POSTER TEMPLATE

METHOD FOR SOLVING RATIO WORD PROBLEMS WITH CERTAINTY— CONCEPTUAL DIAGRAM

Takashi Kato
Tohoku Gakuin University

Regarding the method for solving word problems on ratio or rate with certainty, we unified the style of formularization and the employment of usage no. 2 for ratios. Additionally, we chose a method where usages nos. 1 and 3 are solved through formularization via usage no. 2. As a result, the achievement rate was improved compared with commonly used instruction methods. To help learners and instructors better understand this solution method, we created a conceptual diagram that demonstrates this solution method for word problems with the three aforementioned types of arithmetic structures.

Adopting a more certain solution method

In Japan, regarding the methods for solving word problems on ratios, the substitution of numerical values with formulas is commonly instructed; the achievement rate is not high. By formularizing via usage no.2 and subsequently conducting the transformation of equations, the achievement rate was increased. The increase of correct answers to the equation was follows. Usage no.1: 26.5→82.4%, no.2: 61.8→94.1%, no.3: 32.4→76.5%.

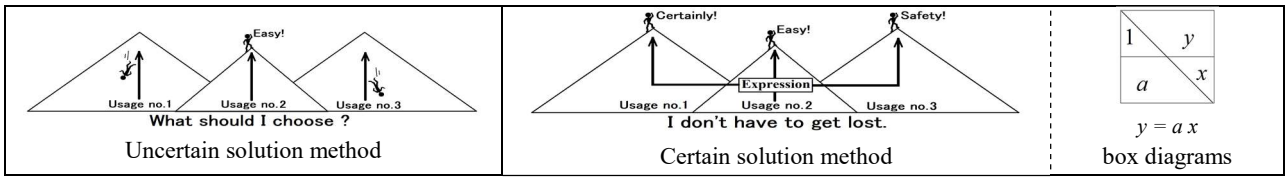

Figure 1: Diagram of method for solving word problems on ratio with certainty

Diagram that reliably solve the three types of word problems using the proposed solving method.

All word problems, such as ratio and speed word problems, can be classified into three types according to their arithmetic structure: Linear, Multi-linear, and Chain types (2015, Kato). In order to help instructors and learners recognize the three types of problems, a diagram of how to solve the three types of word problems was created.

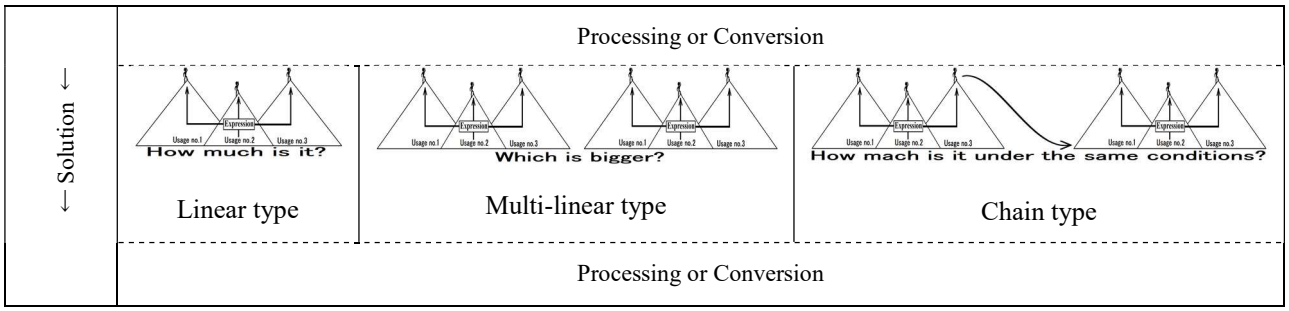

Figure 2: Three types of word problems solved via the proposed solution method

References

Kato, T. (2015). Classifying projection-quantity word problems by their arithmetic structure, *The 2015 Mathematics Education Society of Japan – Spring Annual Meeting - Academic Journal on School Education - extra number*, 234−236.

Kato, T. Moriya, S. Shindo, T. (2017). Educational practices and results of using multiplication/division quantity relationships (box diagrams) to make proportions, *The 2017 Mathematics Education Society of Japan—Spring Annual Meeting Proceedings Collection*, 119-121.

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