules that are interactive to help students imprint the knowledge of how to become better sailing club members and sailors.

Cognitivism

Cognitive Learning Processes in Teaching the Sapient Clinician AI Tool: A Structured Approach to Skill Development and Critical Thinking for Doctors

Primary Theorists: Jean Piaget, Jerome Bruner, Dr. Charles M. Reigeluth

Definition of Theory:

Cognitivism focuses on the inner mental activities of the mind and how they influence learning. It emphasizes understanding how information is received, organized, stored, and retrieved by the mind, and how learners can develop strategies to process and apply knowledge effectively. Based on research from Schunk (2020) on novice-to-expert methodologies, cognitivism will scaffold content to match learners' cognitive development, gradually increasing the complexity of tasks. Beyond being influenced by solely the environment like behaviorism, learning is influenced by the active processes of how the student structures and organizes the information for optimal processing (Dabbagh, 2024). The learner is dependent on both the teacher and the internal processes and what they do with the information themselves. A key component of cognitivism is cognitive load which means only a limited amount of information can be held in the working memory at a given time, and cognitive load theory takes this limitation into account when designing instruction (Schunk, 2020, p. 211)

Learning Activity Scenario Description

In this updated version of my module, I aim to apply cognitive learning processes to create learning modules for Sapient Clinician. These modules will help doctoral students and teachers problem-solve using both general strategies (like generate-and-test, means-ends analysis, analogical reasoning, brainstorming) and specific strategies related to the Sapient Clinician app. The goal is to foster metacognition, critical thinking, creativity, and reasoning when using AI tools. For example, asking, "Why would we input a certain prompt as opposed to another one into the tool?" Some doctors may be more tech-savvy than others, so I need to cover all my bases. My goal is to allow students to move from novice decision-makers who use a "means-ends" analysis focusing on end goals and formulas, to expert decision-makers who can recognize

problems and create immediate sub-goals with how to use the AI-tool on their own, ultimately mastering the program (Schunk, 2020, p. 257).

Connecting to cognitivism, the platform needs to incorporate aspects of computer-based instruction, including elaborated feedback (providing more than just "yes" or "no") and personalization. Ideally, I will also create simulations, games, and other multimedia in the module to further support the cognitive learning process.

Promotion

Learning will be promoted through scaffolded modules using H5P to gradually introduce new information and increase task complexity. Learners will be guided from novice to expert, using key strategies like worked examples, problem-solving tasks, and reflection. The tasks in the module will range from simply logging into the app and creating a profile to creating specialty prompts to excel in actual assessments. This approach will promote students' understanding and transfer knowledge to real-world contexts, helping them become doctors highly proficient at diagnosing real-life patients.

Using cognitive learning processes, my module will also touch on key features of computer-based learning environments, including how computers are "tools to support knowledge construction, information vehicles for exploring knowledge, contexts to support learning by doing, social mediums to support learning by conversing, and intellectual partners to support learning by conversing" (Schunk, 2020, p. 293). My plan is to encourage learners to achieve their goals by incorporating online social media tools for discussion and collaboration or using Microsoft Teams in small, assigned groups.

Example Learning Activity Steps

1. **Worked Examples:** Learners first engage in a worked example activity, observing an instructor step-by-step setting up a virtual patient on Sapient Clinician. The example emphasizes general skills like problem-solving when logging in or setting up a new patient, then evolves to specific skills like training the model to assess a particular illness. Learners then complete the task themselves after observing the instructor.
2. **Scaffolded Learning Progression:** I will progress learners using the novice-to-expert research methodology, scaffolding knowledge in the module to transition from novice users to expert users. Novices begin by solving simple patient cases with structured guidance, while advanced learners handle complex cases with minimal scaffolding. This progression allows learners to gradually increase skill specificity, helping them "generate task-relevant behaviors, identify errors, and correct errors" (Schunk, 2020, p. 254). By employing cognitive strategies, they can enhance their metacognition, thinking about how to get the AI to respond as desired and achieve the necessary assessments.
3. **Metacognitive Reflection:** After completing each module, learners engage in metacognitive reflection by answering prompts like, “How do I know the tool is

programmed correctly?" This encourages them to reflect on their learning process, improving their ability to monitor, plan, and evaluate their performance. Learners are also encouraged to track their progress by keeping tabs on their completed patients; the better they perform; the more evaluators will recognize their effectiveness in diagnosing the AI patient.

