The Transition from Real Numbers to Complex Numbers

ABSTRACT

Humans make sense of mathematics by relating it to personal conceptions and experiences. This might not be a smooth process as it may involve conceptions that work in an old context but do not work in a new context. The framework proposed by Chin and Tall (2012), Chin (2013) and Chin (2014) highlights how prior experiences shape humans' conceptions can be either supportive or problematic in making sense of extended contexts of mathematics. A supportive conception is a conception that supports learning and generalisation in a new context while a problematic conception is a conception that impedes learning and generalisation in a new context. By employing this framework, this study aims to explore how a group of respondents that consists of 30 mathematics undergraduate students from a public university in Malaysia make sense of complex numbers. The system of complex numbers is an extension of real numbers thus students will learn real numbers prior to learning complex numbers. How the respondents cope with the transition from real numbers context to complex numbers context is the focus of this study. Data were collected through a questionnaire and follow up interviews. Respondents participated in the follow up interviews voluntarily and data from three respondents were reported in this study. The result shows that these respondents have several supportive conceptions, such as the concept of addition and multiplication of real variable. The data also support the existence of problematic conceptions in making sense of complex numbers, namely the concept of positive-negative numbers and inequalities. These conceptions are originated from the context of real numbers.