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Integrating Technical Studies into Elementary Education: A Pathway to Holistic Learning in Nigeria

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Abstracts

The main aim of the study was to investigate the integration of technical studies into elementary (primary) education as a pathway to holistic learning in Nigeria. The population of the study was 291,015 comprising 18,796 public primary school teachers, 268,430 parents, and 3789 Education Supervisors from the Ministry of Education in the six states of the Northeast. The study adopted Simple random sampling and a sample size of 379 respondents was determined using Krejcie and Morgan's (1970) sample size table. A structured questionnaire was utilized to gather data for the study. The questionnaire was validated by three experts and a reliability index of 0.86 was obtained using Cronbach Alpha after a trial test. The data for the study was analyzed using mean and standard deviation to answer the research questions while ANOVA was used to test the hypotheses at 0.05 level of significance. The study revealed that technical studies for Nigerian primary schools should include Digital Literacy, Engineering and Design, Digital Creativity, Applied Science and Technology, and Computational Thinking and Problem Solving Technical studies are instrumental in enhancing pupils' skills across various domains, aligning with educational research that emphasizes their practical benefits Technical studies are instrumental in enhancing pupils' skills across various domains, aligning with educational research that emphasizes their practical benefits.

Keywords: Elementary Education, Holistic Learning, Technical Studies, Universal Basic Education

1. Introduction

Primary education and in other clines elementary education in Nigeria serves as the foundation for children's educational journey, typically catering to children aged 6 to 11 years. This six-year educational phase is crucial for establishing basic literacy and numeracy, which are fundamental for further learning and everyday problem-solving. The curriculum is designed to be comprehensive, covering essential subjects such as English, Mathematics, Science, Social Studies, and Nigerian Languages, thereby fostering cognitive, affective, and psychomotor skills [1]. Beyond academics, primary education also aims to develop critical life skills, including critical thinking, creativity, and interpersonal skills, which are essential for personal growth and social integration [2]. The Universal Basic Education (UBE) program underscores the importance of this educational stage by ensuring free and compulsory education, thereby aiming to enhance access and quality [3].

Over the past decades, Nigeria has made significant strides in improving access to primary education. This progress is part of a broader effort to enhance educational outcomes and ensure that every child receives a foundational education. According to the National Bureau of Statistics [4], the net enrollment rate in primary education was approximately 86.72% in 2021, marking a substantial increase from previous years. However, this overall figure masks significant variations across different regions and states, with urban areas generally having higher enrollment rates compared to rural areas. These disparities are influenced by factors such as economic conditions, cultural practices, and regional security issues.

Efforts to increase enrollment have been spearheaded by initiatives like the Universal Basic Education (UBE) program, which was launched in 1999. The UBE program aims to provide free and compulsory basic education for the first nine years of schooling, encompassing both primary and junior secondary education [3]. This initiative includes measures such as the construction of new schools, the renovation of existing infrastructure, and the provision of learning materials. Additionally, the UBE program focuses on improving teacher quality through professional development and training programs. The government has also introduced policies to support school feeding programs, scholarships, and conditional cash transfers to encourage school attendance and reduce the economic burden on families. These concerted efforts have played a crucial role in boosting enrollment rates and ensuring that more children have access to quality education from an early age.

The quality of primary education in Nigeria remains a critical concern, as several systemic issues continue to hinder effective learning and teaching. One of the most pressing challenges is the prevalence of large class sizes, which significantly reduce the ability of teachers to provide individualized attention and support to pupils [5]. Overcrowded classrooms often lead to decreased engagement and lower academic performance among pupils. Additionally, many schools struggle with outdated and insufficient teaching materials, including textbooks and learning aids, which are crucial for delivering a modern and comprehensive education [6].

Another significant issue is the insufficient training and professional development opportunities for teachers. Many primary school teachers in Nigeria lack access to ongoing training programs that would help them stay updated with the latest teaching methodologies and educational technologies. This gap in professional development results in a workforce that is often ill-equipped to meet the diverse learning needs of their pupils or to implement innovative teaching strategies that can enhance learning outcomes [7].

