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An Investigation on Factors Affecting the Teaching of Practical Assessment Tasks in the Senior Phase Technology Classrooms

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ABSTRACT

This paper investigated factors affecting the teaching of practical assessment tasks in the Senior Phase Technology classroom at Ehlanzeni District in Mpumalanga Province, South Africa. The study follows the case study design. Three teachers were purposively sampled from three different schools based on their experience in teaching Technology in the Senior Phase. This paper is grounded on the Cognitive Apprenticeship theory. Qualitative data were collected using interviews. The data was analysed thematically. The emerging themes from the study were teachers' knowledge and skills, resources and class size as contributing factors affecting the execution of practical assessment tasks in the Senior Phase Technology classroom. The study findings have adverse effects on learners' achievements in practical assessment tasks, especially in design process skills.

KEYWORDS

Classroom practices; cognitive; factors affecting teaching; practical assessment tasks; practical work.

INTRODUCTION

This paper investigated factors affecting the teaching of practical assessment tasks in the Senior Phase Technology classroom at Ehlanzeni District in Mpumalanga Province, South Africa. Technology as a subject has been introduced in many countries worldwide (Nordlöf et al., 2022). In New Zealand, for instance, Technology Education reflects on innovative aspects and thus, is a way to introduce learners to impending contexts and novel approaches to learning (Reinsfield et al., 2023). From this perspective, there is provision for teaching practices to be receptive to learner well-being through the development of creative and critical thinking in various technological fields such as Digital Technologies, Materials, and Processing as well as Design and Visual Communication (Reinsfield et al., 2023). Code et al., (2020) in British Columbia state that through Technology Education, learners advance meaningful specialised understanding by applying creative, critical thinking and problem-solving in the tangible world to address real-world challenges that have broad applications across many sectors of the economy. Similarly, in South Africa, Technology Education provides opportunities for learners to engage in practical tasks to solve technological problems. Thus, as it is outlined in the Curriculum Assessment Policy Statement (CAPS) document, the Practical Assessment Task (PAT) in Technology a subject, is a formal assessment used to evaluate the activities that combine knowledge, values, and design process skills [Department of Basic Education (DBE, 2011)]. PATs are meant to promote activities that encourage multiple skills, such as critical, creative, and problem-solving skills, for learners towards developing 21st-century skills (Kennedy & Sundberg, 2020; Mtshali, 2020).

In the Senior Phase Technology classroom, these activities should be designed to strengthen learners' abilities/capabilities to successfully complete the formal PAT known as Mini-Practical Assessment Tasks (Mini-PAT) in each schooling quarter period (Mbongwe, 2016). Therefore, in South Africa, the launching of Technology as a subject in the curriculum was a progressive move towards addressing human needs. From an ontological perspective, one elementary characteristic of technology is that it is a unique phenomenon to humans (DBE, 2011; Mitcham, 1994). As a result, in people's notion of being or reality, when the word technology is mentioned, objects or physical objects such as equipment, machines and consumer products come to one's attention (Van der Walt et al., 1985). This gives the notion that technology would not have existed if it were not for humans. In the context of this knowledge, Technology learners in General Education and Training (GET) should be exposed to the practice of using the design process (DBE, 2011).

Thence, according to DBE (2011), in order for the learner to ace the practice of applying the design process, the following aspects must apply. Firstly, the learner ought to investigate by utilising a range of resources. Secondly, a learner should further be able to exhibit the ability to draw in a distinct manner, create a design brief, and give specifications and limitations. In addition, thirdly, a learner needs to be able to choose suitable resources for a prototype and develop the product manufacture layout. Fourthly, a learner should be able to evaluate the design process objectively. Last but not least, a learner must be able to analyse a system using systems diagrams and communicate their solutions using various techniques. The preceding aspects associated with the design process can be realised when learners are exposed to Mini-PATs in the Senior Phase classroom.

