British International Journal of Education and Social Sciences
Vol.13, No.05; May-2026;
ISSN (3342–543X);
p –ISSN 4519–6511
Impact factor: 9.82

TACIT TO DIGITAL IN POLYTECHNICS: PHILOSOPHICAL PERSPECTIVES ON THE ACQUISITION OF TECHNICAL KNOWLEDGE THROUGH EDUCATION TECHNOLOGY

Sanusi, Aderibigbe Maroof
Directorate of General Studies, Osun State Polytechnic, Iree, Nigeria,

Abstract: This paper discusses the role of Educational Technology (EdTech) integration in polytechnics in Nigeria and how it influences the acquisition of technical knowledge by means of digital mediation of tacit knowledge obtained by traditional means-hands-on training. The study was based on phenomenological and pragmatic models, whereby a descriptive correlational design was applied on 450 final-year students across three polytechnics in Osun State. The EdTech Experience and Integration Questionnaire (EEIQ) was used to collect data, and the Pearson correlation and multiple regression were used to analyze the data. Findings indicate that the lived experiences of EdTech and technical knowledge acquisition among students are strongly positively correlated ($r = .63$, $p < .05$). Technical competency was also explained by EdTech experience and institutional integration ($R^2 = .53$, $p < .05$). The research concludes by finding that tacit knowledge can be successfully digitalized provided that the emphasis is put on the experiential aspects. Some of the recommendations that have been made are investment in discipline-specific EdTech tools, unremitting lecturer professional development, and integrating EdTech standards into accreditation requirements.

Keywords: EdTech integration, Tacit knowledge, Phenomenology, Pragmatism, Technical education.

1.0 Introduction

In Nigeria, Polytechnic education is crucial in the development of manpower in the country because it will result in the production of middle-level technical and technological skills that are relevant to the industry. Polytechnic training focuses on practical competence and workshop-based education and experience, as opposed to traditional university education. The key to this orientation is tacit knowledge, which is gained through embodied practice, observation, repetition and contextual interaction. Over the last few years, learning management systems, instructional videos, simulations, and virtual laboratories are the educational technologies that are progressively implemented in the Nigerian Polytechnics. The factors that have contributed to this shift have been infrastructural limitations, enrolment of more students, policies that have led to digital transformation and post-pandemic pedagogical changes. Although EdTech has offered a larger reach and teaching efficiency, there are still doubts about its ability to assist in the learning of tacit technical knowledge, which has always relied on physical engagement with equipment and devices.

1.1 The Technical Education and Tacit Knowledge

Tacit knowledge is knowledge that is hard to codify and to describe and is manifested through skilled performance (Polanyi, 1966). Tacit knowledge supports such competencies in technical and vocational education as operation of the machines, troubleshooting, and fluency of the procedures. Researchers focus on the fact that this type of knowledge is highly contextualized and embodied (Eraut, 2019).

In the Nigerian polytechnics, tacit knowledge has been passed on in the form of demonstration in workshops, supervised practice as well as in the form of apprenticeship. When these processes are transferred to

British International Journal of Education and Social Sciences
Vol.13, No.05; May-2026;
ISSN (3342–543X);
p –ISSN 4519–6511
Impact factor: 9.82

digital space, they, in turn, beg some critical epistemological and pedagogical questions.

1.2. Edtech Penetration in Nigerian Polytechnics

Recent research shows that there is moderate and uneven adoption of EdTech in the Nigerian Polytechnics. According to Chibugo and Adanma (2023), despite the prevalence of the use of learning management system, more sophisticated digital technologies are not used, including simulations and virtual laboratories. Similar results were found by Ajibade and Amodu (2022) who expressed that the infrastructural constraints and lack of lecturer training hinder the effective implementation of technologies in TVET institutions.

The quantitative data indicates that the application of technology can positively affect the level of student engagement and learning in technical education when used properly (Okorie and Eze, 2021; Yusuf and Afolayan, 2020). Nevertheless, the majority of researches are concerned with the levels of adoption, instead of the performance-related results.

1.3 Phenomenology and Technical Learning

Phenomenology includes lived experience as a form of knowledge and it argues that learning is constituted by perception, embodiment as well as intentional engagement (Merleau-Ponty, 1962). The application of phenomenology to EdTech is the experience learners have of digitally mediated instruction, and the construction of meaning in these spaces.

Phenomenology emphasizes the issue in technical education of digital tools maintaining or disrupting the experiential aspects needed to acquire tacit knowledge.

