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Practical and Soft Skills for Work Readiness among Students of Building Technology Education in Tertiary Institutions in Rivers State.

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Abstract: *The study was conducted to investigate the practical and soft skills for work readiness among students of building technology education in tertiary institutions in Rivers State. The study was guided by two specific objectives, two research questions and two corresponding hypotheses. The study adopted a descriptive survey research design with a population of 105 final year building technology education students from the three tertiary institutions in Rivers State. Because of the manageable size of the population, census sampling was employed. Therefore, the entire population of 105 final year building technology education students will be recruited for the study. The instrument for data collection was a questionnaire titled, Practical and Soft Skills for Work Readiness among Building Technology Students Questionnaire (PSSWRBTSQ) which was validated by three experts and with an overall internal consistency reliability coefficient of 0.87. A total of 105 copies of the instrument were administered and a total of 103 copies retrieved and used for data analysis. Data collected were analysed using a criterion mean of 2.50 for the research questions and Z-test for the hypotheses. Result of the study revealed that students possess building construction competences in some areas to a low extent and in other areas to a high extent; possess soft skills to a high extent; possess entrepreneurial competences to a high extent. Based on the findings, it was recommended among others that Tertiary institutions should increase hands-on training in site setting out, project management, cost estimation, walling, roofing, and electrical installations.*

Keywords: *Practical skills, Soft skills, Work readiness, practical and soft skills for work readiness.*

Introduction

The building industry play significant role in different aspects of the society, economy, and environment. It is a major contributor to the economy as it provides employment opportunities, generating revenue through construction projects, and supporting various related sectors such as architecture, engineering, manufacturing, and materials supply. It also plays a crucial role in developing infrastructure necessary for transportation, communication, healthcare, education, and other essential services. Infrastructure projects contribute to societal progress and improve the quality of life for communities (Ujene, & Odesola,2019). The building industry is responsible for the construction of residential buildings which addresses the housing needs of individuals and families. Access to safe and affordable housing is essential for social stability and economic well-being. Aside residential building construction, the building industry also engages in constructing commercial and industrial buildings such as office buildings, retail centers, factories, and warehouses. These buildings enhance smooth business operations, job creation, and economic growth. Building projects promotes the aesthetics of the physical environment of cities and towns, influencing urban sprawl, land use patterns, and the overall aesthetics

of communities. Furthermore, the building industry contributes to preservation of cultural heritage sites, historic buildings, and architectural landmarks (Obaju, Fagbenle Amusan & Musa, 2022).

The building industry, being an important industry that contributes to development of the society requires professionals from different field of study who put their expertise in place the process of building construction. Among these different field of study is the building technologists (Obaju, Fagbenle Amusan & Musa, 2022). Building technologists, are a group of professionals who specializes in the technical aspects of building construction and design. They are typically involved in various stages of the building process, from planning and design to construction and maintenance. To perform their role effectively, they must be competent, possessing needed skills, knowledge and the attitude to engage in building construction activities (Construction Industry Training Board, CITB, 2016).

The building technology education students are students prepared to provide different services in the building construction industry after graduation. Building Technology Education is a course offered in departments offering Vocational and Technical Education, Vocational and Technology Education or Vocational and Technical Teacher Education in tertiary institutions in Nigeria. Tertiary institutions offering building technology education in Nigeria are Universities, Polytechnics and Colleges of Education (Isa, Salihu, Shuaibu & Cledumas, 2023). Building technology education as offered in tertiary institutions encompasses building and wood technology education which focus on application of theoretical and practical skills of building and woodworking (Mshelia, 2012).

By their training from school, students of building technology education should possess the skills and knowledge to be able to carry out tasks required for designing and erecting various building and wooden structures (Fauzi, Ali, & Amirudin, 2019). They should also be able to teach building trades in technical schools or secondary schools that offer building trades (Akaninwor in Nwineh & Nwineh, 2019). The competences in terms of knowledge, skill and attitude possessed by technology education students are indication of their preparedness for work either in the industry or school.