Research highlights the alarmingly low proficiency levels among primary school pupils in core subjects such as Mathematics, English, and sciences. A study by Adepoju and Fabiyi [8] indicates that only a small percentage of pupils achieve the required proficiency in these subjects, pointing to a significant gap between the intended curriculum outcomes and actual pupil performance. This proficiency gap reflects broader issues within the education system, including inadequate school infrastructure, insufficient learning resources, and a lack of effective monitoring and evaluation mechanisms to track and improve pupil performance [9]. Addressing these quality issues requires comprehensive policy interventions and substantial investment in the education sector. This includes recruiting more qualified teachers, reducing class sizes, updating and distributing modern teaching materials, and establishing robust

teacher training and professional development programs. Additionally, there is a need for improved assessment and monitoring systems to ensure that educational standards are met and that pupils are receiving the support they need to succeed.

In the context of elementary education, technical studies refer to the integration of practical and applied knowledge areas that involve practical activities, problem-solving, and the use of technology. This can include subjects such as computer science, basic technology concepts, and digital literacy. The goal of technical studies at the elementary level is to introduce young pupils to the fundamental principles and skills associated with technology and technical disciplines, fostering their curiosity, creativity, and critical thinking from an early age. Through engaging and interactive lessons, pupils learn to use tools and technologies, understand basic technical concepts, and apply their knowledge to real-world situations, thereby enhancing their overall educational experience and preparing them for future learning opportunities [9, 10].

Technical studies in elementary education are designed to build foundational skills in technology and engineering, which are increasingly essential in today's digital and innovation-driven world. These studies provide pupils with early exposure to STEM (Science, Technology, Engineering, and Mathematics) fields, which are critical for developing the competencies needed for future academic and career success. According to Ref. [10], integrating engineering and technology concepts in elementary education helps pupils understand and apply scientific principles through practical, real-world problem-solving activities.

By incorporating technical studies, elementary education aims to develop pupils' computational thinking, which Ref. [11] defines as a fundamental skill for everyone, not just computer scientists. Computational thinking involves problem-solving techniques that can be applied in various contexts, encouraging pupils to think logically and systematically. Furthermore, technical studies at the elementary level emphasize digital literacy, which includes the ability to use digital tools and resources effectively and responsibly. As defined by the International Society for Technology in Education (ISTE), digital literacy encompasses skills such as understanding digital content, using digital tools to solve problems, and communicating and collaborating online [12]. The integration of technical studies into elementary education aims to prepare pupils for a rapidly evolving technological landscape and equip them with the skills and knowledge necessary to navigate and succeed in a world where technology plays a central role in everyday life and work through holistic education.

Holistic education is an approach that aims to develop all aspects of a pupil's being, including intellectual, emotional, social, physical, artistic, creative, and spiritual dimensions, to foster well-rounded individuals capable of contributing positively to society [13]. This educational philosophy emphasizes the interconnectedness of various learning domains and the importance of nurturing the whole child rather than focusing solely on academic achievement. It advocates for experiential learning, critical thinking, and the development of values and attitudes that support personal growth and social responsibility [14]. By integrating diverse learning experiences and addressing the unique needs and potentials of each pupil, holistic education seeks to create a balanced and inclusive learning environment that prepares pupils for the complexities of life [15].

Integrating technical studies into primary education in Nigeria can significantly contribute to achieving a holistic education by fostering intellectual, emotional, social, and physical development. Technical studies provide hands-on, experiential learning opportunities that enhance critical thinking and problem-solving skills [16]. These subjects encourage creativity and innovation, allowing pupils to apply theoretical knowledge in practical contexts, which bolsters intellectual growth. Moreover, collaborative projects in technical studies promote teamwork, communication, and social skills, essential for emotional and social development [17, 18]. Physical skills are honed through activities requiring manual dexterity and coordination. By integrating these technical disciplines, primary education in Nigeria can produce well-rounded individuals equipped with the diverse skills needed to thrive in a rapidly evolving technological world, thus achieving the aims of holistic education.

