CHEMISTRY CONTENT KNOWLEDGE AND VERBAL ANALOGICAL REASONING AS POTENTIAL PREDICTORS OF TEACHERS' QUALITY OF CHEMISTRY CONCEPT ANALOGIES

Stephen Bryan C. Asenjo[a]

Contact Author: Stephen Bryan C. Asenjo (scasenjo@cvisc.pshs.edu.ph)

[a]MEd Chemistry, University of the Philippines-Cebu, Cebu, 6000, Philippines

THEME:

Teacher education and professional learning in STEM

BACKGROUND AND AIMS

Chemistry is composed of complex and abstract concepts (National Academies of Sciences, Engineering, and Medicine, 2016), which cause difficulty in understanding (Orgill & Bodner, 2004). Problems in students developing misconceptions about Chemistry are prevalent worldwide (Akaygun et al., 2018). With these problems, teachers use analogies.

Teachers play an important role in the teaching-learning process. Moreover, with Chemistry Content knowledge an essential factor for a useful articulation of Chemistry concepts, and with teachers' use of analogies to express ideas, researchers may draw their relationships. However, existing literature regarding these relationships has been scarce.

This study aimed to determine the relationship between Chemistry Content Knowledge and Verbal analogical reasoning to the quality of Chemistry concept analogies of public-school science teachers of the Department of Education Cebu Province.

METHODOLOGY OR PROCESS(ES) UNDERTAKEN

This study uses descriptive-correlational method wherein 20 Public High School Science Teachers in Cebu, Philippines were randomly selected as participants and tested using validated questionnaires which measured their level of Chemistry Content Knowledge, Verbal Analogical Reasoning and determined the qualities of the analogies they employ in their classes.

RESULTS AND CONCLUSIONS

Results showed the Content Knowledge needs and development of Verbal Analogical Reasoning among teacher-respondents. Furthermore, analogies by teacher respondents on Chemistry concepts exhibited qualities of good analogies, although some qualities such as the use of functional similarities and discussing the deviation of the target and analog concept were not observed. It was also found out that there were no significant relationships among the variables, Chemistry Content Knowledge, Verbal Analogical Reasoning, and Chemistry Concept Analogies. Hence, Levels of Chemistry Content Knowledge and Verbal Analogical Reasoning were not predictors of the quality of analogies employed by teachers in teaching Chemistry concepts.

2022. J. Bobis & C. Preston (Eds.), Proceedings of the 7th International STEM in Education Conference (STEM 2022), University of Sydney, Sydney, Australia, November 23-26. University of Sydney.

REFERENCES

Akaygun, S., Brown, C., Karatas, F., Supasorn, S., & Yaseen, Z. (2018). Teaching Chemistry with Analogies around the World: Views of Teachers from Four Countries. *American Chemical Society: Symposium Series*. 10.1021/bk-2018-1293.ch009.

Magwilang, E. (2016). Teaching Chemistry in Context: Its Effects on Students' Motivation, Attitudes, and Achievement in Chemistry. *International Journal of Learning, Teaching and Educational Research.* 15(4).

Orgill, M. & Bodner, G. (2004). What research tells us about using analogies to teach chemistry. *Chemistry Education Research and Practice,* 5. 15-32. 10.1039/B3RP90028B.