4.3 Students Thresholds, Difficult Concepts and Pedagogical Strategies

Findings

✓ Tacit Knowledge:
  
  o Tacit knowledge is known as action-based nature of knowledge where knowing its constituted and inseparable from the action (Orlikowski, 2002).
  
  o Tacit knowledge is represented knowledge based on students (individual) experiences. It is usually expressed in a form of drawing, metaphors and other expressions that are not necessarily language since it is typically difficult to express it. The use of tacit knowledge can be categorized into external and internal factors. Considering external factors are less likely to be controlled also known as “situational systems.” An example of this situational system is organizational systems. On the other hand, the Internal factors are divided into different groups (Koskinen, 2003):
    
    ▪ Memory: This is the construction of mental models, intuitions, and manifestations of developing constructs.
    ▪ Communication: It is the factors that are related to disclosure of data which will become knowledge.
    ▪ Motivational Systems: The factors include in this group is commitment and trust in people that are involved in what motivates them for sharing and receiving knowledge.

✓ Foreign knowledge: This knowledge takes place when students try to understand events that are not aligned with what they know in their culture, their current present, or life settings. However, sometimes foreign knowledge is not that extraneous to giving situations. Another reason for a foreign knowledge to take place is due to students predetermined belief or idea of the new knowledge. One way of addressing this foreign knowledge is to anchoring intuitions to similar situations (Perkings, 2009).

✓ Inert Knowledge: “Many years ago, educators coined the expression “the problem of inert knowledge” to refer to their observation that students seldom apply their learning to novel situations with differing content” (Perkins, 2009).

✓ Cognitive Flexibility Theory (CFT): This theory was created as a successor to schema theories that focus on the transference of knowledge. Even more in domains when the knowledge needs to be transferred to solve wicked problems. The principal tenets for CFT are shown as following (Spiro, Collins, Jagadish, & Feltovich, 2003):
  
  • Multiple knowledge representations: Conceptual knowledge needs to be seen with different “lens” where student apply knowledge and give justification from their perspective during the process. This process allows the construction of open knowledge structures among different aspects that further will help students to be more prepared for a teamwork situation.
  • Interconnectedness: The content in instructions should be organized in basis. In other words, in a different table of contents that allows students to have content that it is widely applicable or transferable.
• **Context-dependency and conceptual variability:** This indicates that conceptual knowledge applied in real-world situations requires the variability of uses across diverse contexts, helping students to evidence the different way of applying the knowledge is part of this tenet.

• **Cases and mini-cases:** One way, for helping students to evidence how a conceptual knowledge is used in real-world, is implementing mini-cases that can help students to transfer knowledge into a bigger scale.

**Instructional Recommendations**

✅ **Helping the students to learn the content** *(Svinicki, 2004)*: Svinicki provides 4 points for explaining why the election of a guiding learning theory is important for instructional design:

1. “Learning involves changing the long-term memory of the learner through new connections” *(Svinicki, 2004, p. 15).*
2. “Students must focus on the key aspects of new information to learn it” *(Svinicki, 2004, p. 15).*
3. “Students must encode information into the long-term memory to learn it” *(Svinicki, 2004, p. 15).*
4. “Students must have multiple exposures to using new information for learning to last” *(Svinicki, 2004, p. 15).*