Rational Number Assessment

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Teacher report on your student’s Rational Number Knowledge and any misconceptions. (294 words)

Matthew has sound knowledge of key concepts related to fractions. Such concepts include the understanding of fractional parts of the whole. He demonstrates his ability by recalling and identifying fractional parts using a number of fraction models such as area models and fraction circles.

Another key idea that Matthew has grasped is that fractions represent a relationship between the part and whole, therefore successfully being able to compare fractions and identifying whether they are smaller or larger in size.

Matthew is also familiar with the language used when discussing fractions, being able to describe parts of a whole, using vocabulary such as ‘partitioning’ and ‘parts of a whole’. He is also proficient in identifying the numerator and denominator that again allows him to successfully partition a whole or compare fractions if requested.

Although Matthew has an understanding of partitioning, he does lack understanding in partitioning with a particular area model, pattern blocks. He does have some understanding that shapes can be mirrored using another shape, however, when requested to identify how many of one shape would fit in another, he segmented the shape further, deriving a partial correct answer.

Matthew has a sound knowledge in fractions however; he lacks understanding of the relationship between fractions, decimals (rational numbers). Matthew needs more experience in understanding the role of the decimal point and this will foster his understanding on where to position the decimal point when converting fractions into
decimals (Van de Walle, 2013).

Matthew also has misconceptions of rational number division. He still applies whole-number thinking when dividing rational numbers - dividing by a fraction or decimal, the answer should result in a smaller value. Therefore, to address this misconception, Matthew could perform estimations to assist him in evaluating his answer (Van de Walle, 2013).
Critical evaluation of the usefulness of mathematics interviews for gaining knowledge about students’ current mathematical knowledge that can be used to plan future learning opportunities. Be sure to draw on relevant research literature to support your evaluation. (390 words)

Mathematical interviews or also commonly known as ‘diagnostic interviews’ is a form of assessment carried out by educators to gain an understanding of students’ existing mathematical knowledge. This form of assessment provides rich results and data to teachers of any misconceptions; students’ may have as well as examine their thinking process when attempting a problem (Van de Walle, 2013).

Teachers are able to assess student knowledge being presented as well as identifying the mental strategies used (Loveridge, 2011). Participating in a diagnostic interview does not restrict students in how they solve a problem, allowing to use various strategies and being able to orally justify their answer. It also benefits students who may experience difficulty in reading as well as comprehending what they have read (Loveridge, 2011). It allows teachers to break down the question/task into smaller sections, allowing students to better understand what is required of them. In my interview with Matthew, if he did not understand the whole question as a whole, I broke up the question into smaller sections so that there were clear instructions. Time in solving the problem/task is not an issue and therefore, students are not assessed according to how fast they can answer the question. Students’ are given ‘sufficient time to solve a given problem’ (Wright, et al., 2006, p. 158).

During interviews, teachers are able to observe and record students pedagogical knowledge and thinking of the focused topic. Once the interview is complete, teachers are able to analyse students’ results as well as reflect on what misconceptions or conceptions that students have, allowing planning for follow up instructional teachings. As examined in (Wilson, et al., 2013), clinical interviews are reflected as effective strategies for teachers to observe student thinking.

Like any other form of assessment, diagnostic interviews provide a picture of student
progress overtime (Department of Education [DE], 2014). Teachers may conduct the same interview a number of times to measure the progress made by individuals. They may conduct these interviews at the start of the year, middle of the year and end of the year.

Assessment is a critical component to effective teaching and student learning. Therefore, it is important that teachers consider effective assessment strategies to foster student learning as well as measure how pedagogical growth is evident in the classroom so that teachers can effectively plan for future learning opportunities.
Critical evaluation of the usefulness of Open Tasks with Rubrics for gaining knowledge about students’ current mathematical knowledge that can be used to plan future learning opportunities. Be sure to draw on relevant research literature to support your evaluation. (426 words)

Open Tasks has been considered a rich form of assessment as well as an engaging way for students to demonstrate their mathematical knowledge learnt during teaching instruction. Planning open tasks allows all students of different competencies to demonstrate their knowledge, skills or understanding (Smith & Stein, 2011, as cited in Van de Walle, 2013). It is important during the planning stage, that teachers devise tasks that apply to real-word experiences and draw an interest to students as this engages them into having a positive experience towards mathematics.

Teachers are also able to collect information during and after completing the set task. Such tasks require students to justify their answers, allowing teachers to have an understanding of how the child is thinking and how they can consolidate learning and knowledge in the next instruction teaching session (Van de Wall, 2013). Getting students to justify their answers does not restrict writing capabilities. Students who may find writing a challenge, can explain their process of thinking orally, allowing the teacher to record the student’s understanding.

It is important that teachers assess students’ knowledge, skills or understanding against a number of criteria points. Rubrics are a great way for teachers to reflect and decide what the purpose of the task given to the students is and what outcomes do they expect from it. This provides insight to students of what understanding or concepts are to be achieved as well as provide feedback of their progress (Van de Walle, 2013).

Information gained through observations and rubrics, allows teachers to enhance instructional decisions made during planning (Shafer & Romberg as cited Fennema & Romberg, 1999). Through analysing data, teachers are able to modify or adapt a
A problem that may extend student thinking by encouraging them to make connections to various mathematical ideas or deliver instructions on a concept using an alternative strategy (Shafer & Romberg as cited in Fennema & Romberg, 1999).

The usefulness of open tasks to gain knowledge about students’ mathematical knowledge is that it also allows teachers to pose questions to students, that may assist them in making connections, and identifying patterns within the problem. This also allows learners to experience various strategies that may have been used by their fellow peers, freeing them from the ‘one-answer syndrome’ (Whitin as cited in Bright & Rubenstein, 2004, p.3).

Planning mathematical lessons through open tasks provides a sense of ownership and responsibility to learners as they carry out mathematical investigations (Whitin as cited in Bright & Rubenstein, 2004). This sense of ownership, allows students to have a positive outlook on mathematics.
References:


