

https://dspace.org/

Teaching and learning linear programming in a Grade 11 multilingual mathematics class.

Mpalami, Nkosinathi

2008-06-17T08:02:21Z
http://hdl.handle.net/10539/4959

Downloaded from a DSpace repository. https://dspace.org/

Abstract

This report presents a qualitative case study, which explored how a Grade 11 mathematics teacher in a multilingual classroom used the learners' home languages in order to support their understanding of concepts in Linear Programming. The study involved one teacher together with his Grade 11 learners and was carried out in a township school located in the Eastrand, Johannesburg. Data was collected through lesson observations of five consecutive lessons and a reflective interview with the teacher. The situated-sociocultural perspectives guided the study. The analysis shows that the teacher used learners' home languages deliberately; in mathematics tasks, for asking questions, to re-voice learners' contributions, for encouraging learners' participation in mathematical discourses and practices, and for probing learners' thinking. In general, the use of learners' home languages enhanced learners' understanding of Linear Programming concepts. The study also highlights the complexities of translating mathematics tasks from English to learners' home languages.

Declaration

I declare that this research report is my own unaided work. It is being submitted for the degree of Master of Science Education by coursework and research in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

Nkosinathi Mpalami

2nd day of October 2007

This work is dedicated to

my son,

Mkhaliphi Mpalami

Acknowledgements

I would like to sincerely thank my supervisor, Professor Mamokgethi Setati for her insightful and professional assistance in this study.

I also want to thank my loving wife Nomsa and my dear son Mkhaliphi for the emotional support they gave me when days were dark.

I would like to extent my genuine thanks to the Mellon Grant Management for their financial support.

Finally, I would like to wholeheartedly thank my two colleagues at Wits Marang Centre for Mathematics and Science Education, Lynn Bowie and Clement Dlamini for reading and editing this document.

Table of Contents

CONTENTS		Page
CHAPTER 1: BACKGROUND TO THE STUDY		1
1.1	Introduction	1
1.2	The purpose of the study	2
1.3	Why this study?	3
1.4	Why Linear Programming?	5
CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK		10
2.1	Introduction	10
2.2	Situated theory	10
2.3	Situated-sociocultural theoretical framework	12
2.4	Literature review	16
CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY		20
3.1	Introduction	20
3.2	Selection of case	21
3.3	Data collection	22
3.4	Video recording the lessons	22
3.5	Reflective Teacher Interview	23
3.6	Data analysis	24
3.7	Validity and reliability	28
	3.7.1 Validity	28
	3.7.2 Reliability	30
3.8	Ethical considerations	32
CHAPTER 4: DATA ANALYSIS		35
4.1	Introduction	35
4.2	Overview of the lessons	36
4.3	Counting situations emerging from data	38
4.4	Data representation and discussion	44
4.5	Analysis of Tasks	58
4.6	Why does the teacher use learners' home languages in the way in which he does?	62
4.7	Complexities of translating tasks	64

4.8 Learners' reflections on the home language versions of the task 70

CHAPTER 5: CONCLUSIONS AND IMPLICATIONS FOR PRACTICE74

5.1 Introduction 74
5.2 Summary of findings 74
5.3 Implications for curriculum development and teaching 80
5.4 Limitations of the study 82
5.5 Conclusion 82

REFERENCES 84

APPENDIX 89

Lessons' Transcripts 89

Teacher's interview transcript 117

Ethical clearance documents 127