

The Ethos Of Civil Technology Hands-On Assessments In The Revised Curriculum Assessment Policy Statement: A Discipline-Specific Pedagogy

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Abstract

A discipline-specific pedagogy is crucial for teachers to cope with the recent curriculum reform in the Civil technology subject. Teachers need such a pedagogy to adequately plan, teach and assess self-made practical activities. The purpose of this study was to explore the ethos of Civil Technology hands-on assessments in the revised Curriculum Assessment Policy Statement through a Discipline-Specific Pedagogy lens. This study conveniently sampled seven Civil Technology teachers in woodwork, construction, and civil services. Document analysis and classroom observations were used to collect data and thematic analysis was used to analyse data. A discipline-specific pedagogy was used as a guide to this study. This study revealed that at face value, teachers could plan Practical Assessment Task lessons, however, their plans had no objectives clearly stating the expectations on the end product and teaching methods. These loopholes in planning knowledge were also manifested in the teaching knowledge where most teachers were not actively involved when learners were busy with their hands-on assessments. This study recommends that thorough guidance is still needed for teachers to become fully autonomous in planning, teaching, and assessing activities. A more classroom-based, pedagogically sound training and community of practice approach is required for all technology teachers to bring flesh into the revised curriculum.

Keywords: Civil Technology, planning, teaching, assessment, pedagogy.

1. Introduction

It is reasonable to assume that Civil Technology teaching, learning, and assessment activities are carried out accurately and within the ambits of quality assurance. This is because,

even in the last ten years, the Civil technology pass rate for Grade 12 has exceeded ninety per cent. Now that the curriculum has been revised, what might teachers of Civil Technology possibly learn from it, or better yet, why do we still care about the teaching, learning, and assessment processes in Civil Technology? Well, the primary reason for that is that the revised curriculum gives teachers autonomy to be local curriculum developers in Grades 10 and 11 with regards to Practical Assessment Task (PAT). This has not happened in the previous curriculum reforms, in so doing, giving us a chance to explore the current ethos in the handling of hands-on assessments in Civil technology.

In this revised curriculum, Civil Technology teachers are suddenly granted the freedom to “determine the content, skills and knowledge to be addressed; set clear criteria and give good instructions to guide learners; determine which resources will be required for PAT and how marks will be distributed” (DBE, 2014, p. 28). Put simply this means that when it comes to Civil Technology PAT, teachers will now activate their planning, teaching, and assessment knowledge to facilitate this skills-based activity. The biggest concern here is that Technology teachers have not been adequately trained to teach PAT as a strategy for skills transfer (Gumbo, 2020). Also, Mathabatha et al. (2022) state that there are loopholes in the Technology teachers’ Pedagogical Content Knowledge (PCK) caused by linear understanding of their content representation. This study, which sought to explore the ethos of Civil Technology hands-on assessments through a Discipline-Specific Pedagogy lens, attempts to address the concern about the teaching, learning and assessment activities of Civil Technology.

A relevant pedagogy that could strike a balance between what teachers know and what they should improve on is essential, particularly for the Practical Assessment Task (PAT). In Civil Technology, PAT, is viewed as a core activity for learners to acquire contemporary industrial skills. Mhlanga et al. (2023) report that the current set of PATs and their associated challenges are not necessarily different from those done in the previous curriculums. So, what is happening with teachers and this revised curriculum, can it be because they have not adequately learned to plan, teach and assess? We must remember that in the revised curriculum, teachers are not expected to use old PAT ideas and rubrics. Kola (2016) stated that there was barely room for creative thought for teachers in those activities. As a result, it was crucial for this revision in the

Civil technology curriculum to happen so that teachers invoke their creative abilities and showcase their innovativeness. Hence, this study is interested in bringing new literature about Civil Technology teachers' planning, assessment and teaching knowledge in the revised curriculum; this gap has not been thoroughly researched. The guiding research question is therefore:

RQ: What is the culture of Civil Technology hands-on assessments in the revised Curriculum Assessment Policy Statement?

