

Teaching Mathematical Thinking to CHC Learners through Paradox: An Exploration

Tiong Kung Ming
Associate Lecturer,
Curtin University of Technology,
Sarawak Campus,
CDT 250,
98009 Miri, Sarawak,
Malaysia.
Tel: +6085 – 443853
Fax: +6085 – 443837
victor.tiong@curtin.edu.my

Abstract

Foundation students at Curtin Sarawak are mainly Confucian Heritage Culture (CHC) learners. Results from case studies at Curtin Sarawak (Krishnan *et al*, 2002; Abdullah *et al*, 2002) regarding CHC learners' learning style show that CHC learners are factual, logical and systematic learners with emphasis on memorization. Numerous researches on CHC learners around the world show similar results. What are the implications in terms of students' mathematical thinking? This paper discusses attempts to teach mathematical thinking to these CHC learners through mathematical problems that are paradoxical in nature. The problems deal with two types of cognitive conflicts in their mathematical thinking: (i) conceptual knowledge vs. procedural knowledge, and (ii) common sense vs. mathematical "proof". Three interesting problems were used: (i) the hippopotamus problem, where two unequal weights are "proven" to be equal, (ii) the infinite sum for a geometric series with $r = \frac{1}{2}$ is $\frac{1}{2}$, and (iii) -1 is "proven" to be equal to 1. The process and nature of mathematical thought of both the Foundation Engineering and Commerce students are outlined to see how the students deal and resolve these paradoxes. From the generally positive response of the students towards these mathematical thinking exercises, we suggest that the introduction of Problem Based Learning (PBL) in Foundation Mathematics might be a feasible option.

Keywords: CHC learners, mathematical thinking, paradox