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Instructional Methods Employed in Teaching Practical Skills for Industrial TVET Programmes in South-South, Nigeria

Arikpo Sampson Venatius
Faculty of Technical and Vocational
Universiti Pendidikan Sultan Idris, 35900, Perak, Malaysia.
*Correspondence: arikposv@ftv.upsi.edu.my

Abstract
Teachers' training institutions in Nigeria have been criticized severely for not producing teachers who are knowledgeable in various teaching methods. As end-users of the curriculum, teachers should be better positioned to utilize the appropriate instructional methods in TVET. A mixed-methods design was employed. The quantitative sample included 120 senior technical (ST1-3) students and 32 technical teachers in Nigeria. A five-dimensional questionnaire encompassing the Lecture method, Project-based learning, student-centered method, Practical demonstration method, and Field trip/Excursion was used to collect data, with the reliability put at 0.68, 0.72, 0.63, 0.74, and 0.79, respectively. Qualitative data were gathered through interviews with twelve participants. The results showed that TVET lecturers preferred the use of five (5) teaching approaches, namely the lecture, project, demonstration, field trip/excursion, and student-centered methods in teaching practical skills. Of these five methods, nine participants expressed their opinion that teachers do not combine these methods duringpractical skillslessons, while three of them think that lectures combine methods in teaching practical skills. Their reasons were that various teaching methods provide different opportunities for students to learn and master skills in various ways. However, the opinion of the twelve (12) participants shows that the lecture methodis the most predominant instructional method employed by TVET teachers. This is followed by the demonstration method as indicated by six participants (P1, P5, P6, P8, P10, and P12), the Students-centered method as opinioned by four participants (P3, P5, P8, and P9), the Project teaching method as indicated by three participants (P4, P7, and P11) and field trip/Excursion as indicated by one participant (P6). Based on these opinions, one concluded that practical skills are taught at technical colleges by merely discussing practical content, which allows students to listen and jot down points without actually demonstrating the skills.

Keywords: Instructional methods, Practical skills, Industrial Education

Introduction

Technical and Vocational Education and Training (TVET) plays a critical role in preparing individuals for employment in industry-driven sectors. Industrial TVET programs emphasize the acquisition of technical skills, knowledge, and competencies essential for various occupations in fields such as manufacturing, construction, and engineering. The effectiveness of these programs largely depends on the instructional methods employed to facilitate learning. Effective instructional methods in industrial TVET integrate theoretical knowledge with practical application, employ competency-based approaches, and utilize

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

modern technological tools to enhance skill acquisition. This introduction provides an overview of instructional methods used in industrial TVET, supported by scholarly research and theoretical frameworks.(Westwood & Westwood, 2008; Romiszowski, 2024), However, for a teaching strategy to be considered effective for use in technical education, it must take into account the learner's peculiarities and the intended learning outcome(Cess-Newsome, 1999; Keller, 2009).

One of the most prominent instructional methods in industrial TVET is the competency-based training (CBT) approach. CBT focuses on the development of specific skills that align with industry standards and job market demands(Darling-Hammond & Sykes, 2003; Levine, 2006). Unlike traditional education models that prioritize rote learning and theoretical knowledge, CBT emphasizes hands-on training and real-world problem-solving. Learners are assessed based on their ability to perform specific tasks, ensuring that they acquire the competencies required by employers. According to(Ekure, Essien, & Nduononwi; Ogunyinka, Okeke, & Adedoyin, 2015; Olatunde, 2017), CBT is particularly effective in TVET because it fosters a learner-centered environment where students progress at their own pace and demonstrate mastery before advancing to more complex skills.