2. Towards a discipline-specific pedagogy in the revised curriculum of Civil Technology.

According to Rollnick and Mavhunga (2016), each subject has a way in which it is taught, and this extends to how the topics are handled in that subject. It is for this reason that they introduced a component of PCK that is known as the Topic-Specific Pedagogical Content Knowledge (TSPCK). This component or version assists with the transformation of topic content into a form that is accessible to the learners. In this study, the researcher perceives Civil Technology as a discipline requiring discipline-specific knowledge to undergird each topic rather than as a topic-specific PCK. Epistemologically, discipline-specific knowledge can be seen as a collection of understandings that go beyond a general understanding of a subject; instead, it is the kind of information unique to a discipline (Hyland, 2022; Meyer & Land, 2003).

Civil Technology operates differently regarding practical assessment tasks; that is, the civil services, construction and woodwork disciplines handle their PATs uniquely (Maeko, 2022). Thus, the researcher construes that the discipline of Civil Technology has its component of PCK which is Discipline-Specific Pedagogical Content Knowledge (DSPCK). Civil Technology may engage with the PAT in various ways; this includes but is not limited to problem-based learning, project-based learning and inquiry-based learning. A correlation can be drawn between the teachers' PCK and skills development. Part of the requirement for Civil Technology is to have a teacher who demonstrates an understanding of the built environment (DBE, 2011). This means that besides knowing how to teach, the Civil Technology teachers' way of teaching should also be guided by the way in which their skills are developed and enhanced. For instance, how a teacher teaches Civil Technology, should reflect the habitual activities in the civil engineering industry. The

design of the activities, interactions with the learners and the resources should become the essence of the Civil Technology teachers' PCK. Haug and Mork (2021) subscribe to the idea that a 21st-century classroom should become a mini-industry where unskilled and semi-skilled personnel learn and improve their skills. This means that the teachers have to transform their teaching strategies, and they must engage with the advanced learning tools to ensure that the learners are up to date on how the modern skills are attained. Civil Technology continues to face chronological challenges such as the lack of financial support and the inadequate provision of training resources, and this hampers the skills progress. Hence, a renewed pedagogical approach is essential (Mtshali & Msimango, 2023).

This study comes at a point where vocational skills are in high demand, and teachers are expected to contribute to producing skilled individuals. The industries are looking at technical and vocational institutions to produce skilled individuals (Buthelezi, 2018). The communities also expect to benefit from the vocational skills training around them to improve the quality of their lives (Spinuzzi et al., 2019). The current Curriculum Assessment Policy Statement stipulates that Civil Technology teachers should become active participants in the capacitation of learners with vocational skills. This means that the Civil Technology teachers are considered the conduits of vocational skills development. Accordingly, the researchers argue that such a teacher must demonstrate high levels of discipline-specific pedagogy. This means that a teacher should know the content, how to teach it and how to link that with industrial and community needs. Subsequently, Civil Technology PAT will be seen as a coal face of economic growth. According to Trigwell (2011), we should not assume that teachers who do not have adequate training in hands-on activities are redundant and their scholarship of teaching is constrained. Thus, it is crucial to understand the culture of a Discipline-Specific Pedagogy for Civil Technology hands-on assessments in the revised Curriculum Assessment Policy Statement.

3. Discipline-specific pedagogical framework

This study used a Discipline-Specific Pedagogy (DSP) framework to understand the culture of planning, teaching, and assessment of Civil Technology hands-on assessments. Developed from the origins of Shulman's (1987) PCK, DSP is a teaching practice that enables learners to obtain adequate

knowledge, skills, and values specific to the contexts, content, and practices of their chosen professions (Tan & Seet, 2020). To ensure adequate context, content, and practice, teachers are required to invoke planning, teaching, and assessment relevant to the discipline. As a result, this study deemed DSP relevant to understanding the pedagogical culture in the Civil Technology discipline during hands-on assessments. It is worth noting that Civil Technology teachers are not given sufficient time to transfer their hands-on practical skills to the learners because the time for the preparation of practical's is not factored into the time allocated for the teaching of Civil Technology. Within the South African context, the Civil Technology CAPS policy stipulates that the teaching of Civil Technology is allocated four hours per week (DBE, 2011), and they have to be utilised for teaching theory and doing practical work. Hence, it is interesting to understand how teachers cope with such a culture when dealing with hands-on activities. So, the following knowledge segments that undergird discipline-specific pedagogy were explored.