To work in the industry, the building technology education student requires building construction competences such as carry out setting out the building plan to get foundation ready, manage and supervise the construction of buildings of different sizes efficiently, understand and interpret structural drawings, understanding and interpreting building drawings, prepare practicable estimates in terms of material, costs, and labor, including maintenance work, competences in drawing building plans, excavating building foundation, casting mixed concrete at the base of building foundation, laying of brick/block work, plastering and rendering the walls, pipe-fitting/sanitary work, application of paints on wall surfaces (Obaju, Fagbenle, Amusan & Musa, 2022; Sagbara, 2021).

Generally, any employer of labour expects a potential employee to possess what is regarded as soft skills, transferable or generic skills which are required to succeed in any work environment. Example of such skills are communication skills, teamwork skills, problem-solving skills, emotional intelligence among others. They promote project success in building construction (Harris & Rogers, 2008; Ikwe, 2021; Okwelle & Owo, 2022). This implies that students of building technology education should possess soft skills which will enable them function successfully in any kind of work environment whether as a teacher in a school or as an employee in the building industry.

To be able to teach in technical schools such as technical colleges, in addition to the technical skills needed to work in the industry, the building technology education students also need to possess pedagogical competences. This will enable them to deliver the content of building trades in technical schools. According to Akaninwor in Nwineh and Nwineh (2019), students of technical education in tertiary institutions are trained as teachers to be able to teach in technical schools. Building technology education students are part of technical education students in tertiary institutions. Therefore, through their teacher preparation programme in tertiary institutions, they should possess pedagogical skills which will enable them apply principles of teaching to deliver instruction in technical schools to prepare students for the industry.

Furthermore, students of building technology education need entrepreneurship competences (Isa, Salihu, Shuaibu & Cledumas, 2023). Entrepreneurship is the process of creating and developing a business venture through creativity, innovation, and risk taking (Sousa, 2018). It is the practice of starting a new business venture with the aim of generating profit and providing employment for others (Isa, et al., 2023). To be successful in entrepreneurship, Isa, et al. (2023) identified essential skills needed by students of building technology. These include: business planning skills, marketing skills, management skills, information and communication technology skills, financial management skills and interpersonal skills among others. All these skills required by students of building technology education students are stipulated in the revised curricular for Bachelor of Technology degree, vocational and technology education program by the Federal Republic of Nigeria (FRN, 2016). In the document, building technology education, building technology education is referred to as construction technology education and aims at equipping in-service teachers with pedagogical and

practical skills; developing soft skills for efficient discharge of duties; as well as developing the spirit of self-reliance and entrepreneurship among students.

Readiness refers to preparedness for something. It means having the requirements for something. In this way, work readiness refers to possession of the requirements such as knowledge, skills, and attributes to work., primarily, young people or individuals, such as the long term unemployed or 'returners' to the labour market, who have not worked for some time (Wiseman, Roe & Parry, 2018) For building technology education students, work readiness would then mean possessing the required competences including knowledge, skills and attitude in preparation for gainful employment (Hall, 2010). As described in the preceding paragraph, the building technology education students need to possess entrepreneurship skill for self-reliance, competences in building construction, pedagogical competences and soft skills. Possessing these skills is a sign of work readiness to transit to the world of work among building technology education students. How much prepared are students of building technology education students to transit to the world of work is a question that needs answer. It is in quest for this question that the present study is intended.

The construction industry is a dynamic and complex field which requires professionals to possess a wide range of competences to be effective and work-ready upon graduation from school. Building technology students, in particular, need to develop a comprehensive set of skills and knowledge to meet the demands of the modern construction workplace. Competence refers to the ability to apply knowledge, skills, and attitudes to perform occupational tasks to the standards expected in employment (Sanghi, 2016). In the field of building construction, this encompasses a wide range of technical, managerial, and interpersonal abilities. The competences include technical knowledge and skills, design and drawing skills, safety and risk management skills, sustainable construction practice, communication and assessment skill and digital literacy and technology integration skills among others. Readiness also encompasses soft skills. This is because, while at work, practical skills are not the only required skills but also soft skills. While the practical skills related to building construction activities are required to be able to accomplish task, soft skills are required to relate well with people for smooth operation. The soft skills include among others, communication, teamwork, problem-solving, time management, adaptability, leadership, and emotional intelligence are key competencies that enhance work readiness. A brief literature review on these skills is presented in the sections that follow.