Primary education largely focuses on foundational literacy and numeracy skills, often neglecting the integration of technical studies. This traditional approach fails to address the evolving demands of the 21st-century global economy, where technological proficiency and STEM skills are increasingly critical. Despite global trends emphasizing early exposure to technical education, Nigerian primary schools have been slow to incorporate such curricula, resulting in a gap between the skills pupils acquire and those required for future academic and career success.

The absence of technical studies in the primary education curriculum has several implications. First, it limits pupils' opportunities to develop essential problem-solving and critical thinking skills, which are fostered through hands-on, technology-based learning experiences. Second, it restricts pupils' ability to engage with and understand the technological advancements that are shaping modern society. Finally, the lack of early exposure to technical studies may contribute to the persistent gender disparity in STEM fields, as early interest and confidence in these areas are crucial for long-term engagement and achievement.

The problem is further compounded by challenges such as inadequate infrastructure, a shortage of qualified teachers, and insufficient training programs to support the integration of technical studies. Without addressing these issues, efforts to integrate technical studies into primary education in Nigeria will remain superficial and ineffective. Therefore, this study seeks to explore the benefits, challenges, and strategies for effectively integrating technical studies into Nigerian primary education, aiming to create a pathway for holistic learning that prepares pupils for the demands of the future.

The following questions guided the study: 1) What are the technical studies to be taught in Nigerian primary schools? 2) What is the impact of technical studies on pupils' skill development; 3) What are the challenges of integrating technical studies in primary education in Nigeria; 4) What are the perceptions of educators, parents, and stakeholders toward technical studies integration in primary education:

2. Research Methods

The study, which adopted a survey research design, was conducted in northeast Nigeria. The Zone includes the states of Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe, and is situated at latitude 6.260 East and longitude 4.920 North East of Nigeria. The population of the study was 291,015 comprising 18,796 public primary school teachers, 268,430 parents, and 3789 Education Supervisors from the Ministry of

Education in the six states of the Northeast. The study adopted Simple random sampling and a sample size of 379 respondents was determined using Krejcie and Morgan's 1970 [18] sample size table. The "Primary Education Technical Studies Integration Questionnaire (PETSIQ)" was a structured questionnaire that the researchers utilized to gather data for the study. The questionnaire responses were organized on a 5-point scale with Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5). A reliability index of 0.86 was obtained using Cronbach Alpha after a trial test. The data for the study was analyzed using mean and standard deviation to answer the research questions and ANOVA was used to test the hypotheses at a 0.05 level of significance. All items with a mean score of 3.5 or higher were judged "Agreed" while those with a mean score of less than 3.50 were rated "Disagreed".

3. Results and Discussion

3.1 Results

Research Question 1: What technical studies should be taught in Nigerian primary schools?

Table 1 summarizes the recommended technical studies for various technical studies proposed for inclusion in Nigerian primary schools, organized into five clusters: Digital Literacy and Information Technology, Engineering and Design, Digital Creativity, Applied Science and Technology, and Computational Thinking and Problem Solving. All items within the clusters had mean scores ranging between 3.54 and 4.18. Overall, the responses indicate strong support for integrating these technical studies into the primary school curriculum.

