

21st Century Skills: The Preparedness Level of Vocational and Technical Education Students in Niger State, Nigeria

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Abstract

The study adopted mixed method research design, both quantitative (questionnaire) and qualitative (interview) were used to obtain responses from the students on the level of preparedness in 21st century skills as there are serious concern of low quality and mismatch of skills among VTE graduates. The population of the study was made up of 768 final years students of VTE programmes in Niger State, Nigeria. Simple random sampling was used to sampled 512 final year students. The outcome of internal consistency of items were grouped in parts; A, B and C, based on research questions. the results of 0.98 for part A was obtained while part B and C have 0.96 and 0.98 respectively. Out of the total of 512 questionnaires distributed to the students, 492 were retrieved given 95% returned rate. 48 students were interviewed to support questionnaire data. The mean, percentage, Standard Deviation (SD) were used for analysis. The result of the findings revealed that VTE students were averagely prepared in 21st century skills. It is therefore recommended among others that the ministry of education at state and national should collaborate with institutions and incorporating the vocational and technical educational skills into their curricular and should be well taught to students.

Key words: 21st Century Skills, Preparedness level, Vocational and Technical Education

Introduction

The main reason of education is to prepare the learners to become reasonable members of the society and to contribute positively to the growth and development of his or her community and the surrounding communities. Education contributes significantly to

the responsible nature in human beings and to develop positively outlooks to life. Education can be seen as the systematic process of acquiring knowledge, psychomotor skills and attitudes that human beings need to function effectively in life. It is a deliberate and conscious effort designed and created a learning environment and the learning process so that learners are actively engaged and developed full potentials needed to become good citizen (Adebisi & Santosa, 2022, Maigida, Saba & Namkere, 2013). It's usually said that education is the key to national development but Vocational and Technical Education (VTE) is a master key that unlock every potential.

VTE is a programme that build appropriate skills, knowledge and attitudes needed to create employment and sustain it. Moses *et al.* (2017) affirmed that VTE help the trainees to acquire necessary skills needed to be enterprise, create opportunities in order to become self-reliant and for societal empowerment. The programmes of VTE are designed to equip the learner with life skills which are very important for job creation and also to provide ability to keep up-to-date with fast changing and complex global markets. VTE can alleviate poverty, conserve the environment, improve the quality of life for all and help achieve sustainable development (Maigida *et al*; 2013). It is not exaggeration that VTE is the backbone of a nation economic development, the aim of VTE is to train learners to acquire competencies and appropriate skills that will enable them fight unemployment, poverty and to contribute significantly to social transformation (Adebisi & Santosa, 2022; Gaya, 2022). In order to make graduates of VTE to be well skilled to contribute positive for nation development 21st century skills are must.

The term "21st Century Skills" refers to the abilities needed to meet the problems of a 21st century world that is active on a global scale, undergoing a digital transformation, advancing cooperatively and creatively, seeking qualified human resources, and being quick to embrace new ideas. One needs to possess the skills referred to as 21st century skills in order to improve and develop one's culture, nation, or even the entire world. It is essential to update educational systems and incorporate 21st century skills to improve students' critical thinking abilities, encourage their creativity, promote their inventive thinking, and provide new workable ideas that are crucial for a country to flourish in the long run (Nakano & Wechsler, 2018). As a result, preparing students for the demanding industry has taken precedence. VTE graduates will only succeed in today's competitive

market if they have a competitive edge in 21st century skills and abilities. Acquiring a variety of 21st-century abilities, including information literacy, problem-solving, and critical thinking. These abilities not only assist create a future workforce that is well-prepared, but they also provide everyone with success-enhancing life skills.

The need for students to acquire the knowledge and skills necessary for success in the 21st century is becoming more urgent as a result of factors globalization, technology change, migration, international competition, shift in markets, and international environment and political development (Alshare & Sewailem, 2018). Students should now be prepared with information and abilities needed to do tasks that cannot be automated. Only when a student is able to successfully carry out and fulfill his or her responsibilities and duties towards self, school, family, society, and most importantly, the nation, is learning complete and holistic. The objective of 21st century skills are to prepare today's students to be decent citizens and responsible individuals who are aware of their abilities and potential.

