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ASSESSMENT OF CURRENCY OF CURRICULAR OF AGRO-BASED TRADES FOR TEACHING AND LEARNING OF 21ST CENTURY SKILLS IN NIGERIAN TECHNICAL COLLEGES

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Abstract

Technical Colleges are educational institutions established at the post-basic education level with the aims of training and producing craftsmen for industries and educational advancement. Enrolments into Technical Colleges are trade-based. Teaching, learning and assessment leading to the award of National Technical Certificate (NTC) in Agro-based trades, including Agricultural Equipment and Implements Mechanic Work (AEIMW), Animal Husbandry (AH), and Fisheries Craft Practice (FCP) are carried out using curriculum of each trade. There are, however, increasing concerns among educators, employment agencies and economic planners over employability of graduates of Technical Colleges in Nigeria. Reports on 21st century economy indicate that the world of work is changing, requiring trainees of Technical Colleges to be equipped with 21st century skills which may not have been contained in the current curricula of the trades. This study therefore investigated the currency of curricula of some Agro-based trades for the purpose of facilitating teaching and learning of 21st century skills in the Colleges. Six research questions were answered. The study adopted quantitative research design. The population comprised all Heads of Department and employers of graduates of the trades across the country's six geo-political zones. Purposive sampling technique was used to select 98 Heads of Department and 92 Employers in each of the trades. Four questionnaires on AEIMW, AH and FCP and Employers Perception on Employees' Skills (QEPES) with Cronbach Alpha reliability coefficients of 0.85, 0.82, 0.89, and 0.80 respectively were used. Frequencies, percentages, means and standard deviation were used for data analysis. Results showed that there is a gap between the contents of the curricula of the trades and the skills needs of the industries. It concluded that the curricula of the Agro-based trades are skewed against the teaching, learning and assessment of the 21st century skills in Nigerian technical colleges. It was therefore, recommended that government, curricula developers and other relevant stakeholders should ensure that the curricula are reviewed to meet the skills needs of the 21st century industries.

KEYWORDS: *Technical Colleges, Curricula, Craftsmen, Agro-based Trade, 21st Century Skills, and Assessment.*

INTRODUCTION

Technical and Vocational Education and Training (TVET) Colleges are educational institutions established at the post-basic education level in Nigeria with the aims of training and producing craftsmen and technicians for industry and for educational advancement. There are 390 TVET colleges both public and private in Nigeria and enrolments into various trades in the TVET Colleges are for students who have completed basic education and obtained Basic Education Certificate (BEC). Each trade offered in the Colleges consists of Trade Component, Trade-Related and General Education subjects (National Business and Technical Examinations Board [NABTEB], 2021). According to the United Nations Educational and Scientific Cultural Organisation [UNESCO] (2020), TVET is considered a value-added aspect of general education that integrates technology, sciences, practical skills, attitudes, understanding, and information relating to employment in different economic and social sectors.

TVET is classified into three categories: formal, non-formal and informal TVET. Ayonmike, (2016) asserted that the formal TVET refers to organised vocational education programmes provided within an approved public or private educational or training institution and it is structured (in terms of curriculum, learning objectives and learning time) in such a way that it constitutes a continuous “ladder” where one level leads to the next and finally leads to assessment and certification. In a nutshell, formal TVET covers vocational education programmes provided within approved public and private institutions. Formal TVET below the tertiary is comprehensively offered at TVET Colleges in Nigeria. Igberadja (2015) citing Moja (2000) stated that whereas the National Board for Technical Education (NTBE) which was established by Act No. 9 of 11th January, 1977 to among others, develop and review curricula TVET institutions and colleges, the National Business and Technical Examinations Board

(NABTEB) was established vide Act 70 of 1993 to among others carry out assessment and award qualifications, based on trades of their choice to graduates of TVET colleges.

