<table>
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<tr>
<th>Author</th>
<th>Kok, Kenan Xiao-Feng</th>
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Abstract

There are not many studies undertaken in Singapore to examine the strategies that secondary school students use to generalise numerical patterns. To explore this phenomenon, the present study was conducted to: (1) examine the generalising strategies that students employed to obtain the far term underpinning numerical linear patterns, and (2) investigate students’ consistency in using the far term to establish the functional rule in numerical linear patterns.

A paper-and-pen test, known as the Numerical Generalising Test (NGT) comprising two numerical linear generalising tasks, was developed and administered to 26 Secondary One Express students from a school in Singapore. These 26 students were not formally taught the topic on number patterns prior to this study. Following the NGT, eight students were purposively selected and interviewed individually to gain insights into how and why they used certain generalising strategies to find the far term and how they used the far term to establish the functional rule in numerical linear patterns.

The data analysis revealed that students in this study were very successful in establishing the far term and functional rule in each of the two numerical linear pattern generalising tasks. This suggests that majority of students found it easy to establish the far term and functional rule despite not formally being introduced to the topic of number patterns.

Three types of numerical generalising strategies were used to derive the far term: Operating on the Differences between terms, Guess-and-Check and Known Formula. Majority of students favoured Operating on the Differences between terms while Guess-and-Check and Known Formula were less popular in comparison. This suggests that students were capable of relating the number of intervals between terms to the position number of the expected term in the numerical linear sequence. They were thus able to identify the position-to-term relationship in numerical linear patterns and engage in functional thinking.
A sizeable number of students in this study were also found to have used the far term to construct the functional rule. This suggests that students leveraged on the form of the far term to construct the functional rule. Based on these findings, implications for teaching and learning are drawn for the teaching of pattern generalisation. The study concludes with recommendations for future research.