Effective communication is paramount in the construction industry, where professionals work in teams and interact with various stakeholders, including clients, architects, engineers, and contractors. Communication skills encompass both verbal and written competencies, which are essential for reporting, interpreting technical drawings, and conveying instructions. A student with strong communication abilities can effectively collaborate with colleagues, share knowledge, and ensure clarity in project execution. Additionally, the ability to listen actively and engage with team members plays a vital role in minimizing errors and enhancing the overall efficiency of the construction process (Aiyewalehinmi, 2013).

The construction industry relies heavily on collaborative efforts, where professionals work in multidisciplinary teams to complete projects. Building technology students must develop interpersonal skills that foster teamwork, mutual respect, and cooperation. Collaborative skills enable individuals to contribute positively to team dynamics, solve problems collectively, and achieve common goals. Studies suggest that graduates who exhibit strong teamwork skills are more likely to integrate quickly into workplace teams and excel in their roles (Tawfik, Kim, Hogan & Msilu, 2019). Employers in the building construction sector also value the ability to manage group conflicts and negotiate solutions, further underscoring the importance of teamwork in work readiness.

Problem-solving and critical thinking are core competencies required for success in the building construction industry. Construction projects often encounter unexpected challenges, such as material shortages, design discrepancies, or unforeseen site conditions, which necessitate quick and effective decision-making. Building technology students must therefore cultivate the ability to analyze problems, evaluate potential solutions, and make informed decisions under pressure. Critical thinking enables them to assess the long-term implications of their actions and implement strategies that improve project outcomes. This skill is increasingly valued as construction practices become more complex, requiring innovation and adaptability in addressing both technical and operational challenges (Oviawe, 2020).

The construction industry operates on tight schedules, where delays can have significant financial and operational consequences. Time management skills are crucial for students transitioning into the workforce, as they must balance multiple tasks, meet deadlines, and manage resources efficiently (Oviawe, 2020). Effective organizational skills allow individuals to prioritize activities, delegate responsibilities, and coordinate different phases of construction projects seamlessly. Students who develop strong time management habits are better prepared to handle the fast-paced nature of the industry, ensuring that they can deliver quality work within specified timelines.

In a rapidly changing world, adaptability has become a vital skill for building technology students to succeed in the construction sector. The industry is witnessing the integration of new technologies, including Building Information Modelling (BIM), automation, and sustainable construction practices, which demand flexibility in both thought and action. Students who demonstrate adaptability are more capable of embracing technological advancements, adjusting to new methods, and contributing to innovative project delivery. Moreover, the ability to adapt to different work environments, cultures, and client preferences is highly valued by employers in an industry that operates across diverse geographic and socio-economic contexts (Oviawe, 2020).

Leadership skills are crucial for building technology students aspiring to supervisory or managerial roles in the construction sector. Leadership involves not only the ability to guide and motivate teams but also the capacity to take initiative and lead by example (Oviawe, 2020). Employers seek graduates who can demonstrate proactive behavior, take ownership of tasks, and provide solutions without constant supervision. Leadership also encompasses the ability to manage risks, allocate resources, and ensure that project goals are met efficiently and effectively. Students who exhibit leadership potential are often positioned for accelerated career progression within the industry.

Emotional intelligence (EI) is an emerging soft skill recognized for its significance in managing interpersonal relationships and conflicts within the construction sector. Students equipped with high emotional intelligence can better understand and manage their own emotions, as well as those of others, which contributes to healthier work environments and improved team performance (Bal & Firat, 2017). Conflict management, a subset of emotional intelligence, enables individuals to address disagreements constructively, ensuring that conflicts are resolved without disrupting project flow. As the construction industry involves high-pressure situations, the ability to maintain composure and navigate conflicts is essential for fostering collaborative and productive workplaces.