Another widely used instructional method in industrial TVET is project-based learning (PBL). PBL involves learners working on real-life projects that require them to apply theoretical concepts in practical settings. This method encourages critical thinking, problem-solving, and teamwork, which are essential for success in industrial occupations(Pham, 2018; Boss & Krauss, 2022). For instance, in automotive engineering programs, students might work on designing and assembling vehicle components, allowing them to integrate knowledge from multiple disciplines. Research (Hmelo-Silver, 2004) highlights that PBL enhances retention and understanding of concepts, making it an effective approach in skills-based education. Apprenticeships and work-based learning (WBL) are also integral to industrial TVET. These methods involve on-the-job training where learners gain practical experience under the supervision of experienced professionals. Apprenticeships are structured programs that combine classroom instruction with industry placements, ensuring that learners develop both theoretical knowledge and practical skills(Fuller & Unwin, 2011). Work-based learning fosters industry-academia collaboration and enhances employability by exposing learners to real work environments. Studies indicate that WBL improves students' transition to the workforce and increases their adaptability to industry demands(Lester & Costley, 2010; Morris, 2018).

Simulation-based learning (SBL) has gained prominence in TVET due to advancements in technology. SBL involves the use of digital simulations, virtual reality (VR), and augmented reality (AR) to replicate real-world industrial scenarios. These tools enable learners to practice skills in a controlled environment before applying them in real workplaces(Sitzmann, 2011). For example, in welding and machining courses, students can use VR simulations to practice

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

techniques without the risks associated with handling heavy machinery. According to (De Jong, Linn, & Zacharia, 2013), simulation-based learning enhances experiential learning and improves student engagement, making it an effective instructional strategy in industrial TVET. Not long ago, blended learning, which combines online and face-to-face instruction, also emerged as a viable instructional method in industrial TVET. The integration of e-learning platforms with traditional classroom instruction provides learners with flexible access to learning materials while maintaining the benefits of hands-on practice. Research by (Graham, 2006)suggests that blended learning enhances learner autonomy and provides opportunities for self-paced learning, which is particularly beneficial for adult learners in vocational education. Online modules can supplement practical training by providing interactive tutorials, assessments, and instructional videos.

Furthermore, the adoption of problem-based learning (PBL) has been noted as an effective approach in industrial TVET. PBL involves presenting learners with complex, real-world problems that require critical analysis and solution development. This method enhances students' ability to apply theoretical knowledge to practical scenarios and develop problem-solving skills crucial for the industrial sector. For instance, in mechanical engineering programs, students might be tasked with troubleshooting faulty machinery, requiring them to use diagnostic tools and technical knowledge. Despite the effectiveness of these instructional methods, challenges persist in their implementation. Limited access to modern training equipment, lack of industry-academia collaboration, and inadequate instructor training can hinder the effectiveness of TVET programs(Elfert, 2015). Addressing these challenges requires policy interventions, increased investment in infrastructure, and continuous professional development for TVET educators.

In conclusion, instructional methods in industrial TVET programs are diverse and tailored to enhance skill acquisition and workforce readiness. Competency-based training, project-based learning, work-based learning, simulation-based learning, blended learning, and problem-based learning each contribute to effective vocational training. These methods align education with industry needs, ensuring that graduates are well-equipped for employment. Future research should explore the integration of emerging technologies and innovative pedagogical approaches to further enhance the effectiveness of TVET programs in industrial sectors.

i. Identify the instructional methods employed in teaching practical skills in TVET in Nigeria technical colleges

Ho_2: There is no significant difference in the responses of technical college students and teachers on the methods employed in teaching practical skills in TVET.

Research Theoretical Framework

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

This research was anchored on the Experiential Learning Theory (ELT) propounded by John Dewey in 1969, which believes that learning is conceived through a continuing reconstruction of experiences in which knowledge is modified and re-formed. It offers a clear view of knowledge and how it is achieved. The ELT paradigm depicts two dialectically connected modes of grasping experience (Concrete Experience, CE, and Abstract Conceptualization, AC) as well as two dialectically related modes of transforming experience (Concrete Experience, CE, and Abstract Conceptualization, AC) (Reflective Observation, RO and Active Experimentation, AE). Learning occurs when these four learning modalities' creative tensions are resolved. This is depicted as an idealized learning cycle or spiral in which the learner "touches all the areas" of experience (CE), reflection (RO), thinking (AC), and acting (AE) in a recursive process that is sensitive to the learning context and what is being learned. Observations and thoughts are based on immediate or actual experiences. These thoughts are digested and dispersed into abstract conceptions, from which new action implications can emerge (Joy & Kolb, 2009; Kolb & Kolb, 2011b; Kolb & Kolb, 2011c). The theory is related to this study in that, creative and innovative thinking are elements of Psychomotor skills learning. The wrong delivery of practical course contents can gear cognitive conflict that may affect students' learning outcomes during the skills-learning process,

