

Week 3 Journal: Learning, Cognition, Problem-Solving, and Nondiscrimination

Student's Name

College

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#### Part 1: Definitions

Ill-structured problem (Nokes & Schunn, 2010): this is a problem that does not have a clear-cut solution, and whose method of solving is not apparently definite. Thus, such a problem may have multiple ways of solving, where neither is more appropriate than the other is.

Deliberate practice (Nokes & Schunn, 2010): this is an approach of building up expertise in a given field using knowledge structures that could be learnt distinctly. To build the expertise, therefore, the concerned individual acquires 'know-how' in a serialized fashion in all the requisite categories.

Deductive reasoning (Mayer, 2010): this is a 'top-down' approach of problem solving, whereby the individual gathers up related premises concerning a required conclusion. More importantly, however, is that the individual first assumes the premises as true before leading to the logical inference as to what the solution to the larger problem should be.

Convergent thinking (Mayer, 2010): this is an approach to problem solving, whereby the problem has only one appropriate solution. The 'thinker', therefore, must apply a deliberate procedure to retrieve the pertinent fact from memory or work out the solution.

Divergent thinking (Mayer, 2010): in contrast to convergent thinking, this approach requires the 'thinker' to work out as many solutions to the problem as possible. This approach is also applicable to cases where the solution has many constituent parts.

#### Part 2: Related Research

In their research, *Metacognition, Need for Cognition and Use of Explanations*, Coutinho, Wiemer-Hastings, Skowronski, and Britt (2005) contend that metacognition (i.e. metacomprehension and self-directed learning) improves performance in ongoing learning and

problem solving. The research finds that when individuals, such as students, get increasing experience at solving a particular problem they can estimate their performance beforehand; which inspires them to seek out the best ways to solve the related problems. Their findings imply that with respect to learning and cognition, good performance is dictated by the need of the problem-set for either high or low cognition. In other words, when a subject-area requires high cognitive effort, individuals who have a need for cognition are more likely to perform well compared to those low in need for cognition.

The findings that Coutinho, Wiemer-Hastings, Skowronski, and Britt (2005) present imply that researchers should consider the development of a high need for cognition as integral to the development of skills necessary to solve intellectually challenging tasks. This need is in line with Mayer's (2010) argument that for an individual to become an expert in a given field, he or she should build upon the requisite cognitive processes and strategies, rather than on the 'surface' characteristics of the given problem domain. This is also in agreement with Nokes and Schunn (2010) who indicate that for an individual to become an expert in a given domain, he or she should undertake deliberate practice in order to enhance the pertinent cognitive processes.

### **Part 3: Personal Example**

I can relate to the arguments that the related research offer. For instance, I have a friend who developed a poor attitude concerning her course requirements. Because she was taking an economics course, she was required to develop her math skills continually. However, my friend had a poor opinion on how math could ultimately improve her knowledge, thus she started slackening in her academic commitments. This case, therefore, illustrates how poorly developed cognition skills in a particular problem domain could cascade into behavioral aspects, which has the potential to negatively affect social relationships (Maggioni & Alexander, 2010). Note,

however, that I have kept the identity of the ‘friend’ confidential because the American Educational Research Association’s (AERA) code of ethics demand that “Researchers do not disclose ... personally identifiable information concerning their research participants... unless consent from individuals or their legally authorized representatives has been obtained” (AERA, 2011).

#### **Part 4: Ethical Conduct in Research**

Based on the tenets of nondiscrimination in the AERA code of ethics, my research should not carry suggestions that race, ethnicity, gender, or socioeconomic status are responsible for the related individuals’ performance in either learning or development of cognitive processes. My research should only focus on the traits required by the suppositions of the study and leave out hurried conclusions, which are easy to formulate based on prevailing social stereotypes. For instance, although there is a widespread assumption that students of Asian origin are likely to perform better in science-based domains—my research should borrow from the code of ethics that demands use of empirical findings that do not assume the subjects’ cultural or socioeconomic pointers as the basis for given conclusions.

## References

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