Scientific and technological investigations are associated with problem-solving, including hands-on and mind-on activities (DBE, 2011; Kibirige et al., 2021). Problem-solving is associated with the design process in the Technology subject that incorporates procedural and conceptual knowledge. The procedural and conceptual knowledge encompass the design processes, practical skills, knowledge, and application of knowledge (DBE, 2011). Therefore, these knowledge categories contribute to the cognitive domain i.e. cognitive processes, knowledge, and creativity (Kennedy & Sundberg, 2020).

Consequently, the design process plays an important role in the teaching of Technology, hence the activities should be planned and organised around it (DBE, 2011; Mbongwe, 2016). Mbongwe (2016) further suggested that when teaching in the classroom, teachers should strive to assign enabling tasks first to learners. However, teachers who lack adequate training in Technology directly impact learners' ability to acquire new skills (Kilinc et al., 2018; Tarman et al., 2019; Winter et al., 2021). For example, Mbongwe (2016) established that teachers' inadequate ability to manage the practical aspect, implies the incompetence to support learners utilising practical work in Technology. Thus, the study's findings will reveal how practical tasks in Technology classrooms are conducted and the challenges encountered when facilitating the practical tasks. This finding would be of significant importance in assessing how cognitive apprenticeship (CA) could be a major tool for facilitating practical work in Technology classrooms. A Mini-PAT is a brief assessment task meant for the primary formal evaluation of learners' application of skills and knowledge per quarter (DBE, 2011). The assessment task could only cover a section of the design process or a full capability design task, for it is created to help learners display their own capabilities (DBE, 2011).

Design should be the primary concept taught because Technology is a practical subject (DBE, 2011). Hence, the suggested method of teaching could start by introducing the essential knowledge (conceptual knowledge) followed by practical design tasks in which procedural knowledge is employed (DBE, 2011). However, many teachers still find it challenging to teach Technology as a subject. In support of this, Blom (2015) highlights the difficulties that arise in the delivery of Technology during the first stages of the design process. Blom (2015) further critiques the Technology CAPS document as deficient in or containing few guidelines for Technology teachers to support learners' required skills that emanate from the design process. Blom (2015) also makes the case that it is difficult for Technology teachers to impart design skills due to their insufficient training and experience. Similarly, this pattern is seen in Botswana, where teachers and learners have a difficult time conceptualising teaching and learning of Technology (Molwane et al., 2008). Janak (2019) suggests that the situation in Botswana could be emanated from the country's extensive use of British textbooks, teaching methods, and curricula. Correspondingly, Gaotlhobogwe and du Toit (2016) highlight shortcomings or gaps in their study on the analyses and comparison of Botswana's and South Africa's Technology subject curricula. Gaotlhobogwe and du Toit (2016) argue that although the Botswana document contains details regarding suggested teaching approaches, it is still not well-detailed. Additionally, the document lacks other subject-specific information that could make it less user-comprehensible as teachers should assess information from other sources. Examples include no indication of pacing or very little information regarding the assessment.

Even though the Technology CAPS document is regarded as being comprehensive in its evaluation, we still think that teachers' experiences impact how practical tasks are taught in the Technology subject. Hence, some Technology teachers are still finding it a challenge to administer the Mini-PAT; thus, investigating factors affecting the teaching of practical assessment tasks in the Senior Phase Technology classroom. The following research questions resulted from this:

- What factors affect the teaching of Mini-PAT in the Senior Phase classroom?
- How do teachers facilitate Mini-PAT in Technology?
- What challenges do teachers face in facilitating Mini-PAT in the Senior Phase?