Methodology

To fully address the research objectives, this study uses a two-phase model approach that combines qualitative and quantitative approaches. This method allows the researcher to investigate the subtleties of a particular occurrence first and then use quantitative analysis to confirm the results. A literature study, semi-structured interviews, and data analysis were all used in the first step of exploratory qualitative research to better understand the topic. To test the hypotheses developed in Phase 1, the second phase will entail quantitative research, including survey design, sampling method, data collection, statistical analysis, and result interpretation. This research methodology combines the advantages of qualitative and quantitative approaches by using a two-phase model approach, guaranteeing a thorough and multifaceted investigation of the research subject (Palacios, 2014). This approach seeks to validate results and offer important insights, thereby enhancing the corpus of knowledge on the topic(Leech & Onwuegbuzie, 2008; Creswell, 2013).

Research Participants

The study participants for the qualitative aspect of the study consist of 12 Heads of Technical Units (HTUs) drawn from 12 Technical Colleges and 37 Industrial Technicians (ITs) working in various technical industries across the South-South zone of Nigeria. The quantitative aspect comprises 120senior technical (ST1-3) students and 32 technical teachers. The HTUs were used for qualitative research because of the administrative functions bestowed upon them, which made them worthy to react to questions on issues that involve the teaching approach. The industrial technicians were involved in this study due to their experiences in the

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

industry as it relates to skills required and procedures for teaching them. ST1-3 students participated in the study because, at these levels, they have taken specialization in technical subjects and are considered mature enough to provide correct information on the instructional methods employed by the teachers in teaching them practical skills. The teachers are considered in this study because they were directly involved in teaching the students, and as end-users of the curriculum, they were in a better position to respond to issues of instructional methods. 5 HTUs have held the post for 6 years, 4 for 3 years, and 3 HTUs have held the post for 2 years. 11 Industrial Technicians have 15 years of Industrial experience, 18 have 9 years of experience and 10 have 7 years of experience in the industry while the teachers used have 11 to 27 years of teaching experience respectively.

The questionnaire was developed through a comprehensive review of the relevant literature and previous studies focused on the methods of teaching technical subjects in colleges. The papers of well-cited researchers in the field of TVET were all included in this review. Next, the important constructs were determined, along with the relevant components for each construct. After that, a panel of knowledgeable reviewers with varying backgrounds and specializations in TVET and Measurement and Evaluation was shown the first draft of the questionnaire. The reviewers offered input on the questionnaire's general coherence, the suitability of the primary subjects, and the significance of each item relative to the study's goals. The study team made the required revisions to the questionnaire in light of the reviewers' remarks and recommendations. Based on the arbitrators' comments about the dimensions' suitability in terms of concept and formulation, the items' alignment with the TVET education philosophy and linguistic integrity, validity was determined. Some of the items were added, changed, or removed based on their input, while others were reworded linguistically. Items that received (70%) or more of the arbitrators' agreement were accepted. Finally, reliability was determined using Cronbach's alpha coefficient to identify the internal consistency of the dimensions and overall questionnaire using a sample of 30 teachers and students who were part of the population but were not contained in the sample frame of the study, as presented in Table 1.

Table 1: Reliability estimate of the questionnaire instrument

Instructional method	No. of items	No. of respondents	Reliability estimate
1. Lecture method	5	30	0.68
2. Project-based learning	5	30	0.72
3. Students center method	5	30	0.63
4. Practical demonstration method	5	30	0.74
5. Field trip/Excursion	5	30	0.79
Total :	**25**	**30**	**Average = 0.71**

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

The most popular method for gathering qualitative data that aims to deepen a study and provide comprehensive information is the interview. We used a variety of methods (written, phone, and in-person). The questions were structured progressively from general to specific, as shown below.

