

# DEVELOPING A CODING SCHEME FOR EXAMINING PRE- SERVICE PRIMARY TEACHERS' SPECIALIZED KNOWLEDGE ON FRACTIONS DIVISION

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## DEVELOPING A CODING SCHEME FOR EXAMINING PRE-SERVICE PRIMARY TEACHERS' SPECIALIZED KNOWLEDGE ON FRACTIONS DIVISION

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Having a profound knowledge of fractions division (FD) is still a challenge for pre-service primary teachers (PTs). The current work aims to develop a coding scheme to examine PTs' specialized fractions division knowledge (SFDK). This coding scheme will be pivotal in unraveling the PTs' initial knowledge, such as their use of representations or errors when solving FD problems before designing instructional activities to develop the knowledge.

Two stages were carried out to develop the coding: (1) development and (2) testing, assessment, and refinement. The coding scheme was developed referring to the SFDK model (Wahyu, 2021) that represents connected and flexible knowledge of FD. Connected SFDK is the PTs' ability to move forth and back when using multiple representations in solving FD problems. Flexible SFDK is PTs' ability to differentiate each FD, which guides her/his movement across the representations.

PTs were given five tasks before being introduced to fractions division. For instance, *write a different word problem for  $4 \div 2/3$ ;  $2/3 \div 4$ ;  $3/4 \div 1/2$ ; and  $1 \ 2/3 \div 1/4$ !* (Task 4). There were 57 PTs' answers to the tasks and 10 answers were purposively selected for the coding to establish reliability. After five iterations of coding, discussion, and refinement, the coding scheme resulted in 7 categories and 36 codes. For example, category 6 (*symbolic-verbal*) has five codes (e.g., *correct answers-partitive*) to examine task 4. The percent agreement of three coders is over 0.7 and the AC<sub>1</sub> coefficient (Gwet, 2014) is greater than 0.7 for each category, both of which show a very good agreement.

### References

- Gwet, K. L. (2014). *Handbook of inter-rater reliability: The definitive guide to measuring the extent of agreement among raters (4<sup>th</sup> ed.)*. Advanced Analytics, LLC.
- Wahyu, K. (2021). Specialized fraction division knowledge: A proposed model. In M. Inprasitha, N. Changsri & N. Boonsena (Eds.), *Proceedings of PME44* (Vol. 4, pp. 212-220). PME.

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