Planning knowledge

Epistemologically, planning knowledge focuses on the activities prior to the actual lesson. The teacher should be able to determine a topic that will be covered and determine lesson objectives, teaching resources and techniques that will be used to carry out instruction (Spear-Swerling & Zibulsky, 2014). In this study, planning knowledge was used to scrutinise teachers' PATs they have planned for learners by looking at the presence of lesson objectives, teaching methods and training resources, among other things. According to Puspitarini and Hanif (2019), the lesson objectives assist in creating an effective lesson that produces the desired learning outcome. The tools and the materials are those resources that make the hands-on PAT possible, whilst the teaching strategies are those instructional approaches that a teacher employs to execute the lesson. In Civil Technology, it is an everyday practice that the PATs given to the learners should also show a picture or a detailed drawing of the final product. This is because picture memory plays a huge role in assisting the learners to understand how the final product should look like.

Teaching knowledge

Teaching knowledge refers to a holistic understanding and capacity to teach content in the most effective way possible. It cannot be divorced from content knowledge because a teacher

should know the content he or she sought to teach (Shulman, 1987; Buchmann, 1987). Summarily, teaching knowledge can be seen as transferring knowledge and skills in a specific way within a particular subject. So, this study used teaching knowledge to understand how civil technology teachers taught practical assessment tasks, including assisting learners in organising resources, wearing protective clothing, and engaging with tools, materials, and consumables to do the given task. In the Civil technology lessons, learners should be engaged with hands-on skills in a safe and organised environment, leaving no room for potential accidents. The setup of the civil technology laboratory /workshop ought to align with the Occupational Health and Safety Act no.85 of 1993. The Act intends:

- To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery.
- To protect people other than the persons at work against the hazards to health and safety arising out of or in connection with the activities of the persons at work.

It is well established that the teachers of technical subjects would not want accidental mishaps in their workshops as they contain many sharp, dangerous tools. To avoid accidents and mishaps, teachers must clearly state how their tasks will be carried out and which resources will be used.

Assessment knowledge

Assessment knowledge is viewed as a grading or reporting based on the learners demonstrating that they have learned or attained the knowledge and skills they were taught (Brookhart, 2011). So, this study used this knowledge to see how the teachers planned rubrics for assessing learners and how those rubrics allow for providing constructive feedback to learners. Teachers also need to be strategic in developing the rubric to promote a safe working environment, so the learners know that good deeds are awarded with the same weight as skills competence.

4. Methodology

4.1 Research approach and design

In order to explore the culture of a Discipline-Specific Pedagogy for Civil Technology hands-on assessments in the revised

Curriculum Assessment Policy Statement, this study used a qualitative research approach. In Yin's (2013) perspective, a qualitative approach is concerned with the attainment of descriptive rich data regarding a particular real-life event. As such, the data collected in this study concentrated on the planning, teaching, and assessment knowledge that teachers displayed during their engagement with hands-on assessments. Ravitch and Carl (2019), supporting Yin (2013), advise that qualitative data was appropriate for what this study explored because the data produced words rather than statistics.

In terms of research design, a single case study design was deemed accurate as it was a case of Civil Technology teachers in the Limpopo region of South Africa. We must remember that in its philosophical stance, a single case study is a design technique that produces compelling proof of the efficacy of an intervention. This study intervenes on the knowledge gap existing in civil technology about the pedagogical events happening in the revised curriculum.

4.2 Sampling and sampling procedures

Denscombe (2017) proclaimed that sampling is choosing a sample unit from a population of interest. As a result, the population of interest were all Civil Technology teachers in the region of Limpopo. However, due to convenience, a total of seven teachers were sampled. The principal researcher was in close proximity with those teachers, and he worked nearby. The convenience was further complemented by the purpose. Maree (2013) tells us that convenience sampling refers to "situations when population elements are selected, based on the fact that they were conveniently available" (p. 177). Also, the researchers had the purpose of sampling teachers who were experts and represented all three disciplines of Civil Technology. Similarly, given that the inclusion criteria for such a case-study design required that participants be deliberately selected, it was inevitable to get three construction, two woodwork and two civil services teachers. The number of teachers in the specialisation is not so much compared to other regions in the country. All seven available teachers of Civil Technology were invited to participate in the study.

4.3 Data Collection

This study used document analysis and lesson observation as its data collection strategy. According to Owen (2014),

document analysis is a qualitative research procedure used to analyse documents (printed or electronic) as evidence to answer specific research questions. Consequently, document analysis was used to understand and develop empirical knowledge on Civil Technology teachers' planning and assessment knowledge. Therefore, this study used the lesson plans, the PAT documents and their rubrics as the documentation to explore the link between the orchestrated practical lesson presentations.