The aim of TVET is to produce skilled workers needed for economic, industrial and technological developments as well as for reduction in unemployment. It is designed to provide the population with knowledge and skills that will allow them to successfully secure and retain their jobs. Teaching, learning and assessment leading to the award of National Technical Certificate (NTC) in Agro-based trades, including Agricultural Equipment and Implements Mechanic Work (AEIMW), Animal Husbandry (AH), and Fisheries Craft Practice (FCP) are carried out using curriculum of each trade. According to NBTE (2008), the main aim for the development and review of curricula for the award of National Technical Certificate (NTC) (Craftsmanship Certificates) in Agro-based trades such as AEIMW, AH, and FCP is to give training and impart necessary skills leading to the production of certified craftsmen and other skilled personnel who will be self-reliant by virtue of their chosen trades. The NTC (craftsmanship certificate) is awarded to a students who successful completed three-year programmes in the TVET Colleges, sat and obtained sufficient credits in the examinations for the award of National Technical Certificate (NTC)/National Business Certificate (NBC) by the National Business and Technical Examinations Board (NABTEB).

TVET has always been seen as a catalyst in the national development plans of industrialised nations. Employers around the world are searching for highly qualified workers who can adapt to diverse needs of work places. This suggests that prospective workers need to go beyond obtaining specialised (vocational) knowledge for world of work and acquire generic or employability skills (GIBB, 2004). They must continuously develop knowledge and skills in other to respond to changing business activities, labour market and address unemployment

problems and good economic development. This, therefore, requires continuous development and review of teaching curricula to meet with the modern day skill requirements of the industries. According to Johanna (2010), the vocational education reforms in Nigeria were attempts to respond to the anticipated changes in the content of work, the introduction of new technologies, current reforms of occupational mobility, and the rate of change in itself which require employees who are more adaptable and able to acquire, new and applied skills and knowledge.

Common challenges facing TVET revolve around mainly on its curricula, lack of infrastructure, equipment and quality programmes and instructors. Curriculum is an inventory of activities implemented to design, organize and plan an education or training action, including definition of learning objectives, content, methods (including assessment) and material, as well as arrangements for training teachers and trainers (European Centre for Development of Vocational Training [CEDEFOP], 2011). It defines the educational foundations and contents, their sequencing in relation to the amount of time available for the learning experiences, the characteristics of the teaching institutions, the characteristics of the learning experiences, in particular from the point of view of methods to be used, the resources for learning and teaching (e.g. textbooks and new technologies), evaluation and teachers' profiles, (Braslavsky 2004). Curriculum innovation and reform is used to ensure stability and relevance in the system. As technology and the economic climate change, the curricular is changed or reformed so that education continues to be a relevant and valuable resource to firms and businesses both in the short and long run.

The TVET curriculum innovation and reform are essential in all trades including agro-based trades like Agricultural Equipments and Implement Mechanic Work, Animal Husbandry

and Fisheries Craft Practice. Agricultural sector which covers a variety of industrial, manufacturing and processing activities based on agricultural raw materials as well as activities and services that serve as input to agriculture is the most important sector in terms of employment in Nigeria; it engages about 70% of the labor force (Manggoel, Ajiji, Damar, Damiyal & Da'ar, 2012). However, Large-scale agriculture is not common in Nigeria despite abundant water supply, favourable climate, and wide areas of arable land. This scenario may be due to lack of desired 21st century skills among practitioners.

Preparing students to be career and work ready is a concern of educators and schools nation-wide and indeed across the globe. The 21st century skills prepare students to enter the work force or higher education with the ability to think critically and creatively, collaborate with others, take the initiative when approached with a task and use technology to its fullest potential. If students are not learning the skills needed for success, it is partly because the skills are not contained in the curriculum for teaching, learning and assessment or the teachers are not teaching them. When students possess these skills, they are prepared to work in teams, then think critically and creatively about a problem, displaying leadership and social skills, and communicate effectively with others and generally work efficiently in the agro-based industries. The integration of the 21st century skills in the curricular of agro-based trades and teaching of the skills to students will enhance productivity and employability of certified craftsmen and master craftsmen of Agricultural Equipments and Implement Mechanic Works, Animal Husbandry and Fisheries) in 21st century agro-based industries. The skills will equally enable them become self-reliant and function effectively as successful entrepreneurs and job creators.