In your opinion, what are the preferred instructional methods used by lecturers in teaching practical skills for industrial TVET subjects?

a. In your opinion, do you think that TVET teachers combine teaching methods to teach practical skills for industrial TVET subjects?
b. What is/are the predominant teaching method(s) used by teachers in teaching practical skills in TVET programmes?

Result

Quantitative questionnaire

Table 2: Stepwise linear regression analysis (SLRA) of TVET students on the methods employed in teaching practical skills in metalwork trades.

S/n	Teaching method	Std. Coeff. Beta	t value	Sig
1.a	Lecture method	.963	42.182	.000
2.a	Lecture method	.622	24.023	.000
b	Project-based method	.514	9.404	.000
3.a	Lecture method	.503	8.612	.000
b	Project-based method	.364	6.541	.000
c	Student centered method	.442	4.220	.000
4.a	Lecture method	.305	3.485	.001
b	Project-based method	.311	4.616	.014
c	Student centered method	.268	3.122	.003
d	Practical demonstration Method	.198	3.099	.019
5.a	Lecture method	.239	2.140	.011
b	Project-based method	.167	1.894	.005
c	Student centered method	.265	2.668	.000
d	Practical demonstration Method	.191	3.080	.090
e	Field trip/Excursion	.133	5.170	.032

Notation: ***Std. coeff Beta*** **=** *Standardized Beta Coefficient*

Table 2 presents the result of the Stepwise Linear Regression Analysis of the computed regression statistic shows F_5, 373 = 2684.013, $p < .05$ (.000) for the five (5) predictor variables (Lecture method, Project-based method, Student-centered method, Practical demonstration Method and Field trip/Excursion) observed with B = .239, .167, .265, .191 and .133 respectively as the teaching methods predominantly used in teaching TVET subjects in colleges of education at the South-South Geopolitical Zones (S-SGZ) of Nigeria. However, Table 3 shows the summary of the SLRA of the five aspects of teaching methods that are employed in teaching practical skills in colleges as observed by ST1-3 students and teachers in Nigeria.

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

Table 3: Summary of regression analysis of technical college students' results on the teaching methods employed in teaching TVET subjects.

S/n	Teaching method	R	R^2	Adjusted R^2	Std. Error
1	Lecture method	.963a	.948	.948	.86402
2	Project-based methods	.969c	.953	.962	.74112
3	Student centered method	.970d	.960	.969	.82290
4	Practical demonstration Method	.971	.962	.969	.56991
5	Field trip/Excursion	.972	.964	.970	.50341

Notation:

R = Regression, R^2 = Multiple Regression Coefficient, Adjusted R^2 = Adjusted Multiple Regression Coefficient, Std. Error = Standardized Error of the Estimate.

Table 3 presents the summary results of the five teaching methods employed for teaching practical skills in metalwork trades. The highest value, Adjusted R2 of .964, reveals that the model accounts for 96.4% of the variance in the teaching methods employed by lecturers/ Instructors in teaching industrial TVET subjects in colleges in Nigeria. The correlation coefficient (R) is presented in descending order, indicating the predominant determinants of teaching methods employed in TVET.

Qualitative Interviews: To gain a more in-depth understanding of the responses to the questionnaire, interviews were conducted with a group of participants differing in terms of gender, teaching experience, and educational stage taught. The responses provided by the HTUs and Technicians were concentrated on three distinct themes:What are the preferred instructional methods used by lecturers in teaching practical skills for industrial TVET subjects? Do you think that TVET teachers combine teaching methods to teach practical skills for industrial TVET subjects? What is/are the predominant teaching method(s) used by teachers in teaching practical skills in TVET programmes?To determine the opinion of HTUs and Industrial Technicians on the instructional methods employed by teachers in teaching practical skills in TVET at colleges, the analysis explores three sub-questions as shown in Table 4 below.

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

Table 4: Qualitative analysis of HTUs and Industrial Technicians on the instructional methods employed by lecturers in teaching practical skills n TVET in colleges.

