**Create: Strategies to Support Learning**

| ***Gagné’s Different Types of Learning – Examples of Outcomes & Assessments Strategies*** | |
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| **Type of Learning & Outcome/Assessment Examples** | **Guidelines & Possible Strategies** |
| **VERBAL INFORMATION (Declarative)**  ***Recall from memory:***   * State four examples of controlled pharmaceutical drugs. * Recite the square roots for numbers 1 through 12. * In your own words, summarize the procedure for obtaining a visa for foreign travel.   ***Recall with aid:***   * Use your bookmarks to find the latest CPR procedure.   ***Recognize:***   * Which of the following is not an appropriate use of green sand for gardening? | The human brain seeks to identify patterns and organize ***declarative information*** to aid understanding and recall. Help learners memorize and attach meaning to declarative information by creating patterns and connections between prior knowledge and new information. 87% of learners must either see or do something with new knowledge. Use:   * Pictographs, charts, and graphs, and graphic representations. * Elaboration like note-taking models and creating analogies, and organizational strategies like outlining and graphic organizers and mind maps. * Use mnemonic devices (for example: “FACE” to help piano students remember the white keys on the treble clef) when information is new and unrelated to learner’s prior learning. * Use visual organizing cues such as color-coding units and arranging instruction to reflect the natural organization inherent in the content. * Use drill & practice, tutorials, games, and lectures. |
| **INTELLECTUAL SKILLS**  ***Discriminations:***   * Distinguish between tonal sounds in Chinese words. * Remove the shooter marbles from the bag. | * Point out critical or essential features and use examples and non-examples to help learners ***discriminate*** or identify something as either matching or differing from other things. E.g., the guessing game song from the *Sesame Street* T.V. show: “one of these things is not like the others ...” |
| ***Concrete & Defined Concepts:***   * Draw a circle around all the triangles. * List two mammals that lay eggs. * Identify examples of stereotyping in these short stories. * Classify each substance below as either acid or base. | * Relate a ***concrete concept*** with which learners are already familiar to newer more abstract information (***defined concepts***). E.g., relate a lesson on fractions to cutting up a pizza, or use pictures and drawings of buildings to help learners isolate specific design elements to distinguish Greek Revival from Gothic Revival American architecture. * Tutorials, case studies, lectures. |
| ***Principles:***   * If students have meaningful practice and repetition, then they learn better and retain information longer. * Reflection enhances self-assessment, leading to recognition of what works & what needs improvement. | ***Principles*** represent the rules for problem-solving in specific domains. Principles are usually in the form of “if-then” statements. Learners should know how to *apply* and not merely state these rules. Principles can be taught deductively by presenting the principle and guiding the learner to apply it in specific examples (works best for novices), or by using an inductive inquiry approach to present examples and guide the learner to identify the principle (works best for those more familiar with the topic). Simulations, games. |
| ***Procedures:***   * Describe the process for calculating the return on investment. * Demonstrate the procedure for eye irrigation. | * Model how to think about the procedure or process, or provide a verbalization or narration of the thought processes of an expert, articulated while performing the procedure. E.g., demonstrate the analysis of a poem by reading it and stopping frequently to verbalize observations, questions and the connections to prior knowledge. * Provide a written set of the steps involved in the procedure, teach learners to mentally rehearse the steps prior to performing the procedure, and provide tips and observations on exemplary performance. * Provide models, flow charts, graphic organizers, and/or examples for learners, and use them to present the content. E.g., for a unit on the water cycle, provide a blank chart and have students label the cycle. * Make connections between new skills and skills learners already possess. * Provide general rules or heuristics for the process. Point out common errors. * Provide practice using the procedure under a variety of conditions that impact the way the procedure is performed. E.g., a language instructor teaches a greeting dialogue and assigns different roles to learners (child to friend, greeting strangers, etc.) to provide practice with both formal and informal greetings. * If the procedure must be performed automatically without conscious thought (i.e., to the level of automaticity), provide practice opportunities and tools for self-assessment (progress charts, reflective exercises and rubrics) so learners can determine how much practice they require to reach their goals. |
| ***Problem Solving:***   * For the provided case, evaluate the available mortgage loans and select the best one for the client. * Use inductive reasoning to predict future elements in a pattern. | The highest-level intellectual skill is *problem solving*. Problems are either well-structured (like a traditional math story problem), or ill-structured. Ill-structured problems are common in life but have unpredictable solutions, often use concepts and principles from several domains, consist of many unknowns elements, and require the use of critical thinking skills. Use case-based exercises, project-based learning, simulations, role play, debate, small group discussions, brainstorming and the generation and testing of hypotheses. |
| **COGNITIVE STRATEGY SKILLS**  ***Rehearsal:***   * Use the acronym Roy G. Biv to remember the order of colors in a rainbow. * Use meaningful visual associations to help you remember the state capitals. | * Passive and active rehearsal strategies that include repeating information over and over to remember it; reviewing notes; using flash cards; and rewriting notes. |
