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OJ-TP

Online Journal for TVET Practitioners

Civil Technology Teacher's Environmental Knowledge in Promoting Active Learning During Practical Lessons: A South African Perspective

Mtshali Thokozani Isaac[1*], Ramaligela Sylvia Manto[1]

[1]University of Limpopo, Polokwane, Sovenga, 0727, South Africa

*Corresponding Author

DOI: https://doi.org/10.30880/ojtp.2019.04.01.007
Received 15th December 2018; Accepted 15th February 2019; Available online 02th May 2019

Abstract: Environmental knowledge refers to a well-managed, safe, learner-centred, practical learning environment that is conducive to hands-on skills learning. For this knowledge to be effective, teachers need to demonstrate competency in practical tasks such that learners are ready for trade industries upon their schooling completion. The purpose of this study was to investigate Civil Technology teacher's environmental knowledge in promoting active learning during practical lessons. Purposive sampling was used to select a total of 63 learners and 5 teachers to participate in this study. Observation and interview instruments were used as data-collection methods. This study employed Stronge qualities of effective teachers as a conceptual framework. The study found that Civil Technology teachers have several challenges in their environmental knowledge that hinders the promotion of active learning. All teachers indicated that they do not do lesson planning and they rarely check on the ones done by DBE. This practice hampers the promotion of active learning in a sense that teachers do not know the extent to which they could engage their learners in practical tasks without wasting time and consumables. All this challenges contribute to the ongoing challenge of producing learners without practical skills necessary for the workplace. This study calls for engineering sectors, higher education institutions, department of basic education as well teachers and subject advisors to continually review teachers pedagogical knowledge and find better ways of improving in-service teachers teaching strategies.

Keywords: Practical task, Planning knowledge, Operational knowledge

*Corresponding author: thokozani.mtshali@ul.ac.za

1. Introduction

There is a growing need for teachers to prepare learners for efficient hands-on skills and this requires a more resourceful and enabling learning environment. This is not exception in Civil Technology since hands-on practical activities are the backbone of skills acquisition in Civil Technology. In South Africa, Civil Technology subject integrates both theory and practical section [Department of Basic Education (DBE), 2011]. The theory content knowledge provides a basis for the practical skills. In theory lesson learners are equipped with content knowledge and knowledge of design process which will be used in practical skill. Content knowledge for Civil Technology subjects includes, Civil services; Construction and Woodworking (Mtshali, Ramaligela & Makgato, 2018). According to DBE (2011) the design process includes skills such as Investigation, Design, Make, Evaluation and Communication (IDMEC). This IDMEC provide learners with proper planning practical skills. During Practical lesson learners develop their skills in a form of Practical Assessment Task (PAT). The aim of PAT is to equip learners with broad range of kno wledge, first-hand experience or skills and values in preparation to trade industries (Maeko & Makgato, 2017). In addition, it also provides learners the opportunity to express their creativity and innovativeness (DBE, 2012). However, teachers need to adhere to national standards by mastering all skills needed and transfer them to learners in a way that constitutes quality (Greenstein, 2012). On account to this, teachers should be competent enough to deliver theory and practical lessons such that learners are ready for trade industries upon their schooling completion. Teachers' knowledge for Civil Technology includes content knowledge, practical skills, instructional knowledge, environmental knowledge, content-related-practical knowledge, and assessment knowledge (Mtshali et al., 2018; Stronge, 2007). Hence this study will focus on investigating teacher's environmental knowledge when preparing and teaching their practical lesson.

