Online Problem Solving Assignment

Which problems did you work through?

The three problems I used for this assignment were the Trio Match Game, Wolf, Sheep and Cabbage and the Tower of Hanoi.

EASIEST PROBLEM:

Which problem was the easiest to solve? Why was it easy to solve? What type of problem was it (see Kirkley, 2003 article pg. 8)? Explain. What strategy did you use to solve the problem? How did you develop this strategy? What declarative knowledge was needed to solve this problem? What procedural knowledge was needed to solve this problem?

   The easiest problem to solve was the Wolf, Sheep and Cabbage. It was easiest to solve because the game was quite short and did not require much back and forth with only 3 components to the game (the wolf, the sheep and the cabbage) and a few set rules such as which will eat which when alone. It was also easy to go through all of the possible moves at random to develop a simple strategy that could easily be memorized. This problem poses itself as a well-structured problem through the criteria described in the Kirkley article. The solution to the problem for the most part was singular/convergent- having to move the sheep first and then back upon moving the second piece of the puzzle. The solution did not require higher ordered thinking or depth of knowledge, and the skills from the game could not easily be transferred to anything out of this context. In regards to the Jonassen article, I would say this falls under the logical typology of problem solving because it was a problem that was easily controlled and required the manipulation of limited variables.

   My first strategy was to move the lowest thing on the food chain (the cabbage) but quickly realized that the wolf would eat the sheep. This told me that I would have to move something in the middle of the food chain to separate the two corresponding links in the food chain. Once I moved the sheep, then when I moved either the wolf or cabbage and the game ended quickly. It is here that I decided to do a bit or research and found out that I can move the pieces back and forth. Knowing that I had to move the sheep first, this meant it would have to go back upon moving the second piece.

   The declarative knowledge required for this challenge was knowing the rules! What species would eat what when left alone and also knowing that the animals could move back and forth from both sides of the river. The procedural knowledge required to solve this challenge was knowing that the sheep needed to go over first. I do not think there was much other procedural knowledge required to solve this task.

MORE CHALLENGING PROBLEM

Which problem was the most challenging for you to solve? Why was it difficult to solve? What type of problem was it (see Kirkley, 2003 article pg. 8)? Explain. What strategy did you use to solve the problem? How did you develop this strategy? What declarative knowledge was needed to solve this problem? What procedural knowledge was needed to solve this problem?

The problem that was most challenging to solve was the Trio Match Game. It was most difficult to solve because it included a variety of variables such as shape, color and various trio patterns that could be used to acquire points. There were also many steps to the game and this game lasted much longer than the other two. The type of problem this was in regards to the Kirkley article was moderately structured problem in that it required various strategies and some adaptation to the specific contexts provided.   There were more than one possible solution to resolve the game and without the description of rules (the information), it would have not been possible to achieve a solution. The game required more mental modeling and reasoning and evaluation. Furthermore, the skills of this game can be more easily transferred to farther contexts. In regards to the Jonassen article, I feel this problem could be classified as a decision-making problem in that I needed to identify benefits and limitations and weigh out my various options in piece placement.

The strategy I used was to keep pieces to the outermost sides and divide the board into manageable areas. I also paid attention to the pieces that were coming up to see how they would fit into the pieces already placed on the board. I also took my time, as there was no time limit in the game as I felt that this would allow me to see all the possible trios I could make.

I used these strategies because this game reminded me of a game I play quite frequently called Set. It is a card game that has various shapes, colors, textures and number of shapes on each card. The cards then need to be collected in sets of three using these differences and similarities. I felt this familiarity with pattern recognition gave me an "upper hand" or transferable declarative and procedural knowledge while playing a game that has a similar context. I also feel that having the experience with playing Set had made it so that I internalized the rules of Trio Match Game before I have even played. I was to some degree more of an expert than a novice based on my past experience. Some of the key differences to Trio and Set are that in set, the cards are already laid out and as cards are used to create Sets, they are replaced. However, the "board" of the game is all laid out and it gives you a good while to look at the variables and make patterns. It is also a game of speed, and the Trio Match Game was different such that you could take as long as you wanted to place a shape down.

The required declarative knowledge needed to solve this problem was knowing how to create a trio and what rules needed to be followed. For example, trios can be made with the same shape, different color, or same color different shapes, or different shapes and different colors. The required procedural knowledge needed to solve this problem was implementing strategies to make trios. This was accomplished by looking at the pieces to come and the pieces that already were on the board. This allowed you to know what type of trio you were aiming to create with the upcoming pieces and allowed you to strategize on placing the blocks to achieve these trios.