Purpose of the Study

The purpose of the study is to investigate the work readiness among students of building technology education in tertiary institutions in Rivers State. Specifically, the study intends to:

1. find out the extent practical competences are possessed by students of building technology education in tertiary institutions in Rivers State.
2. determine the extent soft skills are possessed by students of building technology education students in tertiary institutions in Rivers State.

Research Questions

The study will provide answer to the following research questions.

1. To what extent are building construction competences possessed by students of building technology education in tertiary institutions in Rivers State?
2. To what extent are soft skills possessed by students of building technology education students in tertiary institutions in Rivers State?

Hypotheses

The study will test the following hypotheses which will be tested at 0.05 alpha level of significance.

1. There is no significant difference in the extent building construction competences are possessed by of building technology education students from college of education and universities in Rivers State.
2. There is no significant difference in the extent soft skills are possessed by of building technology education students from college of education and universities in Rivers State.

Methodology

The study adopted a descriptive comparative survey research design. The target population of the study is 105 final year building technology education students from the three tertiary institutions in Rivers State. The number comprise a total of 41 (5 from Rivers State University (RSU) and 36 from Ignatius Ajuru University of Education (IAUOE) final year students from universities and 64 final year students from Federal College of Education Technical (FCET) Omoku (Source: Departmental Office of the different institutions). Because of the manageable size of the population, census sampling was

employed. Therefore, the entire population of 105 final year building technology education students will be recruited for the study. The instrument for data collection for the study is a questionnaire titled, "Practical and Soft Skills for Work Readiness among Building Technology Students Questionnaire (PSSWRBTSQ)" which was developed by the researcher. The instrument was subjected to face and content validaty by three experts. The instrument had an overall reliability coefficient of 0.87. A total of 105 copies of the instrument after validation and reliability was administered to the respondents. This was achieved with the help of three trained research assistants. A total of 103 copies of instrument was retrieved and used for data analysis. This number comprised. The number comprised a total of 41 (5 from Rivers State University (RSU) and 36 from Ignatius Ajuru University of Education (IAUOE) final year students from universities and 62 final year students from Federal College of Education Technical (FCET) Omoku (Source: Departmental Office of the different institutions). Data gathered were analysed using mean and z-test.

Result

Research Question 1: To what extent are building construction competences possessed by students of building technology education in tertiary institutions in Rivers State?

Table 1: Mean on Extent Students Possess Construction Competences

S/N	Building Construction Competences Possessed by Students	FCET (n = 62)			University (n = 41)		
		M	S.D.	RMK	M	S.D.	RMK
1	Ability to interpret building drawings.	2.92	1.11	HE	2.88	1.14	HE
2	Ability to draw building drawing.	2.77	1.03	HE	2.78	1.06	HE
3	Ability to conduct site setting out for building construction.	2.19	1.02	LE	1.98	1.06	LE
4	Knowledge of types of foundations.	3.21	1.09	HE	3.22	1.04	HE
5	Ability to manage building construction project.	2.23	1.09	LE	2.32	1.08	LE
6	Knowledge of material for building construction.	3.29	1.01	HE	3.00	1.12	HE
7	Ability to prepare cost estimate for building projects.	2.18	1.05	LE	2.15	1.09	LE
8	Ability to prepare site report during building construction projects.	1.77	1.03	LE	1.85	1.06	LE
9	Competence in laying blocks.	1.82	0.98	LE	2.32	1.04	LE
10	Competence in cutting blocks.	2.32	1.10	LE	2.46	1.10	LE
11	Competence in mixing mortar.	2.19	1.14	LE	2.00	1.12	LE
12	Knowledge of principle of walling.	2.16	1.03	LE	2.12	1.14	LE
13	Knowledge of principle of tiling.	1.97	1.07	LE	2.32	1.06	LE
14	Ability to conduct walling.	2.39	1.09	LE	2.15	1.17	LE
15	Skill in using builder's square in squaring blocks.	2.87	1.23	HE	2.93	0.96	HE
16	Ability to use carpenters saw to cut wood.	3.53	0.88	HE	3.27	1.03	HE
17	Ability to use masons saw to cut blocks.	3.13	1.06	HE	2.76	1.09	HE
18	Knowledge of roofing materials.	3.16	1.09	HE	2.83	1.12	HE
19	Knowledge of techniques involved in roofing.	1.76	0.99	LE	2.24	1.18	LE
20	Knowledge of electrical installation process.	2.06	1.01	LE	2.12	1.12	LE
21	Knowledge of heating/ventilation system.	3.19	0.96	HE	2.73	1.12	HE
22	Knowledge of carpentry work in building construction.	3.21	0.93	HE	2.90	1.00	HE
23	Knowledge of finishing materials in building construction.	3.35	0.99	HE	2.98	1.15	HE
24	Skill in erecting/dismantling scaffolding.	2.53	1.08	HE	2.02	1.08	LE
	Grand Mean	2.59	1.04	HE	2.51	1.09	HE

