Different Representations of Fractions

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RATIONALE

From teachers' experiences, non-Chinese speaking students are weak in topics in the Number strand in general. Some P3 non-Chinese speaking students could not recall the multiplication facts in a fluent way. Teachers think that students can retain the concepts they learnt if they had hands-on activities in class, but it is not easy to conduct lessons with rich hands-on activities because of the tight teaching and learning schedule. The aim of the following lesson design is to provide students with rich learning tasks so that they can explore different ways to represent a fraction as parts of a whole. Dice is used so that it increases the randomness of the numbers obtained and thus students would get different fractions. This, in fact, creates a lesson with varieties and it enhances student motivation in learning.

In the lesson, it is important that students understand how to obtain a fraction with the dice. It is suggested that teachers can demonstrate a few examples as shown in the worksheet before giving the dice to students. Once students get used to the procedures in creating a fraction with the number shown on a dice and get used to how to represent a fraction with fraction circle, fraction bar and grid, they can start creating their own representation of fraction. It helps students make connection between the concept of fractions and different visual images.

This lesson would better be arranged in group collaboration. It is desired if time is allocated for short presentation on their results. During group discussion, different generic skills such as collaboration, communication skills, creativity might be developed.

LEARNING TARGETS

1. Recognise the concept of fractions – fraction as parts of a whole object.

2. Represent a fraction with different tools.

LEARNING AND TEACHING STRATEGIES

A. *Using self-generated fractions to increase student motivation in learning*

In the lesson, each student is given a 12-sided dice and a set of blank fraction circle, fraction bar and grid. They use the dice to obtain a fraction (refer to the worksheet). The randomness of the number shown on the dice gives students the sense of creating something on their own. Students then represent the fraction with different tools such as fraction circle. Students have totally different results in the worksheets. This enhances students' sense of ownership.

B. *Using different representations for a concept*

For the concept of fraction as parts of a whole, students learn different ways to represent this concept. Visual representations with fraction circle, fraction bar and grid are used. Students could choose their preferred tool to represent a fraction.

C. *Student talk*

Teacher leads students in teacher-student conversion and teacher-led discussion in the lesson. Teacher uses different questioning techniques, such as press for reasoning, explaining why, asking students to explain to the others, etc.

D. Open-ended tasks in the worksheet

The worksheet is designed for 2 to 4 lessons. It helps students represent the concept of fractions as parts of a whole with fraction circle, fraction bar and grid.

Teachers can go through different representations of a fraction in class. For example, teacher can teach students how to represent the fraction ¾ with different representations such as fraction circle, fraction bar and grid. After students learn the basic skill in obtaining a fraction and learn how to represent a fraction with fraction circle, fraction bar and grid, they can start to generate the fraction with dice and choose the ways to represent a fraction. These open-ended tasks help students make sense of the abstract concept of fractions with different visual images.

EVIDENCE

In the lesson, non-Chinese speaking students were able to represent a self-generated fraction by a fraction circle. Students could describe what parts of a whole were. (Refer to the video clip in this Resource page.)

ASSESSMENT TOOLS

Under normal circumstance, it is suggested that students could mark their peers' work in the lesson. It arouses students' awareness of checking one's answers. This could also promote peer learning and train students the essential skill in Assessment as Learning. However, if communication among students is not encouraged, the tasks could be completed individually.

Because of the variety of student answers, student work could be posted on the notice board so that students could learn from the others.