| ***Elaboration:***   * Think of an example and a non-example of a synonym. * Summarize the chapter. | * The use of strategies to expand on information to link it to prior knowledge, including paraphrasing and summarizing; highlighting and underlining; making predictions; and using mnemonics. |
| ***Organization:***   * Provide an example of when you experienced the benefits of better test grades as a result of using distributed practice instead of mass practice. * Using the analogy of a file cabinet, explain how to organize your electronic desktop. | * The use of strategies to organize information to make it more personally meaningful, including creating flow charts, mind maps, outlines, diagrams, matrices, and tables; selecting the main idea from a reading; grouping; attending to headings and subheads; the use of graphic organizers, cause and effect diagrams, and node graphics. |
| ***Metacognition:***   * Reflect on and identify what you know and what you don’t know about the topic. * Estimate the amount of time it will take to read 5 pages. | * The use of metacognitive tasks to improve personal learning by focusing on tasks, avoiding distractions, posing questions, identifying unknown information, setting goals and monitoring progress, planning, controlling time and study environment, seeking help from others, and monitoring emerging understanding and content relevancy. |
| ***Affective:***   * Monitor your emotions by discussing your feelings with your small group. * Develop a personal reward system to encourage yourself to complete the project. | * The use of strategies to improve learning by controlling emotions, self-motivating through rewards and delayed gratification, control of anxiety and negative thoughts, employing coping and stress reduction strategies and monitoring effort. * **Specific Strategies:** ARCS motivation model; extrinsic rewards including grades, praise and money; intrinsic motivators that appeal to learner interests, enjoyment and challenge. |
| **ATTITUDES**   * Develop your own personal learning goals for this unit of instruction. * Describe the relevance of this information to you personally.   Attitudinal outcomes address feelings, attitudes, motivation, values and beliefs. Each attitudinal outcome has a cognitive, an affective and a psychomotor component: knowledge that forms the basis of the attitude, the feelings or beliefs about that knowledge, and the behaviors that reflect the attitude. Address all three components to promote transfer of attitudinal learning. | * Use realistic, relevant, and stimulating instruction; present credible, persuasive messages; elicit purposeful emotional involvement; involve the learner in planning, production, or delivery of the message; provide post-instruction discussions or critique opportunities; demonstrate desired behaviors using a respected role model; provide practice of desired behavior through role-play or debate; reinforce the desired behavior; present the general and then the particular, the abstract and then the concrete; improve source credibility by providing support for the source’s expertise and trustworthiness; use factual and objective messages when information is important but unfamiliar to the learner, and more emotional appeals when information is less important but more familiar to the learner; provide opportunities for learner self-reflection and self-evaluation and assessment; use open-ended assessment instruments along with any Likert-type or close-ended measurements. * **Specific Strategies:** ARCS model, service learning; compelling and/or inspirational stories; role model demonstrations; role-play; simulations; cognitive dissonance; opportunities to observe the behavior of others and the consequences; positive reinforcement of behaviors reflecting desired attitudes. |
| **PSYCHOMOTOR SKILLS**   * Demonstrate correct technique for the butterfly stroke. * Correctly perform a caesarian section on the patient. | * Provide a visual presentation of the skill; describe the skill verbally and then demonstrate it; provide plenty of practice and feedback. * Use drill and practice exercises and games. |
| **INTERPERSONAL SKILLS**   * **Effective Interpersonal Communicator** (writing, speaking, presenting, listening) * **Valuable Contributor** (commited, cooperative, collaborative, team player, follow-up, acknowledging contributions of others) * **Perceptive Global Citizen** (relating and communicating interculturally) * **Capable Manager, Mentor & Leader of Others** * **Self-aware Reflector** (about behavior, appearance, identity, goals, stress, well-being, commitments, relationships, learning, growth) | * **Communicator** – Role-play simulations; experiential methods; highlighting situational constraints and exceptions; reciprocal writing assignments; speeches and presentations; giving and receiving constructive feedback; interaction analysis (observational techniques used to record what’s happening in a group); effective questioning; Triadic exercises (with a speaker, listener, and observer); and effective listening exercises. * **Contributor** – Group projects; norm and goal setting; team synergy and trust exercises; transcript analyses; practice giving and receiving constructive feedback; role and responsibility clarification; progressive collaboration; peer critiques. * **Global Citizen** – Sociological shift; Triadic exercises (with a speaker, listener, and observer); effective questioning; global awareness; key pals; CultureGrams; exploratory learning simulations. * **Manager** – modeling; coaching; positive stress relief and coping strategies; oral and written evaluations; role play; personality tests; management style inventories; peer critiques; Socratic questioning. * **Reflector** – Reflective diaries and self-disclosure inventories; goal setting and monitoring; personality inventories; bio-feedback; wellness questionnaires; writing about graphic products and producing a graphic representation of written work. |
| *Marzano, Pickering, & Pollock, (2001); Miller (2005); Quinn (2001); Simonson & Maushak (2001); Smith & Ragan (2005);, Tileston (2004); Zimbardo & Leippe (1991).* | |