THEORETICAL FRAMEWORK

The study used cognitive apprenticeship (CA) to understand teachers' perceptions of teaching PAT in the Senior Phase Technology classroom (Cakmakci et al., 2020). This theory was chosen because it provides information on actively involving learners in the learning process through cooperative teaching strategies, coaching, scaffolding, and modelling, which could assist in teaching PAT. CA is a combination of two terminologies from distinct fields built on constructivist learning approaches and reinforced with situated cognition theory and the theory of modelling (Bandura, 1997; Collins et al., 1989). According to de Bruin (2019), knowledge acquisition processes serve as the foundation for our understanding of cognition. As a result, we strongly think CA could help teachers impart knowledge in a way that would enable learners to take on design-related tasks with ease. Through "modelling, scaffolding, fading, and coaching," the expert helps the learner become a maestro of knowledge (Collins et al*.,* 1991), which are skills and values of the design process in this instance. This understanding makes apprenticeship possible in the Technology Education (TE) classroom.

A strong foundation in school-to-work learning serves as the basis for Cognitive Apprenticeship Theory (CAT), which incorporates elements of apprenticeship to produce a real-world work environment (de Bruin, 2019). A learner learns by working alongside a master who offers guidance and expertise in accordance with CAT (de Bruin, 2019). In line with de Bruin's (2019) assertion, we firmly believe that given the nature of the Technology subject, CAT has enormous potential for developing a learning environment that might improve learners' active participation and comprehension. CAT and the subject matter teachings, particularly the design process, are well connected in this context. According to the South African CAPS document, the Technology subject aims to provide learners with the chance to practice using various life skills in real-world situations, including design processes skills and problem-solving skills (DBE, 2011). These skills are specifically included in situated and social learning, thus the CA components. Consequently, CA is concerned with the situated social context in which learning occurs, as stated by de Bruin (2019). According to Miyauchi et al., (2020), CAT charters the comparison of the cognitive development of a competent workforce to that of a novice. The following stages are highlighted in the pedagogy built on CAT by Miyauchi et al., (2020), and in our opinion, they would promote social learning and improve the learning environment for PAT in Technology classrooms. Thus, Technology aims to enable learners to use various technological skills through real-world projects that involve researching, designing, making, evaluating, and communicating. If this is done, the technological abilities could be successfully applied throughout the CAT stages. These stages are identified by Miyauchi et al., (2020) and Cakmakci et al., (2020) as:

1. *Modelling*: The expert teacher should exhibit the technique used to solve the problem to the novice learner during Mini-PAT.
2. *Coaching:* The expert teacher gives clues so that the learner can practice solving the existing problem as appears in the Mini-PAT.
3. *Scaffolding and Fading:* The teacher assists the learner towards solving the problem using own capabilities. The teacher provides clues only when the learner is obscured. The number of clues are decreased as learning continues.
4. *Articulation:* The teacher supports the learner to describe the cognitive process used to reach at the Mini-PAT problem's solution. DBE (2011) highlights the prospect of allowing learners to creatively solve problem creatively. Therefore, these aspects may assist in applying knowledge and values learned in line with the design process.
5. *Reflection:* An different method to solve the problem should be presented to inspire the learners to observe the cognitive process that led to the solution. This resonates well with the features and scope of Technology; thus, Technology should enable learners to merge the idea and action in a way that couples abstract concepts to real knowledge (DBE, 2011).
6. *Exploration:* learners are encouraged to challenge new themes, such as new technological problems.

RESEARCH METHODOLOGY

In this paper, a case study design and a qualitative research approach were employed. Three Senior Phase Technology teachers were selected from three different schools in two circuits i.e., Mgwenya and Nkomazi at Ehlanzeni District of Mpumalanga Province, South Africa.