Teachers' environmental knowledge it is an ability of a teacher to know how to prepare and operate equipment needed for practical demonstrations. Correspondingly, teaching learners to become environmentally emancipated means preparing them for the real-world challenges and problem solving skills (Jickling & Wals, 2008). Therefore, Stronge (2007) argue that teachers should have the knowledge of prepare and operation when they involve learners in activities that requires them to be active throughout the lesson. In a context of Civil Technology, preparing knowledge will be based on the ability of the teacher to prepare equipment and tools that learners use to gain skills. Whilst operational knowledge would be the teacher's ability to demonstrate how those workshop equipment and tools are used. Effective skill delivery is largely depended on how the teacher prepares equipment for the skill to be acquired and also how he/she teaches it. Yet, these are knowledge that existing literature have failed to explore when finding ways in which hands-on activities can be strengthened in schools in order to increase employability rate amongst school leavers. Therefore, this study explore how Civil Technology teachers prepare and teach their practical lessons in schools.

Teachers must ensure that while teaching they promote active learning where learners gain practical skills that prepares them for artisanship after they complete their secondary schooling life amongst other things (DBE, 2012). However, Maeko (2014) note that hands-on skills training in schools offering Civil Technology is not well functional. For example, he posit that practical tasks are not given enough time even on schools time -tables. On the other hand, Kennedy (2011) propound that the challenging part in teaching practical skills in Civil Technology is caused by the teachers who do not possess adequate skills in the subject and inadequacy of teaching materials and facilities. However, Cohen and Katz (2015) claim that not all teachers have these challenges, some of them really try to equip learners with practical skills even if it means repeating tasks of previous years. However, Dempsey (2013) argues that in the midst of these challenges, one cannot generalise them because the context of which this challenges unfolds is different to many people. Therefore, this study will also focus on exploring Civil Technology teacher's perception on challenges experienced when teaching practical lessons within their context.

2. Challenges faced by teachers when preparing and teaching practical lessons

In South Africa, we used the term Technology Education but other countries use the term Technical Education and based on the fact that this study looks at the vocational skills broadly, the terms will be used interchangeably. Nowadays the focus of Technology Education is directed to skills provision that are capable of making learners employable or self-employed. However, there is a perception in Technical Education that an equipped practical learning infrastructure is key to quality skills delivery (Maeko, 2014). In a same footing, Kemevor and Kassah (2015) suggest that schools with adequately equipped and good laboratory conditions perform better practically than learners from schools with poorly equipped laboratories and poor laboratory conditions. However, Makgato and Mji (2006) refute this suggestions by

pointing out that the availability of resources for practical skill does not assure that there is an effective skill gain taking place in those schools.

According to Ehikhamenor (2013) affording learners with opportunities to engage with and fully participate in practical work is one of the best ways that teachers can adopt in order to assist learners with better understanding of basic scientific principles. However, affording learners with this opportunity is often a challenge to teachers as there are many tussels that comes with it. For instance, Paryono (2015) observed that while these challenges may vary from different places, the most common challenge in teaching practical lessons comes from the fact that technical education have a lot of fresh graduate teachers who lack industrial experience plus the knowledge of planning. Agreeably, Lam and Lidstone (2007) claims that technical teachers do not always have the required subject knowledge to make appropriate choices in the teaching of practical lessons. Hence the is a need to continuously explore how teachers promote active learning when teaching practical lessons in order to identify flaws that need urgent attention in teacher professional development.

Preparing to teach a subject that integrates both theory and practical content requires a thought on how best will learners contribute to the vocational industry's needs. However, a persisting challenge of teachers being unable to adequately prepare and present theory and practical lessons has been found by several studies and referred to as lack of craft knowledge (Levine, 2006; Roehrig & Luft, 2004; Black-Hawkins & Florian, 2012). For example, Aloraini (2012) observed that most technical subject teachers lack craft literacy and craft competency, echoing that technical subjects' teachers lack skills to interpret their syllabuses correctly. In addition, he also alluded that teachers need help in changing their strategies to suit current situation. Similarly, Maeko's (2014) study established that some South African schools lack integration of practical and theory lessons. This is problematic because some teachers do not see the infusion of theory into practical task as an important aspect and therefore they lack proper planning and competency of teaching both sections concurrently (Brunette, 2006; Maeko, 2014). Yet, teachers allocate more time to the teaching of theory rather than practical component. Bjurulf and Kirlbrink (2012) supported this view that many teachers in schools produce many learners without technical skills while the industry looks for people with the technical expertise. Other studies suggest that workshops lacks appropriate tools and material and that has a major bearing on how teachers prepares to teach practical lessons (Forster, Quarcoo, Ashong & Ghanney, 2017).

