CONCEPTIONS OF RATIO AND PROPORTIONS **AMONG YEAR FIVE** PUPILS

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BACKGROUND

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LEARNING IN AND OUT OF CLASSROOM

Ratio and proportion is a new topic in KSSR. (Curriculum Development Centre, 2016)

Importance of ratio and proportion in daily life and its usage.(Wollman & Lawson 1978, p.227; Heinz, 2002; Akar, 2007)

Mathematics involves far more than accurate computation and rote memorization (Mack, 1990 & Zulkardi, 2002).

Pupils should be introduced to more conceptual knowledge and able to make connections within mathematics. Encourage the students to make sense and produce new ideas in solving problems (Chin & Tall, 2012).

Pupils have difficulity acquiring the knowledge of ratio and proportion(Griffin, 1988; Andini, W., & Jupri A., 2017)

Some are still at the level of additive thinking, while their classmates have already advanced to multiplicative thinking and are thus mature enough to learn the topic(Ben-Chaim, D., Keret, Y., & Ilany, B. S. (2012).

RESEARCH OBJECTIVES	RESEARCH
To identify year five pupils' mental image about ratio and proportion	RQ 1 What is th image of ra
To identify how year five pupils represent ratio and proportion	RQ2 How do yea and propor
To identify year five pupils' meaning about ratio and proportion.	RQ3 What are t about ratio

H QUESTIONS

the year five pupils' mental atio and proportion?

ear five pupils represent ratio rtion?

the year five pupils' meaning o and proportion?

METHODOLOGY

RESEARCH DESIGN	SAMPLING METHOD	SAM
• QUALITATIVE CASE STUDY	<section-header></section-header>	 SEVEN YI PUPILS 3 BOYS & IN A PRIM SCHOOL 3-HIGH 2-MODEI 2-LOW

LEARNING IN AND OUT OF CLASSROOM

PEL

DATA COLLECTION

EAR FIVE

4 GIRLS ARY

• CLINICAL INTERVIEW TECHNIQUE CONDUCTED IN 4 SESSIONS

RATE

METHODOLOGY

INSTRUMENT/ INSTRUMENTATION

• INTERVIEW PROTOCOL COVERING 26 TASKS(adapted,Goh(1998),Nik Azis(1987).Lamon (2006), Singapore maths • MENTAL IMAGE-10 (INTERVIEW 1) • REPRESENTATION-5 (INTERVIEW 2) • MEANING-5 (INTERVIEW 3) • P.SOLVING -6 (INTERVIEW 4)

- Type of data
- Researched notes
- Drawings

DATA ANALYSIS

• CASE AND CROSS CASE ANALYSIS

• Notes by participants. Written and behavioral responses to triangulate the data.

• Data hand coded. Hand coding organizes the data using segmentation, bracketing chunks of text. Then words are used to represent a category in columns (Rallis & Rossman, 2012) and the ideas were organized in tables.

RESULTS AND DISCUSSION

5 PATTERNS OF THOUGHTS

LEARNING IN AND OUT OF CLASSROOM

SYMBOLIC PROCEDURAL **CONCEPTUAL** FIGURATIVE **PRACTICAL REAL-LIFE** SITUATIONS

SYMBOLIC PROCEDURAL CONCEPTUAL • Comparison of quantities • Multiplicative • Part to part • Part to whole thinking • Equivalent ratios • Whole to part • Colons • Simplify ratios • One to one, one to • Concrete many and many to • Two equal ratios • Drawings • Doubling/Tripling/ many • Use concrete correspondences Halving materials • Interchanged/Dual • Simplifying/Divisio Partition/Separation n • Sharing • Scalar/functional • Repeated Addition relationship • Arrays of rows and

columns

FIGURATIVE

PRACTICAL

- Drew patterns
- Jumping, rows and columns
- Two Dots
- Movement of head, fingers, hands, facial expressions.

- Real life situations
- To cook. Ratio rice to water is 1:2
- One football played by eleven players 1:11
- Every child has twenty teeth 1:20
- Every person has two ears 1:2
- One pencil and two rulers in a pencil case.
- Ratio one chair to one fan in a room
- One umbrella shared by two person

LEARNING IN AND OUT OF CLASSROOM PROCEDURAL

SYMBOLIC





CONCEPTUAL



REAL LIFE SITUATIONS

1 konpop = 5000 2 konjoop = RM100 3 konpop = RM1.50











CONCEPTUAL

cip putih outih hitam 22 14 2. 8 4 5 5 10

LEARNING IN AND OUT OF CLASSROOM RATIO AS FRACTION & PERCENTAGE

: Perempuan Lelaki : Semue) *2 2+ (*26 4106 MO 740 60:100 :40 160 :100 100 OD . 100 100 607. : 1007 60%:40%



hitam : putin 60 40 100 +2 40% : 60%. 410 +10 40:60 40% : 60%



Lelah Semuq)×2 ×2 ×26 10) × 10 ×10 × 10(, :100 60 60% 100%

jumlah Cip hitam : Cip putih 5 00 120 100% 60%

RATIO AS FRACTION, **DECIMAL&PERCENTÁGE**

Lelaki: Perempuan Perempuan : Semua 1:5 2:5 $x_{1002}60\%:40\% \times 100 40\%:100\%$ 0.6:0.4 0.4:1

Ielaki : perempuan lekuki : semua 3:5 3:2 0.6:0.4 0.6:1.0 $100\% \frac{3}{5} : \frac{2}{5} \times 100\% \frac{3}{5} : \frac{5}{5} \times 100\% \frac{3}{5} : \frac{5}$

LEARNING IN AND OUT OF CLASSROOM **COMPARISON BETWEEN 3** QUANTITIES



ZERO 5

Nisbah naanggis kepada, mangga nisbah nenas kepada mangat kepada m

COMPARING QUANTITY WITH

Perang Putih Putih : Perang : 5 Hijaw = Perang : 5 Perang Hijan 5 20

CONCLUSION

LEARNING IN AND OUT OF CLASSROOM

- Their **transparent ideas** are mainly on symbolic, verbal interpretations, through concrete drawings, comparison of the part to part, part to whole, sharing, partitioning, and procedural explanations.
- There were some translucent ideas on whole to part, conceptual or operative ideas like multiplicative thinking, interiorized ratios, within and between ratios. • A few ideas on figurative explanations, ratios, and proportions using real-life situations and misconceptions were seen in this study
- The results showed that the year five pupils had the **ability to construct** knowledge that make sense and gave meaning of ratio as comparison of quantities, part to part comparisons, useful in daily routine, belongings, cooking and parts of the body. Part to whole was written in fractions. Meanwhile, **proportions** was meaningful to them as two equal ratios that are related multiplicatively.
- Textbooks usually do not teach fractions, decimals or percentage integrated with ratio and proportion

THANK YOU

