

July 11, 2018

**THE USEFULNESS OF**  
**"MATHS HISTORIES" AS (PART OF)**  
**A HOLISTIC ASSESSMENT TOOL**

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**PH**Bern

# OVERVIEW

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1. Context
2. Threefold assessment
3. Collecting first hand experience
4. Pilot interviews
5. Feedback and first insights
6. Conclusions

# CONTEXT

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- Adult learners:
  - Heterogeneous group (e.g. Safford-Ramus et al. 2016)
  - (Negative) previous learning experiences (Evans 2000)
  - Test anxiety (ibid.)
- Diagnostic assessment:
  - Purpose of the assessment: inform teacher's planning
  - Little standardised testing which assesses adult's basic mathematical knowledge (none in German, Kittel 2016)

# THREEFOLD ASSESSMENT

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- Maths histories (Archer & Newman 2003)
- Problem solving (Nydegger 2015)
- Talking about mathematics (ibid.)

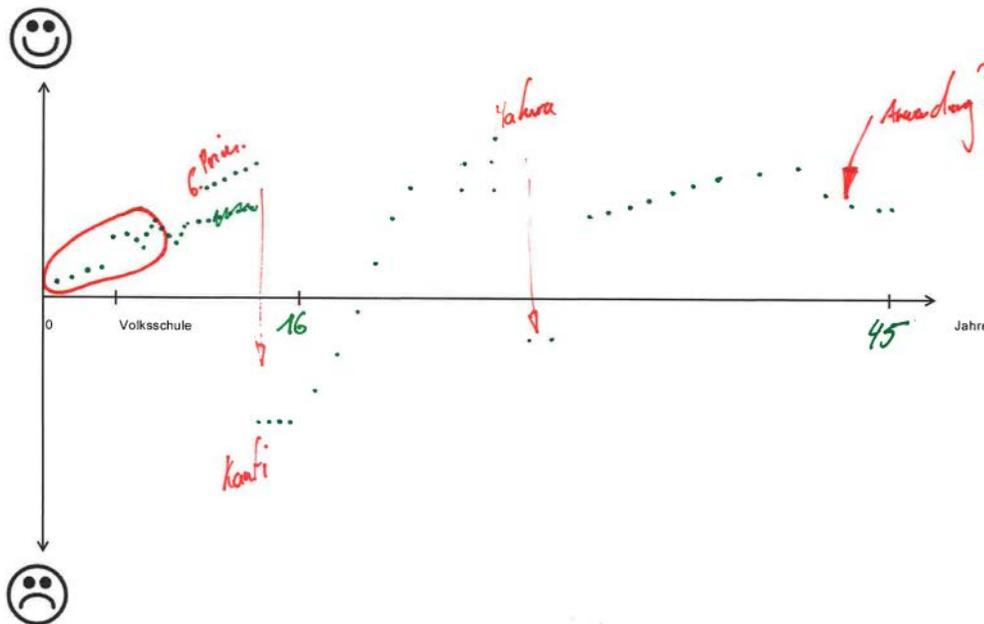
# COLLECTING FIRST HAND EXPERIENCE

Reflect on your personal experiences with mathematics:  
When were they positive, when were they negative? Draw your mathematical history on the paper provided.



# MATHS HISTORIES

- Line graph to illustrate an individual's relationship with mathematics ...



... followed by systematic questions

## FOLLOW-UP QUESTIONS

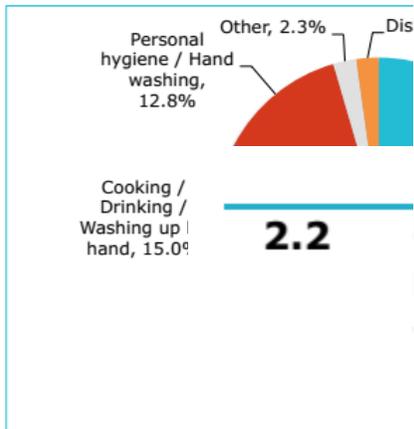
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- What happened here?
- Who was involved?
- What mathematical content was involved?
- How did this event influence your learning and using of mathematics?
  