4. **Problem-Solving with Insight:** Learners engage in complex, open-ended problem-solving tasks where they must generate multiple solutions using Sapient Clinician's diagnostic tools. Beyond trial and error, learners develop insight using the Wallas (1921) four-stage model for problem-solving: preparation, incubation, illumination, and verification (Schunk, 2020, p. 275). These tasks help them develop critical thinking by evaluating data, creativity by formulating alternative treatment plans, and reasoning by justifying decisions based on real evidence from patient evaluations. Group discussions through online platforms or Microsoft Teams will stimulate creative thinking and collaborative problem-solving.
5. **Computer-Based Learning Environment:** My module will exist in a computer-based learning environment, incorporating as many interactive case studies as possible. Ideally, it will include a chatbot providing real-time feedback, though that may be in a future version. Students will access modules remotely, and in classroom settings, they'll work through simulations replicating real-world clinical scenarios, engaging in feedback forums to foster peer-to-peer learning.
6. **Data Interpretation and Analysis:** In future iterations, we'll teach doctoral teachers how to interpret and analyze data on Sapient Clinician. The module will use worked examples showing how to evaluate patient data generated by the platform's AI. These examples guide teachers through mathematical and data interpretation processes like calculating patient risk scores or analyzing diagnostic trends. Learners could then be given patient data sets to apply mathematical principles to solve diagnostic problems, gradually increasing independence.

Rationale

The H5P tool on WordPress is ideal for implementing cognitive learning processes because it allows for structured, scaffolded learning experiences where learners can gradually build both general and specific skills of increasing complexity. By incorporating worked examples, problem-solving tasks, and metacognitive reflection, learners deepen their understanding and transfer knowledge across contexts. The use of real-time feedback and online social tools further reinforces learning by connecting doctors and instructors to a broader community that encourages collaboration, allowing students to discuss challenges and solutions for using AI in the curriculum. The combination of scaffolded tasks and reflection helps students develop critical thinking skills while building a strong foundation in using Sapient Clinician.

Where This Theory Is Helpful in My Professional Context

- **Developing Problem-Solving Skills:** My goal is to teach doctors to analyze complex patient cases and apply critical thinking to diagnose and treat patients using Sapient Clinician.
- **Designing Instructional Videos for a Sailing School:** In my current job I am designing a curriculum to help members interact with the scheduling system and forum to bring more value to their membership. Using CIP strategies will help imprint the knowledge by use of scaffolding in a computer-based learning environment.

Social Cognitive Theory

Integrating Triadic Reciprocal Causality and Self-Efficacy Using H5P on WordPress for Doctoral Students Using an AI Tool

Primary Theorist: Albert Bandura

Definition of Theory:

Social Cognitive Theory emphasizes the importance of observing and modeling behaviors, attitudes, and emotional reactions of others. It highlights triadic reciprocal causality, where behavior, personal factors, and environmental influences interact and influence each other in the learning process (Schunk, 2020). In social cognitive theory the learners self-regulate their actions by setting goals and evaluating their progress towards those goals using internal standards. Bandura emphasized the importance of modeling, which extends beyond mere imitation of a behavior. The four processes of observational learning through modeling are attention, retention, production and motivation (Schunk, 2020).

Learning Activity Scenario Description

My goal is to work in AI education at Sapient Clinician, so I can create interactive learning modules for doctoral students and teachers. By designing and adjusting my learning module to include a social cognitive framework, students will integrate triadic reciprocal causality where behavior, personal factors, and the environment interact to influence learning. This means thinking through activities beyond what can be observed, unlike in behaviorism. Through various methods in the module, the training will distinguish between vicarious learning (learning through observation) and enactive learning (learning by doing) with the end goal being to encourage self-regulation and self-efficacy throughout the process.

The modules are designed using the H5P plugin on WordPress to create a fully interactive experience. By observing an expert performing tasks, students learn the complex skill of fully using an AI product, and through practice, they receive corrective feedback to perfect these skills, either from the instructor or embedded in the module.

Promotion

Learning is promoted through observation, modeling, and reflection activities within the H5P framework on WordPress. Learners watch demonstrations, practice using interactive modules, and engage in reflective exercises to develop self-efficacy. By incorporating goal setting, feedback, and self-monitoring features of H5P, learners build confidence and improve their performance over time with the Sapient Clinician tool.

