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Teacher Clusters or Networks as opportunities for learning about
science content and pedagogical content knowledge

by

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Abstract

Changing classroom practice is a difficult and complicated business. It involves challenging both what teachers know and do in their classrooms. It involves a process of re-configuring both teacher knowledge and practice. Many attempts at teacher development have had less than spectacular results in this regard. This study explored one such attempt of a teacher development programme that was aimed at challenging and reshaping teacher's science content knowledge (CK) and pedagogical content knowledge (PCK), with the aim of influencing classroom practice.

Using Shulman's argument on the importance of uncovering teachers' knowledge, this study investigated teacher clusters or networks and the opportunities they provide for science teachers to collaborate and share their knowledge and classroom practices. The collaboration was intended to strengthen science content knowledge (CK) and pedagogical content knowledge (PCK) in order to improve classroom practices. The context of the study was a professional development intervention on science and mathematics in Mpumalanga; the Mpumalanga Secondary Schools Initiative (MSSI) funded by the Japanese International Co-operation Agency (JICA), where the teachers met regularly to share knowledge and experiences in smaller groups commonly referred to as Teacher Clusters.

Qualitative research methods in the form of case studies were used to investigate and understand how these clusters helped science teachers in particular to challenge and change their CK and PCK by working collaboratively. The study presents two case studies of science teacher clusters, and examines the interactions and mechanisms by which the clusters constituted resources for teacher learning and improvement in teaching practice. The major findings of this research are that:

- Teacher clusters indeed provided better resources for changing the classroom practice of science teachers by allowing them to focus specifically on their CK and PCK and the interactions between the two forms of teacher knowledge

- Most importantly, teacher clusters also functioned in such a way that they allowed teachers a substantially more and better set of collective resources from which to begin and sustain changes in classroom practice.

In making these major findings, this research established the critical role of the structure and leadership of the cluster in helping to create conditions for successful clustering and teacher change. The study concluded by observing that clustering or networking does provide teachers with enhanced opportunities for professional growth and classroom change. Variations in forms of clustering and teacher leadership issues within the clusters still require further investigation and research than this study was able to provide.

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Declaration

I declare that apart from the assistance acknowledged, this thesis is my own assured work. It is being submitted for the degree of Doctor of Philosophy at the University of Pretoria, South Africa. It has not been submitted for any degree or examination at any other university.

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Table of Contents

	Page
Title Page	i
Abstract	ii
Acknowledgements	iii
Declaration	v
Table of Contents	vi
References	x
List of Appendices	xi
List of Tables	xii
List of Figures	xiii
Definitions and Abbreviations	xiv

Chapter 1. An Investigation into Clusters or Networks as Opportunities for Learning about Science Content and Pedagogical Science Knowledge

1.1 Study Overview	1
1.1.1 Personal Drivers	4
1.1.2 Teacher Development	6
1.1.3 Theoretical Drivers	7
1.2 Clusters as aid to teacher development	7
1.3 Mpumalanga Secondary Science Initiative	10
1.4 Statement of the problem	13
1.5 The organization of the study	14

Chapter 2 Literature review

2.1 Introduction	17
2.2 Meaning of knowledge as viewed by researchers	18
2.2.1 Content knowledge (CK) and pedagogical content knowledge (PCK)	19
2.2.2 Conceptual framework	20
2.2.3 Knowledge of practice	22
2.2.4 Knowledge in practice	23
2.2.5 Knowledge for practice	24
2.2.6 Knowledge construction	25
2.2.6.1 Knowledge construction through reflection	26
2.2.6.2 Knowledge construction through sharing	28
2.3 Teacher development	28
2.3.1 Traditional approaches to teacher development	29
2.3.2 New and innovative approaches to teacher development	31
2.3.3 Cluster approach	33
2.4 Summary	35

Chapter 3 Research Methods

3.1 Introduction	37
3.1.1. Description of the field	39
3.2 Research design	44

3.2.1 Methodological approaches used	44
3.2.2 Sampling	49
3.2.2.1 Sampling of documents	49
3.2.2.2 Sampling of clusters	50
3.2.2.3 Sampling of schools	51
3.3 Research Instruments and data sources	51
3.3.1 Interviews	51
3.3.2 Observations	52
3.3.3 Instruments, Structure, Purpose and Processes	52
3.3.3.1 Classroom case Scenarios	52
3.3.3.2 Cluster Simulation	56
3.3.3.4 Regional Cluster Workshop	57
3.4 The Process of data collection based on Questions	58
3.4.1 Research question one	58
3.4.2 Clusters in Mpumalanga	58
3.4.3 Research Question two	60
3.4.3.1 Simulation as a tool to collect data	63
3.4.4 Research Question three	63
3.4.4.1 Observations and field notes	63
3.4.4.2 Interviews and classroom observations	64
3.5 Reliability and Validity of data	64
3.6 Problems and Resulting Limitations	64
3.7 Research ethics in data collection	66
3.8 Data Analysis	69
3.9 Summary	71
Chapter 4 The structure and formation of clusters	
4.1 Introduction	72
4.2 Summary of the Administration Management Structures	74
4.2.1 Formation of clusters	74