- When did/do you do mathematics outside of school?
- Is it important in your work? In your private life?
  
- How should your personal history with mathematics continue?
- What do you need for it to continue the way you want it to?

# PROBLEM SOLVING

- Different tasks combined with self assessment

## 1. What do these percentage rates represent?



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**A** For what do we

## 2.4 Fill the boxes.

Percentage	Decimal Fractions	Common Fraction
40%	0,4	$4/10 = 2/5$
80%		
		$3/4$
	0,01	
		$1/20$

50% = 50/100 = 1/2

20% = \_\_\_\_\_

1% = \_\_\_\_\_

75% = \_\_\_\_\_

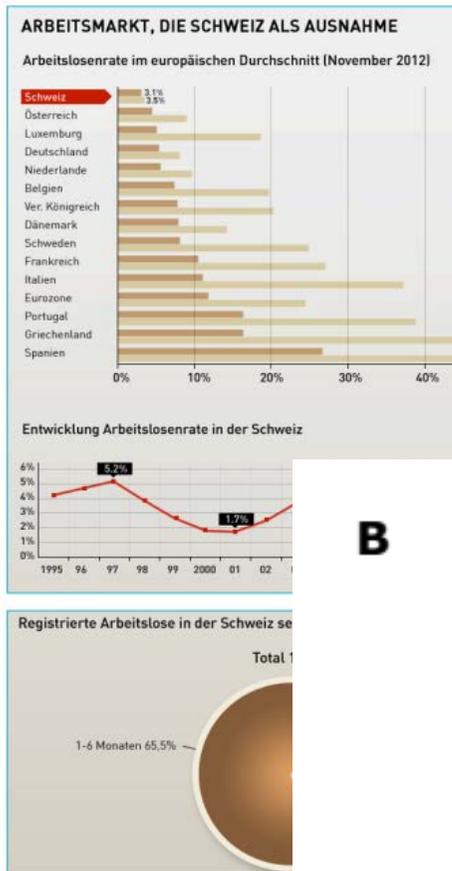
10% = \_\_\_\_\_

0,5% = \_\_\_\_\_

simple  
  
  
  
  
very difficult

very difficult

# TALKING ABOUT MATHEMATICS



Quelle: Seco, eurostat

**A**

**Why can 20% stand for different numbers?**

Make an example where 20% correspond to CHF 100.-

Make an example where 20% correspond to CHF 2.-

Make an example where 20% correspond to CHF 10'000.-

Why is this possible?

**B**

**Which is the better offer?**

Offer 1 2% on all bought goods plus a reduction of 50.-

Offer 2 4% on all bought goods.