Table 1.
Participants' profile information

Technology teacher (Tt)	Circuit	Highest qualification in Technology Education	School setting	Teaching experience in years	Grade 9 enrolment
Tt1	MC	BEd (Hons)	Semi-Rural	8 years (2016 - 2023)	226 (class size 50+)
Tt2	MC	ACE -Advanced Certificate in Education	Rural	24 years (1999-2023	131 (class size 60+)
Tt3	NC	MEd	Rural	16 years (2007-2023)	70 (class size 70)

In Table 1, two participating teachers (Tt1 and Tt2) from different schools in the Mgwenya circuit (MC) were selected and the third participating teacher (Tt3) was selected from one school in the Nkomazi circuit (NC). The participants were selected based on (1) their qualifications at an advanced level in Technology subject, (2) teaching experience of five years and beyond, (3) teaching big class sizes of 50 and more in Grade 9. The Grade 9 class is an exit level to Further Education and Training (FET) band. We believe that skills acquired in this grade would be advantageous in other FET subjects e.g. design, civil technology, and other technical subjects with similar skills. The sample size of three participants from different schools and circuits was to gather information from qualified and experienced teacher participants. The participants were engaged to share their perspectives from diverse settings (rural and semi-rural) to acquire a fuller grasp of the factors affecting teaching practical assessment tasks in the Senior Phase Technology classroom. All three teacher participants gave their consent to take part in the study. Individual semi-structured interviews (face-to-face) were used.

Semi-structured interviews were applied to acquire a better sense of teachers' perspectives on teaching PAT in their Technology classrooms, particularly teachers' experiences with teaching design activities. According to Britten (1995), the qualitative research interview aims to determine the interviewee's context of meaning, and the research task is to circumvent forcing the researcher's constructs and expectations as much as conceivable. Following in the footsteps of Braidotti (2002), Kuntz and Presnall (2012) reframed interview as a "*process-based, intra-active event rather than a concept*". Furthermore, qualitative interview studies address questions that quantitative research does not. Similarly, Roulston and Choi (2018, p.233) wrote that interviews have a commonality in forms of interaction, such as parent-teacher, job, and research interviews, among others, and that question-answer sequences drive these forms. Individual semi-structured interviews were used to facilitate interaction and uncover interviewee perceptions. Galletta (2013) found that the semi-structured interview method effectively enabled interchange between the interviewer and participant. Additionally, semi-structured interviews consist of open-ended questions that gives the interviewer or interviewee to investigate and track an idea in more detail (Britten, 1995).

The interviews were audiotape recorded and transcribed. Thematic analysis was used to analyse the data. Thematic analysis is described as a technique for analysing qualitative data that involves exploring a dataset to identify, analyse, and report recurring patterns (Braun & Clarke, 2006). Thematic analysis is a compelling yet adaptable process for analysing qualitative data that could be handled within a diversity of paradigmatic or epistemological locations (Kiger & Varpio, 2020). Two broad themes were identified using thematic analysis based on the six steps by Braun and Clarke (2006). As a result, the findings based on two broad themes are discussed in the next section: factors affecting the teaching of practical assessment tasks and challenges faced in administering the practical assessment tasks in the Technology classroom. Firstly, as researchers, we familiarised ourselves with the data by repeatedly reading through the transcribed data. Secondly, we generated the initial codes (i.e., Mini-PAT, design process, practical work, group work, thinking skills etc.). Thirdly, we identified themes. Fourthly, themes were reviewed. Fifthly, themes were defined. Lastly, the themes were written up. The teachers were labelled as Technology Teacher 1 Mgwenya circuit (Tt1Mc), Technology Teacher 2 Mgwenya circuit (Tt2Mc) and Technology Teacher 3 Nkomazi circuit (Tt3Nc).

According to Denzin (1989), there are three types of data triangulation: time, space, and person. Space triangulation, for instance, entails the collection of data from several sites with the aim of verifying the findings (Tobin & Begley, 2010). Through space triangulation, three different schools were selected for the collection of data on the same phenomenon, i.e., facilitation of practical tasks in the Senior Phase Technology classroom, and this allowed for an investigation of consistency of the data across sites (Shih, 1998). Additionally, space triangulation enables congruity, i.e., results from each school uphold similar results from all other schools; therefore, this added to the study's validity (Tobin & Begley, 2010). Nonetheless, the following was ensured to strengthen the trustworthiness of this study. To ensure credibility and trustworthiness (validity and reliability), the data was collected from the semi-structured interviews, transcribed and verified through member checking. The context and how participants were selected were discussed to ensure transferability. The interview audio recordings, transcripts, and field notes were made available to ensure trustworthiness. The verbatim extracts from the interviews were included in the discussion of findings to ensure confirmability. The qualitative methodology within an interpretivist paradigm enabled a thorough understanding of factors affecting the teaching of PAT in the context of social learning while considering the various points of view and perspectives.

