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How Civil Technology Teachers Teach Woodworking Practical Skills in Schools: A Case of Ekurhuleni East, South Africa

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ABSTRACT
In this Fourth Industrial Revolution (4IR) date, Technology Education teachers are exposed to a of variety teaching methods to ensure that they practice teaching practical skills effectively. Thus, Civil Technology teachers may use different methods such as practical demonstration of skills, videos and photos for teaching woodworking practical skills in schools. The goal of this research was to enquire how Civil Technology Teachers teach woodworking practical skills in schools at Ekurhuleni East, South Africa. Purposive sampling was used to identify a total of Nine (9) Civil Technology teachers to participate in this study. Mixed method research was used where semi-structured interviews and explanatory survey research were combined and integrated as a complementary data collection tool. According to the findings of this study, most of the Civil Technology teachers use practical demonstration of skills as a method to teach woodworking skills in schools. This is because practising the skills in front of the students in the workshop will not only benefit the students but will also develop teachers' effective teaching skills for woodworking practical skills. The study recommended that teaching and learning time allocation for Civil Technology must be increased so that teachers can be able to demonstrate woodworking practical skills and also monitor hands-on activities. This paper will aid Civil Technology teachers in exploring some ways of teaching that can benefit all students regardless of their class differences when teaching woodworking practical courses.

Keywords: Civil Technology, Woodworking, Demonstration, Practical skills, Effective teaching

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INTRODUCTION
Teaching practical skills for woodworking specialisation is a critical component of the teacher's role, and the successful acquisition of skills typically depends on the competent execution of practical lessons. Thus, the teaching of woodworking practical skills requires the use of precise demonstration of hands-on skills to enable students to follow the steps or process under the supervision of the teacher. Asmah, Baah, and Eghan emphasised that learning skills especially in a workshop or laboratory setting may necessarily require support and guidance from the teacher.[1] As a result, Civil Technology teachers should be prepared to take responsibility for imparting knowledge through demonstration, and then to effectively direct the

[1] Justice Asmah, A K Baah, and K P M Eghan, "Knowledge Base of Chemistry Teachers' Support Materials Used in Teaching Practical Skills in Titration in the Senior High Schools in Ghana," *International Journal of Materials Chemistry and Physics* 7, no. 1 (2021): 5–13.

didactic process as claimed.[2] Furthermore, the primary responsibility of the teacher in the woodworking workshop is to create and maintain a collaborative problem-solving teaching and learning environment in which learners are allowed to integrate theory knowledge into practice by practising what their teacher has demonstrated, and the teacher acts as a facilitator. Shobowale describes woodwork as the art of producing objects or articles basically deals with the use of wood in buildings or rooms such as doors, windows, roofs, beds, cupboards, chairs, and tables.[3] Also, it deals with the possession of skills, knowledge, and attitude in constructing woodwork joints in framing items, objects and structures, using diverse types of woodworking machines to perform different practical tasks.[4] Woodworking specialisation enables students to acquire the requisite knowledge and skills to live effectively in and contribute to society.

Woodworking is a Technology Education programme in South Africa that combines hands-on work with creativity obtained from schools that specialise in Civil Technology. This consists of construction, civil services, and the woodwork disciplines.[5] Moreover, woodworking subject teachers in schools also teach the value of working in trades like carpentry. Therefore, students will learn how much skill and knowledge is required to work with wood professionally.[6] Civil Technology is part of technical education in South Africa and should prepare learners to succeed through the acquisition of hands-on skills for market and industrial purposes. It is geared towards equipping its recipients with profitable skills for self-reliance or paid employment.[7] Civil Technology outcomes should ensure that learners can demonstrate an understanding of the industry, enhance knowledge, skills, values and reasoning abilities, as well as establish connections to life outside the classroom and address real-world challenges.[8] Civil Technology teachers utilise a variety of methods to ensure that effective teaching of woodworking skills is successfully acquired by students immediately after they are introduced to the subject in grade ten. Generally, woodworking specialisation teachers are expected to expose students to hands-on skills for the production and set for the site; give and impart skills to students who shall be able to identify convention of representation using on working drawing, use woodworking machines when constructing woodwork joints and make any woodworking simulations.