Interview question 1a	In your opinion What are the preferred instructional methods used by lecturers in teaching practical skills in TVET?
Main idea	Teaching Methods are preferred
Participants/Responses	P1. Lecture method, Project method, Demonstration. P2. Demonstration, Field trip/excursion,Students-centered P3. Project method, Lecture method P4. Project method, Lecture method, Field trip/excursion P5. Students-centered, Lecture method, Demonstration, Field trip/ Excursion P6. Project method, Students-centered, Lecture method, Field trip/Excursion P7. Lecture method, Demonstration, Project method P8. Demonstration, Students-centered, Lecture method P9. Lecture method, Demonstration, P10. Demonstration, Lecture method P11. Project methods, Field trip/Excursion P12. Lecture method, Demonstration, Projects methods
Frequency of idea	Lecture method (10), Project method (7), Demonstration (8), Field trip/Excursion (5) and Students-centered (4)
Interview question 1b	In your opinion, do you think that TVET lecturers combine teaching methods to teach practical skills in TVET
Main idea	Teaching methods are combined
Participants/Responses	P1. No, they do not, P2. No, it is not necessary, P3. No, due to a lack of equipment, P4. Yes, though not often, P5. No, most teachers are notknowledgeable in practical content, P6. No, it makes no difference, P7. Yes, it gives another opportunity for students to learn skills, P8. No, it does not provide students' notes, P9. No, you do not have to combine methods, P10. No, P11. Yes, variety is good, P12. No
Frequency of idea	No (9) and Yes (3)
Interview question 1b	What do is/are the predominant teaching method(s) used by lecturers in teaching practical skills in TVET?
Main idea	Teaching methods use
Participants/Responses	P1. Lecture method, Demonstration P2. Lecture method, P3. Lecture method, Student-centered, P4. Project method,Lecture method, P5. Discussion method, Demonstration, Student-centered, P6. Lecture method, Field trip/Excursion, Demonstration, P7. Project method, Lecture method, P8. Demonstration method, Lecture method, Student-centered, P9. Lecture method, Student-centered, P10 Lecture method, Demonstration method, P11 Project method, Lecture method, P12 Lecture method, Demonstration method

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

Frequency of idea	Lecture method (12) - (P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11 & P12) Demonstration (6) - (P1, P5, P6, P8, P10 & P12) Students-centered (4) - (P3, P5, P8 & P9) Project method (3) - *(*P4, P7 & P11) Field trip/Excursion (1) - (P6)

Table 4 shows the participants' responses to interviews conducted with HTUs and Industrial Technicians on the instructional methods lecturers employ in teaching practical skills in TVET. The 12 participants indicated one or two preferred teaching methods or the other. In all, their responses indicated that TVET teachers preferred the use of five (5) teaching approaches, namely lectures, projects, demonstration, field trip/excursion, and student-centered methods in teaching practical skills. Of these five methods, nine participants expressed their opinion that teachers do not combine these methods during lessons, while three of them believe that lectures incorporate methods for teaching practical skills. Their reasons were that various teaching methods provide different opportunities for students to learn and master skills in various ways. However, the opinion of the twelve (12) participants shows that the lecture method is the most predominant instructional method employed by TVET teachers. This is followed by the demonstration method as indicated by 6 participants (P1, P5, P6, P8, P10, and P12*)*, the Students-centered method as opinioned by 4 participants (P3, P5, P8, and P9), the Project teaching method as indicated by 3 participants (P4, P7, and P11) and field trip/Excursion as indicated by 1 participant (P6). Based on these opinions, one may conclude that practical skills are taught at colleges by merely discussing practical content, which allows students to listen and jot down points without actually demonstrating the skills.

Most of the participants, P1, P3, P5, P7, P9 and P11, summarized their thoughts on preferred instructional methods used by lecturers in teaching practical skills in TVET by saying. Teachers should use instructional methods that integrate hands-on practice, problem-solving, collaborative learning, and technology-enhanced teaching to ensure that students efficiently acquire relevant technical skills. P4, P6, P8, and P12 believe that teachers should adopt teaching methods that encourage "Learning by doing,". This will help students grasp concepts better when actively engaged in tasks. They believe that demonstrations, coupled with guided practice, allow students to observe, replicate, and refine their skills under expert supervision. Some participants feel that teachers should use teaching methods that foster critical thinking and problem-solving abilities should be used by teachers as any teaching methods that facilitate real-world scenarios where students analyze and address technical challenges ensure they develop industry-relevant competencies. Furthermore, P3, P5, P9, P10, and P12 think that when teaching technical skills, teachers advocate for industry-based learning through apprenticeships and internships, ensuring students gain exposure to authentic work environments.