Example Learning Activity Steps

1. **Triadic Reciprocal Causality in Action:** Using H5P on WordPress, learners will engage in modules where behavior (completing tasks in Sapient Clinician), personal factors (self-efficacy beliefs, goal setting), and the environment (peer and instructor feedback) constantly interact, following the social cognitive theory framework. For instance, a learner's confidence will improve as they successfully complete tasks and receive praise, while the environment adjusts to support their next learning challenge.
2. **Vicarious and Enactive Learning:** Learners will start with a vicarious learning activity using H5P interactive videos to observe an expert demonstrating tasks. They then will transition to enactive learning, using H5P interactive quizzes to perform these tasks themselves. The module tracks their progress, highlighting the difference between learning by observation and by action.
3. **Distinguishing Learning and Performance:** H5P allows learners to progress through scaffolded tasks distinguishing between learning (understanding features) and performance (applying them in real scenarios). Reflection activities will help learners review their learning versus performance, identifying and closing any gaps.
4. **Goal Setting and Progress Tracking:** Learners will use H5P's tools to set personal objectives for mastering Sapient Clinician. For example, they will be able to set goals like completing patient diagnoses within a certain timeframe. The system will prompt them to reflect on their progress regularly. Self-monitoring checklists will guide learners to evaluate and refine strategies toward these goals.
5. **Modeling:** Modeling in the modules will serve three functions: (1) Instructional—In-house made H5P's interactive videos will help demonstrate tasks; (2) Motivational—the presentation of successful outcomes will motivate learners; and (3) Social—peer learning activities will allow learners to observe and share strategies with each other. Social tools like Microsoft Teams or OneNote will further facilitate social learning within assigned peer groups so they can collaborate and model each other.
6. **Observing Different Models:** Learners will observe expert and peer demonstrations via my H5P tutorials. By breaking down complex tasks into smaller steps and including practice opportunities, factors like model relevance, attention, and retention will be managed.
7. **Reinforcing Self-Efficacy Through Feedback:** Learners will set specific goals. As they achieve these goals, continuous feedback will reinforce positive expectations and

progress value. Peer recognition in group discussions will foster a sense of accomplishment, encouraging continued progression toward mastery.

8. **Building Self-Efficacy Through Coping Models:** Learners will be exposed to examples in H5P by observing both expert models and coping models (peers who initially struggle but succeed through effort). Schunk (2020) describes how varying competence levels help learners believe that success is attainable through perseverance, and this will lead to higher assessment scores and accurate real-life diagnoses.
9. **Interacting with Different Types of Models:** The interactive presentation in H5P will enable interaction with various models: (1) Peer models—observing peers completing tasks; (2) Multiple models—showcasing different problem-solving approaches; (3) Coping models—observing someone who struggles but masters the platform. These examples will help normalize mistakes and encourage persistence.

Rationale

Using H5P on WordPress is ideal for implementing social cognitive theory because learners can observe expert demonstrations via an interactive presentation, practice with immediate feedback, and reflect on their learning process with peers. Strategies like vicarious learning and modeling allow students to build confidence through observation and imitation of expert behavior. The module design incorporates self-regulation strategies like goal setting, and this will ensure that students and teachers stay engaged and motivated throughout the course. The social cognitive theory approach will allow teachers to use the AI tool so they can build both technical and cognitive skills while increasing self-efficacy, this will allow for effective application to accurately diagnose real-life patients in the performance context and save lives.

Where This Theory Is Helpful in My Professional Context

- **Building Self-Efficacy:** Assisting learners in gaining confidence using new AI tools by observing experts and peers and practicing with guided support.
- **Collaborative Learning:** Facilitating peer interactions where learners model behaviors for each other, share strategies, and provide mutual support.

Cognitive Information Processing Theory

Primary Theorists: Richard Atkinson & Richard Shiffrin, Robert Gagné, George Miller

Definition of Theory:

Cognitive Information Processing (CIP) Theory focuses on how information is received, processed, stored, and retrieved in the human mind. CIP is a generic name for theories that deal with "the sequence and execution of cognitive events" (Schunk, 2020, p. 169). Theorists in this arena are focused on the effects of the environment on the learner, how they encode information

and relate it to what they know already, and how they store knowledge in their memory to be retrieved at a later time. The most recent CIP models highlight how learners take control of the learning process by selecting the most relevant information and organizing it into knowledge that connects with their prior learning, resulting in a transformative experience.