3. Problem statement

Civil technology is like any FET technology subjects that has been clustered with many challenges, some of which are currently to producing learners without practical skills necessary for the workplace (Jossberger, Brand-Gruwel, Boshuizen & Van de Wiel, 2010). This challenge hamper learner from getting well deserved jobs up to date. As a result, this raises a concern of what roles are played by teachers in workshops if their products are of no or little use to the economy. It is for this reason that this study seeks to investigate Civil Technology teacher's environmental knowledge in promoting active learning during practical lessons. Practical lessons are the ones that are meant to build learners practical skills capacity and teacher's environmental knowledge comes to play in the process. Therefore, there is a need to explore teachers' practices during practical lessons in order to uncover challenges that have impact on producing unskilled Civil Technology learners.

4. Research questions

In order to investigate Civil Technology teacher's environmental knowledge in promoting active learning during practical lessons. This study asked the following questions

a. How do Civil Technology teachers prepare their workshop environment to promoting active learning?
b. How do Civil Technology teachers promote active learning when teaching practical lessons?
c. What challenges do Civil Technology teachers experience when promoting active learning in teaching practical lessons?

5. Methodology

This study used qualitative approach. Purposive sampling was used to identify 63 learners and 5 teachers of Civil Technology in Ekurhuleni district in Gauteng Province, South Africa. The researcher identified teachers who have expertise and experience in Civil Technology field and the volunteered to take part in this study (Creswell & Creswell, 2017; Büthe, Tim & Stephen, Morgan, 2015). As per the aim and focus of this study data was conducted through observation and interviews from the teachers.

Each school's observation was supplemented by narrative stories. The intention of this exercise was to find similarities and differences among the lesson activities in the Civil Technology workshop or classroom. Non-participatory observations were made in the classroom at each of the five schools. Ethical clearance was issued and

approved by the Tshwane University of Technology prior to the conduction of the study in order to protect the participants and researcher from scientific misconduct (Badiee, Wang & Creswell, 2012). The Gauteng department of education (GDE) also gave consent to conduct research in Ekurhuleni district. Prolonged engagements were made to build trust with teachers and learners before conducting practical lessons in Civil Technology workshops. In addition, it was made to ensure that learners as well as their teacher behave as they are used to when they are not subject to research study.

For the focus and aim of this study, the researcher observed a lesson which was based on practical activity of learners making a breakfast-nook for their Grade twelve (12) practical assessment task. Field notes were written to report on what happened during the lesson observed. Data analysis was done by proper structuring of those narratives of the lesson observations and "verbatim" for interviews. Furthermore, observations were analysed using some aspects of a criterion developed by Dr Barry Ziff on "developing strategies that encourage hands-on learning". These aspects include (a) Teacher communicated the goals of the lesson? (b) The teacher indicated model skill(s) to be learned? (c) Allowed learners ample time to practice? (d) Checked for learner pre-mastery of skill? (e) Learning environment organised? (f) All materials prepared in advance? The results and discussion were presented according to research questions. Confirmability involves neutrality of the research interpretations, which can be enhanced by triangulation (Creswell & Creswell, 2017). Therefore in this study, the interpretations of observation were checked by the participants as well as Civil Technology teachers in Sasol 2nd Annual Technical Teachers' conference 2017 and they confirmed them as true reflection. Similarly, Credibility was emphasised through triangulating the data from observations and semi-structured interviews vis-a-vis.