1.4 Pragmatism and Education Technology.

Pragmatism considers the knowledge and means with reference to their practical implications (Dewey, 1938). In a pragmatic perspective, the usefulness of EdTech is that it can enhance competence, performance, and problem-solving capacity. Regarding polytechnic education, the use of EdTech is reasonable provided it results in graduates who can work successfully in practice in a technical environment.

This study is the connection between subjective experience and objective results on the same plane of analytical nature. Although there has been an increasing literature on adoption of EdTech in tertiary institutions in Nigeria, empirical research on how experiential engagement with EdTech qualitatively and quantitatively is associated with any measurable outcome of technical performance, in a well-defined philosophical context, is still less than desired. This paper will fill this gap by combining phenomenological and pragmatic approaches to a quantitative study on EdTech integration in Nigerian Polytechnics.

2. 0 Aim and Objectives

This paper seeks to investigate how EdTech integration facilitates the form of tacit to digitally mediated technical knowledge of acquisition in Nigerian Polytechnics. The objectives that guided the study entailed the following:

1. To establish the connection between the lived experiences of students with EdTech and their learning of technical knowledge in Nigerian Polytechnics.
2. To test whether the level of EdTech implementation has a predictive value on the technical skill competence of students.

2.1 Hypotheses

The null hypothesis tested at the 0.05 level of significance were as follows:

H_{01}: Lived experiences of students with EdTech are not significantly related to learning technical knowledge.

H_{11}: Lived EdTech experiences of students have a significant relationship with learning of technical knowledge.

H_{02}: Technical skill in students is not significantly predicted by the degree of EdTech integration competency.

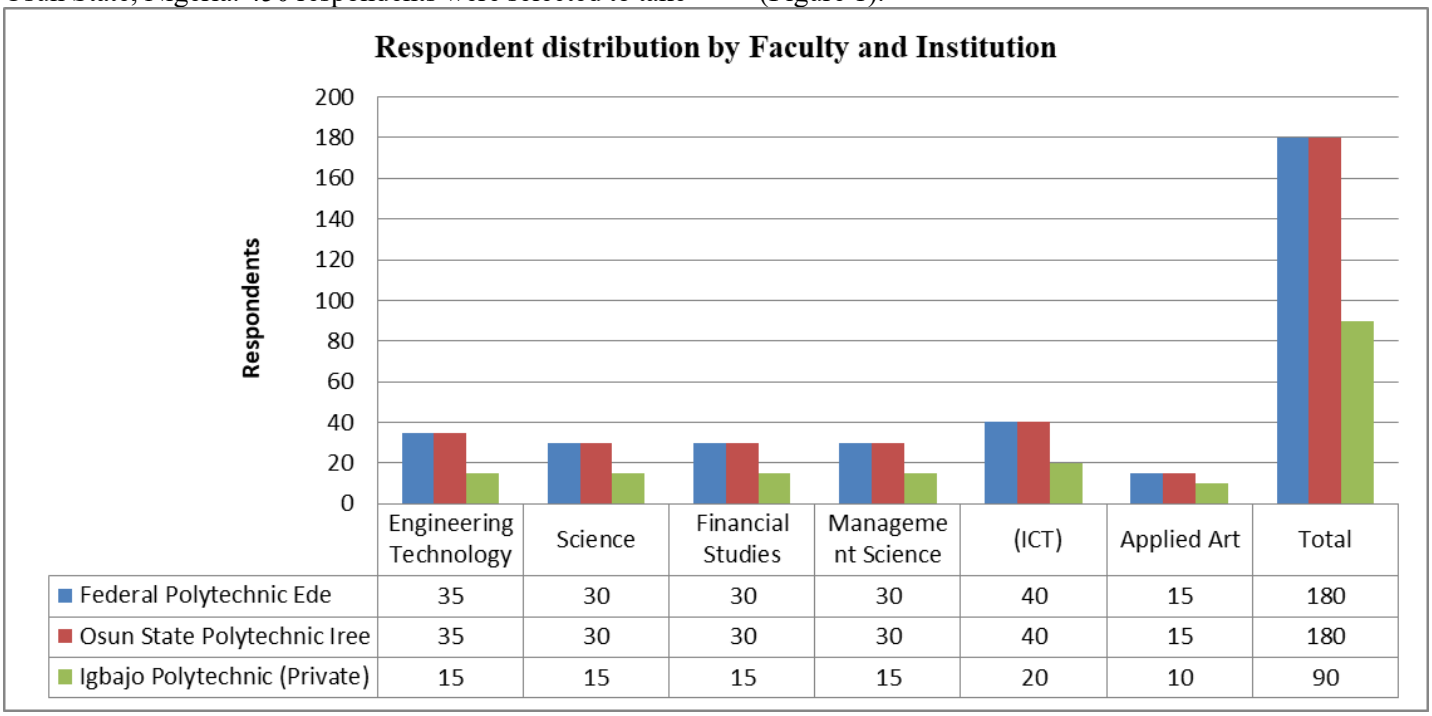
H_{12}: The level of the EdTech implementation is the major predictor of the technical ability of students competency.

