Integration: Social Cognitive Theory

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Social cognitive theory insists that learning comes from enactive and vicarious processes. An enactive method suggests learning occurs from doing or performing, while a vicarious method involves observing others perform. Most learning in this theory is applied vicariously, where individuals learn by observing, reading, and listening. More complex skills require using both methods by combining the powers of observation and performing. According to this theory, these skills, aligned with proper motivation, are the primary factors that drive learning. Applying this knowledge to the course outline of the Cardiac Pathology curriculum will help determine whether this theory has the most practical application to this course.

Where the curriculum excels within the social cognitive theory is its vicarious or observational learning. Every week, the class has students observing through watching, reading, and listening. Students are assigned a chapter to read with the correlating topic subject combined with another observational method, such as watching a YouTube video, reading a journal article, or watching a demonstration. Four components of observational learning can additionally lean on the success or failure of the course. Components include attention, retention, production, and motivation.

Attention is influenced by how the course is designed, valued, and presented. Regarding design and presentation, the instructor is primarily responsible for attracting attention. The teaching materials must be distinctive in color, size, shape, or sound to keep the observer's attention. For example, in Figure 1, Jeopardy!, the game should look, feel, and sound like the original Jeopardy! game. If not, the model loses its characteristics and may cause learners not to give their full attention.

Figure 1

Topic from Cardiac Pathology curriculum

9	Valvular Heart Disease	• Reading: Lilly Chapter 8 • Activity: Jeopardy! Game of valvular heart disease • Assignment: Concept Map – Similarities and Differences of Valve Disease	7

Instructors presenting this material must be competent and knowledgeable of the subject matter. Teachers without a background in cardiology and sonography should not attempt to present this class, as learners rely on their instructors to be informative and functional. This idea ties into the characteristic of model prestige and competence. Learners believe they will face the same situations as the instructor, which drives the ability to learn the necessary methods to succeed. Students attend to a teacher because the teacher prompts them and because they believe they must demonstrate the same skills and behaviors (Schunk, 2020). Plainly, a math teacher instructing a sonography class to sonography students will not demand the same attention as a sonographer teaching the class. Presenters who are informative and functional increase their learners' attention. The last influence of attention, value, is dependent on the student. Students must believe that the activities presented are important and will lead to success, such as high grades, graduating, or advancing careers to demand their attention.

In the social cognitive theory, retention depends on rehearsing or coding information as an image, verbal form, or both (Schunk, 2020). In the course curriculum, students must recall information periodically throughout the semester in the form of exams. Figure 2 shows that in week 13, students must recall information from chapters 10, 13, and 14 to demonstrate their retention ability.

Figure 2

Topic from Cardiac Pathology curriculum

13	Diseases of the Pericardium	• Reading: Lilly Chapter 14 • Exam 4: Chapters 10, 13-14	12

Production takes place when a student can demonstrate a skill learned through observation. In Figure 3, students get assigned a case study to determine what they have learned during the class. The weeks leading up to the final assignment show various cardiac pathologies for the student to learn through observational methods, such as reading and watching videos. Production can be a vital learning step, as complex behaviors are rarely learned only through observation. As an instructor, providing feedback on production activities is important to help refine students' skills.

Figure 3

Topic from Cardiac Pathology curriculum

15	Final	• Assignment: Case Study – Choose one cardiac pathology discussed and give a presentation involving the pathology diagnosis, physical exam findings, echocardiography findings, and prognosis • Complete Course Evaluation	1-13

It is important to note that some students may face difficulties converting observational skills into action. Instructors should prepare to have other methods to test students if they demonstrate difficulties presenting information learned through observation.

Motivation is the catalyst that increases attention, retention, and production when individuals believe that learning is important. Motivation stems from a student's goals, outcome

expectations, values, and self-efficacy. However, instructors must influence motivation by making learning engaging, relating material to student interests, having students set goals and monitor goal progress, providing feedback, and stressing the value of learning (Shunk, 2020). In the Cardiac Pathology curriculum, motivation is engaged in multiple ways. Learning material is made interesting through gamifying assignments such as the Jeopardy! game activity. Students engage in a fun and interactive learning method instead of a lecture or PowerPoint presentation. Also, students receive feedback by exam tests throughout the class as a formative assessment.

