Analogies in Science Teaching are those examples teachers use to make difficult concepts more understandable by using something familiar to teach something that is unfamiliar. A common science teaching analogy is to compare electricity in a circuit to water flowing in the pipes in a house.

Analogies may be in the form of metaphors, similes, examples, and visual representations used during instruction to compare what the student already knows with new information the student will learn (Venville & Treagust, 1997). For example, biology teachers often suggest that the cell is a factory and the organelles are the components of the factory (i.e. the mitochondrion as the "powerhouse" of the cell and ribosomes as protein factories). Other examples include the structure of DNA as a twisted ladder, and Darwin's branching tree to represent evolution

A typical analogy has two parts, the source (familiar to students) and the target (less familiar). For instance, teachers may refer to the heart as a pump and the flow of electricity as similar to water in a pipe. In these two cases, the "sources" in the analogies are the pump and flowing water because these are more familiar concepts. The "targets" are heart function and the movement of electrons as the less familiar concepts that we want students to understand.

Analogies are also used to motivate students by provoking their interests and to help students restructure their knowledge frameworks by making the unknown more understandable. Before using an analogy in the classroom, the strength and usefulness must be considered and must be based on how accurately it relates one concept to another and the prior knowledge and experiences of the students for whom it is intended (Dagher, 2004). In some cases, students can grasp a particular concept without the use of analogies. In other situations, some students will benefit from one particular analogy while other students need different ones. The use of analogies should be constantly assessed and based upon students' background knowledge, their experiences, and their needs. Good analogies must be personally and culturally relevant to students. For instance, if a science teacher uses an analogy about a sport such as cricket that is not known to her students, the analogy might be ineffective or even cause confusion.

There is some conflicting research regarding the use of analogies in the classroom (Venville & Treagust, 1997). Analogies used carelessly may cause confusion and even promote student misconceptions (Dikmenli, 2010). Therefore, caution should be exercised to ensure students learn about and remember the concept and not just the analogy. Teachers must be skilled at recognizing the strengths and weaknesses of analogies used during instruction. (PW)

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