3.0 Methodology

In the present study, a descriptive correlational survey design was used, which aims to test the relationship

British International Journal of Education and Social Sciences
Vol.13, No.05; May-2026;
ISSN (3342–543X);
p –ISSN 4519–6511
Impact factor: 9.82

between the educational technology (EdTech) experiences, institutional EdTech integration, and knowledge of technology acquisition among students, but with the experimental intervention, in keeping with the quantitative research traditions in the context of Nigerian TVET and polytechnics (Ajibade and Amodu, 2022; Chibugo and Adanma, 2023). The sample consisted of final-year students of The Federal Polytechnic Ede, Osun State Polytechnic Iree and Igbajo Polytechnic, Igbajo as the representatives of federal, state and private polytechnics in Osun State, Nigeria. 450 respondents were selected to take part in the study through proportional stratified random selection, in that the federal and state polytechnics were chosen in equal numbers (180 and 180 respectively) and the private polytechnic was chosen in fewer numbers (90) reflecting typical enrolment patterns. The use of stratification was based on the NBTE classification of faculty, Engineering Technology, Science, Financial Studies, Management Science, Information and Communication Technology (ICT) category (purposely weighted to reflect EdTech exposure), and Applied Art (Figure 1).



	Engineering Technology	Science	Financial Studies	Management Science	(ICT)	Applied Art	Total
Federal Polytechnic Ede	35	30	30	30	40	15	180
Osun State Polytechnic Iree	35	30	30	30	40	15	180
Igbajo Polytechnic (Private)	15	15	15	15	20	10	90

Figure 1: Respondent distribution by Faculty and Institution.

The methods applied to data collection were the EdTech Experience and Integration Questionnaire (EEIQ) and standardized technical knowledge scores. The EEIQ indicated how students lived with EdTech and institutional support. The analysis of the data entailed the use of SPSS version 26, where descriptive statistics were used as well as Pearson correlation and multiple regression. The validity of the instrument was checked by the expert review and the reliability was tested by a pilot study of 30 students at Osun State Polytechnic Iree with a Cronbachs alpha of 0.83 which was a high internal consistency value (Taber, 2018; Zhao and Frank, 2022).

4. 0 Results and Discussion

Table1: Descriptive Statistics of Study Variables

British International Journal of Education and Social Sciences
Vol.13, No.05; May-2026;
ISSN (3342–543X);
p –ISSN 4519–6511
Impact factor: 9.82

Variable	N	Mean	Std. Dev.	Min	Max
EdTech Experience Score (EE)	450	3.67	0.66	1.00	5.00
EdTech Integration Level (EI)	450	3.45	0.71	1.00	5.00
Technical Knowledge Score (TK)	450	73.12	9.84	46	96

Conclusion: Based on the findings (Table 1), there are moderate to high scores on perceived EdTech experience and institutional integration in polytechnics in Nigeria. The scores of the mean technical knowledge (M = 73.12) indicate that respondents are generally well-informed in terms of the level of technical competence.

Hypothesis One

H_{01}: Lived experiences of students with EdTech are not significantly related to learning technical knowledge.

H_{11}: Lived EdTech experiences of students have a significant relationship with learning of technical knowledge.

Table 2: Pearson Correlation Matrix of Study Variables

Variable	1	2	3
1. EdTech Experience (EE)	1.000		
2. EdTech Integration Level (EI)	.57 (.0001)	1.000	
3. Technical Knowledge (TK)	.63 (.0001)	.49 (.0002)	1.000

Inference: Lived experiences with EdTech are strongly positively correlated with the acquisition of technical knowledge in the students ($r = .63$, $p < .05$). Also, EdTech integration level demonstrates the moderate positive relation with the technical performance ($r = .49$, $p < .05$). These results are empirical evidence to disapprove H_{01} (Table 2) and conclude that Lived EdTech experiences of students have a significant relationship with learning of technical knowledge.