Lesson observation was done relatively in a non-obstructive approach where the researcher watched the subjects of his study, with their knowledge, but without actively participating in the situation playing out (Marietto, 2018; Lavia et al., 2018). This was aligned with the views by Marietto (2018) that observation is a data-collecting technique that involves observing and recording the participants' data when conducting case study research. Although the researcher was prohibited from taking videos, which would help watch specific segments of the sessions repeatedly. The researcher took pictures, though, to a limited extent, without necessarily involving the learning events. Also, the researcher consulted with the union site representatives in the schools to verify if the video recordings were discouraged. They confirmed that the unions in the education systems discourage this practice. In light of observing ethical matters, the researchers agreed to the unions' demands but took notes and pictures of the artefacts or the models that the learners did without involving any natural persons. Given that the teachers were conducting practical lessons during the schools' recess, more time to observe was gained, such that each teacher was observed between one and three hours.

4.4 Data analysis

For all the data collected, thematic analysis was applied in order to sort and sift data and to help identify similar patterns (Lester et al., 2020). According to Clarke, Braun and Hayfield (2015) thematic analysis is used to identify, analyse and interpret the patterns into themes within the data. So, this is how the thematic analysis steps were used:

Data Familiarisation

According to Brown and Stockman (2013), researchers need to familiarise themselves with the research data collected by reading, watching, and listening to the audio recordings. The

researchers habituated with the transcripts to start writing down the notes.

Generating of codes

According to Braun and Clarke (2014), coding involves creating codes for the significant attributes of the data collected, specifically relevant to the research question. Therefore, after grasping the data, the research introduced codes.

Searching and reviewing themes

Immediately after coding, the researchers sorted them and identified those which were similar and ultimately created themes. Braun and Clarke (2014) stated that this process includes the grouping of the codes together that share similarities, so that it can reflect a comprehensible and meaningful pattern in the data. So, all the themes were examined in the light of the coded data, in order to see whether any logical patterns emerged. This allowed the researcher to recognise the distinct themes, and show how they were combined to tell a narrative by using the data.

Defining and naming themes

Friese, Soratto, and Pires (2018) state that researchers should be aware of what each theme is about and that themes must give the person reading the report a sense of what the theme is about. As a result, the whole process assisted the researchers in writing a report by interlinking the analytic narrative and data extracts in order to convey to the reader a cogent story about the data with the literature.

5. Ethical considerations

A study such as this needs to be conducted in accordance with the research ethics codes and the requirements of the relevant institutions. Ethical clearance was sought from the ethics committee of the university, after which permission was granted to carry out the research within acceptable ethical boundaries. The following process briefs about the steps taken.

Permission to conduct the study

The permission to conduct this study was requested firstly, from the school principals to allow the researcher to have access to their school premises. Secondly, it was sought from the Civil Technology teachers, the parents and the learners to give the researcher access to the respective teaching and learning stations. Lastly, permission was sought from the

Limpopo Department of Education so that they could monitor that data collection was done correctly and that the members were not forced to take part. Permission letters were given to the participants to inform them of the intention behind the study so that they could choose whether to take part (Egharevba et al., 2021; Nnebue, 2010; Archard, 2008).

Informed consent

Informed consent can be defined as a procedure whereby the potential participants in a study are given essential details about the study, including the risks and the benefits before they choose whether to participate (Egharevba et al., 2021; Nnebue, 2010). In this study, a consent form was not used as a contract per se, but rather to ensure that each person participates in the study of their own free will (Eyal, 2011). Additionally, the participants were informed of the option to withdraw from the research at any time if they wished to do so. This was another way to ensure that the participants were fully aware of the research rationale, the *modus operandi* and the intention behind the line of questioning.

Voluntary participation

No participant was coerced to participate in the study (Babbie, 2016). The participants were entitled to give their consent initially and to later change their minds, without any questions being asked. As indicated, this was to ensure that the participants understood their role within the study context.

Anonymity and confidentiality

The collected data was used only for research purposes within the confines of the study. Anonymity was ensured, with the researcher informing the participants that their names would not appear in the research reports. For reporting purposes, the researchers gave the participants pseudonyms, and in the case of audio-visual recordings, no faces were shown to protect the participants from possible physical, emotional, intellectual and social harm (Qamar, 2018). Confidentiality was ensured, with the researchers assuring the participants that the information they provided would not be shared with anyone else and would be safely secured in a storage facility provided by the institution where the researcher is studying (Badiee et al., 2012).