Field Data, 2024 (HE = High Extent; LE = Low Extent)

Table 1 shows the result on building construction competences possessed by students of building technology education in tertiary institutions in Rivers State. As shown, the students possessed some

competences to a high extent and some to a low extent. This is evident by mean responses being less than 2.50 for items 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 19 and 20 show that students from Federal College of Education (Technical) and universities possessed these competences to a low extent. On the other hand, mean responses being greater than 2.50 for items 1, 2, 4, 6, 15, 16, 17, 18, 21, 22, 23 and 24 show that students from the Federal College of Education (Technical) and universities possessed these competences to a high extent. Furthermore, grand mean values of 2.59 for students of FCET and 2.51 for students of universities indicate that they possessed the skills to a moderately high extent.

Research Question 2: To what extent are soft skills possessed by students of building technology education students in tertiary institutions in Rivers State?

Table 2: Mean on Extent Students Possess Soft Skills

S/N	Soft Skills Possessed by Students	FCET (n = 62)			University (n = 41)		
		M	S.D.	RMK	M	S.D.	RMK
1	Time management skills.	3.60	0.86	HE	3.29	1.01	HE
2	Problem solving skill.	3.02	1.06	HE	2.78	1.17	HE
3	Critical thinking skill.	3.37	0.93	HE	2.93	1.15	HE
4	Creativity.	3.53	0.92	HE	3.24	1.11	HE
5	Teamwork skill.	3.29	1.05	HE	2.98	1.15	HE
6	Collaboration Skill.	3.26	1.02	HE	3.10	1.09	HE
7	Interpersonal Skill.	3.02	1.11	HE	2.90	1.04	HE
8	Adaptability.	3.06	0.99	HE	3.00	1.02	HE
9	Numeracy.	3.24	0.97	HE	2.76	1.18	HE
	Grand Mean	3.27	0.99	HE	3.00	1.10	HE

Field Data, 2024 (HE = High Extent; LE = Low Extent)

Table 2 shows the result on soft skills possessed by students of building technology education in tertiary institutions in Rivers State. As shown, the students possessed soft skills to a high extent. This is evident by mean responses being greater than 2.50 for all items in the table show that students from Federal College of Education (Technical) and universities possessed these soft skills to a great extent. Furthermore, grand mean values of 3.27 for students of FCET and 3.00 for students of universities indicate that they possessed the skills to a very high extent.

Hypothesis 1: There is no significant difference in the extent building construction competences are possessed by of building technology education students from college of education and universities in Rivers State.

Table 3: Z-test for Extent Students Possess Construction Competences

Groups	N	M	S.D.	Z-cal	Z-crit	Decision
FCET	62	2.59	1.04	0.37	1.96	Accepted
Universities	41	2.51	1.09			

Result in Table 3 shows the result for z-test for the extent students possessed building construction competences in tertiary institutions in Rivers State. As shown, calculated value of z (z-cal) = 0.37 while the critical value of z (z-crit) = 1.96. Since calculated value is less than critical value, the hypothesis is accepted. This implies that there is no significant difference in the extent building construction competences are possessed by of building technology education students from college of education and universities in Rivers State.