Structured Skill Development for Doctors Using H5P on WordPress

Learning Activity Scenario Description

My goal in this version of the module is to apply Cognitive Information Processing Theory (CIP) to assist doctoral students and teachers in developing CIP-specific problem-solving strategies (e.g., advance organizers, encoding-retrieval similarity, teaching for transfer), along with strategies related to using the AI tool Sapient Clinician. I will focus on enhancing attention, perception, and working memory through scaffolded tasks while building long-term memory using schema theory, encoding techniques, and elaboration strategies. These modules will utilize the H5P plugin on WordPress to support these processes, creating an environment that minimizes forgetting and reinforces information learned in previous modules, or the students' own personal work and experiences to make the learning more meaningful.

Promotion

Learning will be promoted through modules that link new information with learners' existing knowledge (Schunk, 2020). The module will guide learners and reduce unnecessary cognitive load by introducing one new element at a time. Attention will be focused by connecting instruction to meaningful situations, such as asking learners to input a problem into the tool that is personal to them. A simple-to-complex sequencing approach will be used, starting with basic operations of the AI tool and progressing to more elaborate scenarios.

The module will emphasize working memory processes like elaboration, helping to encode the steps of using the AI tool through maintenance rehearsal (repetition) and elaborative rehearsal (relating new information to prior knowledge). Information will be organized into a hierarchy of essential skills for using the tool, with audiovisuals supporting mnemonic strategies and mental imagery development.

Example Learning Activity Steps

> **Attention Management Using Advance Organizers:** The module will capture learners' attention by using signals such as bold prompts and interactive elements within H5P. An advance organizer will connect the basic principles of prompting to the various categories required for effective tool use (e.g., symptoms, diagnoses, follow-up recommendations). Questions will be included to maintain interest and help learners link their existing knowledge of AI prompting with the capabilities of Sapient Clinician for teaching

effective diagnostic techniques. This helps learners prioritize critical information effectively.

1. **Teaching Using Encoding-Retrieval Similarity:** Since the AI tool eliminates the need for simulated patients, learners can practice diagnoses repeatedly until they achieve accuracy. The module will include practice questions that are similar, but not identical, to actual test questions to ensure variety and challenge, enhancing encoding-retrieval similarity. This approach strengthens the connection between learning and assessment contexts.
2. **Encoding into Working Memory Using Retrieval-Based Learning:** As learners interact with Sapient Clinician, they will be cued to retrieve essential information, increasing their motivation to use the tool in more advanced ways. For example, they might begin by inputting cues for diagnosing a minor injury and progress to diagnosing complex conditions like lung cancer. The module will help learners develop concept maps that link basic diagnoses to more advanced ones, facilitating deeper understanding.
3. **Strengthening Long-Term Memory Through Schema Theory and Propositions:** To enhance long-term memory, the module will apply schema theory to help learners organize and store information effectively. Learners will start by understanding the general schema for using the tool with simple AI prompts, then apply the same strategy to more complex prompts. Propositions will be embedded within the module to connect knowledge of basic AI usage with the specific functionalities of Sapient Clinician, aiding in knowledge integration.
4. **Using Procedural Knowledge and Strategy Transfer:** Learners will practice specific diagnostic procedures through interactive case studies within H5P, building their procedural knowledge of using the tool. Feedback with explanations of correct answers will promote proper use of the AI tool over time. The module will build on learners' prior knowledge of AI tools, drawing from their previous experiences, as each student's skill set will differ.
5. **Testing as a Means of Relearning:** During each module, learners will take non-graded quizzes covering previously learned material to facilitate knowledge transfer. These quizzes provide opportunities to reinforce concepts and practice their application, serving as a form of retrieval practice that strengthens memory.
6. **Promoting Learning Through Visual Memory:** Research indicates that people remember information better when presented visually, and memory is enhanced when content is presented in both verbal and visual formats (Schunk, 2020). The module will include visual and verbal cues for correct answers, such as screenshots or mnemonic devices, to help imprint the knowledge of Sapient Clinician usage on both teachers and doctoral students.

Rationale

The H5P tool on WordPress is ideal for implementing Cognitive Information Processing strategies because it allows for self-directed learning while providing structured guidance.

Learners will progressively build both general and specific problem-solving skills using advance organizers, encoding-retrieval strategies, schema theory, and visual cues. These CIP techniques help strengthen working memory and long-term memory in using the tool.

Additionally, the module will use signals, varied content, and stimulating material to ensure learners focus their attention on mastering the tool. This approach allows them to process information meaningfully and transfer that knowledge to real-life diagnostic tasks (and, of course, pass their exams). The CIP approach in the module enhances critical thinking for diagnosing AI-generated patients, improves metacognition through feedback from quizzes and tests, and ultimately boosts long-term retention, all of which are crucial for mastering Sapient Clinician.

Where This Theory Is Helpful in My Professional Context

- **Complex Skill Acquisition:** Teaching doctors to process and retain how to use an AI-tool to enhance the learning experience in the classroom using a trained AI agent that goes beyond using paid actors to help students in assessment of these skills.
- **Enhancing Memory and Retention:** When designing curriculum for my sailing school (at my current job) I will use strategies that improve attention, encoding, storage, and retrieval of information, to make sure that learners can recall and apply knowledge in the real-world scenarios of using the reservation system, online forums, and specific boat usage.

Constructivism

Collaborative and Inquiry-Based Learning for Doctors Using H5P on WordPress (and In-Person)

Primary Theorists: Lev Vygotsky, Jean Piaget, Jerome Bruner, John Dewey

Definition of Theory:

Constructivism explains how people learn through their own experiences, purporting knowledge is not an exact "truth" that can be drilled into the learner like behaviorist models posit, but rather that the truth is a "working hypothesis" (Schunk, 2020, p. 315) Theorists who align with constructivism believe that learners construct knowledge only through experience and then reflect on those experiences to cement the knowledge into the respective performance context. Learning is looked at more of an active process that is built by strategies which include: apprenticeship, discussion and debates, and hands-on problem-solving activities. "Constructivist theories of learning emphasize the importance of learners actively engaging in constructing their own knowledge" (Hmelo-Silver et al., 2007, p. 100)

Learning Activity Scenario Description

In this next adaptation of my learning module, I aim to apply constructivist learning strategies to help doctoral students and teachers develop live situation problem-solving skills and master using the AI tool Sapient Clinician. I say "tool" throughout this paper, when really, Sapient Clinician is more of a "trained agent" to help the students and doctoral teachers provide a learning lab without hiring actors. My module, using a constructivist framework, will involve strategies like inquiry-based learning, peer collaboration, scaffolding, authentic assessments, apprenticeships, class discussions, student portfolios, and reflective teaching via the instructor. These activities will engage learners in a more meaningful exploration and will help them use Sapient Clinician independently without guidance.

After completing this module, learners (both students and teachers) will actively construct their knowledge of Sapient Clinician and patient diagnosis through their own experiences. This will be achieved by incorporating multiple instances of peer interaction and self-reflection. Ultimately, the focus will be on real-world applications like diagnosing patients in various contexts, whether in a hospital, outpatient facility, ski resort clinic, or first-aid office at a school or casino.

Promotion

"Learning situations should provide students with opportunities to engage in the scientific practices of questioning, investigation, and argumentation" (Hmelo-Silver et al., 2007, p. 105). In this module, learning will be promoted through activities that will encourage inquiry-based learning and peer-assisted collaboration. The learners will be engaged using inquiry practices that become scaffolded by expert guidance through embedded videos or in-person instruction.

My goal is for students to develop a deeper understanding of Sapient Clinician (SC) so they can explore concepts beyond the simple task of using the AI platform. I want them to learn and grow through hands-on experience and exploration. The updated module will challenge students' preconceptions of how AI can replace a real-life patient or actor in similar scenarios. The instructor or I will guide learners as they explore SC in complex real-life situations, helping them structure concepts holistically (Schunk, 2020). I will adapt the training to include an in-person module where learners engage in reciprocal teaching, allowing the students to teach the instructor how to use Sapient Clinician once they grasp the core concepts. Peer collaboration will follow, and help promote knowledge as students teach each other about the various input options in SC. The instructor's teaching style will be able to adapt to the learners' various contexts, using personal and professional knowledge as reflective teaching to create authentic assessments for each clinician type. This approach will help students acquire practical skills in their specific workplaces to develop a deeper understanding of AI diagnostic tools as a whole.