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

Do you think that TVET lecturers combine teaching methods to teach practical skills in TVET?

According to 9 participants, Lecturers do not combine teaching methods. They noted that Lecturers often use lectures, demonstrations, simulations, problem-based learning, and others separately to enhance students' practical understanding. They fail to realize that employing many methods allows learners to observe and grasp procedural details accurately, and a singular lecture method cannot foster industry readiness by exposing learners to workplace expectations and professional standards.

What teaching method should be predominantly used by lecturers in teaching practical skills?

Participants summarized their views on what they feel should be the predominant teaching methods in TVET institutions. Many of them said that the demonstration, apprenticeship, and project-based learning should be well-used. According to them, these methodologies align with the practical and skill-oriented nature of TVET, ensuring that students develop both technical proficiency and problem-solving capabilities.

Why do you prefer these methods?

P1, P4, P7, P9, and P11 said that it allows students to progress at their own pace, ensuring they achieve the required competencies before advancing to more complex tasks. CBT is particularly effective in TVET as it bridges the gap between theoretical knowledge and real-world application. P3, P5, P7, P8, P9, P12 said that the demonstration approach enhances understanding by providing a visual and step-by-step guide, reducing errors, and reinforcing learning. According to P2, P4, P5, P7, P10, and P12,Project-Based Learning (PBL) further enhances skill acquisition by engaging students in real-world challenges by applying technical knowledge to solve practical problems, encouraging creativity, collaboration, and critical thinking.

Discussion of Findings

The concern of this study was to determine the instructional methods employed in teaching practical skills in TVET programmes at Nigerian colleges. The findings of the quantitative and qualitative data analysis show that there was no significant difference in the mean responses of TVET students and teachers on the most significant determinants of the teaching methods employed for teaching technical skills at Nigerian colleges. Lecturers preferred the use of five (5) teaching approaches, namely, lecture, project, demonstration, field trip/excursion, and student-centered methods. The lecture method was the most predominantly used instructional method employed by teachers, followed by the demonstration method, Student-centered method, Project teaching method, and field trip/Excursion. These findings might be due to the lack of qualified teachers, lack of modern equipment for teaching technical skills, improper funding of technical education programs, lack of adequate provision of

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

teaching facilities, and industrial collaboration that made lecturers unable to diversify their teaching approach. Consequently, the lecture approach was used.

The fact that the majority of industrial technical instructors lack the practical knowledge necessary to impart to their students may be another factor. The results of this study also agreed with those of previous studies by (Anindo, 2016; Islam, Uwameiye, & Uddin, 2017, 2021; Oviawe) who observed that teachers are better at theoretical content these days than the practical aspect of technical subjects consequently, they pay more attention to teaching methods that suite the delivery of theory rather than practical. In addition, the Netherlands Organization for International Cooperation in Higher Education2010) found out that in most technical colleges, limited instructional resources for practical lessons result in overcrowding of available equipment. As a result, the usage of lecture methods in TVE programs has continued because the majority of students just watch what is being presented by the instructor without having the chance to participate in the practical themselves.

The findings of this research corroborate popular research works of(Odo, Adenle, & Okwori, 2012; Fayomi et al., 2019; Anaekwe, 2020), which claimed that the current trends in TVE instruction in Nigeria are theory-based with an emphasis on the use of the traditional (lecture) teaching method, which is no longer relevant.(Abrahams & Millar, 2008; Moore, 2014; Muijs & Reynolds, 2017) who noted that the most effective and important way to instruct pupils in the core skills and practices is through practical demonstration. This study aligned it selves with the accretion of (Abrahams & Millar, 2008; Otu, Udo, & Usoro, 2010; Peter, Abiodun, & Jonathan, 2010; Ayeni, 2015; Fu, Ayob, Wenxin, & Bamiro; Igaru, 2023;)who posited that the use of mixed instructional methods is a relevant alternative to the teaching of practical skills in technical and vocational education institutions in Nigeria. The study supported the belief that the TVET teaching and learning process requires the use of technology training methods since the syllabuses were designed based on hands-on, conscious creation, and collaborative experience concepts. This result is consistent with the findings ofmany research works that noted that the utilization of demonstration, inquiry, project, and assignment methods is the most pertinent technique for teaching practical skills. Regularly going on trips, using the apprenticeship system, and participating in the Students' Industrial Work Experience Scheme (SIWES) program, among other things. The findings in this study relate to the Experimental Learning Theory (ELT) propounded by John Dewey in 1969 and the Instructional Design Theory (IDT) propounded by Robert Gagne in 1965.

