Chapter 2
The Rhetoric of Hands–On Practical Skills:
Advancement of Innovative Teaching and Learning Techniques in Civil Technology

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ABSTRACT

Learning hands-on skills in Civil Technology ensures that learners are capacitated with skills that address socio-economic ills. However, most learners who have completed their studies in Civil Technology are still experiencing unemployment. The purpose of this chapter is to explore innovative teaching and learning techniques that Civil Technology teachers possess during hands-on practical lessons. This chapter used qualitative research approach using observation and interview data collection instruments. This chapter purposefully sampled nine teachers and 145 learners from Gauteng and Limpopo provinces of South Africa and used two frameworks, namely Roger's diffusion of innovativeness and 9E instructional model. The study found that teachers have various challenges in using innovative teaching and learning techniques such as digital technologies to enhance learners understanding of tools concepts. This chapter recommends training for teachers about how to execute hands-on lessons using 9E instructional model as a guide to innovative knowledge.

INTRODUCTION

The quality of technical education (TE) content and hands-on skills delivery has been largely placed on the teacher's ability to transfer content knowledge into hands-on skills in South African schools (Moyo & Hadebe, 2018). At the cutting edge of hands-on skills learning, rest the need to teach for industrial demands. As a result, the need to continuously explore innovative teaching and learning techniques in TE is imminent. Innovative teaching and learning techniques are those methods that convey knowledge and skills anticipated in a way that makes the sending and receiving of the information effective and efficient (Boahin & Boahin, 2018). Actually, innovative teaching and learning techniques broadens all aspects of learning environment because they outline the content value, technology to be used for learning and the pedagogy to be used. Therefore, the use of innovative teaching and learning techniques by Civil Technology teachers need to be explored during their hands-on practical skills lessons. For instance, Civil Technology aims to equip learners with practical, technical, craftsmanship and application of technological process skills in order to address socio-economic ills amongst other things. To some degree, these skills may be learned and assessed using video clips, role play and inquiry based instruction given that a large part of Civil Technology focuses on hands-on skills training.

In this 21st century, industrial demands have changed, evocating for less man power for mass production and requiring modified set of hands-on skills(Luckman, 2015). And so, opening a room for new learning patterns and innovative teaching techniques. Equally, these new learning patterns and innovative teaching techniques are necessary to be explored in Civil Technology for the period of this century. This chapter sheds a light on how hands-on practical skills lessons are conducted in schools whose infrastructure is not in demise. The reason for the choice of these schools is that it is possible for teachers to use various teaching and learning techniques because they do not experience learner overcrowding, school financial breakdown and their workshops are well equipped to conduct hands-on practical tasks. In support to the above, Dempsey (2013) advocates that there is an excess of studies reporting on lack of infrastructure, finances and unqualified teachers in TE while there are far too many issues that are not explored.

Hence this chapter seeks to explore:

● Which innovative teaching and learning techniques do Civil Technology teachers use during hands-on skills training to equipping learners for industrial needs?

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