Table 1. Mean Response on the Technical Studies to be taught

S/No	Items	$\bar{x}$	σ	Remark
Cluster 1: Digital Literacy and Information Technology				
A. Basic Computer Skills				
1.	Introduction to computers and their components	3.88	0.56	Agreed
2.	Basic keyboard and mouse skills	3.89	0.64	Agreed
3.	Understanding operating systems and file management	3.88	0.56	Agreed
B. Internet Safety and Digital Citizenship				
4.	Safe internet browsing practices	4.03	0.18	Agreed
5.	Understanding digital footprints and privacy	4.07	0.25	Agreed
6.	Introduction to ethical use of information and online resources	4.03	0.18	Agreed
C. Basic Software Applications				
7.	Word processing (e.g., Microsoft Word)	3.76	0.81	Agreed
8.	Spreadsheets (e.g., Microsoft Excel for mathematical task)	3.95	0.28	Agreed
Cluster 2: Engineering and Design				
A. Engineering Basics				
9.	Introduction to engineering principles	3.69	0.06	Agreed
10.	Understanding simple machines and their functions	3.73	0.13	Agreed
B. Hands-on Projects				
11.	Building basic structures and models	3.85	0.64	Agreed
12.	Engaging in design challenges and problem-solving activities	3.54	0.44	Agreed
Cluster 3: Digital Creativity				
13.	Photography and Graphic Design	3.89	0.64	Agreed
14.	Basics of digital photography	4.03	0.18	Agreed
15.	Introduction to graphic design principles and tools	4.07	0.25	Agreed
Cluster 4: Applied Science and Technology				
16.	Basic Electronics	3.76	0.81	Agreed

S/No	Items	$\bar{x}$	σ	Remark
17.	Understanding electronic components	3.95	0.28	Agreed
18.	Simple electronic experiments	4.18	0.38	Agreed
Cluster 5: Computational Thinking and Problem Solving				
A. Logical Thinking and Patterns				
19.	Engaging in activities that develop logical reasoning	3.85	0.64	Agreed
20.	Recognizing and creating patterns	3.88	0.55	Agreed
B. Games and Puzzles				
21.	Using educational games to enhance problem-solving skills	4.03	0.18	Agreed
22.	Solving puzzles and engaging in brain teasers	4.07	0.25	Agreed
C. Mathematical Concepts				
23.	Integrating technology to teach mathematical concepts	3.88	0.56	Agreed
24.	Using apps and software for interactive math learning	3.89	0.64	Agreed

The ANOVA results for Hypothesis 1, testing the difference in mean responses among educators, parents, and stakeholders regarding the technical studies to be taught in Nigerian primary schools, show a Between Groups Mean Square of 0.028 and a Within Groups Mean Square of 0.031. With a calculated F-statistic of 0.888 and a corresponding p-value of 0.418, the hypothesis that there is no significant difference in mean responses among these groups is accepted.

Research Question 2: What is the perceived impact of technical studies on pupils' skill development?

Table 2 reflects strong agreement among respondents on the positive impact of technical studies on pupils' skill development, with mean responses ranging from 3.33 to 4.56. Key areas of impact include enhanced technical proficiency, critical thinking, analytical reasoning, problem-solving skills, and creativity. Technical studies also promote teamwork, effective communication, digital literacy, and attention to detail. They align with industry demands, improving employability and instilling ethical standards. Overall, the consensus indicates that technical studies significantly contribute to pupils' comprehensive skill development.

Table 2. Mean Response on the Impact of Technical Studies on Pupils' Skill Development (N=379)

SN	ITEMS	$\bar{x}_G$	σ	Remark
1.	Pupils gain practical knowledge in specific technical domains which enhances their technical proficiency and competence	4.35	0.78	Agreed
2.	Technical studies often involve solving complex problems, which helps pupils develop critical thinking, analytical reasoning, and problem-solving skills	4.29	1.06	Agreed
3.	Engaging with technical studies encourages creativity and innovation as pupils explore new ideas, design solutions, and implement novel approaches to address challenges	3.54	1.51	Agreed
4.	Many technical projects require collaboration with peers, fostering teamwork skills, effective communication, and the ability to work in diverse teams	3.77	1.35	Agreed
5.	In an increasingly digital world, technical studies equip pupils with the skills and adaptability needed to navigate and utilize technology effectively in various contexts	3.92	1.42	Agreed
6.	Technical disciplines emphasize attention to detail and precision, instilling habits of thoroughness and accuracy in pupils' work	4.56	0.79	Agreed
7.	Technical studies often align closely with industry demands, preparing pupils with practical skills and knowledge that enhance their employability and readiness for professional roles	3.69	1.33	Agreed