Statement of the Problem

Success of a TVET institution is often tied to its graduate employability rate. Developments in technology, the economy and the labour market show that the world of work is changing requiring new set of skills from the 21st century graduates. According to the Nigerian Bureau of Statistics [NBS], (2021), the Nigeria's unemployment rate hit a new record of 33.3 per cent in fourth quarter (Q4) 2020 from 27.1% recorded in second quarter (Q2) 2020 which implies that less than 20 hours a week, making them unemployed during the fourth quarter of 2020. There is no doubt that there is an epic gap between the manpower required and that which is currently available. The high number of unemployment and underemployment has become major socio-economic challenges over the past decade; it is connected to the issue of skills development which is interlinked to the challenges of adjusting TVET policies, regulations and implementations (Echono, 2021). This calls for reforms of TVET programmes which ultimate objective is to achieve a TVET system that promotes greater employment for the graduates and efficiency in the economy and labour market. Reducing skills shortages and skills mismatches from TVET colleges' programmes through the review of contents of the curricular will facilitate alignment of teaching, learning and assessment to the needs of the economy and labour market for enhanced employability of the graduates. It is against this background, that this study was carried out to investigate the currency of curricula of Agro-Based Trades for the teaching and learning of the 21st century skills in Nigeria technical colleges.

Research Questions

1. To what extent does the curriculum of Agricultural Equipments and Implement Mechanics Work contain the 21st century skills?
2. To what extent are the employees (craftsmen) of Agricultural Equipments and Implement Mechanics Work applying 21st century skills in workplaces?

3. To what extent does the curriculum of Animal Husbandry contain the 21st century skills?
4. To what extent are the employees (craftsmen) of Animal Husbandry applying 21st century skills in workplaces?
5. To what extent does the curriculum of Fisheries Craft Practice contain the 21st century skills?
6. To what extent are the employees (craftsmen) of Fisheries Craft Practice applying 21st century skills in workplaces?

LITERATURE REVIEW

According to Bafana (2014), while citing Africa Economic Outlook Report 2013, published jointly by the African Development Bank, the Organisation for Economic Co-operation and Development and the UN Development Programme stated that the agricultural sector employs as much as 60% of Africa's labour force; yet because of low productivity, the sector accounts for only 25% of the continent's gross domestic product (GDP). Low productivity occurs when craftsmen lack the ability to create products due to lack of requisite 21st century skills. However, despite such grim statistics, the sector has huge potential. Bafana (2014) remarked that the World Bank estimates that African agriculture and agribusiness could be worth one trillion dollar by 2030. To achieve this, there may be need for improvements in revision of curriculum of agro-based trades (Agricultural Equipment and Implement Mechanic Work, Animal Husbandry and Fisheries) by integrating the 21st century skills in the core trade programmes.

A thorough review of the objectives Agro based trades' curricular indicates that NBTE curricular on Agro-based trades indicates that the curricular were not designed for the teaching, learning and assessment of 21st century skills. According to NBTE (2017), the Agricultural

equipment and implement mechanics programme is intended to produce a mechanic who should be able to diagnose faults, carryout repairs and maintenance to tractors, agricultural equipment and their implement, the trainee should also have an in-depth theoretical knowledge of its operations. In a similar vein, students of Animal Husbandry should be able to manage animals such as Pig Keeping, Poultry Raising, Cattle Production, Rabbit Keeping, Goats and Sheep Production Breeding, Health, Production, Feeding, Diseases and Pest, various types of species and their management while the curriculum for Fisheries Craft Practice (FCP) is designed to acquaint students with Warm Water Fish Species, Handling, Preservation, Processing and Marketing (NBTE, 2017). Since examination syllabuses for the trades are traditionally derived from the curricula, the teaching, learning and assessment leading to the award of NTC in the Agro-based trades do not facilitate possession of 21st century skills by learners. This has serious implication on the employability of TVET graduates (certified craftsmen) as they may not possess the skills needed in the 21st century industries and workplaces.