However, the factors affecting effective teaching of practical lessons in schools have not been left unnoticed and this study will be valuable in solving such factors. Previous studies have revealed several concerns that hinder Civil Technology teachers from teaching woodworking practical skills which include a very short time allocated in the teaching and learning timetables in schools. These studies have also found a negative relationship between achievement and the number of hours and days students are formally required to take woodworking hands-on instruction in a subject. Hence, the teaching and learning time allocation cater for more theory than practical lessons with only one formal Practical Assessment Task annually. Thus, Peterson has blamed the dramatically lower number of learning hours in developing countries that hindering students' effective learning in schools.[9] Although it is probably impossible to have one hundred per cent student compliance and time use, some systems can become fairly efficient. Furthermore, schools with poor teaching and learning time are likely to produce students who are most likely to score well in achievement from both theory and practical assessment learning outcomes.

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[2] M. S. A. Maeko, "Technical Skills Development in Civil Services: A Conundrum from the Perspective of Pre-Service Teachers in South African University of Technologies," in *Research Developments in Science and Technology Vol. 10* (Book Publisher International (a part of SCIENCEDOMAIN International), 2022), 18–29, https://doi.org/10.9734/bpi/rdst/v10/2224A.

[3] I Olukayode Shobowale, "Strategies for Improving Woodwork Practical Projects in Tertiary Institutions in Lagos State, Nigeria," *International Journal of Educational Research* 10, no. 1 (2022): 102–11.

[4] J I Oviawe, "Enhancing Academic Performance and Retention of General Woodwork Students' Using Adaptive Instructional Strategy in Technical Colleges in Edo State, Nigeria," *East African Scholars Journal of Psychology and Behavioural Sciences* 3, no. 1 (2021): 1–9.

[5] Thokozani Isaac Mtshali and Simphiwe Magnificent Msimango, "Factors Influencing Construction Technology Teachers' Ability to Conduct Simulations Effectively," *Jurnal Penelitian Dan Pengkajian Ilmu Pendidikan: E-Saintika* 7, no. 1 (March 13, 2023): 88–102, https://doi.org/10.36312/esaintika.v7i1.1079.

[6] I-Jui Lee, "Applying Virtual Reality for Learning Woodworking in the Vocational Training of Batch Wood Furniture Production," *Interactive Learning Environments* 31, no. 3 (April 3, 2023): 1448–66, https://doi.org/10.1080/10494820.2020.1841799.

[7] Oviawe, "Enhancing Academic Performance and Retention of General Woodwork Students' Using Adaptive Instructional Strategy in Technical Colleges in Edo State, Nigeria."

[8] Thokozani I Mtshali, "Critical Thinking Skills for Civil Technology Practical Assessment Tasks (PATs)," *World Transactions on Engineering and Technology Education, WIETE* 18, no. 2 (2020): 237–41.

[9] Leif Peterson, "K-Nearest Neighbor," *Scholarpedia* 4, no. 2 (2009): 1883, https://doi.org/10.4249/scholarpedia.1883.

Thus, Civil Technology teachers end up engaging a number of means to enable the teaching of woodworking practical skills which include demonstrations, videos and the use of photos. Several constructivist strategies have been seen as an intervention plan for enhancing students' academic performance; among which are two programmed instructional strategies, mastery learning approach, think-pair-share, peer tutoring, reciprocal peer tutoring, concept mapping, instructional scaffolding, exchange board substitution strategy, etc yet students' academic performance and retention remain low or poor.[10] However, Mtshali and Msimango conducted a study about factors influencing construction technology teachers' ability to conduct simulations effectively.[11] The researchers indicated a worrisome finding where Civil Technology teachers were not fully fit to conduct simulations effectively for their subject specialisation. Furthermore, the researchers recommended that Civil Technology teachers must be thoroughly equipped with hands-on skills from tertiary for the best benefit of students in schools. Thus, this study spotted a gap from their study and this study will add valuable data concerning the effective teaching of Civil Technology practical lessons in schools by focusing on the methods used by Civil Technology teachers to teach woodworking practical skills. Hence, the purpose of this study is to investigate how Civil Technology teachers teach woodworking practical skills in schools at Ekurhuleni East in South Africa.

