Chapter 17
Reconceptualizing Preservice Teacher Preparation in Science Literacy Education Using Action Research in South Africa

André P. Botha
University of Pretoria, South Africa

Leila Goosen
https://orcid.org/0000-0003-4948-2699
University of South Africa, South Africa

ABSTRACT

This chapter presents a reconceptualization of preservice teacher preparation in the context of science, information technology, and African language education using action research (AR). The authors provide a background of AR as a transformative practice, along with benefits and possible limitations, and describe how student teachers turn theory to practice as change agents engaging in reflection and implementing solutions. Collaborative interaction between mentor teachers and lecturers and the project reports and reflective journals generated by the student teachers are integral parts of the research design and internship program. The authors recommend the use of AR to empower student teachers to deal effectively with probems that arise, and they discuss future research directions.

"Education is the most powerful weapon which you can use to change the world" – Mandela (1990).

INTRODUCTION

The preparation of preservice teachers is integral to the success of both such students and schools. Therefore, it is important to understand how effective teacher preparation is manifested and being implemented

DOI: 10.4018/978-1-7998-8725-6.ch017

Copyright © 2022, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

across different programs around the world. In this chapter, providing ideas to reconceptualize the curriculum, tools, and professional development is of primary importance. This chapter hopes to bring to bear and share the processes, experiences, and knowledge of university faculty and other professionals as programs engage in the work of curricular and programmatic transformation. Reconceptualizing Preservice Teacher Preparation Using Action Research focuses on high-quality research and instruction in preservice education, as well as similar and related fields.

Although many countries in Africa have taken momentous steps forward in their education structures (Pandor[1], 2006a), analyses of the progress made by South Africa in the first two decades of democracy indicate massive gaps in development that still needs to be confronted (Pandor, 2004). Developing countries such as South Africa need to enhance their capacity in Science and Information Technology (IT) if they are to succeed in their developmental goals. South Africa, particularly, is short of women and men with IT skills. Recent studies and surveys confirmed what was already known: IT was "one of the key areas of shortage" in terms of scarce skills (Pandor, 2006b). The first democratically elected government in South Africa faced a particular challenge in this regard: during the Apartheid-era (before 1994), black children were not thought suited to learning these and related subjects (Pandor, 2006d) – this despite the fact that information systems and educational technologies are opening new horizons for learning to children (Goosen, 2019c; Goosen & Van Heerden, 2017)!

Another area of concern pertains to the future of South African languages as areas of academic study, as access to language skills is critical in enabling individuals to realize their full potential for participating in, and contributing to, social and cultural life in South African society.

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2016, p. xix) pointed out that "less than three-quarters of pre-primary and half of upper secondary school" teachers in sub-Saharan Africa are adequately trained. More specifically, especially teachers in South African disadvantaged schools have not had sufficient support in confronting problems in their classrooms (Pandor, 2006e). According to Pandor (2004), although a new orientation towards developing solutions, which emphasize ethics and values, is embedded in more curricula, this was not the case in previous decades (Goosen, 2018a). Ensuring that conditions are conducive to quality teaching and learning in all schools will require that teachers' ability and confidence to deliver the curriculum be appropriately developed by supplying them with the necessary ways and means.

According to McNiff and Whitehead (2016, p. 1), interest had exploded across the world around "the idea of practitioners studying their practices and offering explanations for what they" were doing. In line with this statement, Stringer (2013, p. 1) defined Action Research (AR) as systematically approaching investigation, which enables researchers towards finding effective solutions to the problems that they confront in their everyday lives, while the central thesis of the book by McKernan (2013) was that curriculum redesign can be enhanced through AR and teachers and other practitioners were in the best position when choosing to conduct such inquiries (Goosen, Mentz, & Nieuwoudt, 2007).

In order to address the issues and problems described in this chapter, the experiences of (student) teachers[2] as they were using action research in the classrooms of secondary schools in South Africa are thus described. Andile[3], Aziza[3], Jabulani[3] and Johan taught Science, Information Technology and a South African language towards addressing aspects of reconceptualizing preservice teacher preparation in Science, Information Technology and African language education using action research.

In line with the 'Reconceptualizing Preservice Teacher Preparation in Literacy Education' theme of this book, the purpose of the research reported on in this chapter is therefore to highlight how preservice teacher preparation in science literacy, IT and African language education can be reconceptualized by

20 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/reconceptualizing-preservice-teacher-preparation-in-science-literacy-education-using-action-research-in-south-africa/290770

Related Content

Lesson Study as an Effective Performance-Based Measure of Teacher Effectiveness
Mark Patrick Ryan (2016). *Evaluating Teacher Education Programs through Performance-Based Assessments (pp. 281-294).*
www.irma-international.org/chapter/lesson-study-as-an-effective-performance-based-measure-of-teacher-effectiveness/146043

What Are the Key Principles of Lesson Study?: A Systematic Review of the Evidence
Stuart Burrows (2022). *International Journal of Teacher Education and Professional Development (pp. 1-14).*
www.irma-international.org/article/what-are-the-key-principles-of-lesson-study/295548

Fostering Creativity and Joy of Learning Amongst Students in a Singapore Classroom Through Fun Design-and-Make STEM Projects
Nazir Amir (2021). *Fostering Meaningful Learning Experiences Through Student Engagement (pp. 51-73).*
www.irma-international.org/chapter/fostering-creativity-and-joy-of-learning-amongst-students-in-a-singapore-classroom-through-fun-design-and-make-stem-projects/268510

Preparing New Zealand's Teachers to Use Culturally Responsive Relationship-Based Pedagogies
Mary Beth Ressler, James D. Resslerand Barrie Gordon (2021). *International Journal of Teacher Education and Professional Development (pp. 19-33).*
www.irma-international.org/article/preparing-new-zealands-teachers-to-use-culturally-responsive-relationship-based-pedagogies/281116

Improving Indian Teachers' Readiness to Adopt New Methodologies: Role of Learner-Centered In-Service Training
Nandini Narayanan (2020). *International Journal of Teacher Education and Professional Development (pp. 102-120).*
www.irma-international.org/article/improving-indian-teachers-readiness-to-adopt-new-methodologies/243394