In a classroom of the twenty-first century, instructors' change role from "expert" to "facilitator." The emphasis of training switches from merely "knowing" material to actually being able to use and apply it. Students who are being prepared for the 21st century will participate in continuous cycles of learning (Nakano & Wechsler, 2018). That result in a deeper comprehension of the subject area content and that help students build the vital skills needed to tackle future difficulties.

21st Century Skills can be categorized into three key skill sets, known as 3 Ls - namely, Learning Skills, Literacy Skills and Life Skills. Learning Skills: they are skills required for learning new knowledge. Literacy Skills: aid in generating and acquiring new knowledge through reading, media, and digital resources. Life Skills: the abilities needed to properly navigate daily life. Some people use the term "critical thinking" to describe a type of introspective thinking focused on analyzing and evaluating current communication, information, and arguments, especially through the application of logic and reason (The Central Board of Secondary Education India, 2020; Grafstein, 2017).

In order to be creative, a person must put in a lot of effort and keep improving their concepts and solutions. Creativity can be understood as being a multidimensional construct, involving cognitive variables, personality characteristics, family, educational

aspects, and both social and cultural elements. As a concept, innovation has been defined as the development of the product or practice of new and useful ideas to benefit individuals, teams, organizations or a broader range of society (Bledow, Frese, Anderson, Erez & Farr; 2009). Supported the definition of creativity as the capacity to generate, bring into existence, create in a new form, create using creative skill, and bring something new into life (Nakano & Wechsler, 2018).

The students collaborate when they take on roles and interact with one another in groups to create result. Taking on leadership roles, making choices, developing trust, communicating, reflecting, and handling disagreements are all examples of collaborative relationships. Students who work together to solve difficulties do so more effectively than those who work alone because they respond to comments and inquiries to develop answers that are more appropriate for the issue at hand (Eristi, & Erdem, 2017). Collaboration is a crucial skill to improve problem solving and knowledge acquisition. Peer interactions that imitate verbalized thinking can help students learn to control their own learning. Even the most brilliant scientific discovery is of little use if it is not communicated broadly and accurately (Tican & Deniz, 2019).

The skilled communication is used to refer to forms of discourse that are employed to communicate or explain information. Information literacy skills gives abilities that will improve the caliber of their research and increase their career options in the information economy; knowledge of how to analyze and evaluate study results critically; Knowledge of the ethical and legal implications of information use: knowledge of how to reference and cite sources, therefore appreciating others' contributions. Media literacy is typically understood as an informed, critical understanding of the dominant mass media, and it entails looking at the institutions, technologies, and techniques used in media production; being able to analyze media messages critically; and understanding the role audiences play in deriving meaning from those messages. It's a modified form of communication and informational ability that adapts to how information is used in our society. As consumers consume information in their homes and living rooms, it addresses the competencies citizens must possess as well as the capabilities workers must possess to comprehend the problems of a global economy in the twenty-first century (Malik, 2008).

While educational institutions can assist students in acquiring some of the success-related skills. This is mostly due to how quickly the working conditions in the technology-driven, fast-paced digital economy of the twenty-first century are evolving. This indicates that in order for employees to remain productive in the 21st-century digital economy, they must be willing to take the initiative to learn new information that will improve their efficiency and effectiveness (Kivunja, 2015). During a storm, a tree that does not bend is uprooted. That suggests that it is necessary to be flexible and adaptable without compromising the objective or the ideals. The ability to alter or transform oneself to best fit the demands of a situation or environment is known as flexibility and adaptability (The Central Board of Secondary Education India, 2020). Self-direction has emerged as a crucial competency for success and ongoing employability in the workforce of the twenty-first century, not just for coping with change but also for learning how organizational performance and productivity can be increased (Pacific Policy Research Center, 2010). In order to succeed in the workplace of the twenty-first century, participants must possess social and cross-cultural skills. They must also be able to work effectively in diverse teams, both in their own physical workplace and in the virtual community of the digital economy, in which they are immersed (Kivunja, 2014). Furthermore, researcher said self-directed learners investigate and expand their own learning and opportunities to acquire expertise in addition to mastering skills and/or curriculum. Take the initiative to raise your skill level to a professional one. Convey a desire to study as a lifetime process. To guide future development, critically consider the lessons learned from the past. Leadership plays a key role is in a matter of personality; it is the capacity to elicit cooperation from subordinates; the use of influence; a method of persuasion; a tool for achieving goals; and an impact on interpersonal interactions.