6. Environmental Knowledge

This paper investigates Civil Technology teacher's environmental knowledge in promoting active learning during practical lessons. This study adapted the concept of 'environmental learning' from Stronge's (2007) conceptual framework of "qualities of effective teachers". Qualities of effective teachers is a collaborative design process model that evaluate teachers' professional growth with respect to practical skills, practice, subject content and professional accountability (Stronge, 2007). In trying to define the qualities of effective and good teacher, Stronge (2007) developed seven (7) performance standards of qualities of effective teachers thus, (1) professional knowledge, (2) instructional planning, (3) instructional delivery, (4) assessment of/for learning, (5) learning environment, (6) professionalism in communication; and (7) student progress. However, for the purpose of this study, only performance standard five (5) of learning environment adopted. In this paper the term "learning environment" was adopted as "environmental knowledge". This was based on the fact that this study doesn't only look at the learning environment only but how the teacher orientates learners with respect to practical workshop rules and workshop management (Dyer, 2014). In this context, environmental knowledge is viewed as how the teacher considers environmental factors when planning and execute instructional tasks when teaching practical lesson. Hence, this paper zoomed into environmental knowledge to explore the research phenomenon. In order to understand how teachers considers environmental factors when prepare their workshops and present practical lesson, the study looked at two themes, thus, practical setting environment and instructional practice. To understand how teachers prepare practical setting environment to promoting active learning, the study looked at how teachers arrange workshop tools and equipment; consider safety precautions; arrange learners desks in order to promote active learning. In order to understand how Teachers promoting active learning when teaching practical lessons, the study looked at how the teacher promote safety precautions and if activities promote active learning.

7. Constructive theory

Civil Technology teacher's environmental knowledge is paramount in promoting active learning in the classroom or workshop (Rotgans & Schmidt, 2011). Active learning encourage problem solving, cooperative learning and simulations among other things which are strategies needed in Civil Technology when learners work on their practical assessment task (DeMonbrun, Finelli, Prince, Borrego, Shekhar, Henderson & Waters, 2017). The importance of acknowledging that a learner is an active agent in the process of knowledge acquisition increases the ability to allow learners to form new knowledge against old and test scientific principles that are no longer relevant for learning. Constructive theory suggest that learners learn by fitting new information together with what they already know (Novak, 2010). This theory promote learners engagement into teamwork as they *inter alia* work collectively with others. Furthermore, there is a great focus on social and communication skills which allows a room to exchange ideas. Activities associated with this theory in a classroom includes experimentation where learners perform an experiment and then come together as a class to discuss the results. Again research project activities allows learners to work on a given scenario and later present their final products. According to Abdal-Haqq (1998) Constructivism provides teachers with opportunities to rethink how their learners learn in order to introduce transformation. It also reminds teachers to look for different ways to engage individual learners, develop environments for exploration.

8. Findings and discussion

The findings of this study were presented according to research questions and sub questions.

8.1 How do Civil Technology teachers prepare their workshop environment to promoting active learning?

Most teachers had a challenge in preparing their workshop environment to promote active learning. This findings were based on observing the following:

Preparing knowledge

- Arrangement of workshop tools and equipment

When looking at how teachers arranged their workshop tools and equipments, the researcher observed that most teachers were able to prepare the tools and equipment for learners to use. Most of the teachers presented practical lessons in their workshops. Therefore, the tools and equipment that were used during practical lessons were placed orderly in the workshop. For example, when Teacher C was teaching inside the workshop, all hand tools were displayed on the tool-wallboard. Learners were allowed to use all tools available and put them back to the tool-wallboard after use. However, in some workshops, some new machines were down on the floor and not connected to the power source. Those that were in good conditions were accumulating dust as learners only used either a circular saw or radial arm saw and the rest of machines were not used. For instance, Teacher E workshop had old machines, properly functioning as they were tested by the teacher during observation. However, they were not cared for as some of them had rust on them.