Respect for participants' dignity

To ensure respect for the dignity and well-being of the participants, the researcher did not judge or discredit the

participants' views, inputs and decisions. During the interactions with the participants, respect took precedence. Also, the researchers ensured that the participants' autonomy was protected in that they were not made to feel vulnerable or marginalised. At no time did the researcher lie or deceive the participants (Babbie, 2016).

Privacy

Regarding privacy, the researchers did not ask personal and private questions as this would invade the participants' rights to privacy (Badiee et al., 2012). The researcher also safeguarded the privacy of the participants by ensuring that they were not forced to take part in the study in a place or space where they might be stigmatised. All the interactions with the participants occurred in school or places, under conditions and at times suitable for them, which did not put their privacy at risk. Furthermore, the researcher did not conceal anything from the participants or deceive them when seeking information which might have encroached on their privacy (Badiee et al., 2012).

6. Results and Discussions

This study was concerned with understanding the culture of Civil Technology hands-on assessments in the revised Curriculum Assessment Policy Statement. Therefore, PAT lesson plans were analysed (document analysis) and teachers' PAT lessons were observed. Thus, the data illuminated that the culture of Civil Technology hands-on assessments in the revised CAPS is affected by Civil Technology teachers:

- Planning knowledge.
- Teaching knowledge.
- Assessment knowledge.

Each of the abovementioned was used as a theme and is elaborated upon below.

6.1 Planning knowledge

It is crucial that all the teachers thoroughly plan for their lessons so that they enter their classrooms each day fully prepared to teach new concepts, lead meaningful discussions as well, and ensure that the lesson can be completed within the allocated time frame (Taylan, 2018). Taylan (2018) claims that planning for hands-on assessments is crucial as it helps teachers determine the best moments for learners to be

equipped with the skills. So, in the case of planning knowledge, teachers' assessment activities were analysed by looking at lesson objectives, tools, and material and the teaching strategies they were to use for their PAT, see the extracts below.

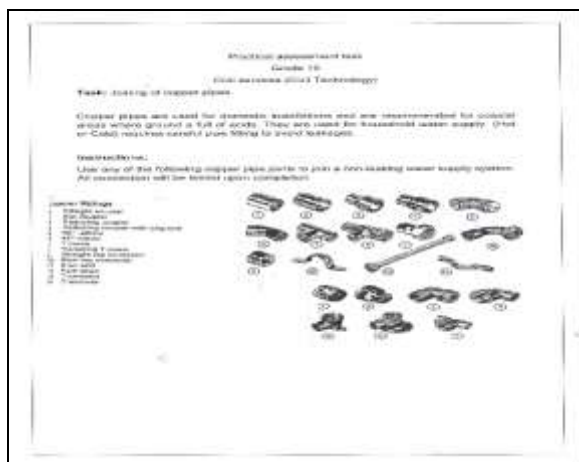


Figure 1: Teacher A's planned PAT lesson.

In reference to the abovementioned figure, Teacher A's PAT had a brief synopsis of the task, which was about using copper pipes, which are prevalent in the coastal areas. This PAT did not indicate the lesson objectives, it contained various diagrams showing what the learners could use to connect the copper pipes. Sadly, these diagrams were shown without stating the material and the equipment that will be used to connect them. According to Kelly and Zakrajsek (2020), most teachers avoid lesson objectives in their lesson plans because they do not know the appropriate verbs to use, nor do they align the verbs they use to Bloom's taxonomy. Rather, they use verbs such as "enjoy," "appreciate," or "grasp". Kelly et al. (2020) further assert that in the absence of clearly stated objectives, the lesson will lack direction, and the learners will not be guided in the learning process, which will result in confusion and immeasurable outcomes. Hence, this task contained an instruction without stating the goals that were to be achieved by the learners. Even though the lesson outcomes were not stipulated, the pictures of the copper joints served as a point of departure for the learners to understand the task.

Also, Teacher D's activity (shown in Figure 2 below) was analysed, which was about the dry packing of bricks; see extract below.