Conclusion

The effectiveness of instructional methods in teaching practical skills within Technical and Vocational Education and Training (TVET) programs is crucial for producing competent, industry-ready graduates. Various pedagogical approaches, including demonstration, apprenticeship, simulation, and problem-based learning, are vital for bridging the gap between

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

theoretical knowledge and hands-on application. The choice of instructional methods depends on several factors, such as the nature of the skill taught, available resources, and industry demands. While these techniques have shown their value, challenges such as inadequate infrastructure, low industry participation, and outdated content impede skills acquisition. TVET institutions should prioritize continuous professional development for instructors, modernize training equipment and facilities, and enhance the connection between industry and academic institutions. Future efforts ought to evaluate the long-term effects of various instructional modes on graduates' job performance and career trajectories. Implementing industry-relevant strategies and best practices in instructional design can enable TVET institutions to play a vital role in economic development by fostering a skilled workforce.

Recommendations

1. **Lecturers should** design instructional methods around clearly defined industry-relevant competencies, ensuring that learners acquire skills directly aligned with workplace demands.
2. Lecturers should combine classroom instruction with apprenticeships to bridge the gap between theory and practice
3. Curriculum planners should incorporate real-world industrial problems and hands-on projects into the curriculum to foster active learning and problem-solving abilities
4. Lecturers should encourage group work, peer teaching, and collaborative tasks where students learn from and with each other under guided supervision.

References

Abrahams, I., & Millar, R. (2008). Does practical work really work? A study of the effectiveness of practical work as a teaching and learning method in school science. *International Journal of Science Education, 30*(14), 1945-1969.

Anaekwe, M. C. (2020). Acquisition of Skills in Science, Technical and Vocational Education (STVE) for a Knowledge-Based Economy in Nigeria: Status, Constraints and the Way Forward. *Bulgarian Journal of Science and Education Policy, 14*(1), 54-70.

Anindo, J. (2016). *Institutional Factors Influencing Acquisition Of Employable Skills By Students In Public Technical And Vocational Education And Training Institutions In Nairobi County, Kenya.* University of Nairobi,

Ayeni, A. O. (2015). World Wide Comparism of Technical and Vocational Education: Lessons for Nigerian Technical and Vocational Education Sector (I). *Journal of education and practice, 6*(30), 103-110.

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

Boss, S., & Krauss, J. (2022). *Reinventing project-based learning: Your field guide to real-world projects in the digital age*: International Society for Technology in Education.

Cess-Newsome, J. (1999). Secondary teachers' knowledge and beliefs about subject matter and their impact on instruction. In *Examining pedagogical content knowledge: The construct and its implications for science education* (pp. 51-94): Springer.

Creswell, J. W. (2013). Steps in conducting a scholarly mixed methods study.

Darling-Hammond, L., & Sykes, G. (2003). Wanted, a national teacher supply policy for education: The right way to meet the" highly qualified teacher" challenge. *Education policy analysis archives, 11*, 33-33.

De Jong, T., Linn, M. C., & Zacharia, Z. C. (2013). Physical and virtual laboratories in science and engineering education. *Science, 340*(6130), 305-308.

Ekure, B. I., Essien, E. O., & Nduononwi, a. A. Orientation process and teachers'effectiveness in nigeria: challenges and way forward.

Elfert, M. (2015). UNESCO, the Faure report, the Delors report, and the political utopia of lifelong learning. *European Journal of Education, 50*(1), 88-100.