SN	ITEMS	$\bar{x}_G$	σ	Remark
8.	Technical education typically incorporates ethical considerations and professional standards, shaping pupils' understanding of responsible practices in their chosen field	4.37	1.00	Agreed
9.	The dynamic nature of technology requires continuous learning and adaptation, instilling a mindset of lifelong learning and skill development in pupils	4.36	0.95	Agreed
10.	Beyond technical skills, pupils develop resilience, perseverance, and a growth mindset through the challenges and successes encountered in technical studies, contributing to their overall personal development	3.33	1.65	Agreed

The ANOVA table for Hypothesis 2, testing the difference in mean responses among educators, parents, and stakeholders regarding the impact of technical studies on pupils' skill development, reveals a Between Groups Mean Square of 0.020 and a Within Groups Mean Square of 0.119. The calculated F-statistic is 0.167 with a corresponding p-value of 0.846. Based on these results, the hypothesis that there is no significant difference in mean responses among these groups regarding the impact of technical studies on pupils' skill development is accepted.

Research Question 3: What are the challenges of integrating technical studies in primary education

Table 3 presents the challenges of integrating technical studies into Nigerian primary education. The respondents indicate substantial agreement on the challenges to incorporating technical studies into primary education with mean scores ranging from 4.00 to 4.44, the major challenges include inadequate facilities and resources, a shortage of teachers with specialized training, and difficulties aligning technical subjects with the existing curriculum. Budgetary constraints for equipment and training programs, along with economic disparities and socio-cultural beliefs affecting access and perception, are significant barriers. Traditional attitudes that prioritize theoretical over practical education and insufficient professional development for teachers also hinder integration.

Table 3. Mean Response to the Challenges of Integrating Technical Studies (N=379)

SN	ITEMS	$\bar{x}_G$	σ	Remark
1.	Lack adequate facilities and resources for teaching technical subjects like computer labs, workshops for practical activities, and access to modern technology	4.00	1.22	Agreed
2.	Scarcity of teachers with specialized training in technical fields, which hinders effective delivery of technical education	4.08	1.06	Agreed
3.	Aligning technical subjects with the existing curriculum and ensuring they meet educational standards can be challenging without proper guidelines and frameworks	4.15	1.12	Agreed
4.	Insufficient budgetary allocation for the procurement of equipment, materials, and training programs necessary for technical studies poses a significant barrier	4.09	1.21	Agreed
5.	Economic disparities and socio-cultural beliefs may influence access to and perception of technical education, affecting enrollment and participation rates	4.06	1.17	Agreed
6.	Traditional attitudes towards education may prioritize theoretical subjects over practical or vocational skills, affecting acceptance and implementation of technical studies	4.00	1.22	Agreed
7.	Inadequate opportunities for ongoing professional development and training in technical subjects limit teachers' ability to effectively teach and update their knowledge	4.44	0.85	Agreed
8.	perceptions about the value and relevance of technical education compared to academic subjects may deter pupils and parents from embracing technical studies	4.14	1.12	Agreed

The ANOVA table for Hypothesis 3, examining the differences in mean responses among educators, parents, and stakeholders regarding the challenges of integrating technical studies in Nigerian primary education, shows a Between Groups Mean Square of 0.030 and a Within Groups Mean Square of 0.049. With a p-value of 0.543, the hypothesis that there is no significant difference in mean responses among these groups regarding integration challenges is accepted.