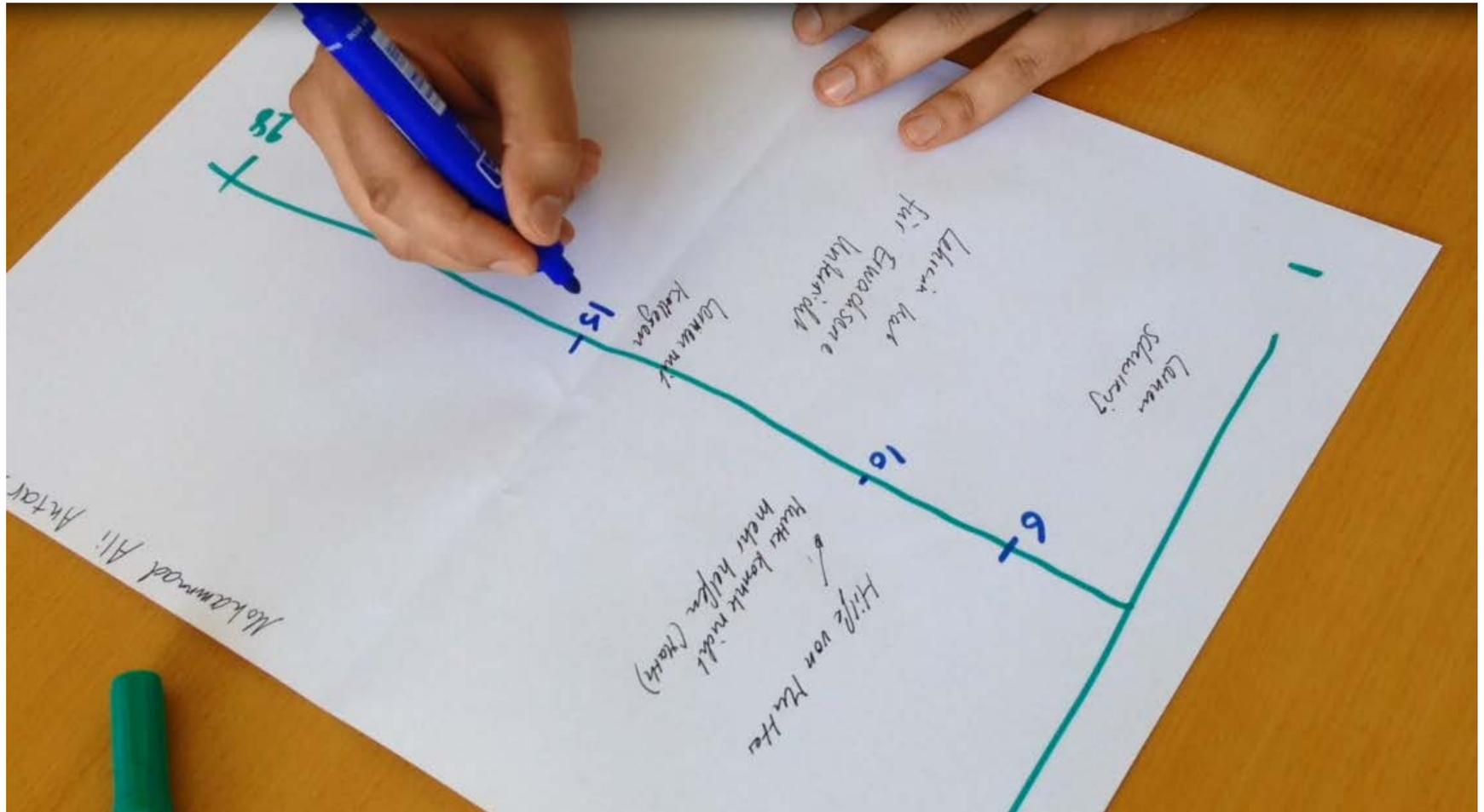
At what price is offer 1 better? When is offer 2 better?

7-12 months  
more than a year

# RESULTS FROM PILOT INTERVIEWS

- Six interviews conducted
- Participants:
  - One secondary school teacher (46 years)
  - Three teenagers (16 years)
  - Two refugees (28 and 33 years)
- Different interviewers (presenters and student teachers)
- Duration of interviews between 7 and 40 minutes
- Recorded on video (hands and paper only, no faces)

# EXAMPLE OF AN INTERVIEW SITUATION



# FEEDBACK AND FIRST INSIGHTS

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- Demanding to implement for both interviewer and interviewee
- Start/instruction for maths history is crucial
- Language based
- (Life) experience relates to preference for different parts of assessment

# CONCLUSION

- Threefold assessment works, because ...
  - ...it addresss different dimensions of learning, specifically affective and cognitive dimensions
  - ...it enables identifying knowledge outside the curriculum, not least of all learning barriers
  - ...it provides a basis for a positive teacher-student relationship
- Appropriate material for teachers:



# LITERATURE

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