LITERATURE REVIEW

Principles of Skills Teaching

Teaching hands-on practical skills in Technology Education has traditionally been founded on the concepts of "design, demonstrate and teach." Thus, Civil Technology teachers learn a wide range of practical skills over the years through demonstration and supervision of their practical lessons in the workshop. Furthermore, the trainer needs to possess the skills necessary to move a novice from a baseline level of awareness and knowledge of a particular skill through higher levels of showing an ability to perform the skill and ultimately achieving mastery.[12] To teach woodworking skills, Civil Technology teachers must be competent at performing the skill themselves, be able to provide balanced feedback within a structured approach, assess the student's proficiency, and ensure a phased withdrawal of supervision that allows the student to feel fully supported and then trusted to perform the skill as an autonomous practitioner. Therefore, woodwork concepts need to be presented to the learners in a manner that touches their subconsciousness which can trigger quick recalling of the concept being taught or learnt.[13] Those trainers who effectively combine opportunities for their trainees to mentally rehearse the skill with opportunities for the physical practice of each new skill can increase the accuracy with which the procedure is conducted significantly quicker than physical practice alone.[14]

The Four Step Model for Teaching Skills

To understand how Civil Technology teachers can teach woodwork practical skills, this study adapted Allery's four step model for teaching skills.[15] Thus, adopting a structured approach to learning, the model is well suited to teaching woodworking practical skills that will be utilized in critical care settings and that may need to be reproduced in stressful situations. These four steps involve:

1. Realistic demonstration
2. Trainer talk through
3. Learner talk through

[10] Oviawe, "Enhancing Academic Performance and Retention of General Woodwork Students' Using Adaptive Instructional Strategy in Technical Colleges in Edo State, Nigeria."
[11] Mtshali and Msimango, "Factors Influencing Construction Technology Teachers' Ability to Conduct Simulations Effectively."
[12] Amanda Helen Douglas, Samita Pant Acharya, and Lynne A. Allery, "Communication Skills Teaching and Learning in Nepal; What Are Medical Students' Perceptions and Experiences? A Qualitative Study," *BMC Medical Education* 20, no. 1 (December 29, 2020): 391, https://doi.org/10.1186/s12909-020-02330-y.
[13] Oviawe, "Enhancing Academic Performance and Retention of General Woodwork Students' Using Adaptive Instructional Strategy in Technical Colleges in Edo State, Nigeria."
[14] Ahsan Rao, Ian Tait, and Afshin Alijani, "Systematic Review and Meta-Analysis of the Role of Mental Training in the Acquisition of Technical Skills in Surgery," *The American Journal of Surgery* 210, no. 3 (September 2015): 545–53, https://doi.org/10.1016/j.amjsurg.2015.01.028.
[15] Douglas, Acharya, and Allery, "Communication Skills Teaching and Learning in Nepal; What Are Medical Students' Perceptions and Experiences? A Qualitative Study."

4. Learner does

- **Realistic Demonstration**

Based on this first step, Civil Technology teachers sometimes alternate teaching and learning between classroom and workshop to expose the students to practical and hands-on activities. Furthermore, in this step, they have the opportunity to relate theoretical knowledge gained from school to workplace experience.[16] Therefore, Civil Technology teachers are expected to demonstrate woodworking practical skills at normal speed without commentary. Furthermore, this stage allows students to observe and take notes to acquire and master the practical skills of woodworking.

- **Trainer talks through and Learner talk through**

Civil Technology teachers are expected to repeat the technique while describing each step and manoeuvre, addressing students' queries, and clarifying any points in detail in the second and third stages. Thus, they can maximize their existing potential to gain knowledge widely via theInternet and communicate with teachers in the classroom.[17] This also gives teachers a chance to rectify any mistakes that happened during the initial demonstration of their skills and also a chance to remind students of safety while using woodworking tools and equipment. Also, students are expected to ask questions and request the teacher to repeat some steps for understanding and mastery purposes. Douglas et al. confirm that the trainee directs the trainer, providing instructions to the trainer on each step and manoeuvre as the trainer does the skill.[18]

- **Learner does**

The last step is where the students execute woodworking practical skills on their own under the close supervision of the teacher. Therefore, in this Civil Technology teachers are expected to show their workplace basics knowledge through facilitation and supervision in the woodworking workshop. However, teachers should be competent with workplace basics to prepare and demonstrate construction practical lessons that promote undeniably marketable skills that students can use to contribute to this competitive economy.[19]

However, it is worthwhile to explore the utility of this technique and how it may be modified to allow skill instruction in a variety of settings. Allowing a learner to see a recording of a skill method, for example, could replace stages 1 and 2, and then a training session may be used to allow for conversations about the topic and skill training. It is also essential to explore scenarios in which such a strict approach may not be the best form of training.

