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.

Thembi.C Ndlalane

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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 cuuiculum
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
UP University of Pretoria