Hypothesis Two

H_{02}: Technical skill in students is not significantly predicted by the degree of EdTech integration competency.

H_{12}: The level of the EdTech implementation is the major predictor of the technical ability of students competency.

Table 3: Multiple Regression Analysis Predicting Technical Knowledge Acquisition

Predictor	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	21.936	3.985	—	5.503	.000
EdTech Experience (EE)	7.518	1.012	.50	7.430	.000
EdTech Integration Level (EI)	4.976	0.947	.34	5.253	.000

Summary of the Model: $R = .73$, $R^2 = .53$, Adjusted $R^2 = .52$, $F(2,447) = 252.41$, $p < .05$.

Inference: The regression equation accounts 53 percent of the variation in the acquisition of technical knowledge by students of the polytechnic in Nigeria. The experience of EdTech and EdTech integration are both significant predictors of technical skill competency ($p < .05$), thus rejecting H_{02}. It is thereby concluded that the level of the EdTech implementation is the major predictor of the technical ability of students competency.

Discussion of Findings

The results from the empirical data showed that the integration of EdTech in Nigerian polytechnics is statistically significant and related to technical knowledge

British International Journal of Education and Social Sciences
Vol.13, No.05; May-2026;
ISSN (3342–543X);
p –ISSN 4519–6511
Impact factor: 9.82

acquisition among final-year students. Two themes can be identified: (a) a close connection between experienced EdTech and technical knowledge acquisition among students and (2) the predictive quality of EdTech experience and institutional integration on technical skill competency.

(a) Connection between experienced EdTech and technical knowledge acquisition among students

The Pearson correlation analysis indicated that there is a positive strong relationship between lived EdTech experiences and scores of students in terms of knowledge acquisition in technical matters ($r = .63$, $p < .05$). This is a statistically significant and theoretically meaningful finding that gives some credence to the phenomenological arguments according to which learning is basically constituted by lived, embodied experience (Merleau-Ponty, 1962). The close relationship suggests that students that worked more with the digital content in terms of digital tools, i.e. LMS platforms, simulation software, virtual laboratories, etc. indicated higher rates of technical competence, meaning that the quality of experience with the EdTech interaction is just as important as its availability.

Conventional polytechnic education has been relying on manipulation of physical equipments and apprenticeship models as the main channels of tacit knowledge transmission (Polanyi, 1966). This paper has shown that EdTech simulations, interactivity, and contextual problem-solving tools can be taken into consideration as valid supplements to workshop engagement. One of the indicators of this fact is the TVET digital transformation framework offered by Ajibade and Amodu (2022), Okorie and Eze (2021), and UNESCO (2021), all of which support the idea that learner engagement is the essential variable of EdTech efficacy.

Interestingly, the moderate degree of correlation between the EdTech integration level and technical knowledge ($r = .49$) was lower, compared to the provided lived experience and implied that the institutional provision is not enough alone. It is also possible to spend on digital infrastructure in schools a lot and get minimal returns when students find it not interesting and not pedagogically meaningful, which is where the role of instructional design and lecturer facilitation comes in.

(b) The predictive quality of EdTech experience and institutional integration on technical skill competency

The results of the multiple regression analysis revealed that the EdTech experience and level of integration together explained the variance of technical knowledge scores ($R^2 = .53$, $F(2,447) = 252.41$, $p < .05$). Experience in EdTech was more predictive ($b = .50$) than integration level ($b = .34$), which once again demonstrates the fact that subjective engagement is more predictive than institutional provision. According to the pragmatist viewpoint (Dewey, 1938), the quality of the experience students have with technology is what makes technical competence measurable rather than its existence.

These findings contradict the established criticism that online learning cannot possibly recreate the incarnate circumstances of acquiring tacit knowledge. The statistics indicate that the dichotomy of tacit-embodied and digital-mediated learning is not as rigid as seems to be the case with conventional vocational epistemology. More so, Chibugo and Adanma (2023) observed that simulation-based and interactive EdTech tools are currently underused in Nigerian polytechnics; the regression evidence in this case contends that since EdTech tools are more experience-focused, they will result in disproportionately larger gains in competencies as compared to content-only platforms.

