Rational Number Assessment

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Teacher report on your student's Rational Number Knowledge and any misconceptions (300 words)

Josh demonstrates a good understanding of Rational Number through knowledge of representation in fraction, decimal and percentage form. Josh can clearly identify visual fractions in comparison to the whole, however seems to lack knowledge in relation to equal parts constructing a whole, getting confused by the amount of parts and not concentrating on their size. Josh also has some misunderstandings in relation to comparing fractions in number form, once again not fully understanding the size of the parts that make up the whole.

Josh has a good grasp on the idea of equivalent fractions, accepting them to be the same, however does get confused and overwhelmed by the idea of rearranging improper fractions into mixed numbers. Josh had some misconceptions related to working out fractions of fractions, only being able to produce answers to route learned questions such as "half of a third".

In relation to decimals Josh is capable of successfully arranging decimals in order of smallest to largest but has some errors linked with decimals in fraction form, such as thinking 0.3 to be one tenth as well as mistakes related to decimal place value, thinking 27 thousandths to be 0.0027 instead of 0.027.

He also struggled with the idea that there is an infinite amount of decimal numbers between two numbers, being unable to successfully name a number in between 0.1 and 0.11. Related to this, Josh had some small confusions related to decimal comparison, very much related to place value, for example thinking 0.12 to be large that 0.6, due to 12 being large than 6.

Josh was successful in using ratios to work out new amounts, however was overwhelmed in relation to ratios with percentages. This was evident from Josh's lack of knowledge of percentage in fraction form, not understanding 125% to be 125/100.

Overall Josh demonstrated a good knowledge of Rational Number, with some small misunderstandings related to equal parts creating a whole, comparing fractions in number form, mixed numbers, fractions of fractions, decimal place value, and percentages in fraction form.

Word Count: 335 Words

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. (400 words)

In order to gain a true understanding of a student's knowledge on a topic of work to support learning and inform teaching, assessment is required (Clarke, Mitchell and Roche, 2005).
One single assessment strategy cannot offer a complete view on students mathematical thinking and understanding, however the benefits and insight of a one-on-one mathematics interview could be seen as being near to this.
One-on-one mathematics interviews create not only an insight into student knowledge and learning, but develops teacher content knowledge and knowledge for teaching (Hill and Ball, 2004).
As the interview is assessed through the completion of a record sheet, the teacher must be equipped with an understanding of strategies needed to work out the problem, therefore building pedagogical content knowledge (Shulman, 1987). It is stated by Ginsburg and Seo (1999) that "teachers cannot process or fully appreciate students' thinking without first understanding the mathematics underlying it", therefore by teachers having a better content knowledge they will be able to better recognize student thinking and reasoning.
Empson and Jacobs (2007) along with Sowder (2007) explain that if teachers have a more in depth knowledge of student's mathematical thinking, teaching becomes aimed at teaching for student understanding. If teachers have better awareness of how students think and reason with mathematics from a one-on-one interview (Jenkins, 2009), then they are better prepared to aid students in learning new content, or assisting them with any misconceptions.
In regard to this, a mathematics interview gives teachers time to listen and observe student responses revealing common difficulties and misconceptions had (Clarke, Mitchell and Roche, 2005).
The interview develops listening and questioning skills that are assessment tools that are necessary for not only the one-on-one interview, but observational assessment of students reasoning and thinking in the classroom (Jenkins, 2009). These listening and questioning skills are also very useful in relation classroom questioning (Clarke, Mitchell and Roche, 2005).
One-on-one interviews are also extremely
The mathematics interview itself could be modified and used as a teaching tool (Hurst, 2007) and could be a used as a model (Clarke, Mitchell and Roche, 2005) for the development of classroom activities.
Another advantage of an assessment interview is that is can show the growth in student understanding over time, if used at the beginning and end of the school year (Clarke, Mitchell and Roche, 2005).
There are many topics in mathematics that are difficult to assess with traditional means such as visualization and orientation, and manipulation of objects and many require the teacher to listen and observe. An assessment interview combines these traditional means of assessment along with the ability to assess justification through speech and demonstration (Clarke, Mitchell and Roche, 2005).
Although as suggested the benefits of a one-on-one mathematics assessment interview are vast, there are some limitations such as having to interview one student at a time, reluctance of some students to think out loud, and having to collect and assess all student work to use as data and analyze. In saying this, although there are limitations to the interview, there is certainly a place for it in mathematics assessment, due to all of its benefits.

Word Count: 518

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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. (400 words)

Open-ended tasks are useful for assessing students strategies and problem solving skills in mathematics. They can be very effective when used to begin a unit of work to gather an understanding of student's pre existing knowledge on a topic (Sullivan, Warren & White, 2000). In relation to this, open-ended tasks may also be used for assessment of students during a unit of work to assess how well they are recognizing, using and applying mathematics learned in class (Varygiannes, 2013). Due to the open-ended tasks being of such a broad nature, students are required to use a larger variation of mathematical skills such as investigating, creating thinking, problematising, mathematising, communicating, and thinking as opposed to merely recalling procedures demonstrated to them in class (Sullivan, Warren & White, 2000). It is stated by Varygiannes (2013) that "asking less may indeed enable a learner to demonstrate more understanding", therefore supporting the idea that open tasks encourage more mathematical thinking than that of a closed task, and thus producing a larger collection of data to assess and reflect on (Sullivan, Warren, White & Suwarsono, 1998).

According to Zevenbergen, Mousley, & Sullivan (2001) "an open-ended task is one that has the potential to include a range of 'correct responses' so that they are more encompassing than the typical closed questions used in most teaching situations". The benefits of a range of "correct responses" is that is allows the student to demonstrate a variety of skills to answer the question, as well as their approach to the task, demonstrating to the teacher clearly the level of understanding the student has (Varygiannes, 2013). The openness of open-ended tasks allows multiple correct answers, but also allows incorrect answers and the combination, giving the teacher a deeper understanding of the student's quality of knowledge as well as their misconceptions (Sullivan, Warren & White, 2000). If a teacher can assess the quality of knowledge their students have, they can then highlight the common errors and create lessons that help students. Therefore open ended tasks are both an assessing tool and teaching tool where assessing and teaching are in sync (Zevenbergen, Mousley, & Sullivan, 2001).

Open-ended tasks also hold plenty of flexibility within the classroom in relation to including all levels in the classroom. Children who are at lower levels in the classroom can benefit from being assessed with open-ended tasks as they are more inclusive as all students are able to make an attempt at a question, compared to a closed task where only one answer is required (Zevenbergen, Mousley, & Sullivan, 2001).

Although there are a number of obvious benefits from conducting open-ended tasks in the classroom there is one negativity that has been suggested by Sullivan, Warren & White (2000); "tension may be created because the openness can reduce the focus on particular aspects of mathematics", meaning students may not learn the specific content due to the task being too open (Sullivan, Warren & White, 2000). However, a teacher could conduct a "Content specific open-ended task" which would aim at the task being open, but very much requiring the related mathematics needed to complete the task.

Open-ended tasks are extremely useful in assessing students knowledge and understanding in mathematics. It has been noted by Boaler (1997) that schools that use the open-ended task approach to teaching and assessing math are able to produce better learning outcomes than schools that use a traditional format.

Word Count: 565

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