Example Learning Activity Steps

1. **Instructional Scaffolding and Discovery Learning:** The module will start by guiding learners through Sapient Clinician's basic functions using instructional scaffolding. In the in-person module, the instructor will "push students to explain their thinking to help them

build a causal explanation or identify the limits of their knowledge" (Hmelo-Silver et al., 2007, p.101). Instead of dictating prompts to input into SC, they will let them take the reins to ensure the learning is more meaningful. Learners will receive initial support with step-by-step tutorials but gradually take more control as they explore independently. When they encounter roadblocks, they will be able to overcome these issues themselves to help apply this knowledge to real-world patient cases and their specific contexts.

2. **Peer Collaboration and Reciprocal Teaching:** As learners progress through the module, they will engage in peer collaboration and work in small groups to diagnose patient cases using Sapient Clinician. The instructor will ensure an environment that provides "prompts to use particular reasoning strategies... structures for students to follow... and models of expert performance" (Hmelo-Silver et al., 2007, p. 101). This environment will encourage reciprocal teaching, where learners explain their thought processes and strategies. One unit can even focus on argumentative strategies where peers discuss the strengths and weaknesses of using the tool in certain ways. Peer feedback and group discussions will strengthen understanding and promote shared knowledge construction.
3. **Authentic Assessment and Apprenticeships:** Building from Vygotsky's (1962) theory of the zone of proximal development, learners will "bring their own understandings to social interactions and construct meaning" (Wertsch, 1984 as cited in Schunk, 2020, p. 333). Learners will participate in authentic assessments to diagnose real-life patient scenarios using SC in a context most relevant to them. These assessments will mirror challenges they will face in their future medical practices. Following assessments, apprenticeship-style learning will pair learners with skilled mentors to tackle greater challenges and grow in their unique environments.
4. **Inquiry-Based Learning and Class Discussions:** To foster inquiry-based learning, I will also design a question template for learners to ask AI chatbots (ChatGPT, Gemini, Claude, etc.) to serve as a personal tutor that will help guide them toward deeper understanding of Sapient Clinician and help the learners with the ability to "reason, derive general principles, and apply them to new situations" (Schunk, 2020, p. 354). Instructors will present open-ended questions and problem-solving tasks that will require learners to explore different diagnostic approaches using Sapient Clinician. Learners will then engage in class discussions and/or online debates within class forums to share findings, challenge assumptions, and further develop critical thinking in a very hands-on manner. This constructive process will help learners internalize the knowledge deeply and be able to transfer this knowledge to various medical cases in the performance context.
5. **Reflective Teaching and Student Portfolios:** Throughout the module, instructors will employ reflective teaching methods where the module is student-centered and adaptable to the specific context. Instead of simply using SC in one way, learners will take the role of the patient and act out scenarios previously inputted. This will help them experience the differences between AI and human interactions. Instructors will adapt and seek solutions if students aren't learning effectively in their own context and suggest a

different or opposing context. Additionally, learners will build portfolios that document their progress with Sapient Clinician and catalogue the diagnoses made during the module. They will also journal and reflect on how their understanding of the tool has evolved. These portfolios will serve as personal records of growth to help foster meaningful and deep-structured learning that will transfer beyond the classroom into real-life patient diagnosis.

Rationale

The constructivist approach in this version of the module ensures that learners actively engage with the material and construct their own understanding of Sapient Clinician through discovery, collaboration, and reflection. Scaffolding will allow learners to gradually build skills, and peer collaboration will foster a community of shared learning. Authentic assessments will be tailored to each learner's environment to promote knowledge transfer. Inquiry-based learning will encourage deeper engagement with SC in the different contexts of the students. Reflective teaching will enable instructors to adapt to different learners, and student portfolios will provide personalized understanding and concrete evidence to carry into their medical careers. Class discussions and forum discussions will also ensure learners will develop critical thinking skills that are essential for success to build confidence in how to use Sapient Clinician effectively. As Confucius said, “Tell me and I will forget, show me and I may remember, involve me and I will understand” (Hmelo-Silver et al., 2007, p. 101).

Where This Theory Is Helpful in My Professional Context

- **Real-World Problem Solving:** I am encouraged to know specific ways beyond mentoring and apprenticeship to convey this information via a constructivist approach.
- **Designing Courses for my Sailing School:** Hands on learning is very effective, but harder to design, especially if the learners don’t have a wealth of knowledge. I am excited at the possibility of designing a course for more advanced knowledge at the sailing school.