Research Question 4: What are the perceptions of educators, parents, and stakeholders towards technical studies integration in primary education

Table 4 summarizes perceptions towards the integration of technical studies in Nigerian primary education among educators, parents, and stakeholders, with mean scores ranging from 3.63 to 4.45. Educators recognize the importance of technical studies for practical skills and career preparation (mean = 3.63) but express concerns about insufficient training and resources (mean = 3.95) and acknowledge the potential for enhancing pupil engagement and critical thinking (mean = 3.96). Parents show varied perspectives: while some prioritize traditional academic subjects (mean = 4.40), many acknowledge the value of practical skills and vocational training (mean = 4.38) in preparing children for future employment. Stakeholders, including government officials and community leaders, strongly support technical education as part of educational reforms (mean = 4.44), express concerns about funding (mean = 4.28), and emphasize aligning curricula with industry demands (mean = 4.35). Overall, there is broad agreement among respondents on the benefits of technical studies, alongside recognition of challenges such as resource limitations and differing educational priorities.

Table 4. Mean Response on the Perceptions Towards Technical Studies Integration (N=379)

S/No	Items	$\bar{x}_G$	σ	Remark
A. Educators:				
1.	Some educators see technical studies as crucial for equipping pupils with practical skills and preparing them for future careers in a technology driven world.	3.63	1.65	Agreed
2.	Many educators are concerned about the lack of training and resources needed to effectively teach technical subjects, which can hinder successful integration.	3.95	1.36	Agreed
3.	Educators acknowledge the potential of technical studies to enhance pupil engagement, critical thinking, and problem-solving abilities.	3.96	1.23	Agreed
2. Parents:				
4.	Parents may have diverse views depending on their understanding of the benefits of technical education and their aspirations for their children.	4.45	0.83	Agreed
5.	Some parents prioritize traditional academic subjects over technical studies, fearing they may detract from core learning areas like Mathematics and English.	4.40	0.87	Agreed
6.	Many parents recognize the importance of practical skills and vocational training in preparing their children for future employment opportunities.	4.38	0.98	Agreed
3. Stakeholders (Government, NGOs, Community Leaders):				
7.	Government officials and policymakers often advocate for the integration of technical studies as part of broader educational reforms aimed at enhancing workforce readiness and economic development.	4.44	0.85	Agreed

S/No	Items	$\bar{x}_G$	σ	Remark
8.	Stakeholders are concerned about funding and resource allocation to support the implementation of technical education initiatives effectively.	4.28	0.93	Agreed
9.	Stakeholders prioritize curricula that align with current industry demands to ensure graduates are equipped with relevant skills.	4.35	0.89	Agreed

The ANOVA analysis for Hypothesis 4, exploring differences in mean responses among educators, parents, and stakeholders regarding their perceptions towards integrating technical studies into primary education in Nigeria, shows a Between Groups Mean Square of 2.111 and a Within Groups Mean Square of 1.321. With a p-value of 0.846, the hypothesis that there is no significant difference in mean responses among these groups is accepted.

3.2 Discussion

The study revealed that technical studies for Nigerian primary schools should include Digital Literacy, Engineering and Design, Digital Creativity, Applied Science and Technology, and Computational Thinking and Problem Solving. The finding coincided with Ref. [20; 21] who emphasized that digital literacy and information technology reflect a global trend in educational reform, aiming to equip pupils with foundational computer skills and internet safety, essential for navigating modern information landscapes. Specifically, digital literacy initiatives are designed to ensure pupils can effectively utilize digital tools, understand online safety protocols, and critically evaluate digital content [22; 23]. Similarly, the integration of engineering basics, digital creativity through photography and graphic design, and applied science including basic electronics align with broader STEM education initiatives aimed at fostering critical thinking and problem-solving abilities from an early age [24]. These initiatives are crucial for preparing pupils to engage with real-world challenges and innovations, thereby enhancing their adaptability and readiness for future careers in technology-driven fields.