The rate of unemployment among VTE graduates are growing geometrically in Nigeria. When young adults are unable to gain employment or been self-employed for many years or are taken away from the labour market completely, this not only has dramatic consequences in terms of economic growth and development; it also poses a serious threat to social cohesion. It is expected that over 75% of graduates of VTE are to work immediately after graduation but there is low level of absorption of VTE graduates in the business world / industrial world (Yoto & Bella, 2019).

When young people are equipped with relevant and appropriate skills, they possess a potential to increase country economic and for economy transformation, the nation require availability and quality human resources that will explore vast mineral resources (Saba, Ibrahim, & Kareem, 2011). In spite of the large graduate's nation turns out every year. There are serious concern of low quality and mis-match of skills among VTE graduates. To have complete and holistic graduates that can perform and fulfill his or her duties effectively towards one self, family, society and nation at large. The graduate must be well trained and equipped with both technical and 21st century skills. For quick intervention and development of strategies for training VTE students with 21st century skills. The study is designed to investigate how prepared are students for 21st century skills in addition to technical skills they possessed.

Purpose of the Study

The study is to specifically determine;

- i. Preparedness level of VTE students in 21st century learning skills.
- ii. Preparedness level of VTE students in 21st century literacy skills.
- iii. Preparedness level of VTE students in 21st century life skills.

Research Questions

The study sought to provide answers to the questions;

- i. How prepared are VTE students in 21st century learning skills?
- ii. How prepared are VTE students in 21st century literacy skills?
- iii. How prepared are VTE students in 21st century life skills?

Methodology

The study adopted mixed method research design, both quantitative (questionnaire) and qualitative (interview) was used to obtain responses from students on the level of preparedness of 21st century skills. The method was adopted to allow the researchers broaden their inquiries with enough depth and breadth (Dawadi, 2021). Specifically, the study adopted convergent parallel mixed methods design as the qualitative data were used to supplement quantitative data. The population of the study was made up of 768 final

years students of VTE programmes in Niger State, Nigeria. Multi-stage sampling was used to sampled 512 final year Students from three higher institutions offering VTE programmes. FUT Minna and Niger State College of Education were sampled. Industrial and Technology Education Department was used as only department offering VTE. Three departments from School of technical education; Electrical and Electronics Technology Education; Building Technology Education and Metalwork Technology Education and three school of Vocational Education, Agricultural Science Education; Business Education and Home Economics Department all in College of Education Minna were sampled through stratified random sampling. 512 students were sampled through simple random sampling as represented in the Table 1.

Table 1: Sampled Size

S/No	Department	Sampled Sizes
1	Industrial and Technology Education	155
2	Electrical and Electronics Technology Education	52
3	Building Technology Education	48
4	Metalwork Technology Education	40
5	Agricultural Science Education	82
6	Business Education	70
7	Home Economics Education	65
	Total	512

Questionnaire and Interview were instrument used for data collection. The instrument were subjected to validity by the experts in the field of VTE. The reliability coefficient was obtained with the used of Cronbach Alpha statistics. The out come of internal consistency of items were grouped in parts; A, B and C, representing research question, 1, 2 and 3. the results of 0.98 for part A was obtain while part B and C have 0.96 and 0.98 respectively. This signify that the questionnaire is reliable for use. Out of the total of 512 questionnaires distributed to the students, 492 were retrieved given 95% returned rate. 48 students were interviewed to support questionnaire data. The mean, percentage, Standard Deviation (SD) were used for analysis. The decision of research questions was based on Table 2. 1.96 was used as a decision point for SD to determine divergent opinion of students and how closed their opinion were.

