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Understanding Horizon Content Knowledge: A review

D.R.N.N. Rathnayake* and G.N. Jayakody

*Department of Science for Technology, Faculty of Technology, University of Sri Jayewardenepura,
Pitipana, Sri Lanka*

The Mathematical Knowledge for Teaching (MKT) that a mathematics teacher requires has been explored by researchers in the mathematics education field. MKT has emerged as a promising framework to define, assess and develop those knowledge requirements. Horizon Content Knowledge (HCK) is a powerful domain in MKT which is generally viewed as an awareness of broader mathematical landscape. However, HCK is often categorized as the conflictingly defined and the least understood domain. Researchers are continuously working on understanding, re-conceptualizing HCK and empirically proving its importance in teaching and student achievements. Many definitions presented for HCK are not specific, subject to clarification, and often encounter criticism. The purpose of this review is to capture the essence of various interpretations presented for HCK for future work. This review uses a qualitative approach, and the selection is limited to articles with different interpretations of HCK. The concept of HCK was originally defined as a kind of a “peripheral vision” and the awareness of the broader mathematical landscape. Some scholars included “Advanced Mathematical Knowledge” that a teacher acquires in undergraduate levels as part of HCK while others argue academic knowledge itself does not guarantee effective teaching, but ought to understand connections among structures and ideas related to the discipline. Many have perceived HCK as “Elementary perspective of advanced knowledge” and a few have complementing definitions for it. It is also viewed as an orientation to, and familiarity with, the discipline related to teaching content and “hearing” students’ mathematical insights. Further refinements have been made to include the knowledge of history of mathematics and knowledge of applications to other subjects. However, it is understood that many of these components pertaining to HCK domain are implicitly included in many definitions, even though it may look different at a glance. Our findings indicate the role of the horizon knowledge is so broad that it has led educators to present different interpretations. It is understood that defining HCK as “what else” knowledge that teachers should possess, permits no boundaries for the conceptualization and also varies due to the dynamic nature of the knowledge demands in the future curricula.

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E-mail: rovininr@gmail.com