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2010-11-09
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INVESTIGATING LESOTHO JUNIOR SECONDARY SCIENCE TEACHERS' PERCEPTIONS AND USE OF LABORATORY WORK

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A research report submitted to the

Faculty of Science
of the

University of the Witwatersrand, Johannesburg

In partial fulfillment of the requirements for the degree of

Master of Science in Science Education.

Supervisor: Dr. Elaosi Vhurumuku

DECLARATION

I declare that, apart from the sources acknowledged, this research report is my own unaided work. It is being submitted in partial fulfillment for the degree of Master of Science in Science Education to the University of the Witwatersrand, Johannesburg, and has not been previously submitted for any degree or examination at any other university.

_____

Monare Thulo Julius

15th day of September 2010

DEDICATION

This work is dedicated to my mother, ‘Mapuleng Monare and my late father Lefurutse Monare for their sacrifice to give me education, and for inspiring in me courage for further learning.

ACKNOWLEDGEMENTS

I sincerely extend my gratitude to my supervisor Dr. Elaosi Vhurumuku for his tireless, invaluable professional guidance without which this study could not have been successful.

I would also wish to thank the Ministry of Education and Training for allowing me to conduct this study in Lesotho schools. I also thank the principals of the schools for allowing me in their premises, the teachers who participated in this study by responding to the questionnaires. I also thank those teachers who further sacrificed their time and participated in interviews, and above all, those teachers who also allowed me to observe them during laboratory instruction.

I will not forget my dearest wife, 'Mamoeletsi Monare for inspiring in me ambition to further my studies and the financial and emotional support she gave me when the going was tough. I also thank our sons, Moeletsi and Molefi Monare for the patience they showed while both their parents were studying away from home when they needed their presence.

TABLE OF CONTENTS

Content **page**

Declaration…….....ii
Dedication…….iii
Acknowledgements……iv
Table of contents……v
List of acronyms……ix
List of tables……...x
List of figures…….xi
Abstract……..xii

CHAPTER 1: Introduction to the study

1. Introduction…….....1
1.1 The Purpose of the Study……..2
1.2 Rationale for the study……..3
1.3 The Lesotho context……..4
1.4 Theoretical Framework……..5
1.4.1 Scientific inquiry and constructivism……..5
1.4.2 The aims of laboratory work in school science…….....7
1.5 Literature Review……8
1.6 Chapters Organization…….....10
1.7 Conclusion ……..11

CHAPTER 2: Literature Review

1 Introduction……...12
2.1 Perspectives on laboratory work……12
2.2 Historical Overview of Laboratory Work…….....15
2.3 Aims of Laboratory Work……..17

2.4 Non-inquiry and inquiry oriented laboratory instruction…….....19
2.5 Research on Teachers' Perceptions of the Aims of Laboratory Work…….....21
2.6 Research on Teachers' Use of Laboratory Work……..24
2.7 Research on interaction between teachers' perceptions and instruction……...25
2.8 Conclusion ……27

CHAPTER 3: Research Methodology

3. Introduction…….....28
3.1 Research design…….....28
3.2 Participants' sampling and demographics ……30
3.3 Research instruments……..31
3.3.1Teacher Perceptions of the Aims of Laboratory Work (TPALW) Questionnaire.....32
3.3.2Teacher Perceptions of Instruction (TPI) Questionnaire…….33
3.3.3Open ended questionnaire (Appendix C)…….....34
3.3.4Interview schedule…….....34
3.3.5 Laboratory observation schedule…….....36
3.4 Validity and reliability……...36
3.5 Pilot study……...38
3.6 Data collection procedures……39
3.6.1 Questionnaires administration…….....39
3.6.2 Semi-structured interviews -teachers' perceptions and use of laboratory work…….....40
3.6.3 Laboratory observations -teachers' use and practices in laboratory work Teaching…….....41
3.7 Data Analysis…….....42
3.7.1 Teachers' Perceptions of Aims of Laboratory Work (TPALW)…….....42
3.7.2 Teachers' Perceptions of Instruction (TPI)…….....43
3.7.3 Teacher perceptions of aims and use of laboratory work -open ended Questionnaire…….43
3.7.3.1 Teachers' perceptions of aims of laboratory work…….43
3.7.3.2 Teachers' use of laboratory work……44
3.7.4 Teachers' perceptions and use of laboratory work- analysis of interview data….....45

3.8 Conclusion…….....45

CHAPTER 4: Results and Discussion

4. Introduction…….....46
4.1Teachers' perceptions of the aims of laboratory work in school science…….46
4.1.1 Results from Teachers Perceptions of Aims of Laboratory Work Questionnaire…….....46
4.1.2. Teacher perceptions of the four major aims of laboratory work…….....49
4.1.3 Teachers' perceptions of laboratory work for conceptual understanding and gender…….....51
4.1.4 Results from open ended questionnaire and interviews…….....52
4.2 Teachers' use of laboratory work in teaching of science…….....56
4.2.1 Results from the Teachers' Perceptions of Instruction Questionnaire…….....56
4.2.2 Results from open ended questionnaire…….59
4.2.3 Results from interviews……..60
4.2.4 Results from laboratory class observations……63
4.2.5 Teacher use of laboratory work: some pertinent comments…….....65
4.3 Relationship between teacher perceptions and use of laboratory work……66
4.3.1 Chi-Square test of association between teacher perceptions of laboratory work……..66
4.3.2 Results from interviews and lesson observations for conceptual understanding and their use of inquiry-oriented strategies……....68
4.4 Conclusion…….69