As explained previously, complex learning benefits from both observing and performing. However, the curriculum needs more enactive experiences. The teaching strategy for this curriculum leans more towards retrieval-based learning from the information processing theory. Students use retrieval to complete exams, quizzes, and reading content during the semester. Multiple areas within the curriculum could add enactive activities to help improve learning.

In week 3 of the curriculum, the instructor performs a lab activity to demonstrate operating a transducer during an echocardiogram, as seen in Figure 4.

Figure 4.

Topic from Cardiac Pathology curriculum

3	Imaging and Hemodynamic Assessment	• Reading: Lilly Chapter 3 • Activity: Lab – Watching echocardiogram and learning probe manipulation for proper imagining assessment	3

Lab demonstrations can make for an excellent observational learning activity, but the experience could be enhanced by adding a lab for the students to practice the observed skills. This process makes way for motor skill learning. Motor skills are essential for becoming a successful

sonographer. Sonographers must be capable of controlling a transducer with one hand while using the other hand to operate the ultrasound cart. However, it may be difficult for this class to demonstrate some pathology topics with ultrasound in a lab setting. Beyond learning the basic transducer manipulations, this learning requires time outside the lab and at clinical rotations. Clinical preceptors are then relied upon to help teach ultrasound skills for different pathologies. Feedback from these preceptors is vital for motor skill development and self-efficacy.

One form of enactive experience found in the curriculum is group presentations. Group presentations have shown that students prefer working in groups to help them understand more about an assignment and enable them to learn more (Abdul Kadar et al., 2023). The key to group work, however, is the role of the instructor. For successful group presentations, practical teaching materials, examples, clear communication, and pedagogical strategies, such as social cognitive theory, facilitate effective learning environments in the group setting. The curriculum has many opportunities for group work, such as a simple group discussion board to recap each week.

Beyond the pros and cons of the curriculum, student and teacher self-efficacy is the significant variable that drives learning. Self-efficacy is a belief about what one is capable of doing; it is not the same as knowing what to do (Schunk, 2020). Student self-efficacy partly depends on a student's ability. Students with higher ability tend to have higher self-efficacy than students with lower ability. Higher efficacy is directly related to student participation, effort, and persistence. These positive behaviors lead to learning. This type of student can persevere through complex tasks, such as a challenging class because their efforts to complete a degree will be worth it.

Another reason self-efficacy leads to better performance is the component of self-regulation. Self-regulation is the complex process through which you control your thoughts, emotions, and actions (Maddux & Kleinman, 2024). Students with better self-regulation, for example, can concentrate in class and listen rather than engage in behaviors such as web surfing or screen scrolling. Self-regulation takes a lot of effort but can be advantageous in distress or failure. Those with higher self-efficacy are less likely to be bothered by failure and, consequently, have more substantial control of their self-regulation. For example, classroom failures can lead to procrastinating, lack of self-belief, avoiding feedback, and being overly self-critical.

Collective efficacy is a concept related to self-efficacy that echoes the same ideas regarding group work. The idea is that groups with higher collective efficacy perform better than groups with lower collective efficacy (Maddux & Kleinman, 2024). For the group's efficacy to be high, team members must contribute portions to the project and believe that they can succeed on the subject together.

Teacher self-efficacy refers to the personal belief about one's capabilities to help students learn (Schunk, 2020). This is an important component of efficacy, as it influences the instructor's activities, effort, and persistence. For example, teachers should not push activities that students have difficulties with. As previously discussed, if students have problems converting observational skills into action, instructors should have other methods to test students. For the curriculum to succeed, the instructor should have high self-efficacy to develop challenging activities and work harder with students to help them achieve learning goals. Teacher self-efficacy significantly predicts student achievement (Schunk, 2020).