Technical studies are instrumental in enhancing pupils' skills across various domains, aligning with educational research that emphasizes their practical benefits. For instance, Ref. [25] highlights that technical education fosters critical thinking and problem-solving skills through hands-on learning experiences. This approach not only enhances pupils' ability to apply theoretical knowledge but also cultivates creativity and innovation [26]. Moreover, integrating digital literacy into technical education equips pupils with essential skills for navigating digital environments effectively, ensuring they can responsibly engage with technology [18]. Ref. [14] underscores the importance of integrating digital literacy into the curriculum to prepare pupils for future technological challenges. Such initiatives are pivotal in shaping pupils' readiness for the demands of modern society and the workforce.

Integrating technical studies into Nigerian primary education faces several significant challenges that impact its effectiveness and implementation. One major challenge is the lack of adequate facilities and resources essential for teaching technical subjects. This includes the absence of computer labs, workshops for practical activities, and access to modern technology, which are crucial for hands-on learning experiences [22]. Another critical issue is the scarcity of teachers with specialized training in technical fields, hindering the effective delivery of technical education [21]. Without qualified teachers who can effectively impart technical knowledge and skills, the quality

of education suffers. Aligning technical subjects with the existing curriculum and ensuring they meet educational standards poses another significant challenge. The current curriculum may not always accommodate technical studies seamlessly, leading to integration difficulties without proper guidelines and frameworks [20]. Moreover, there is often insufficient budgetary allocation for the procurement of equipment, materials, and training programs necessary for technical studies. This financial constraint limits schools' ability to acquire necessary resources and update them regularly to keep pace with technological advancements By overcoming these barriers, Nigerian primary education can better prepare pupils for the demands of the modern workforce and contribute to national development through enhanced technical skills and innovation.

The finding that there was no significant difference in the mean response of educators, parents, and stakeholders regarding perceptions towards technical studies integration in primary education highlights a consensus among these groups. This alignment suggests a shared understanding and agreement on the importance and benefits of integrating technical studies into primary education. Such agreement can be crucial for fostering collaboration and support among stakeholders, which is essential for successful educational reforms [23]. The unity in perceptions may indicate that all parties recognize the role of technical education in preparing pupils for future challenges and opportunities in a rapidly evolving world [26]. This finding underscores the potential for cohesive efforts in policy-making and resource allocation to enhance technical education initiatives across primary schools in Nigeria.

4. Conclusion

Integrating technical studies into elementary (primary) education presents a promising pathway toward holistic learning in Nigeria. This study has illuminated several key findings regarding the feasibility, benefits, challenges, and perceptions surrounding technical education integration within the primary school curriculum. The consensus among educators, parents, and stakeholders on the importance of technical studies underscores its potential to enhance pupils' critical thinking, problem-solving abilities, and digital literacy skills essential for navigating a modern, technology-driven world. Despite challenges such as inadequate resources, limited teacher training, and curriculum alignment issues, stakeholders' unified perception paves the way for collaborative efforts in policy-making and resource allocation. Moving forward, addressing these challenges through strategic investments in infrastructure, teacher development, and curriculum reform will be crucial. By doing so, Nigeria can empower its young learners with the practical skills and knowledge needed to thrive in diverse educational and professional contexts, thereby contributing to national development and societal progress.

References

[1] Federal Ministry of Education. (2013). National Policy on Education (6th Edition). Lagos: NERDC Press.

[2] Osakwe, E. (2016). Holistic Development in Primary Education: The Nigerian Perspective. African Journal of Education and Developmental Studies, 7(1), 22-33.

[3] Universal Basic Education (UBE) Act. (2004). The Federal Republic of Nigeria Official Gazette.

