

TOWARDS A HOLISTIC MODEL FOR PROFESSIONAL DEVELOPMENT OF SCIENCE EDUCATORS IN AFRICA THROUGH DISTANCE EDUCATION

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Introduction

- Aim - to share experiences and lessons from a professional development model
- Science Education in Rural Settings
- Biology, Mathematics, Chemistry, Computer Science and Physics Educators
- distance education.

Professional development: Definitions

“the opportunities offered to educators to develop new knowledge, skills, approaches and methods to improve their effectiveness in their classrooms and organizations” Loucks-Horsley, Hewson, Love and Stiles (1998).

- “activities engaged in by teachers to enhance their knowledge, skills and attitudes in order to educate children more effectively” Brown and Earley (1990) .

Introduction

- Education System in South Africa before 1994
- Education System after 1994
- Curriculum 2005- Gov driven change



Historical Perspective

- Prior to 1994, South Africa, like Namibia, suffered the inequitable policies and practices of apartheid that left blacks in poverty unlike their white counterparts (Ottevanger, Macfarlane & Clegg, 2005)

Teacher education

- Teacher education system characterized by segregation and fragmentation
- was totalitarian, dictatorial, bureaucratic and controlled the curriculum to such an extent that black teachers spent only 3 years in the colleges while their white counterparts were educated at degree level for four years
- repressive teacher education system backed by policies like the Bantu Act of 1953
- produced mass schooling for blacks aimed at social control and subservient roles.
- teachers trained in departmental education centres, the so called homeland teacher and professional training centres
- Welch, 2002.

Context

The educational context-prior to 1994:

- inadequate level of training for black teachers
- few schools built in the rural areas designated for blacks, coloureds and Indians.
- For the blacks, there were teacher colleges that concentrated on content rather than pedagogy with disastrous consequences on the students (Cohen, 1994).

Historical Perspective

- division of the subjects between standard and higher grade
- blacks taking mathematics and sciences on at standard grade
- could not join Universities
- ill preparation of teachers
- students desolate and unable to perform at the peak of their potential.

History

Old Education System
Perpetuated race, class, gender and ethnic divisions

Emphasized separateness rather than common citizenship and nationhood (C 2005, 1997:1)

New System

Proposed to be just and equitable education that is relevant to majority
Based on principles of co-operation, critical and social responsibility
Should empower all individuals



Research questions

- What is the best model for developing Science Teachers in an African Context?
- What is the impact of professional development through distance education on the teaching practices of rural Science teachers?
- How do rural biology teachers engage the constraints they face on a day to day basis?

Approach

- a mixed methods approach consisting of both quantitative and qualitative strategies,
- document analysis; semi-structure interviews; focus-group discussions, questionnaires
- Site-visits
- classroom observations
- Action research

Modules

- **content**, the model was focused on addressing deeper understanding, misconceptions, creating high order thinking and removing educator's anxiety towards Science.
- The **process** was multi-faceted comprising face to face interactions, tutorial letters, readers, assignments and self-reflective inquiry learning.
- Recognition of **prior learning** was conducted through group interviews and pre-tests before modules were developed in the above areas.
- underpinned by the **constructivism** paradigm and based on **out comes based education**.
- develop content knowledge as well as **pedagogy**

Mode of delivery

- modules designed in response to the constraints identified by these rural teachers
- modules offered through distance education
- four compulsory assignments
- a journal as completion requirements
- Contact sessions near the teachers
- Formative and summative assessments

Professional development Model

- Qualitative and quantitative methods of research, including action research, focus group interviews and semi-structured interviews, were used in finding evidence based results that were integrated into the professional development model

Distance education Model

Advantages:

- Teachers can study in their own time
- The information can be utilized immediately into the class rooms
- The teachers do not have to be taken out of the class rooms
- Contact sessions used to clarify issues

Model challenges

- African rural schools
- lack of infra-structure
- poverty
- impact of HIV/AIDS
- Professional conduct of teachers

Professional development Model

- Holistic development of the educators at four levels;
- the **environment**,
- the **“self”**,
- **content** knowledge
- **pedagogical** content knowledge.

Lessons learnt

- need for a holistic professional development model
- cognizance of the **resource poor rural African contexts**

African Renaissance

- African needs a new model of teacher education
- Relevant content
- Contextualized for Africa
- New ideas needed to solve Africa's problems

African Renaissance

- Education systems have to change to address African needs
- Poverty eradication
- Disease prevention and control
- MIT
- "Owned" by the Teachers
- Government- invest heavily in teacher development

African Renaissance

- Philosophical frame works to be changed
Theories of Human development
- *Ubuntu* philosophy /spirit-African values, ethics, norms and standards
- Local and yet global in nature
- Trends-internet; new technology; financial intelligence;
- African consciousness instilled

African Renaissance

- Africa's riches and natural resources to be taught and protected in the education systems
- Brain drain of teachers to be reduced
- Instill in youth that African is good

Multi, Trans and Inter-disciplinary (MIT) Education

- Mono disciplinary- has not solved African's problems
- MIT- across disciplines should be introduced in schools, Universities
- New body of knowledge and thinking
- CARS- focuses on the paradigm

Conclusion

- Teacher Education Models should involve the Managers of the schools
- Continuous education- Life long learning for teachers
- Holistic in nature characterized by 4 principles:
 - "Self"-leadership skills and emotional intelligence

Conclusion: Teacher Model

Holistic in nature:

- Environment:
 - School (labs)
 - Community
- Psychosocial- (HIV/AIDS impact)
- Infrastructure
- Resources

Conclusion

- African Renaissance- in Teacher Education Models
- "African is good and to be an African is cool"
- Teachers should be proud of who they are and should be respected for the noble profession

- A holistic model- Self, environment, content, PCK, MIT and African Renaissance Paradigms

