

|                          | <b>Factual</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Procedural</b>                                                                                                                                                                                     | <b>Conceptual</b>                                                                                                                                                                                                                                                                                                                                                                                 | <b>Metacognitive</b>                                                                                                                                                                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cognitive process</b> | <i>Knowing facts, concepts, ideas, theories</i>                                                                                                                                                                                                                                                                                                                                                                                                 | <i>Knowing how to do something; steps or methods</i>                                                                                                                                                  | <i>Knowing when and why to use facts or procedures; knowledge of principles and generalizations</i>                                                                                                                                                                                                                                                                                               | <i>Knowledge of cognition in general, as well as awareness and knowledge of one's own cognition</i>                                                                                                                                                      |
| <b>Create</b>            |  Categorize facts, concepts, ideas, behaviors, emotions                                                                                                                                                                                                                                                                                                        |  Develop a strategic plan for X                                                                                      |  Design a proposal that meets X, Y, Z criteria                                                                                                                                                                                                                                                                   |  Integrate: concept map the various elements involved in X                                                                                                            |
| <b>Evaluate</b>          |  Evaluates ideas through reasoning, experience, values, conceptual understanding, alignment with a goal or purpose<br>Determines whether a fact corresponds with reality, whether it is true<br> Compares arguments or summarizes pros and cons based on patterns in the data |  Evaluates methods through reasoning, experience, values, conceptual understanding, alignment with a goal or purpose |  Select the most appropriate ideas and facts related to a method. Select the most appropriate solution. Research. Explain and justify                                                                                                                                                                            |  Reflects, revises, and processes to improve outcomes<br>Asks follow-up questions<br>Judges the value, worth, or quality of a situation based on established criteria |
| <b>Analyze</b>           |  Identifies patterns in speech and images in a probabilistic way (i.e., using predictive algorithms) in the data it was trained on                                                                                                                                                                                                                             |  Breaks a problem down into steps                                                                                    |  Selects the key points of a source based on previous understanding and aims<br>Identifies the different aspects of the problem, the factors contributing to it, and potential solutions                                                                                                                         |  <u>Revises the representation of a source</u> (i.e., the key points selected by human or AI).<br>Breaks down a method, procedure or problem and revise its steps.    |
| <b>Apply</b>             |  Selects related ideas or facts because they are statistically likely to appear together in the training data                                                                                                                                                                                                                                                |  Follows a procedure to solve a problem or a query<br>Tries to solve a problem through trial and error             |  Selects the appropriate rule or procedure to use in a specific context, implying they understand the context<br> Specifically trained in step-by-step reasoning tasks and formal logic<br>Works best with problems in STEM |  Uses facts, ideas, concepts, and methods in a specific context and revises the application of thereof                                                              |
| <b>Understand</b>        |  Paraphrases, rewrites, and summarizes facts and ideas                                                                                                                                                                                                                                                                                                       |  Gives examples<br>Summarizes procedures, methods, and steps involved in doing something                           |  Selects facts, ideas, and procedures based on patterns it learned during training                                                                                                                                                                                                                             |  Explains ideas, concepts, theories, or the steps involved in performing a task in their own words                                                                  |
| <b>Remember</b>          |  List facts, concepts, ideas, images                                                                                                                                                                                                                                                                                                                         |  Reproduces procedures (i.e., algorithms)                                                                          |  Lists related concepts and procedures (e.g., basic mathematic operations)                                                                                                                                                                                                                                     |  Identifies facts, ideas, patterns in speech, images, emotions, behaviors, social contexts, and omissions in patterns                                               |

Note.  : What students and instructors can do;  : What AI can do