In a similar vein, the some Heads of departments of the trades orally interviewed on the 21st century skills content of the curricula for the Agro-based trades stated that the skills were not contained in the curricula's learning objectives. The Head of Department of Animal husbandry of Malali Technical College, Kaduna when interrogated on whether the curriculum of the trade contains 12st century skills remarked that "neither the learning objectives of the curriculum nor those of the examination syllabus developed by NABTEB for assessment and award NTC in Animal husbandry contain 21st century skills". The implication is that NTC holders in Agro-based trades possess 21st century skills since teaching, learning and assessment are anchored the curriculum. An employer of NTC holder in Agricultural Implements and Mechanic Works when interviewed on the level of possession of 21st century skills by the employee stated thus:

“He lacked communication skills, he was not security conscious, he hardly worked in teams, he was not creative, innovative, and was also not a critical thinker. He hardly solves problems without close supervision and lacked ICT literacy; so the company had no option but to train him on these skills which are 21st century skills”

Trends in the economy and labour market show that the world of work is changing; technology is currently reducing the need for workers to complete routine jobs which implies that students will need a range of skills and capabilities, including creative skills, critical thinking and problem solving skills in order to thrive in the future world (Foundation for Young Australians [FYA], 2017). At this juncture, questions that comes to mind is what skills do future generations need; have they found their ways yet into teaching and learning in schools and how can we make sure that schools are able to teach and transmit them?

Binkley, Erstad, Herman, Raizen, Ripley, Miller-Ricci, and Rumble, (2012) remarked that 21st century skills are competencies a person needs to survive in a future society which should be included in the contents of national curriculum. The emphasis is on higher level thinking skills (creative thinking, problem solving and critical thinking), communication and collaboration skills as well as tools of digital technology and digital literacy skills. Binkley, et al (2012) while developing a framework for the 21st century skills categorised them into four namely: ways of thinking (creativity, innovation, critical thinking, problem solving, decision making, earning to learn and meta-cognition), ways of working (communication, collaboration or team work), tools of thinking (information literacy and ICT literacy) and living in the world (citizenship – local and global, life career, personal and social responsibility including cultural awareness and competence).

METHODOLOGY

The study adopted a mixed method of qualitative and quantitative research design. The population comprises all Heads of Department of the agro-based trades - Agricultural Equipment and Implement Mechanics Works, Animal Husbandry and Fisheries Craft Practice in Technical Colleges in Nigeria and employers of the trades' certificate (National Technical Certificate) holders. Purposive sampling technique was used to select 98 Heads of Department and 92 employers of graduates of each of the trades across the six geo-political zones where the employers of the craftsmen constituted the respondents. The research instruments – Questionnaire on Agricultural Equipment and Implement Mechanics Work (QAEIMW) Animal Husbandry (QAH) and Fisheries Craft Practice (QFCP) solicited Heads of Departments perception on the 21st century skills content of trades' curricula while the questionnaire - QEPES solicited the employers' perception of the employees' (craftsmen's) application of the 21st century skills in their work places. The questionnaire for the Head of Department were categorised into three sections (Section I-III): Section I is Bio-data of the focus group, Section II dealt with perception of Heads of Department on 21st Century Skills' Contents of trades' curricula while section III is open ended items. Similarly, the questionnaire on perception of employers on employees (craftsmen) application 21st century skills in workplaces consisted of four sections (I –IV). Section I is Bio-data of the focus group, Section II is categories of agro-based trades, section III dealt with perception of employers on employees' (craftsmen's) application of 21st century skills in workplaces while section IV is open ended items. The questionnaires are faced validated by experts and possible corrections were made. The reliability coefficient of 0.80, 0.82, 0.89 and 0.80 were obtained using Cronbach Alpha for QAEIMW, QAH, QFCP and QEPES respectively. Questionnaires were administered and collected by

researchers. The data were analysed using frequency, mean and standard deviation. The decision that a 21st century skill is contained or not contained in the trade's curriculum is based on the mean value of 2.5 on the content of each skill on the curriculum. Similarly, the decision that an employee possesses or does not possess any of the 21st century skills is based on mean value of 2.5 on employer's perception on the employee's possession of the skills.