In summary, when deployed correctly, the social cognitive theory is an effective pedagogy for the Cardiac Pathology curriculum. Learners will excel with a combination of vicarious (observing, reading, listening, watching) and enactive (performing, teaching, presenting) activities. The instructor must present the activities effectively to capture the learners' attention, retention, production, and motivation. In the case of this curriculum, creating attractive and immersive content delivered by a reputable teacher will help promote learning. For students and teachers to succeed in this course, they must have high self-efficacy. With proper modifications to the curriculum, students will begin to learn through observational methods to learn skills and abilities until they eventually can internalize their skills and abilities so they can become successful sonographers independently.

References

Abdul Kadar, Nur Syafiqah, et al. “Exploring online group work through the social cognitive theory.” *International Journal of Academic Research in Business and Social Sciences*, vol. 13, no. 9, 25 Sept. 2023, https://doi.org/10.6007/ijarbss/v13-i9/17744.

Maddux, J. E. & Kleiman, E. (2024). Self-efficacy. In R. Biswas-Diener & E. Diener (Eds), *Noba textbook series: Psychology.* Champaign, IL: DEF publishers. Retrieved from http://noba.to/bmv4hd6p

Schunk, Dale H. *Learning Theories: An Educational Perspective*. Pearson, 2020.

Curriculum

Week	Topic	Module	Learning Outcomes
1	Normal Cardiac Structure and Function	• Reading: Lilly Chapter 1 • Introductory Activity (*Things and Lies*) • Assignment: Matching – Names and Structures of the heart	1
2	The Cardiac Cycle: Mechanisms of Heart Sounds and Murmurs	• Reading: Lilly Chapter 2 • Watch: Learn Heart Murmurs video (https://www.youtube.com/watch?v=IrWEAucHoA0) • Quiz: Basic Cardiac Structure and Function	2
3	Imaging and Hemodynamic Assessment	• Reading: Lilly Chapter 3 • Activity: Lab – Watching echocardiogram and learning probe manipulation for proper imagining assessment • Exam 1: Chapters 1-3	3
4	The Electrocardiogram	• Reading: Lilly Chapter 4 • Activity: Play/Practice EKG game • Assignment: Matching – Cardiac Rhythms with Rhythm Strips	4
5	Cardiac Arrhythmias	• Reading: Lilly Chapter 11 • Assignment: Matching Cont'd – Cardiac Arrhythmias with Rhythm Strips • Quiz: Basic EKG readings	10
6	Atherosclerosis	• Reading: Lilly Chapter 5 • Reading: Article (John Hopkins – Atherosclerosis)	5
7	Ischemic Heart Disease	• Reading: Lilly Chapter 6 • Reading: Article (Wall Motion Abnormalities)	6
8	Acute Coronary Syndromes	• Reading: Lilly Chapter 7 • Assignment: Matching – Regional Wall Motion with Coronary Artery Distribution • Exam 2: Chapters 5-7	6
9	Valvular Heart Disease	• Reading: Lilly Chapter 8 • Activity: Jeopardy! Game of valvular heart disease	7

		• Assignment: Concept Map – Similarities and Differences of Valve Disease	
10	Heart Failure	• Reading: Lilly Chapter 9 • Watch: Heart Failure – Compensation and Decompensation • Exam 3: Chapters 6,8-9	8
11	Cardiomyopathies	• Reading: Lilly Chapter 10 • Assignment: Group Presentation of one of the following cardiomyopathies: Dilated, Hypertrophic, Restrictive, or Takotsubo	9
12	Hypertension	• Reading: Lilly Chapter 13 • Reading: Article (Echocardiography and Blood Pressure Management)	11
13	Diseases of the Pericardium	• Reading: Lilly Chapter 14 • Exam 4: Chapters 10, 13-14	12
14	Cardiovascular Drugs	• Reading: Lilly Chapter 17 • Assignment: Group Presentation of one of the following heart medications: Anticoagulants, ACE inhibitors, Beta blockers, Calcium channel blockers, or vasodilators	13
15	Final	• Assignment: Case Study – Choose one cardiac pathology discussed and give a presentation involving the pathology diagnosis, physical exam findings, echocardiography findings, and prognosis • Complete Course Evaluation	1-13