FINDINGS

In this section, we present the results from the semi-structured interviews with Technology teachers at three different schools in the Ehlanzeni District.

Factors affecting the teaching of practical assessment tasks.

- Teachers' perceptions of Mini-PAT

The teachers' understanding was based on the outline of the CAPS document. Tt2Mc, for instance, stated that Mini-PAT is an assessment given to learners wherein they are expected to apply hands-on and mind-on aspects. Tt2Mc said: "*Mini PAT is a practical assessment that is given to learners that they have to do with their own hands. After maybe they've acquired certain knowledge from the theory in technology.*" However, they understand that teaching the Mini-PAT should comprise all aspects of the design process each quarter term. The teachers asserted that Mini-PAT is carried out in accordance with the design processes steps. This means that the design process drives the teaching of Mini-PATs in Technology. Mini-PAT is clearly associated with practical activities, according to the teachers. Taking a cue from teacher Tt3Nc, who stated: "*I think it's one way or one form of assessment that is provided in technology in order to understand or in order to enhance the development of learner skills following the design process.*" Moreover, teachers indicated that Technology is an important subject as it prepares learners for the outside world. Tt2Mc claimed that: "*even if they can drop out. In grade nine, they can do things with their hands after they've learned technology in grade nine".* Also, problem-solving, critical and creative skills were highlighted as some of the skills enabled by the design process.

- Teachers' approach(es) in teaching Mini-PAT

When facilitating the Mini-PAT, teachers typically guide their learners on how to solve technological problems and believe that group work, demonstration, and lecture methods are beneficial to facilitating the Mini-PAT. Even so, a gap appears in the facilitation of the practical tasks as indicated that the use of approaches depends on a specific design aspect they are dealing with. Tt3Nc mentioned: "*They do not have designated areas for people to do this work and do it practically and all that.*" The above claim gives the impression that teachers conduct practical tasks as mere tasks and not for the sake of assessing learners. This adds no value to the primary purpose of practical tasks in the subject. Conversely, Tt1Mc showed that the use of scenarios, case studies, and collaborative learning is encouraged in their facilitation of practical tasks. Additionally, Tt1Mc claimed that individuality is encouraged as it increases each learner's thinking ability. Tt1Mc stated: "*We want to see the different types of thinking from each learner; that is why we give them to operate as individuals.*" Furthermore, Tt1Mc asserted that the facilitation of the practical tasks starts with informal activities before the formal task. As a result, teachers felt that these methods aid in achieving the desired outcomes, which is the resolution of practical problems. Despite the approaches used by teachers, it was revealed that teachers were still unclear on how to interact with their learners in a way that benefits all learners, as some learners still struggle with some aspects, such as graphics, when presenting their ideas in the form of drawings. Tt1Mc stated: "*They can't draw, particularly females; the girls they can't draw. They struggle when it comes to drawing, especially technical drawings, the isometric ones, and they can't draw.*"

Challenges in administering the practical assessment tasks in the Senior Phase Technology classroom.