- Safety precautions

When looking at safety precautions, only one teacher was found to be safety cautious in the workshop. It is only Teacher E who started by telling learners about the importance of safe handling of tools and how dangerous they are if they were to be used for wrong purposes or untrained personnel. He seemed to have rich information about those tools hence he asked learners not to bring their textbooks but he will explain everything, which he did very well. When he finished, he asked few learners to explain to him some tools randomly so that he may check for understanding.

However, most teachers showed a weakness in this regard. For instance, in teacher A's workshop very few of the tools were in good working condition and fitted properly with handles. However, most of wood files had no handles on them. Some learners were handling them and observing the energetic boys imitating how they are used. Learners seemed to just enjoy the holding of tools other than working with them in that poor condition they were in order to complete the practical task. In addition, Teacher A's workshop, there were also machines working such as radial arm, circular and table saw, and driller while spindle shaper, wood turning lathe and jointer were not working. His workshop had other machines such as driller and band saws that seemed to have never been used since they were bought.

- Arrangement of Workbenches

Most teachers indicated that they teach both theory and practical in their workshops. Therefore, in most cases workbenches were shoved at the back of the workshop to make space for theory class tables. However, during observation, teachers had not prearranged workbenches for the practical lesson. For instance, teacher C learners started by arranging the workbenches they will use before taking the tools. Four learners shared a workbench in which at least each workbench had combination square, try square, sliding bevel, mortice gauge, jackplane, tenon saw, keyhole saw, different files, chisels, harmer, bench hook, and mallet that learners used. Electric tools that learners used most were portable jigsaw, driller and circular saw. All learners were given an opportunity to cut their own wood pieces as they each had different things appearing on their cutting lists. Similarly the challenge of workbenches was identified in Teacher D. For example, teacher D workbenches were dumped outside the workshop and learners used the wall semi-attached desks. The teacher was helping with the cutting of the boards on the radial arm saw. During the cutting, most of female learners were not taking part in the cutting and helping the teacher to equally distribute the boards after cutting. Since the teacher used only one radial arm saw, the cutting happened until the class was dismissed because the place was very dusty and most learners had not worn protective clothing such as nosepiece and goggles.

8.2 How do Civil Technology teachers promote active learning when teaching practical lessons?

Most teachers were at variance on their responses with regards to how they promote active learning when teaching practical lessons. Nevertheless, PAT guidelines provide the procedures to be followed by all teachers when they teach practical tasks and the appropriate time in which that should happen. Therefore, the study deemed it important to know

if teachers are aware of those processes. However, these teachers showed lack of knowledge on how the process of teaching practical lessons in Civil Technology is done. The findings were based on the following observation and interview responses:

Operational Knowledge

- Safety precautions

When looking on how teachers teach safety precautions when starting their practical activities, the researcher observed that most teachers had a challenge in teaching safety precautions. For instance teachers A did not explain the use, safe handling and maintenance of tools and equipment selected for the practical lesson. The teacher was not regularly observing learners while doing this practical activity. Some learners worked without protective clothing such as gloves, overall and goggles but instead they only removed their shirts and jersey so they may not get dirty.

During interview teachers indicated that they do not regularly orientate learners with safety precautions during practical lessons because they assume learners have the knowledge as they were taught "Safety in the workplace" chapter at the beginning of the academic year. For Example Teacher A indicated that learners are taught "Safety in the workplace" chapter every year from Grade 10-12 and so they are well versed about safety deeds in the workshop. While Teacher B indicated that there are posters in the workshop which always emphasise the issues related to safety and they assist teachers and learners to always remember how to work safe and a teacher does not need to always orientate learners with safety everytime they do practical activities. As for teacher E he alluded that all learners know they are supposed to wear protective clothing before they touch any tool and so there they automatically know what should be their conduct throughout the lesson.

- Practical activities that promote active learning.

