CODE-SWITCHING ONLINE

An evaluation of a bilingual online maths program for Grade 7 learners in Diepsloot, Johannesburg, South Africa

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MLE5 October 2016
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MOTIVATION

• ANA results, TIMSS study, SACMEQ reports illustrate an education crisis in South Africa

• Grade 9 Annual National Assessment 2014 results: 3% of learners achieved 50% or more for Mathematics

• Learners are learning Mathematics through a language they do not adequately understand
CONTEXT

South Africa:
- 11 official languages
- English spoken as L1 by 9% of the population
- English as primary LoLT

Diepsloot:
- Impoverished township on the outskirts of Johannesburg
- Melting pot of languages

OLICO Youth:
- Mathematics support NPO working with Grade 7 to 12 learners in Diepsloo
RESEARCH QUESTIONS

• How can video-based translanguaging for online Mathematics lessons promote learners’ conceptual development?
• How does the use of translanguaging in the OLICO Youth Mathematics course affect learners’ attitudes to learning?
SOCIO-POLITICAL CONSIDERATIONS

• Utility and prestige vs heritage and cultural importance of languages
• Apartheid legacy of education in South Africa
• English is the preferred LoLT for socio-political reasons
LINGUISTIC CONSIDERATIONS

- Second language acquisition in South Africa
- Learning through a second language
- Code-switching in the classroom
MATHEMATICAL CONSIDERATIONS

- Perceptions and misconceptions regarding learning Mathematics through L2
- Understanding fractions
THEORETICAL FRAMEWORK

INPUT

Context-embedded and reduced

CONCEPTUALISE IN L1

OUTPUT

Developmental Interdependence Hypothesis
METHODOLOGY

• Application of Design Based Research
• Challenges of Design Based Research
• Implementation of the design
• Ethics
**INTRODUCE CONCEPT**
Concept is introduced in isiZulu so conceptualisation can begin

**EXPAND CONCEPT**
Once concept is clear, it is expanded on in English

**INTRODUCE NEXT CONCEPT**
IsiZulu is used to introduce the next concept

**EXPAND CONCEPT & RECAP**
English is used to expand on the concept and recap the lesson
CODE-SWITCHING MODEL

1. Concept is introduced in isiZulu so conceptualisation can begin

2. Once concept is clear, it is expanded on in English

3. IsiZulu is used to introduce the next concept

4. English is used to expand on the concept and recap the lesson
OUTPUTS

40 GRADE 7 PUPILS LEARNING FROM VIDEOS

18 LEARNING IN ENGLISH & ISIZULU

22 LEARNING IN ENGLISH

8 BILINGUAL VIDEOS

6 WEEKS
DATA PRESENTATION

• Pre-quiz to post-quiz improvement in Fractions course
  • Calculated by finding difference in pre-quiz to post-quiz performance

• Glossary usage
  • Measured in number of clicks and retention of meaning
PRE-QUIZ TO POST-QUIZ IMPROVEMENT

Fractions 1

Fractions 2

- Pre-quiz average
- Post-quiz average
- Average
- Improvement
PRE-QUIZ TO POST-QUIZ IMPROVEMENT

 Fractions 3

 Fractions 4

 Control group  Experimental group

 Control group  Experimental group

 Pre-quiz average  Post-quiz average  Average improvement
PRE-QUIZ TO POST-QUIZ IMPROVEMENT

Fractions 5

- Pre-quiz average
- Post-quiz average
- Average improvement

Control group | Experimental group

Fractions 6

Control group | Experimental group
PRE-QUIZ TO POST-QUIZ IMPROVEMENT

Fractions 7

- Control group
- Experimental group

Fractions 8

- Control group
- Experimental group

Pre-quiz average
Post-quiz average
Average improvement
GLOSSARY USAGE

Clicks per glossary item

- Simplest form (64): 14%
- Shaded (14): 12%
- Equivalent (2): 11%
- Diagram (12): 2%
- Convert (11): 0%
GLOSSARY USAGE

Number of correct answers per term

- Total correct
- English
- L1 or mix

- Convert
- Diagram
- Equivalent
- Illustrate
- Represent
- Revise
- Shaded
- Share fairly
- Simplest form
DATA ANALYSIS

Pre-quiz to post-quiz improvement:
- No statistically significant difference
- Time period limiting
- Implications of results

Glossary
- Actively used by learners
- Glossary terms’ meanings retained
- Increase in use of L1 to express terms
CONCLUSIONS

- No significant quantitative results due to time frame
- Positive qualitative results
- Different linguistic contexts would impact the results
- Design-based research requires further iterations of designs
FURTHER RESEARCH

• What would the results be of this model in different contexts; particularly linguistically homogenous contexts, both locally and internationally?

• How could this model be sustainably used to assist teachers?
THANK YOU