- Lack of resources

Teachers felt that a lack of resources hindered their success in facilitating Mini-PAT in a way that learners clearly understood. Teachers felt that the schools and even the department were the cause of failure in creating a thriving environment to administer Mini-PAT as they did not provide equipment for the subject. Tt1Mc mentioned that: "*The first one is the lack of materials. Because normally, the school does not provide you with the materials, so kids must bring their own materials."* One teacher also felt that there was a substantial difference between rural and urban schools because urban schools have better resources while rural schools struggle to get them. Tt2Mc specifically mentioned: "*We do not have the resource materials, the learning support materials. You'll find that you don't have those handy tools when doing the practical assessment."*

- No designated classroom for practical work

From the teachers' perspective, having a designated classroom to teach Technology is the main challenge because they must teach using what they have rather than strictly what should be used as tools and materials. *"No, we don't have a lab*," said Tt2Mc. "*We use the staff room and the head of the department's office*."

- Insufficient time

Teachers felt that teaching the Mini-PAT is never enough because there are areas where learners struggle the most and require additional attention. For example, teacher Tt1Mc stated that if you are introducing an isometric drawing, you might need two hours just to teach learners how to construct a drawing using angles and doing that in an hour is difficult. Tt1Mc contended, "*And the other one is time constraints, the subject is not given enough time because in a week, a subject is given two hours*."

- Subject matter exposure

Teachers felt that the subject-limited exposure posed challenges when teaching and learning of the Mini-PAT. The teachers said less exposure to the Technology subject impacted learners' interest in the subject. This is due to the subject itself receiving less importance, particularly at the primary level, making it hard for teachers to win the hearts of the learners when teaching, specifically the practical activities. Tt2Mc asserted: *"If I can mention other challenges that the learners themselves, some of them, I don't know what to say, but they are not committed enough."* Due to this: "*In primary school, they call it life skills. They don't call it subject per se, but in grade seven, they start calling it technology."* Furthermore, the background laid for the subject fails to accommodate different types of learners at the secondary level, resulting in fewer qualified Technology teachers. More workshops on the subject are not fruitful. According to Tt3Nc: "*At my level, or with the background that I have with technology as a subject, I find it somehow not fruitful going to those workshops, because instead of dealing with the core issues, such as the one that we're talking about now to say this is the issue."*

DISCUSSION of FINDINGS

The study's findings revealed that participanting teachers have basic understanding of Mini-PAT, i.e., practical tasks assessing the design processes in relation to problem-solving, creative and critical thinking skills. Hands-on and mind-on aspects in the study's findings appeared to be critical in facilitating practical tasks. However, the teachers appeared to consider all the design aspects when facilitating Mini-PATs each term. This then proves that there is a lack of subject knowledge about practical task facilitation. Drawing from the findings, it is evident that there are challenges in the execution of Mini-PAT at schools. This is in accordance with Kubheka's (2018) claim that implementing the Mini-PAT has been handled hastily as some teachers were not accustomed to the basics of Technology subject. This study thus showed that despite their understanding of Mini-PAT, they still have a challenge facilitating it in a manageable manner. For example, the CAPS document tabulates the Mini-PAT focus for each grade and term, e.g., for Grade 9 term (quarter) one, the focus was on structures, and thus the Mini-PAT focused only on the three aspects of the design process, namely communicate, design, and make. As a result, despite their knowledge of Mini-PAT, teachers require assistance to teach Mini-PAT in an understandable manner as the Mini-PAT activities seem inflaxible. The inflexible nature of the Mini-PAT on design processes activies, do not afford enough capacity teachers for acquiring the creative skills of the learner and suggest the need for an alternative teaching approaches. This is in accordance with what scholars such as Hill (1998); Williams (2000); Mawson (2003); and Rowel (2004) (cited in Ohemeng-Appiah, 2014) said. Hence, teachers need to know how to conduct an assessment in Technology, specifically Mini-PAT.