Together, the results justify the need to restructure the polytechnic EdTech strategy into an urgent reorientation, where access-centred models on tool delivery are replaced by experience-centred models based on systemic institutional embedding instructional design, authentic simulation, and systemic institutional embedding. Phenomenology and pragmatism are mutually supportive in this case: the pragmatic results are attained through experiential engagement, which provides a plausible philosophical and empirical platform of enhancing technical education in the digitalising environment of Nigeria.

5.0 Conclusion

The use of EdTech in Nigerian polytechnics is an important factor in improving technical knowledge acquisition when learners find digital tools interesting and the institutional integration is sufficient. The study proves empirically that tacit knowledge can be substantially stimulated by digital mediation, as long as experiential and practical factors are put on the first plane.

6.0 Recommendations

1. Polytechnic management ought to put an investment in discipline specific EdTech tools which facilitate experiential learning.
2. Constant upkeep of the lecturers on digitally mediated technical pedagogy must be provided.
3. EdTech competency benchmarks should be included in the accreditation standards by the National Board for Technical Education.
4. The future research must embrace mixed-methodology research strategies to enhance experiential research.

References

Ajibade, O., & Amodu, A. (2022). Curriculum delivery and technological adoption in the Nigerian TVET institutions. N*igerian Journal of Technical Education*, 14(2) 45-59.

Chibugo, O. D., & Adanma, A. K. (2023). The use of the emerging technologies in teaching and learning in the Nigerian polytechniques. *Unizik Journal of Business Education and Entrepreneurship,* 7(1), 112126.

Dewey, J. (1938). *Experience and education*. New York, NY: Macmillan.

Eraut, M. (2019). Tacit knowledge and professional learning. *Educational Research Review*, 28, 100112.

Merleau-Ponty, M. (1962). *Phenomenology of perception.* London: Routledge.

Okorie, N. C., & Eze, T. I. (2021). The use of digital learning tools and student interaction in the Nigerian TVET institutions. *Journal of Vocational Education Studies,* 9(1) 23-38.

Polanyi, M. (1966). *The tacit dimension.* London: Routledge.

Taber, K.S. (2018). Application Cronbach Alpha in the formation and presentations of research instruments in science education. *Res Sci Educ,* 48, 1273-1296. https://doi.org/10.1007/s11165-016-9602-2

UNESCO. (2021). *Online transformation of technical and vocational education and training. Paris:* UNESCO.

Yusuf, M. O., & Afolayan, A. O. (2020). The use of information technology and the educational outcomes of students in higher education institutions in Nigeria. *African Journal of Educational Technology,* 10(2), pp. 1-14.

Annex

Questionnaire

All questions of the questionnaire were rated on a basis of 5-point Likert scale:
1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly agree.

A. Demographic information.

Gender: Male Female Other Age: ☐20 ☐24 2☐

Program of Study: _____

Year of Study: ☐National Diploma ☐igher National Diploma.

British International Journal of Education and Social Sciences
Vol.13, No.05; May-2026;
ISSN (3342–543X);
p –ISSN 4519–6511
Impact factor: 9.82

B: EdTech Experience (Phenomenological Dimension).
This part gauged student lived experience of digitally mediated technical learning, which is in tandem with the assumptions of phenomenology that meaning is created through experience.

S/N	Item	1	2	3	4	5
1	Digital tools (e.g., LMS, simulation software) make technical concepts easier to understand.					
2	I find digital learning platforms engaging and helpful for skill acquisition.					
3	EdTech tools enhance my confidence in performing technical tasks.					
4	Using digital resources has improved my ability to solve practical problems.					
5	My learning experience feels more interactive with EdTech					

Section C: EdTech Integration Level (Institutional Dimension)

S/N	Item	1	2	3	4	5
6	Instructors regularly use digital tools to deliver technical instruction.					
7	My department provides access to relevant EdTech resources (e.g., virtual labs).					
8	EdTech tools are aligned with core technical course objectives.					
9	Technical workshops and simulations are available in digital format.					
10	There are adequate support and training for students to use EdTech					

Section D: Technical Knowledge Acquisition (Outcome Variable)

S/N	Item	1	2	3	4	5
11	I perform well in practical technical assessments.					
12	I can independently use tools and techniques learned through digital instruction.					
13	My technical skill proficiency has increased due to digital and blended learning.					
14	I can transfer knowledge from digital instruction to real workshop tasks.					
15	My final project/performance reflects mastery of essential technical skills.					