METHODOLOGY

This study adopted a mixed-method research approach to find out how Civil Technology teachers teach woodworking practical skills. Mixed-methods research (MMR) is a research methodology that incorporates multiple methods to address research questions in an appropriate and principled manner, which involves collecting, analysing, interpreting and reporting both qualitative and quantitative data.[20] Furthermore, a mixed methods design offers some benefits to approaching complex research issues as it integrates philosophical frameworks of both post-positivism and interpretivism interweaving qualitative and quantitative data in such a way that research issues are meaningfully explained.[21] It also offers a

[16] Judith Nse, "Evaluation of Student Industrial Work Experience Scheme (SIWES) in Library School: The Federal Polytechnic Nekede Experience," *Library Philosophy and Practice*, 2012, 1.
[17] Berlinda Mandasari and Achmad Yudi Wahyudin, "Flipped Classroom Learning Model: Implementation and Its Impact on EFL Learners' Satisfaction on Grammar Class," *Ethical Lingua: Journal of Language Teaching and Literature* 8, no. 1 (2021): 150–58.
[18] Douglas, Acharya, and Allery, "Communication Skills Teaching and Learning in Nepal; What Are Medical Students' Perceptions and Experiences? A Qualitative Study."
[19] Mtshali and Msimango, "Factors Influencing Construction Technology Teachers' Ability to Conduct Simulations Effectively."
[20] John W Creswell, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (pearson, 2015); Alan Bryman, "Sampling in Qualitative Research ," *Social Research Methods* 4, no. 1 (2012): 415–29; John W Creswell and Vicki L Plano Clark, *Designing and Conducting Mixed Methods Research* (Sage publications, 2017).
[21] Michael D. Fetters, "'Haven't We Always Been Doing Mixed Methods Research?,'" *Journal of Mixed Methods Research* 10, no. 1 (January 16, 2016): 3–11, https://doi.org/10.1177/1558689815620883.

logical ground, methodological flexibility and an in-depth understanding of smaller cases.[22] In other words, the use of mixed methods enables researchers to answer research questions with sufficient depth and breadth; furthermore, it helps generalizing the findings and implications of the researched issues to the whole population. Thus, semi-structured interview questions (qualitative approach) and explanatory surveys (quantitative approach) were used to collect data. The qualitative approach, on the other hand, provides a better knowledge of the problem under investigation while valuing the participants' opinions. In other words, quantitative data adds breadth to the investigation, and qualitative data adds depth. Furthermore, quantitative data can be triangulated with qualitative results and vice versa.

- **Population and Sampling**

The population for this study comprises nine (9) Civil Technology teachers from eight (8) different schools at Ekurhuleni East, South Africa. Therefore, from this population, this study purposively sampled nine (9) Civil Technology teachers who specialize in woodworking in schools. The researcher used purposive sampling to select the participants that were most likely to yield appropriate and useful information. However, the scope of this study was limited to woodworking specialization teachers at Ekurhuleni East, South Africa.

FINDINGS

The findings from this article were generated through the use of two (2) types of data collection methods, where the researcher designed semi-structured interview questions (Qualitative Research Method) and explanatory survey research questions (Quantitative Research Method) hence this paper opted for Mixed Research Method (MRM) for data collection purposes. However, the research questions together with the findings were structured and presented as follows:

Semi-structured interviews (Qualitative Research Method)

To reiterate, the following are the two (2) research questions:
Research Question One (RQ1): Do you articulate your own hands-on skills when teaching woodworking practical lessons?
Research Question TWO (RQ2): How do you affirm that your students gain experience and skills in woodworking at the end of each practical lesson?

However, the data from semi-structured interviews provided the primary answers to these two (2) research questions. Therefore, the data that reveal how Civil Technology teachers teach woodworking practical skills is presented in a sequence of research questions. Thus, the responses to the RQ1 and RQ2 from woodworking teachers were provided as follows:

Research Question One (RQ1): Do you articulate your own hands-on skills when teaching woodworking practical lessons?

Teacher A: *"It depends on the woodworking practical lesson I am teaching on that day. For example, if I am supposed to teach woodworking joints, I may opt to demonstrate hands-on skills during the lessons to better illustrate the techniques and processes involved in woodworking skills."*
Teacher B: *"Since woodworking discipline is a hands-on subject I provide them with practical knowledge through demonstration and I believe that can help students to understand the concepts more effectively."*
Teacher C: *"Yes, I do articulate my own hands-on skills when teaching woodworking practical lessons by demonstrating every step and different techniques, using e-hand tools."*
Teacher D: *"Although it takes time I create a template or a booklet with all the steps and directions to follow when my students are practising woodworking craftsmanship by the use of screenshot videos from the internet. This makes my work so easy and it assists the students to master that practical lesson quickly."*

[22] Joseph Maxwell, "Evidence for What? How Mixed Methods Expands the Evidence for Causation in Educational Research," in *Proceedings of the 2019 AERA Annual Meeting* (Washington DC: AERA, 2019), https://doi.org/10.3102/1440524.