[4] National Bureau of Statistics (NBS). (2018). Nigeria Education Indicators. Retrieved from https://www.nigerianstat.gov.ng.
[5] Akinyemi, S., & Bassey, U. (2012). Planning and Funding of Education in Nigeria: The Challenges. International Education Studies, 5(4), 86-95.
[6] Okebukola, P. (2015). Quality Assurance in Nigerian University System. International Journal of Education Management, 2(1), 24-33.
[7] Ololube, N. P. (2006). Teacher Education, School Effectiveness and Improvement: A Study of Academic and Professional Qualification on Teachers' Job Effectiveness in Nigerian Secondary Schools. International Journal of Educational Foundations and Management, 1(1), 1-15.
[8] Adepoju, A., & Fabiyi, A. (2007). Universal Basic Education in Nigeria: Challenges and Prospects. African Journal of Educational Management, 9(1), 151-165.
[9] Edozie, C., & Oluwatobi, S. (2014). An Assessment of the Quality of Primary Education in Nigeria. Journal of Education and Practice, 5(29), 27-33.
[10] Guzey, S. S., Moore, T. J., & Harwell, M. (2016). Building up STEM: An Analysis of Teacher-Developed Engineering Design-Based STEM Integration Curricular Materials. Journal of Pre-College Engineering Education Research (J-PEER), 6(1), 2.
[11] Wing, J. M. (2006). Computational Thinking. Communications of the ACM, 49(3), 33-35.
[12] International Society for Technology in Education (ISTE). (2016). ISTE Standards for Pupils. Retrieved from https://www.iste.org/standards/for-pupils.
[13] Miller, R. (2007). What is Holistic Education? Encyclopedia of Peace Education. Teachers College, Columbia University.
[14] Forbes, S. H. (2003). Holistic Education: An Analysis of Its Ideas and Nature. Foundation for Educational Renewal.
[15] Nava, R. G. (2001). Holistic Education: Pedagogy of Universal Love. Rowman & Littlefield Publishers.
[16] Guzey, S. S., Moore, T. J., & Harwell, M. (2016). Building up STEM: An Analysis of Teacher-Developed Engineering Design-Based STEM Integration Curricular Materials. Journal of Pre-College Engineering Education Research (J-PEER), 6(1), 2.
[17] Barker, B. S., & Ansorge, J. (2007). Robotics as Means to Increase Achievement Scores in an Informal Learning Environment. Journal of Research on Technology in Education, 39(3), 229-243.
[18] Miller, R. (2007). What is Holistic Education? Encyclopedia of Peace Education. Teachers College, Columbia University.
[19] Krejcie, R. V., & Morgan, D. W. (1970). Sample size determination table. Educational and Psychological Measurement, 30, 607-610.
[20] Adesoji, F. A., & Ugwu, C. N. (2017). Integrating Digital Literacy into Nigerian Primary School Curriculum: Issues and Strategies. Journal of Education and Practice, 8(1), 23-29.
[21] Afolabi, A. F., & Okwilagwe, E. A. (2018). Enhancing Digital Creativity Skills among Nigerian Primary School Pupils through Project-Based Learning. Journal of Educational Technology Systems, 47(3), 319-335.
[22] Babatunde, S. K., & Adegoke, A. A. (2020). Teaching Engineering Concepts in Nigerian Primary Schools: Challenges and Solutions. Journal of STEM Education: Innovations and Research, 21(4), 12-24.

[23] Ogundokun, R. O., & Amoo, T. A. (2019). Promoting Computational Thinking and Problem-Solving Skills in Nigerian Primary Schools. African Journal of Education and Technology, 7(2), 45-58.
[24] Eze, J. U., & Nwachukwu, C. I. (2019). Challenges and Prospects of Implementing STEM Education in Nigerian Primary Schools. International Journal of Education and Information Technology, 3(1), 1-10.
[25] López, F., Contreras, M., Nussbaum, M., Paredes, R., Gelerstein, D., Alvares, D., & Chiuminatto, P. (2023). Developing critical thinking in technical and vocational education and training. Education Sciences, 13(6), 590.
[26] Saripudin, S., Sumarto, S., Juanda, E. A., Abdullah, A. G., Ana, A., & Ariyanti, T. (2019, December). Digital Literacy Qualitative Analysis in Vocational Teachers. In 1st Vocational Education International Conference (VEIC 2019) (pp. 262-270). Atlantis Press.
[27] Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. Educational technology research and development, 68(5), 2449-2472.