Gagné's Nine Events of Instruction

Applying Gagné's Nine Events of Instruction to Teaching the Sapient Clinician AI Tool

Primary Theorist: Robert Gagne

Definition of Theory:

The nine events of instruction spring from the behaviorist framework where first the instructor determines the objectives and then categorizes them into one of the five domains of learning outcomes. Each of the objectives are stated in performance terms using one of the standard verbs

associated with the desired learning outcome. The instructor then uses the conditions of learning to determine the conditions necessary for transfer of knowledge, and finally the events of instruction are decided to promote the internal process of learning and put into the lesson plan (Nine events of instruction -Ed Tech Wiki). The nine events are a blueprint for effective teaching and can be used to guide the learner towards acquiring knowledge.

Scenario Description

My goal is to create interactive learning modules for Sapient Clinician and use Gagne's nine events to do so. By structuring the module using this theory of instruction, my aim is to first gain attention, then build on prior knowledge, next provide guided learning, and promote the transfer of skills to real-world medical contexts using feedback and assessments.

Gagné's Nine Events of Instruction

1. Gain Attention:

I start the module by referencing the classic movie *Short Circuit*, which features a friendly robot to highlight how robots have long been a part of our culture and how they help humans similar to Sapient Clinician. This nostalgic reference grabs the learners' attention and sets the stage for introducing AI as a tool to assist us. Additionally, I incorporate highly visual AI art, created using prompts through the Cosmic Dream tool to further capture interest. However, I could enhance this even more by replacing the movie reference with compelling data on diagnostic errors in medicine and how AI tools like Sapient Clinician can significantly reduce these errors. This approach would not only engage the learners but also motivate them by emphasizing the real-world impact of mastering the tool.

2. Inform Learners of the Objectives:

My primary objective is for learners to grasp both the basic and advanced features of Sapient Clinician. I also make it clear that mastering these features will directly contribute to improving their diagnostic skills and, ultimately, patient care. Setting these expectations helps the learners see the value of the tool in their professional development and patient outcomes.

3. Stimulate Recall of Prior Learning:

To stimulate recall, I include multiple-choice questions that encourage learners to reflect on what they already know about AI tools and their applications in medicine. This step helps learners activate prior knowledge, making it easier to connect new information with what they've already learned.

4. Present the Content:

Using Cognitive Information Processing (CIP) techniques, I methodically present the content, guiding students through the context of how Sapient Clinician works. I walk them through the process of inputting patient information, ensuring that each step is clear and easy to follow.

5. Provide Learning Guidance:

After presenting the content, I summarize the key takeaways into straightforward bullet points. These bullet points not only reinforce the material but also offer practical tips for using the tool more effectively, helping learners apply what they've learned with confidence.

6. Elicit Performance (Practice):

Following the learning guidance, the module includes a hands-on practice session where learners get the chance to input patient information into Sapient Clinician themselves. This interactive element allows them to apply the concepts in a real-world setting, reinforcing their understanding.

7. Provide Feedback:

Throughout the module, reinforcement and corrective feedback is provided through built-in online tests. These tests give immediate responses to the learners' input, helping them identify areas where they may need further improvement or clarification.

8. Assess Performance:

To assess learners' understanding of the material, I include a fill-in-the-blank test. This type of assessment helps ensure that the learners have internalized the key concepts and can recall them accurately when needed.

9. Enhance Retention and Transfer:

To support long-term retention and the transfer of skills to their professional practice, I provide learners with additional resources such as a job aid and flashcards. These tools reinforce the material, making it easier for learners to retain and apply their knowledge in real-world situations.

Rationale

Applying Gagné's Nine Events of Instruction ensures a comprehensive and effective learning experience that is very thorough. This theory of instruction provides a good foundation for modules and can be further polished with more feedback to create a more permanent learning experience for Sapient.

Where This Theory Is Helpful in My Professional Context

- **Structured Learning Experience:** Gagné's model is clear and transferable to online learning and in-person learning.
- **Teaching Sailing to Members at the Sailing Club:** This knowledge will allow me to create structured modules that go beyond a simple presentation and allows me a foundation to create lasting learning experiences to increase the value for each member and student for years to come.

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