When looking on how teachers teach their practical activities and how it promote active learning, the researcher observed that most teachers do not regularly check on learners on how they perform their practical tasks. Most of the time they monitor the beginning stages of the lesson and few teachers check on the progress of their learners. For instance, teachers B ordered one learner to take electric wire extensions and other tools they might need from the storeroom and for everything that the learners needed in order to continue with their PAT artefact, they were referred to the learner who had access to the storeroom. Similarly, teacher D could not promote active learning because learners used only one radial arm saw and the cutting happened until the class was dismissed because the place was very dusty and most learners had not worn protective clothing such as nosepiece and goggles. Furthermore, most learners were not taking part in the cutting and helping the teacher to equally distribute the boards after cutting. However, teacher C had given all his learners an opportunity to cut their own wood pieces as they each had different things appearing on their cutting lists. The teacher was occasionally checking on the learners' progress because some of them had started to play around and holding on the tools instead of using them. At the end of the lesson, the learners placed all tools, cleaned workbench and opened the dust extractor then they left. His learners showed an understanding of safe normal practice of workshop conduct.

During interview teachers indicated lack of understanding on how practical lessons are conducted in order to promote active learning. According to DBE (2011:104), "Practical tasks accounts for the skills the learner has mastered. This is assessed at intervals and requires the learner to engage in multiple practical sessions. During these weekly sessions, skills such as simulation, experimentation, hand skills, tool skills, machine skills, and workshop practice are honed and perfected to the point where the learner may engage in the tasks set out for that particular term.". However, teacher B teacher indicated that he teaches practical in groups to save time and do more work faster. However, teacher C indicated that he is aware that practical tasks and associated assessment should reflect individual effort as prescribed by DBE but they normally overlook that practice because they always work against time in finishing practical tasks before they are moderated by their district seniors.

8.3 What challenges do Civil Technology teachers experience when promoting active learning in teaching practical lessons?

This study also looked at the challenges experienced when promoting active learning in teaching practical lessons. The data revealed that teachers experience challenges with teaching large classes in their workshop, fixing and maintaining tools as well as using tools and machines correctly. With regards to their preparing knowledge they indicated the following by means of interviews.

- Preparing knowledge

According to Jenkins (2015), teachers' preparing knowledge to delivering practical knowledge is one of the missing pieces in the puzzle of high-quality teacher education and professional development. This challenge was evident in the Civil Technology teachers. Teachers have a challenge in preparing tools and equipment for what they referred to a large number of learners as well as correctly using the machinery. During interviews, teachers indicated to have challenges in ordering and identifying consumable material to be used for practical tasks. For instance, teacher B indicated that he has limited knowledge in operating most of old manual tools in his workshop and therefore he always struggles on choosing tools he must prepare for his practical lesson. Furthermore, teachers A and D also indicated that some machines were very old and no one was using them nor maintaining them. Therefore, teachers need development in fixing and maintain all the tools and equipment they have and not just one selected kinds of machines so that they can help enhancing learners' understanding of practical skills (Umar & Ma'aji, 2010). In most cases, teachers depend more on the knowledge and skills they get from their teacher training institutions, not taking note that some institutions focus on design skills, without resulting in an end product to illustrate the manufacturing process. Other institutions focus more on the planning and organisation of workshops, skills to handle a variety of tools, knowledge of materials as well as the processing of these materials (Pool, Reitsma, & Mentz, 2013). This creates a gap that teachers might not be aware of and therefore compromising the quality of skills their learners should receive.