Table 2: Interpretation of Six Points Scale

S/ NO	Scale	Points
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1	Very Highly Prepared	5.50-6.00
2	Highly Prepared	4.50-5.49
3	Averagely Prepared	3.50-4.49
4	Fairly Prepared	2.50 -3.49
5	Poorly Prepared	1.50 -2.49
6	Not Prepared	0.50 -1.49

Results

Research Question 1: How prepared are VTE students in 21st century learning skills?

Table 2: Results of Preparedness of VTE Students in 21st Century Learning Skills

S/N	ITEMS	Mean	SD	Remark
Critical thinking Skills				
1	Identification of problem	4.23	1.02	Averagely
2	Discover best solution to the problem	3.96	0.34	Averagely
3	Analyze the decision	3.56	0.01	Averagely
4	Curious to solve problem	3.45	0.90	Fairly
Creative and Innovation Skills				
5	Generate new ideas	3.61	0.02	Averagely
6	Conceive new things	3.51	0.36	Averagely
7	Uniqueness in creativity	3.59	0.45	Averagely
8	Shift one’s view easily	4.65	1.23	Highly
Collaboration Skills				
9	Working effectively with others	4.78	0.14	Highly
10	Accepting others opinion	4.58	0.04	Highly
11	Cooperatively addressing the problem	4.89	0.00	Highly
12	Apologizing for wrong doing	4.11	1.00	Averagely
Communication Skills				
13	Listening actively	3.56	0.02	Averagely
14	Write correctly	4.76	0.06	Highly
15	Communicate verbally	3.43	0.78	Fairly
16	Communicate non-verbal	2.48	0.71	Poorly
		3.95	0.44	Averagely

Out of four critical thinking skills they were averagely prepared in three and fairly prepared in one; in creative and innovation skills they were averagely prepared in three skills and highly prepared in one skill; collaboration skills the students highly prepared in three and one was averagely prepared and in communication skills they’re highly prepared in writing skills averagely prepared in listening skills, fairly prepared in verbal communication and poorly prepared in non-verbal communication. The results of interview revealed that 78% of the students agreed that they’re averagely prepared in critical thinking skills, 15% said they were highly prepared while 7% said fairly prepared.

They are preparedness level in creative and innovation skills shows that 62% said they were averagely prepared, 16 % said highly prepared, 12% said fairly prepared and 10% responded they were fairly prepared. The VTE students interviewed revealed that 79% said they were prepared in collaboration skills, 9% said they were very highly prepared and 12% said they were fairly prepared and in the aspect of communication skills 48% agreed that they were highly prepared, 35% said averagely prepared, 12% said fairly prepared and 5% said they were very highly prepared. The SD result is 0.44 below the 1.96 point, so their opinions were closed no diversion.

Research Question 2: How prepared are VTE students in 21st century literary skills?

Table 3: Results of Preparedness of VTE Students in 21st Century Literacy Skills

S/N	ITEMS	Mean	SD	Remark
Information Literacy Skills				
1	Find related information	3.65	1.08	Averagely
2	Organize information	3.25	0.09	Fairly
3	Use information	3.29	0.45	Fairly
4	Evaluate information	2.67	0.00	Fairly
Media Literacy Skills				
5	Effectively search the media	4.45	0.03	Averagely
6	Understand digital tool prints	3.78	0.65	Averagely
7	Guide information	3.89	0.09	Averagely
8	Citing information sources correctly	4.82	0.92	Highly
Technology Literacy Skills				
9	Assess web sites	4.62	0.32	Highly
10	Create and edit software	3.28	0.01	Fairly
11	Use on-line classes	2.45	0.07	Poorly
12	Choose correct media to show case learning	2.41	0.10	Poorly
		3.55	0.32	Average