Teacher E: *"By showcasing my own woodworking practical skills, experience and knowledge in woodworking specialization that assist the students to visualize and understand the steps and process easily."*
Teacher F: *" I rely on alternative methods, such as detailed explanations, visual aids, or videos, to teach woodworking practical skills hence the time allocation for this subject is very short."*
Teacher G: "*I recommend some links from the internet prior to the practical lesson to save time and finish the practical lessons."*
Teacher H: *"Demonstration is the key and it assists me in explaining all expected from my students, so I do that"*
Teacher I: *"I demonstrate all practical lessons in the woodworking workshop and that develops an interest in the woodworking context from my students."*

DISCUSSION

This study discovered that Civil Technology teachers in the Ekurhuleni East area employ a variety of methods, including the use of images, films, and practical demonstrations of woodworking skills, although the majority of the participants in this study liked to demonstrate their woodworking practical hands-on abilities to students. Thus, these findings confirm that demonstrations play a crucial role in teaching hands-on subjects like woodworking as they offer numerous benefits to both the students and the teachers. Moreover, support by Ghaemi and Potvin that onsite practical lessons play a crucial role in engineering curricula as some of the key opportunities to facilitate the development of analytical skills and higher-order transferrable skills including critical-thinking, problem-solving and troubleshooting, teamwork, and technical communication.[23] This means that the participants from Ekurhuleni East District have not lost track of effective teaching of practical skills in schools.

Research Question TWO (RQ2): How do you affirm that your students gain experience and skills in woodworking at the end of each practical lesson?
Teacher A – I: In this situation, all participants responded similarly to the research question, stating that they relied on the Practical Assessment Task (PAT) document issued by the Department of Basic Education (DBE) and the Gauteng Department of Education. However, the PAT document also includes a PAT management plan, which helps teachers evaluate and analyse all of their students' progress in woodworking practical exercises.

Explanatory Survey Research Questions (Quantitative Research Method)

In this case, data and questions were constructed and displayed in a table form, as follows in the tables below:

Table 1: PARTICULARS OF THE PARTICIPANTS (TEACHERS)

	AGE	GENDER	QUALIFICATION	TEACHING EXPERIENCE
Teacher A	30-39	Female	B. Education	8
Teacher B	20-30	Male	B. Education	6
Teacher C	30-39	Male	B. Education (Hons)	9
Teacher D	40-49	Male	N. Diploma	15
Teacher E	30-39	Female	PhD	6
Teacher F	20-29	Female	B. Education (Hons)	13
Teacher G	50+	Male	ACE	20
Teacher H	30-39	Male	B. Education	7
Teacher I	30-39	Male	B. Education	8

[23] Manizheh Ghaemi and Mohammad-Reza Feizi-Derakhshi, "Feature Selection Using Forest Optimization Algorithm," *Pattern Recognition* 60 (December 2016): 121–29, https://doi.org/10.1016/j.patcog.2016.05.012.

Table 2: QUESTIONS AND ANSWERS

Question(s)	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F	Teacher G	Teacher H	Teacher I
How do you teach woodworking practical skills?	Demonstration	Demonstration	Demonstration	Use of photos	Demonstration	Use of videos	Demonstration	Demonstration	Demonstration
How do you ensure that learners acquire woodworking hands-on skills?	I give learners practical activities during practical lessons	Practical activities are highly preferable in this case to help them learn	frequent practice of woodworking practical activities	I let them explore the machines whilst inspecting them	I promote project-based lessons then theory then evaluate them later	I give them a chance to practice more under my supervision	Letting them practice after my demonstration	Monitoring their woodworking practical task does help to see mistakes early.	Students must be given enough time for practical activities.
How do you evaluate students' woodworking hands-on skills?	Learners are assessed during practical lessons and also on their final products at a specified interval and are assessed in line with the assessment criteria used in the rubric	their performance reflection is judged from their practical activities and marked by using PAT marking guidelines	I use a rubric	I designed a marking rubric for each and every simulation	Via PAT	Through PAT	I use PAT	I use PAT assessment guidelines	I use my knowledge and understanding of woodworking to evaluate and assess my students
Is the time allocated for woodworking subject sufficient for both teaching and learning of woodworking practical tasks?	No	No	No	Yes	No	No	Yes	No	No
Does demonstrating hands-on woodworking skills in a workshop make	Agree	Highly agree	Agree	Not sure	Agree	No	Agree	Agree	Agree

it easier for you to teach practical skills?									
Is demonstration of woodworking practical skills convenient for effective teaching of practical skills?	Yes	Yes	Yes	No	Yes	No	Yes	Yes	yes
Does demonstrating woodworking practical skills facilitate effective teaching of practical skills?	Agree	Agree	Agree	Do not agree	Agree	Do not agree	Agree	Agree	Agree