Fayomi, E. J., Fields, Z., Arogundade, K. K., Ojugbele, H. O., Ogundipe, F., & Ganiyu, I. O. (2019). Complementary approach to teaching and learning entrepreneurship in Nigerian universities: A conceptual framework. *Universal Journal of Management, 7*(2), 57-77.

Fu, L., Ayob, A., Wenxin, X., & Bamiro, N. The relationship between student self-efficacy and learning engagement at Chinese vocational colleges during internship.

Fuller, A., & Unwin, L. (2011). Apprenticeship as an evolving model of learning. *Journal of Vocational Education & Training, 63*(3), 261-266.

Graham, C. R. (2006). Blended learning systems. *The handbook of blended learning: Global perspectives, local designs, 1*, 3-21.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational psychology review, 16*, 235-266.

Igaru, L. M. (2023). *Enhancing student practical skills in carpentry and joinery at national instructors college abilonino in kole district, Uganda.* Kyambogo University [unpublished work],

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

Islam, M. S. (2021). Problems of insufficient practical equipment: A study through technical and vocational education in Bangladesh. *International Journal of Vocational and Technical Education, 7*(1), 43-68.

Keller, J. M. (2009). *Motivational design for learning and performance: The ARCS model approach*: Springer Science & Business Media.

Leech, N. L., & Onwuegbuzie, A. J. (2008). Qualitative data analysis: A compendium of techniques and a framework for selection for school psychology research and beyond. *School psychology quarterly, 23*(4), 587.

Lester, S., & Costley, C. (2010). Work- based learning at higher education level: Value, practice and critique. *Studies in higher education, 35*(5), 561-575.

Levine, A. (2006). Educating school teachers. *Education Schools Project*.

Moore, K. D. (2014). *Effective instructional strategies: From theory to practice*: Sage Publications.

Morris, C. (2018). Work- based learning. *Understanding medical education: evidence, theory, and practice*, 163-177.

Muijs, D., & Reynolds, D. (2017). *Effective teaching: Evidence and practice*: Sage.

Odo, M., Adenle, S., & Okwori, R. (2012). Enhancing mastery of practical skills in students of vocational and technical education through activity based. *Journal of Technical Education and Training, 4*(2).

Ogunyinka, E. K., Okeke, T. I., & Adedoyin, R. C. (2015). Teacher education and development in Nigeria: An analysis of reforms, challenges and prospects. *Education Journal, 4*(3), 111-122.

Olatunde, O. T. (2017). *Experiential education in a proposed existential teacher education philosophy in Nigeria.*

Otu, E. S., Udo, B. A., & Usoro, H. (2010). Skills acquisition in Nigerian education system: Problems and prospects as they relate to vocational and technical education. *Journal of qualitative Education, 6*(4), 34-41.

Oviawe, J. I., Uwameiye, R., & Uddin, P. S. (2017). Bridging skill gap to meet technical, vocational education and training school-workplace collaboration in the 21st century. *International Journal of vocational education and training research, 3*(1), 7-14.

Vol. 10, Issue 1, - Oct/Dec, 2025. ISSN p2536-748x, e-2565-7498

Palacios, J. (2014). John W. Creswell. A concise introduction to mixed methods research. Thousand Oaks (CA): Sage. 2014. 152 pp. *Barataria: revista castellano-manchega de ciencias sociales*(18), 247-249.

Peter, O. I., Abiodun, A. P., & Jonathan, O. O. (2010). Effect of constructivism instructional approach on teaching practical skills to mechanical related trade students in western Nigeria technical colleges. *International NGO Journal, 5*(3), 059-064.

Pham, T. (2018). *Project-based learning: From theory to EFL classroom practice.* Paper presented at the The 6th International OpenTESOL Conference.

Romiszowski, A. J. (2024). *Producing instructional systems: Lesson planning for individualized and group learning activities*: Taylor & Francis.

Sitzmann, T. (2011). A meta- analytic examination of the instructional effectiveness of computer- based simulation games. *Personnel psychology, 64*(2), 489-528.

Westwood, P. S., & Westwood, P. (2008). *What teachers need to know about teaching methods*: Aust Council for Ed Research.