Table 3: revealed the responses of the students on their preparedness level in 21st century skills. The responses on information literacy skills shows that the students were averagely prepared in one item and fairly prepared in three listed skills. They were averagely prepared on three skills listed as media literacy skills and averagely prepared in one item. On information literacy skills, they were highly prepared in one item, fairly prepared in one item and poorly prepared in two items. The interview conducted shows that 64% of students said they were fairly prepared in information literacy skills, 22% said they were averagely prepared, 10% said they were highly prepared while 4% said they were poorly prepared. It revealed that in media literacy skills 59% agreed that they were

averagely prepared, 26% said they were highly prepared, 9% said they were fairly prepared and 6% said they were poorly prepared. The results of technology literacy skills indicated that they were 54% poorly prepared, 23% were fairly prepared, 18% highly prepared and 15% averagely prepared. The SD result is 0.32 below the 1.96 point, so their opinions were closed no diversion in their opinions.

Research Question 3: How prepared are VTE students in 21st century life skills?

Table 4: Results of Preparedness of VTE Students in 21st Century Life Skills

S/N	ITEMS	Mean	SD	Remark
Flexibility and Adaptability Skills				
1	Face unprecedented situation	3.49	0.09	Fairly
2	Change his or her actions easily	3.90	0.90	Averagely
3	Create modification to new environment	3.78	1.12	Averagely
4	Progress despite challenging condition	3.24	1.34	Fairly
Leadership and Responsibility Skills				
5	Motivate others to work	3.56	1.89	Averagely
6	Delegate duties	3.46	0.04	Fairly
7	Trustworthy in handling things	4.01	0.67	Averagely
8	Positive mindedness	3.11	0.93	Fairly
Initiative and Self Direction Skills				
9	Take full responsibility of actions	3.25	1.01	Fairly
10	Plan/direct/control thought during learning task	3.12	1.21	Fairly
11	Work independent of people	3.59	0.35	Averagely
12	Time management	4.54	0.78	Highly
Productivity Skills				
13	Solve problem	3.45	0.54	Fairly
14	Make solid decision	3.56	0.88	Averagely
15	Manage stress effectively	3.94	0.65	Averagely
16	Set limit and deadlines	3.57	0.25	Averagely
Social Skills				
17	To share with others	4.50	1.00	Highly
18	Cooperate with others	4.77	1.43	Highly
19	Respect personal space	4.56	0.07	Highly
20	Using good manner	4.98	0.78	Highly
		3.82	0.80	Averagely

Table 4 indicated the responses of students in life skills. Under flexibility and adaptability skills, they were fairly prepared in two items and averagely prepared in two items. Leadership and responsibility skills, they were averagely prepared in two items and fairly prepared in other two. The students were fairly prepared in two items on initiative and self-direction skills, one item averagely prepared another item highly prepared. Three

items under productivity skills were rated averagely prepared and one fairly prepared and in social skills all items were rated highly prepared. The results of interview show that 51% agreed that they were averagely prepared, 42% said they were fairly prepared, 5% said they were poorly prepared and 2% said they were highly prepared in flexibility and adaptability skills. The interview on leadership and responsibility skill preparedness level revealed that, 48% were averagely prepared, 44% were fairly prepared, 6% were highly prepared and 3% were poorly prepared. In initiative and self-direction skills, 58% were fairly prepared, 22% were averagely prepared, 12% were poorly prepared and 8% were highly prepared. Report on productivity skills preparedness level indicated that 45% were highly prepared, 39% were averagely prepared, 10% were fairly prepared and 6% were very highly prepared. Interview revealed that 54% were highly prepared, 30% were very highly prepared and 16% were averagely prepared in social skills. The SD result is 0.80 which is less than 1.96 point, so their opinions were closed no diversion in their opinions.