According to Mngunikazi (2014), teachers should be able to assist learners with Mini-PAT, provided they possess the knowledge and capacity to teach. Moreover, Rauscher (2016) posits that teachers require sound understanding of objects (artefacts) in particular, knowledge about artefacts to be able to support their learners in the designing and making of artefacts that are functional, aesthetically pleasing, and have utility value outside of the classroom. Regrettably, this is not the case; hence, Rauscher (2016) further argues that "some Technology teachers in South African schools seem to have a poor grasp of the complexity of this important part of knowledge about artifacts specific to Technology". In line with the study, the findings showed that teachers minimally understand precisely what is expected of them regarding design process facilitation. For instance, the statement above *(in findings)* highlighted that practical tasks cover all the design process aspects. Therefore, we believe that it would be beneficial if teachers are well-trained in the role of cognitive apprenticeship theory towards teaching of Mini-PAT.

Nonetheless, the study revealed that demonstration, collaboration, and lecturer methods used when facilitating practical work assist in achieving the goal of learners' participation in design activities. Activities from scenarios and case studies were also mentioned as other means teachers use to successfully facilitate practical work. As much as teachers have reflected on the approaches and teaching strategies, individual work was still encouraged to activities that enforce critical thinking skills among learners.

The study's findings further highlighted that teachers appreciate the subject as it intends to prepare learners for the outside world. This is supported by Mngunikazi (2014), who in her study, indicated that teachers believed that the subject contributes to equipping learners' skills to face the real-world problems and impact through Technology. Despite these studies, findings revealed that the main challenge is obtaining resources because the school, department, and SGB do not assist in obtaining the necessary resources. Despite the CAPS document's clear expectations, there is insufficient provision of resources to schools. The CAPS document specifically stated that schools are responsible for supplying tools and materials (resouirces) required when teaching the Mini-PAT. As a result of the schools' failure to provide resources, teachers are unable to deliver to the expected standard. On the other hand, Black et al., (2011) argue that teachers need support to improve assessment strategies. The support also contains the period learners spend completing projects in Technology under the teacher supervision. However, the study's findings showed that teachers regard Technology workshops or training they receive from their district as unfruitful despite the duration and support provided. Hence, insufficient time and lack of support remain a challenge in administering Mini-PAT, especially for those who do not qualify to teach the subject.

In addition, on contextual factors, participating teachers mentioned learners' background as one of the challenging factors towards the success of facilitating practical tasks. For instance, urban schools are well-equipped with resourced Technology classrooms or labs compared to rural schools. Hence, in some rural schools, it becomes challenging for teachers to conduct practical tasks due to overcrowding.

CONCLUSION

Drawing from the participants' responses, the study provided evidence to respond to the research title: Teachers' experiences of teaching practical assessment tasks in the Senior Phase Technology classroom. The study demonstrated that teachers have a basic understanding of Mini-PAT, but only to the extent of each schools' calendar term. The Mini-PAT is designed to complete all the aspects of the design processes. The study findings also revealed that teachers struggled to conduct fruitful practical activities due to a lack of resources. Furthermore, it demonstrated that learners from disadvantaged backgrounds, on average, had no exposure to resources used during the teaching and learning process when compared to learners from advantageous backgrounds. Nonetheless, they are highly motivated to acquire the necessary technological skills, such as creative and critical thinking abilities, and to apply them when solving technological problems. According to the study, disadvantaged learners' comprehensive academic potential will remain unrealised unless special provisions are made to compensate for this lack of support from schools, the department, and curriculum specialists.

Recommendations

Based on the study's findings, we recommend the following: (1) Technology teachers should become familiar with the CAPS document to fully understand how the Mini-PAT should be conducted; (2) The heads of department for the Technology subject should be on board to oversee the teaching of the subject; (3) Schools should be committed enough to meet the needs of the subject, such as designating a classroom and materials for the Technology subject. Furthermore, (4) the Department of Basic Education should ensure that all schools receive the same amount of attention when it comes to Technology, and (5) Curriculum specialists should ensure that they conduct fruitful workshops addressing the most pressing issues teachers face. In addition, further research can still be done to cover more than three participants to have a better understanding of how teachers experience administering Mini-PAT in the Senior Phase.

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