DISCUSSION

Discussion based on semi-structured interviews and Explanatory Survey Research

The researcher established that Civil Technology teachers have woodworking backgrounds from the university and annual training programs, which assists them with knowledge and practical skills of woodworking. Thus, having woodworking artisanship influences the way teachers integrate theory knowledge and practical skills. However, Nurtanto et al. state that vocational education teachers must master vocational philosophy, vocational theory, vocational principles, foundations, and assumptions in vocational education.[24] Consequently, Civil Technology teachers from Ekurhuleni East District can integrate vocational theory with vocational skills as most of them have attended skills development programs organized by the GDE. The findings further established that teachers prefer articulating their woodworking hands-on skills because they have access to basic resources like tools and equipment in their schools, hence the availability of resources is convenient for effective teaching of woodworking practical skills. However, some teachers indicated poor time management skills because they mentioned that the time allocated for Civil Technology does not allow them to conduct woodworking simulations effectively hence it is very short. On the other hand, some teachers indicated that they invest more in practical lessons than theory since the aim of this subject is to ensure that at the end of the year, students have acquired woodworking craftsmanship. This concurs with findings in a study by Korn's book titled "Why We Make Things and Why it Matters: The Education of a Craftsman. Random House" which emphasises the practice of woodworking practical skills to students become real craftsmen to be a skilled tradesman.[25] From the semi-structured interviews, the study established that teachers understand the importance of integrating theory knowledge with practical activities when teaching woodworking craftsmanship in schools. Through explanatory survey research, the study further established that the majority of Civil Technology teachers prefer the demonstration of woodworking practical skills instead of photos and videos as means of teacher assistance resources.

Discussion Summary

The main purpose of this study was to investigate how Civil Technology teachers teach woodworking practical skills in schools in Ekurhuleni East District, South Africa. Consequently, this study noted that Civil Technology teachers use both formal and informal practical tasks which include PAT to keep track if their students gain experience and skills in woodworking at the end of their practical lessons. To affirm that students gain experience and skills in woodworking at the end of each practical lesson, it is essential to employ a comprehensive assessment approach. This involves evaluating both the practical application of woodworking techniques and the acquisition of relevant knowledge. Furthermore, more than eighty per cent (80%) of the participants agreed that demonstration of woodworking practical skills is the best way to teach practical lessons while twenty per cent (20%) opted for different methods namely videos and photographs as the best. Lastly, the participants believe that more practice of woodworking practical lessons can be fruitful for both teachers and students to master woodworking practical skills easily.

RECOMMENDATIONS

Based on the findings of the Civil Technology teachers, this study recommends that Civil Technology teachers' development programs not only focus on hands-on skill development but also train teachers on how to use allocated time to allow students to practice woodworking practical activities regularly under their teachers' supervision. Furthermore, Civil Technology teachers' skills development skills programs must also include design skills for teachers hence this study found that most teachers rely on the PAT assessment plans and marking guidelines to assess students' hands-on skills for woodworking instead of designing their own assessment plans and criteria.

CONCLUSION

The study findings established that the majority of Civil Technology teachers from Ekurhuleni East, South Africa prefer the traditional approach which is the demonstration of practical skills as a means of teaching

[24] Muhammad Nurtanto et al., "Professional Identity of Vocational Teachers in the 21st Century in Indonesia," *Journal of Engineering Education Transformations* 35, no. 3 (January 1, 2022): 30–36, https://doi.org/10.16920/jeet/2022/v35i3/22085.
[25] Peter Korn, *Why We Make Things and Why It Matters: The Education of a Craftsman* (Random House, 2015).

woodworking practical lessons. Furthermore, the study recommended that Civil Technology teachers should attend workshops and teacher skill development programs so that they can acquire more knowledge and skills for teaching woodworking practical lessons effectively. Also, this study found that it is crucial to investigate how Civil Technology teachers teach woodworking practical lessons to eradicate the issue of teachers with inadequate hands-on skills which may result in students graduating with either overpopulated skills or lacking the required skills for their woodworking specializations.

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