CHAPTER 5: Conclusions, Implications and Recommendations

5. Introduction…….71
5.1Teacher perceptions of the aims of laboratory work……...71
5.2 Teachers' use of laboratory work and practices in teaching science…….72
5.3 Relationship between teacher perceptions and use of laboratory work…….73
5.4 Implications and recommendations for teaching……73
5.5 Recommendations for policy makers and curriculum developers…….....74
5.6 Recommendation for further research…….74
5.7 Strengths and limitations of the study……75
5.8 Conclusion…….76

REFERENCES……...77

APPENDICES:

Appendix A: Teachers' perceptions of aims of laboratory work questionnaire……...87

Appendix B: Teachers' perceptions of instruction questionnaire…….90

Appendix C: Open ended questionnaire……....92

Appendix D: Interview schedule……...93

Appendix E: Laboratory observation schedule…….95

Appendix F: Application for conducting a research study in Lesotho schools……....98

Appendix G: Interview transcripts……....99

Appendix H: Information sheet……...104

Appendix I: Authorization for conducting an educational research……...105

LIST OF ACRONYMS

CU: Conceptual understanding

IM: Interest and motivation

MIS: Make science interesting

NOS: Nature of science

PST: Process skills and techniques

SI: Scientific inquiry

TIP: Teachers' instructional practices

TPALW: Teachers' perceptions of the aims of laboratory work

UT: Understanding of theory

LIST OF TABLES

Table **Page**

2.1 Teachers' responses on aims of laboratory work in order of perceived importance…...18

2.2 A comparison of the age ranges used in both studies……..22

2.3 Levels of openness to inquiry in laboratory activities (Hegarty-Hazel, 1986)……24

3.1 Teachers' academic qualifications……31

4.1 Contingency table for observed (O) and expected (E) frequencies……..51

4.2 Questionnaire results – Teachers' perceptions of the aims of laboratory work……53

4.3: Closed questionnaire results-Teachers' use of laboratory work……..57

4.4 Main ideas emerging from teachers' responses…….....59

4.5: Contingency table for observed (O) and expected (E) frequencies……..67

LIST OF FIGURES

Figure **Page**

Figure 3.1 Summary of methodological framework……30

Figure 4.1: Teachers' perceptions of the aims of laboratory work…….....47

Figure 4.2: Teacher perceptions of the four major aims of laboratory work……50

Figure 4.3: Teacher perceptions of the four major aims of laboratory work……57

Investigating Lesotho Junior Secondary Science Teachers' Perceptions and Use of Laboratory Work

Abstract

This study investigated Lesotho junior secondary science teachers' perceptions and use of laboratory work in teaching**.** Teaching is described as engagement in a relationship between a person called a teacher and another person called a student with the purpose of facilitating the student's acquisition of content which the student previously lacked (Fenstermacher, 1986). Using the constructs of scientific inquiry and inquiry-based instruction and constructivism as theoretical lenses the study empirically explored the Junior School Science teachers' perceptions of the aims of laboratory work and how the teachers used laboratory work in their teaching. At the centre, the investigation sought to understand whether there was any relationship between teachers' perceptions of the aims of laboratory work and their use of laboratory work. The sample of the study consisted of fifty science teachers (n=50) conveniently selected from 12 schools in the Butha-Buthe district of Lesotho. Data were collected through closed and open ended questionnaires (n=50), semi-structured interviews (n=5), and laboratory lesson observations (n=2). Data were analyzed quantitatively using descriptive statistics and qualitatively using a combination of typological and interpretational analysis. The results show that as a group the sampled teachers held the view that the most important aim of laboratory work was to promote conceptual understanding. In their teaching, most of the sampled teachers use laboratory work to verify theory through largely verificationist, expository and non-inquiry laboratory instructional practices and strategies. The following barriers were reported by the teachers as limiting their use of inquiry oriented and student centered teaching strategies: limitations of resources; time constraints; large classes; pressure to complete the prescribed curriculum; safety issues; and preparations for external examinations. The results also suggest that the teachers' seeing laboratory work as important for developing conceptual understanding is associated with their use of verificationistic teaching approaches. It is recommended that; Lesotho science curriculum be reviewed, and that teachers should participate in curriculum development to enhance successful implementation of inquiry instruction, professional development programmes be established, and the enactment of inquiry instruction be systematically monitored and evaluated. It is recommended that curriculum developers facilitate teachers' transformation from expository to inquiry instruction.

Key words

Laboratory work, scientific inquiry, constructivism, teachers' perceptions, instructional practices, assessment, inquiry teaching, conceptual understanding.