- Operational knowledge

Bybee and Loucks-Horsley (2000) aver that technology teachers should know more that learners so that the introduction, interpretation and explanation of new concepts simultaneously with practical skills are appropriate when gauged against what economic world demands. However, when looking at interview responses about the challenges Civil Technology teachers experience when promoting active learning in teaching practical lessons, teachers indicated the burden of having to teach more learners with limited resources. For example, Teacher A indicated tha**t** his challenge was controlling large number of learners in the practical workshops**.** Teacher D also indicated that he has too many learners to teach for practical lesson. In the same vein, teacher A also highlighted some challenges with fixing machines and said that *"I can't fix any machines or maintain tools available in this workshop"***.** Teacher B indicated that **"***Using of tools and machine correctly and servicing to maintain quality function of these machines is a challenge and to fix the broken ones is even a great challenge"***.** Whilst Teacher C and E was an exception since they didn't experience any challenges. For Example Teacher C said **"***I do not consider myself challenged in teaching practical and all machines in this workshop are constantly serviced according to machine specification. Even though I have a knowledge of fixing some machines and some I service them twice a year"* While teacher E indicated that **"***I have been teaching since 1974, no problem that's why I don't go for CAPS 2 training. Because who can train me there? I have experience"***.**

According Zhang (2009) teachers are the most important resource in technical schools, and their practical capacity plays a crucial role in training future holders of the economy. In addition, their environmental knowledge plays a far important role in learners' practical skill acquisition necessary for industrial demands. However, based on this study's findings, the sampled Civil Technology teachers have a challenge in executing environmental knowledge. For instance, these teacher's preparing knowledge was not systemic because only two (2) teachers were able to communicate the goals of the lesson with their learners upon commencement of the task. Furthermore, they did not give learners ample time to understand the task given to them for the observed lesson. In the view of Johannsen, Bolander-Laksov, Bjurshammar, Nordgren, Fridén and Hagströmer (2012) these teachers failed to transfer skills because they ignored the knowledge of methods, processes, procedures, and techniques for conducting a specialized task and the ability to operate tools and equipment related to that task.

As for operational knowledge, some of these teachers indicated a challenge of not being able to use machines for what they are purposed for. This assertion is drawn from teacher B who said his challenge was *Using of tools and machine correctly and servicing to maintain quality function of these machines is a challenge and to fix the broken ones is even a great challenge***.** This contention harmonize with claims by Amyotte and Eckhoff (2010) who indicated that a pool of technical teachers still have more theoretical knowledge than practical which makes them to tussle when practical teaching emerge. As such, learner engagement into skills acquisition remains tarnished. Along similar strand, Freeman, Eddy, McDonough, Smith, Okoroafor, Jordt and Wenderoth (2014) suggest that technological design process is a backbone of this subject and when correctly applied it provides maximum opportunities for learner engagement. However, only one teacher indicated a depth understanding of practical teaching process of Civil Technology and this demonstrate that very few learners experience environmental knowledge emancipation during their schooling life. Therefore, this study discovered that the lack of Civil Technology teacher's environmental knowledge had a bearing in promoting active learning during practical lessons.

7. Conclusion

The finding of this study has shown that Civil Technology teachers have several challenges in their environmental knowledge that hinders the promotion of active learning. For instance, during observation, most teachers were unable to orientate learners before they could commence with their practical tasks. As stated, Jenkins (2015) claims that teachers planning of delivering practical knowledge are one of the missing pieces in the puzzle of high-quality teacher education and professional development. During interviews, all teachers indicated that they do not do lesson planning and they rarely check on the ones done by DBE. This practice hampers the promotion of active learning in a sense that teachers do not know the extent to which they could engage their learners in practical tasks without wasting time and consumables. Ono and Ferreira (2010) propagates that lesson planning ensure that all envisaged outcomes are tracked and met on stipulated time. However, in the case of these teachers the tracking of practical skills from learners was not in practice. During questionnaires, all teachers indicated several challenges that hamper with the planning and implementation of practical content, among others; teachers have a challenge in preparing tools and equipment because of what they referred to a large number of learners as well as correctly using the machinery. All this challenges contribute t o the ongoing challenge of producing learners without practical skills necessary for the workplace. Active learning should be encouraged in Civil Technology practical lessons to move away from this challenges. This study calls for engineering sectors, higher education institutions, department of basic education as well as it teachers and subject advisors to continually review teachers pedagogical knowledge and find better ways of improving in-service teachers teaching strategies.

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