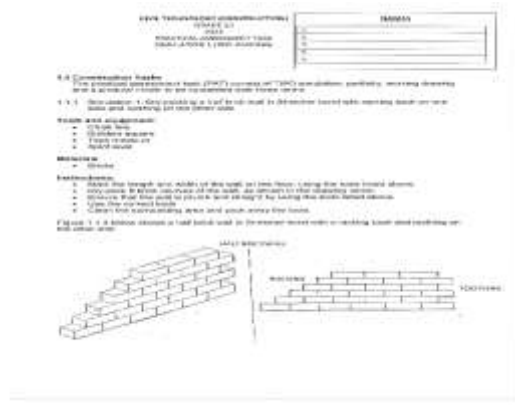


Figure 2: Teacher D's planned PAT lesson

As depicted above, the task clearly outlined what it is about and what the learners would use. Two pictures were included so that the learners may know what their product ought to look like. However, Teachers A and D did not outline their lesson objectives. However, their activities were self-explanatory in that the pictures were shown with corresponding instructions. For instance, Teacher D's PAT lesson plan shows a 2- and 3-dimensional drawing of a stretcher bond (refer to Figure 2 above). It is easy for learners to see how their final product ought to look by simply observing the displayed drawings. The inference is that the learners will be able to assume the objective/s of the lesson without it being explicitly articulated in the lesson plan. According to Kösa and Karakuş (2018), drawings or pictures assist in developing and enhancing learners' spatial visualisation skills, and they help them to understand complex situations without text description. This was the same analysis for teachers B, C, E and G.

6.2 Teaching Knowledge

Having a thorough understanding of both the content and the most effective ways to teach it is one of the many requirements for becoming an effective teacher. In the academic literature on teaching and learning, subject-matter expertise is called disciplinary content knowledge (Shulman, 1987). Equally, in the Civil Technology discipline, teaching knowledge is the knowledge that a Civil Technology teacher should demonstrate when handling a practical assessment task (Mtshali & Singh-Pillay, 2023). This includes the ability to prepare tasks and demonstrate them, which are essential discipline-based skills that are included in a Civil Technology teacher's teaching repertoire. As a result, when exploring a teacher's task preparation knowledge, the researchers observed teachers' ability to choose tools and

materials that will be used for a task, ensuring that learners are wearing protective clothing as well as consumables to be used for the given task. Regarding the demonstration phase, Mtshali et al. (2023) advised that a teacher should be able to facilitate individual and group activities by assisting with the operation of machines, assembling or connecting materials and guiding learners with correct procedures to complete given tasks.

Task preparation

When preparing learners to commence with the task, Teacher D ensured that all learners had worn protective gear; see Figure 3 below.



Figure 3: Teacher D learners

It could also be observed that learners were preparing their first course of the bricks to determine how many bricks each course would have. This can be hinged on an experiential learning approach because learners started by marking the building lines while working on an exposed foundation base. This indicated that they understand the real-world task where the walls are typically built on a set foundation. According to Smith (2016), when the learners participate in experiential learning, they:

- Deepen their understanding of the subject material.
- Attain a wider worldview and an appreciation for community.
- Get insight into the skills, interests, passions, and values.
- Get the opportunity to work with different people and their world view.
- Develop positive professional practices and skills.

When looking at how teacher G prepared her task, it was clear from her tool board mounted next to the machines that learners would use the tools hung in the task; see Figure 4 below.



Figure 4: Teacher G's workshop

Looking at Figure 4 above, it is evident that the physical layout of the workshop makes it easy for teachers to prepare their tasks. This tallies with Zimmermann-Niefield, Turner, Murphy, Kane, and Shapiro's (2019) understanding that the physical layout of a workshop plays a significant role in performing tasks. Workshops in schools serve as a space where the learners can be introduced to some elements of artisanship as they can demonstrate their skills using authentic materials and equipment.

With regards to the physical layout of Teacher F's workshop, there was evidence to prove that the workshop was functional as there was also sawdust showing that the learners had used it before, as seen in Figure 5 below:



Figure 5: Teacher F tool's station

Now that teachers had shown their ability to prepare for tasks, it was crucial to fulfil the teaching knowledge described by Mtshali and Msimango (2023) by looking at teachers' demonstration abilities.

Demonstration skills

The reader's attention is drawn to teacher D as a case to display evidence of what teachers made their learners do during the demonstration phase. In Figure 6 below, learners engage in a dry packing wall activity.



Figure 6: Teacher D learners' tasks

It is worth noting that the teacher was rarely involved in assisting learners with the task. Given that the learners did this task so well and quickly, the researcher suspected that it might have been done prior to my visit.