4.2.2 Dominant clusters	75
4.2.3 Dynamics of formation and structure of clusters	79
4.2.4 External clusters	85
4.3 Summary	88

Chapter 5 Challenging and changing teachers' content knowledge (CK) and pedagogical content knowledge through cluster activities

5.1 Introduction	89
5.2 Case study one	90
5.2.1 The structure of the SIM cluster	92
5.2.2 Cluster leaders' content knowledge	93
5.2.2.1 Conceptualization of energy	93
5.2.2.2 Conceptualization on growth and soil	96
5.3 Uncovering teachers' knowledge	100
5.3.1 Barriers to sharing	100
5.3.2 Fear and confrontation of knowledge	102
5.3.3 Construction of knowledge	103
5.4 Second case study	108
5.4.1 Challenging the structure	108
5.4.2 Challenging the structure through collaboration	113
5.4.3 Sibonelo cluster teaching	115
5.4.4 Classroom experiences	117
5.4.5 Challenging CK and PCK through reflection	121
5.4.6 Challenges of clustering	124
5.4.7 Sibonelo cluster – a reexamination	125
5.5 Comparing the two cases	127
5.6 Teacher collaboration	131
5.7 Cluster operation within the structure of the MDE	133
5.8 The operational structure at the Sibonelo cluster	133
5.9 Summary, conclusion and implications for further research	134
5.10 Improving the quality of teachers' CK and PCK	135

5.11 The research design of the study	138
5.12 Key Findings of the Study	139
5.13 Implications	144

6. References	147
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List of Appendices

Appendix 1. Map of the Mpumalanga Province	158
Appendix 2 Mpumalanga Secondary Schools Initiative document	159
Appendix 3 Brief Summary of the MSSSI Project	191
Appendix 4 MSSSI Regional Workshop document	197
Appendix 5 Cluster meeting programme	198
Appendix 6 Cluster meeting questionnaires	199

List of table

Table 1. Cluster definitions and characteristics	35
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List of figures

Figure 1. Schematic presentation of my conceptual Framework	22
Figure 2. Illustration of the three regions of Mpumalanga	39
Figure 3. Composition of a dominant Clusters in Mpumalanga	41
Figure 4. Simulated Cluster	41
Figure 5. Data collection point at Sibonelo Cluster	42
Figure 6. Curriculum Implementers Workshop	57
Figure 7. The Regional Cluster Leaders' Workshop	58

Glossary of Terms and Definitions

Term	Definition
C2005	Curriculum 2005 is the new curriculum that was introduced in South Africa by the National Education department
CASS	Continuous Assessment is the assessment procedures policy adapted by South Africa to take into consideration all the performance of tasks by the learners
CES	Chief Education Specialist is the person who is in charge of the specific subject at the provincial level
CI	Curriculum Implementer is the subject advisor whose responsibility is to support teachers on specific content knowledge
CK	Content Knowledge is the knowledge of the subject matter
CL	Cluster Leader is a teacher who is selected to be a facilitator of a cluster
CM	Circuit Manager is the person that is in charge of a number of schools and activities in the circuit
DCES	Deputy Chief Education Specialist is the person that is assisting the person that is in charge of the specific subject
EHL	Ehlanzeni region is one of the three regions in Mpumalanga which means the low veld
FET	Further Education and Training is the level of education that is made up of three grades 9 to 12 which are the final last years of schooling
GET	General Education and Training is the senior primary and the junior secondary school grades (4-9)
GS	Gert Sibande is one of the three regions in Mpumalanga
HOD	Head of Department of the specific subject /s at the school level
INSET	In-Service Training is the training and the development of teachers who are already teaching
JICA	Japan International Cooperation Agency
JP	Japan
M&S	Mathematics and Science
MDE	Mpumalanga Department of Education
MSSI	Mpumalanga Secondary Science Initiative
NCS	National Curriculum Statement is policy document issued by National department of education in S.A. that is a guide on the implementation of the new curriculum
NKA	Nkangala is one of the three regions in Mpumalanga . Nkangala means Highveld.
NUE	Naruto University of Education in Japan
OBE	Outcome-Based Education is an approach adopted by South Africa for its New Curriculum.
PCK	Pedagogical Content Knowledge is the knowledge that is imparted in the classroom

PD Professional Development means the process of engaging teachers with the aim of improving their teaching profession.

RNCS Revised National Curriculum Statement is the modified policy on the implementation of the new curriculum

SEP Science Education Project is the Non Governmental Organization that helped teachers to improve their science teaching

Sibonelo The name given to the external cluster which means Exemplary

SIM Simulated cluster is the created cluster that modeled how the cluster could operate in helping teachers to learn from each other

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