

ANALOGY-GUIDED LEARNING: RELEVANCE IN NURSING

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Introduction

Analogy is a mapping of knowledge from one domain (the base) in to another (the target) which conveys that a system of relation that holds among the base objects also holds among the target objects need not have to resemble the corresponding base objects. Here the objects are placed by virtue of their roles in the common relational structure. Thus, an analogy is a way of noticing a relational commonality independently of the objects in which the relationships are embedded. The principle of systematicity is the central core of the analogy. There is also a maximization of consistency and systematicity in analogy.

Components of Analogy:

1. Identification
2. Retrieval (Base –precedent and target –exercise)
3. Elaboration
4. Mapping
5. Justification

Analogy-guided learning experiences specifically designed to promote analogical reasoning, reflection-on-action, and reflection-in-action. The design of learning experiences was based on theoretical and empirical literature related to analogical reasoning and reflective practice.

Analogical Reasoning

Individuals often use analogical reasoning to make inferences in a problem situation based on known solutions from prior experiences. The analogical reasoning process includes a systematic correspondence between one or more familiar analogues or bases in long-term memory to the novel problem situation or target (Gentner, 2003). The analogical mapping process is influenced by an individual's ability to interpret cues or information in the novel situation and the ability to access his or her repertoire of experiences from long-term memory relevant to the novel situation (Gentner, 2003). Nursing students who are novices with limited experience in context-specific clinical situations are often unable to apply knowledge gained from prior experiences to new decision making situations because their knowledge is encoded and stored in a rule-based situation specific manner (Benner, 2004). They often miss cues and information in the novel situation, unless explicitly instructed, that would enable connecting prior learning to the novel CDM situation (Benner, Tanner, & Chesla, 1994; Cholowski & Chan, 2004). Several researchers have demonstrated that when instructors use strategies that promote analogical reasoning, student learning and transfer of principles to novel

situations is enhanced (Gentner, Loewenstein, & Thompson, 2003; Hepner, 1989; Thompson, Gentner, & Loewenstein, 2000). Specifically, analogy-guided learning involving explicit comparisons across two or more cases, as opposed to single-case analysis, leads to better learning and transfer because it focuses students on the common underlying principle embedded in the cases (Speicher & Kehrhahn, 2009). Other researchers (e.g., Hepner, 1989, Newsome, 1989) have demonstrated that these outcomes are magnified when the learning and test situations occur in real environments as opposed to experimental situations. For example, in a study of the effect of instructional strategies on clinical problem solving, Hepner (1989) found that compared with traditional activities-guided design, which supported analogy guided learning, teacher support had a large effect size ($ES_{sm} = 0.93$) on nursing students' application of knowledge and a very large effect size ($ES_{sm} = 2.09$) on their transfer of concepts to a patient care problem. An important factor in Hepner's study was the use of real hospital patient situations in the guided design group.

Within the clinical component of nursing students' education, postclinical group discussions provide opportunities for students to compare multiple real cases where similarities and differences between cases become explicit. When faculty instructors also engage students in a reflective process of reconstructing incidents, actions, and patient outcomes, students gain an increased awareness of appropriate actions in subsequent decision-making situations.

Reflective Practice

The clinical practice environment is a key component of nursing education where students integrate theories and prior experiences within the context of actual CDM situations. When students engage in reflection on critical incidents from clinical practice (i.e., reflection-on-action; Schön, 1983), their decision making ability is enhanced because this type of reflection enables relating concepts and theories in the context of real situations that are meaningful to students (Atkins & Murphy, 1993; Baker, 1996; Getliffe, 1996). The critical incident emphasizes a specific situation or event unique to the individual student, where reflection-on-action provides a basis for identifying and challenging the student's beliefs, assumptions, and actions (Brookfield, 1990). The process of guided reflection on critical incidents promotes development of student self-evaluation and self-reflection skills (Davies & Sharp, 2000), which can result in transformation of knowledge gained from the incident to knowledge available for future problem solving and decision making (Ertmer & Newby, 1996). Greater accuracy and competence in decision making can result when students apply self-valuation and self-reflection knowledge and skills to a novel CDM situation (Gehring, 1997). This process of applying knowledge and skills to inform action as a situation unfolds is reflection-in-action (Schön, 1983).

Summary

As previously described, analogical reasoning involves individuals' comparison of one or more features of prior experiences stored in long-term memory (i.e., base analog) to features of a novel situation (i.e., target analog). Explicit case comparison with real situations is one way students develop analogical reasoning ability. When instructors explicitly question students in clinical practice to recall prior situations and identify similarities and differences with a current novel situation, it fosters the development of students' analogical reasoning skills used in the decision-making process. The processes of reflection-inaction and reflection-on-action increase students' ability to interpret cues in

the novel situation that relate to prior situations. Students' development and application of these skills during practice results in enhanced CDM ability.

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