6.3 Assessment Knowledge

It is important to reiterate that assessment knowledge is widely understood as an assessment that measures a person's understanding and application of knowledge in a specific subject area. This study used this knowledge to understand how teachers planned assessment rubrics to guide learners for the given tasks. The general understanding of a marking rubric is that it assists the teachers in communicating the standards of the assessment task. It is an effective way to implement the standards-based assessment (Link & Guskey, 2022). A marking rubric contains the descriptors of the standards for several criteria, usually in a matrix (ibid). It is essential that each teacher determines how the skills and competencies can be quantified. According to Bearman and Ajjawi (2021), the marking rubrics should promote active learning and create space for the learners to reflect on their progress. Teachers should design a rubric that allows for constructive criticism and provides an integrated space for the learners to communicate with the teachers about the improvement strategies. The researchers, therefore, perused through the teachers' portfolios to ascertain what their marking rubric entailed.

Teacher B's rubric showed that it was taken from a textbook. Given that the task was about metal sheets, most of the covered components normally follow mechanical technology structure. Hence, it may not be surprising that Teacher B took the PAT from the mechanical technology textbook. Figure 7 indicates the below:

The image shows a document titled 'Lesson Plan' with a list of topics on the left and a table of marks on the right. The topics include: Planning, Designing, Drawing, and Making. The table has columns for 'Topic', 'Marks', and 'Total'. The total marks for each topic are: Planning (10), Designing (10), Drawing (10), and Making (10). The total marks for the entire lesson plan are 40.

Figure 7: Teacher B lesson plan

While the learners were aware of the assessment criteria, the competency levels (mark distribution) were not clear on how each aspect is assessed, the conversion to a total of 50 marks written at the end of the table indicates a low level of teachers' creative design of the PAT rubrics. Teacher C's "Making of a square concrete column" task had the following attachment which indicated how the learners would be assessed. Figure 8 shows how the rubric was structured.

The image shows a table titled 'Marking Rubric' with columns for 'Criteria', 'Excellent', 'Good', 'Satisfactory', and 'Poor'. The criteria include: Planning, Designing, Drawing, and Making. The marks for each criterion are: Planning (10), Designing (10), Drawing (10), and Making (10). The total marks for the entire rubric are 40.

Figure 8: Teacher C's marking rubric

As depicted in the above rubric, there was no indication of flexibility to accommodate learner creativity. Also, given that all the learners were to make a square concrete column, no evidence of innovation was demonstrated. Similarly, Teacher

D's PAT assessment criteria for the dry-packing activity were prescriptive as shown below:

Face sheet		
Criteria	Marks	LM
Draw guidelines on the floor	4	
Stretcher course	4	
Correct placement of bricks	4	
Rucking back	2	
Toothling	2	
Wall is straight/ plumb	2	
Clean surrounding area pack away tools	2	
Total	20	

Figure 9: Teacher D's marking rubric

On account of the flexibility of the rubric to accommodate the learners' creativity and the demonstration of innovativeness, this PAT rubric failed. For example, this rubric did not address context-based solutions such as building a wall for the bathroom's external or internal walls. This would have allowed learners to be innovative in their stretcher bond instead of following the building instructions for something they do not know.

7. Conclusion and recommendations

This study concerned understanding the ethos of Civil Technology teachers' hands-on activities in the revised CAPS. It was crucial to make such an investigation as the revised CAPS had introduced an autonomous pedagogical capital approach to teachers. This study discovered that at face value, teachers could plan PAT lessons. However, their plans had no objectives clearly stating the expectations for the end product. These loopholes in planning knowledge were also manifested in the teaching knowledge, where most teachers were not actively involved when learners were busy with their PATs. The biggest challenge for the teachers was that they could not develop assessment rubrics that were engaging learners so that they could improve their performance. This study recommends that thorough guidance is still needed for teachers to become fully autonomous in planning, teaching and assessing PATs. A more classroom-based, pedagogically sound training and community of practice approach is required for all technology teachers to bring flesh into the revised curriculum.

8. Limitation of the study

This study focused on seven schools in the Limpopo region at a specific grade. Only two data collection methods were used. If the teacher's insights were captured, the findings could have had a more bird eye view of the matter under scrutiny. To circumvent this challenge, rich descriptive data was presented on how planning, teaching and assessment unfolded in the classrooms.

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