Discussion of Findings

The result in Table 2 revealed the outcomes of the student's opinions on level of their preparedness in 21st century skills. The study shows that students were averagely prepared in learning skills which comprises of critical thinking, creative and innovation, collaboration and communication skills. These skills are very important for graduates of VTE in this 21st century. Average preparedness level of these students may not enable them cope with today's employment. This is supported by P21, (2009) which they agreed that every effort to integrate 21st century skills must first establish fundamental academic topic knowledge and awareness among all pupils. Students must master the necessary skills for success in the modern world, such as critical thinking, problem solving, communication, and cooperation, within the context of education in fundamental knowledge. Those with the capacity for critical thought and good communication need a foundation in fundamental academic subject knowledge. There is a growing understanding that the abilities that led to success in the 20th century Industrial Age are no longer adequate to lead to success and wealth in the 21st century as the globe has transitioned from the 20th century Industrial Age to the 21st century Information Age (Kivunja, 2015. Kivunja, 2014). It was further backed up by the fact that success today requires people to be able to handle non-routine,

innovative work. The capacity to excel at non-routine work is no longer just rewarded; it is now anticipated as a basic prerequisite. While abilities like self-direction, creativity, critical thinking, and innovation may not be new to the 21st century, they are now more vital than ever (Nakano & Wechsler, 2018, Joo, McLean, & Yang, 2013). It is necessary for high school graduates to be able to think critically, solve problems, communicate, collaborate, find reliable information quickly, and use technology effectively, regardless of whether they intend to attend a vocational school, community college, or university or plan to enter the workforce straight out of high school. These are the talents needed to survive in today's world, not just for professional success but also for personal and societal well-being.

The study revealed that the students were averagely prepared in literacy skills. This indicated their weakness to cope with 21st century job that need information, media and technology literacy skills. This is buttressed in the study of (Tican and Deniz, 2019; Malik, 2008) opined that to be literate today, one must be able to read, assess, and create text, images, and sounds, or any combination of these elements, through and with all types of media. In other words, in addition to being literate in print, math, and technology, literate people must also be literate in media. Furthermore, giving people the option to communicate, create, and participate fully in today's fast-paced world is the fundamental goal of promoting media literacy and this will contribute to the development of a society where everyone has equal rights, regardless of their social, economic, or ethnic background, and where the creative and knowledge industries may access the largest pool of producers and inventors.

Life skills which include; flexibility and adaptability, leadership and responsibility, productivity, initiative and self-direction and social skills were possessed at average level and students ought to possess these skills at very high or high level. Participants must possess social and cross-cultural skills in order to succeed in the workplace of the information age (Kivunja, 2015). These abilities allow participants to learn from and collaborate with individuals representing various cultures, religious beliefs, and lifestyles in an atmosphere of mutual respect, trust, and openness. These abilities help students manage tasks effectively (The Central Board of Secondary Education India, 2020, Kivunja,

2015). In the information economy of the twenty-first century, skilled project managers are in high demand.

Conclusion

The study revealed average level of preparedness among VTE students. It is crucial that educational institutions, especially those in higher learning that are directly in charge of preparing students for the workplace after graduation, give every one of their students the chance to learn these skills in addition to those from the other areas of the new learning paradigm. Giving them these skills will make them better citizens who will be able to contribute more to trade and civil life in the 21st-century digital economy, in addition to making them better educated people.

Recommendations

Based on the findings of this study, the following recommendations were made:

- i. The ministry of education at state and national should collaborate with institutions and incorporating the vocational and technical educational skills into their curricular and should be well taught to students.
- ii. Educational strategies that naturally stimulate or support the development of cross-disciplinary skills should be used by schools and teachers. Educational strategies like authentic learning, demonstrations of learning, or project-based learning tend to be cross-disciplinary in nature and it will great help the students to acquire 21st century skills that can help them succeed in life.
- iii. Teachers' roles in classrooms of the twenty-first century should change from those of the expert to those of the facilitator and the emphasis of training switches from merely knowing material to actually being able to use and apply it.
- iv. Schools should allow students to explore alternate learning paths, such as Students work experience scheme, internships, apprenticeships, or voluntary work, which they can use to gain academic credit and fulfill graduation requirements. In this scenario, students could complete academic coursework and fulfill the same learning requirements expected of them in more conventional academic courses

while simultaneously gaining a variety of practical, career-related skills and work habits.

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