Hypothesis 2: There is no significant difference in the extent soft skills are possessed by of building technology education students from college of education and universities in Rivers State.

Table 4: Z-test for Extent Students Possess Soft Skills

Groups	N	M	S.D.	Z-cal	Z-crit	Decision
FCET	62	3.27	0.99	1.27	1.96	Accepted
Universities	41	3	1.1			

Result in Table 4 shows the result for z-test for the extent students who possessed soft skills in tertiary institutions in Rivers State. As shown, calculated value of z (z-cal) = 1.27 while the critical value of z (z-crit) = 1.96. Since calculated value is less than critical value, the hypothesis is accepted. This implies

that there is no significant difference in the extent soft skills are possessed by of building technology education students from Federal College of Education (Technical) and universities in Rivers State.

Discussion of Findings

Research question one sought to find out the extent students of building technology in tertiary institutions in Rivers State possess building construction competences. The result showed that they possessed some skills to a low extent and possessed others to a high extent. Specifically they possessed ability to conduct site setting out for building construction, ability to manage building construction project, ability to prepare cost estimate for building projects, ability to prepare site report during building construction projects, competence in laying blocks, competence in cutting blocks, competence in mixing mortar, knowledge of principle of walling, knowledge of principle of tiling, ability to conduct walling, knowledge of techniques involved in roofing and knowledge of electrical installation process to low extent.

On the other hand, they possessed ability to interpret building drawings, ability to draw building drawing, knowledge of types of foundations, knowledge of material for building construction, skill in using builder's square in squaring blocks, ability to use carpenters saw to cut wood, ability to use mason's saw to cut blocks, knowledge of roofing materials, knowledge of heating/ventilation system, knowledge of carpentry work in building construction, knowledge of finishing materials in building construction and skill in erecting/dismantling scaffolding to a high extent.

This result suggests that the students had some level of work readiness in some areas. This result agrees with the result obtained by Obaju, Fagbenle, Amusan and Musa (2022) who found an encouraging level of work readiness among graduates for the construction industry. The study by Obaju, Fagbenle, Amusan and Musa (2022) also showed that students were not very sound in terms of practical skills carrying out building surveys, preparation of site reports and preparation of reliable estimates for materials, labor and cost of construction works.

Research question two sought to find out the extent students of building technology in tertiary institutions in Rivers State possess soft skills. The result showed that they possessed these skills to a high extent. Specifically, they possessed ability of time management skills, problem solving skill, critical thinking skill, creativity, teamwork skill, collaboration skill, interpersonal skill, adaptability and numeracy to a high extent. This suggests that the students had some level of work readiness which agrees with the result obtained by Ideozu and Puyate (2022) also showed that students were very sound in terms of practical skills carrying out skills such as appropriate mixing of mortar in appropriate measure, mixing concrete continuously until desired consistency is achieved.

Conclusions

In conclusion, this study has provided valuable insights into the level of building construction competencies and soft skills possessed by students of building technology in tertiary institutions in Rivers State. The findings indicate a mixed level of technical competencies, with students demonstrating higher proficiency in specific skills such as interpreting building drawings, creating foundational knowledge, working with construction materials, and operating construction tools. However, students showed lower proficiency in areas like site setting out, project management, cost estimation, walling, roofing techniques, and electrical installations. This varied skill profile suggests a partial readiness for work in the construction field, with a need for further development in practical, hands-on skills to enhance their preparedness for industry requirements.

Additionally, the study revealed a high level of proficiency in soft skills among these students, including time management, problem-solving, critical thinking, creativity, teamwork, adaptability, and numeracy. This strong foundation in soft skills is encouraging, as these are crucial for effective collaboration, problem-solving, and adaptability in dynamic work environments. Overall, the study concludes that while students possess many of the soft skills necessary for the workplace, further emphasis on practical, technical training would significantly enhance their competence and readiness for real-world construction roles.

Recommendations

1. Tertiary institutions should increase hands-on training in site setting out, project management, cost estimation, walling, roofing, and electrical installations.
2. The building technology curriculum should focus more on skills like construction surveys, cost estimation, and site reporting to better prepare students for the industry.

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