Results

Research Question 1: To what extent does the curriculum of Agricultural Equipments and Implement Mechanics Work contain the 21st century skills?

Table 1: AEIMW curriculum contents of 21st century skills

S/N	21 st century skills	GE (%)	ME (%)	LE (%)	NA (%)	Mean	SD	Decision
1	Creativity	0(0.0)	30(60.0)	18(36.0)	2(4.0)	2.56	0.75	Contained
2	Innovation	0(0.0)	30(60.0)	18(36.0)	2(4.0)	2.56	0.84	Contained
3	Critical Thinking	0(0.0)	30(60.0)	18(36.0)	2(4.0)	2.56	0.71	Contained
4	Problem Solving	0(0.0)	38(76.0)	12(24.0)	0(0.0)	2.76	0.76	Contained
5	Decision Making	0(0.0)	32(64.0)	10(20.0)	8(16.0)	2.50	0.84	Contained
6	Earning to Learn	0(0.0)	30(60.0)	20(40.0)	0(0.0)	2.60	0.64	Contained
7	Meta-Cognition	0(0.0)	30(60.0)	18(36.0)	2(4.0)	2.56	0.78	Contained
8	Communication	0(0.0)	32(64.0)	10(20.0)	8(16.0)	2.50	0.84	Contained
9	Collaboration	8(16.0)	30(60.0)	0(0.0)	12(24.0)	2.68	0.86	Contained
10	Team Work	0(0.0)	38(76.0)	0(0.0)	12(24.0)	2.52	0.92	Contained
11	Information Literacy	0(0.0)	38(76.0)	2(4.0)	10(20.0)	2.56	0.80	Contained
12	ICT Literacy	8(16.0)	32(64.0)	0(0.0)	10(20.0)	2.76	0.97	Contained
13	Citizenship	0(0.0)	38(76.0)	2(4.0)	10(20.0)	2.56	0.95	Contained
14	Life Career	0(0.0)	38(76.0)	0(0.0)	12(24.0)	2.52	0.91	Contained
15	Personal Responsibility	0(0.0)	30(60.0)	10(20.0)	10(20.0)	2.40	0.88	NC
16	Social Responsibility	0(0.0)	30(60.0)	10(20.0)	10(20.0)	2.40	0.87	NC
17	Cultural	0(0.0)	32(64.0)	8(16.0)	10(20.0)	2.44	0.72	NC
18	Awareness	0(0.0)	30(60.0)	2(4.0)	18(36.0)	2.24	0.83	NC
19	Competence	0(0.0)	38(76.0)	0(0.0)	12(24.0)	2.52	0.92	Contained

As presented in Table 1, the result shows that Agricultural Equipment and Implement Mechanics Work Curriculum contains 15 of the 21st century skill representing 78.95% while of the while 4 of the skills representing 21.05% are not contained in the trade's curriculum.

Research Question 2: To what extent are the employees (craftsmen) of Agricultural Equipments and Implement Mechanics Work applying 21st century skills in workplaces?

Table 2: Employees of AEIMW application of 21st century skill in workplaces

S/N	21 st century skills	GE (%)	ME (%)	LE (%)	NA (%)	Mean	SD	Decision
1	Creativity	0(0.0)	0(0.0)	12(50)	12(50)	1.50	0.51	Not Apply
2	Innovation	0(0.0)	0(0.0)	20(83.3)	4(16.7)	1.83	0.38	Don't Apply
3	Critical Thinking	0(0.0)	6(25.0)	6(25.0)	12(50.0)	1.75	0.84	Don't Apply
4	Problem Solving	0(0.0)	2(8.3)	11(45.8)	11(45.8)	1.63	0.64	Don't Apply
5	Decision Making	2(8.3)	4(16.7)	12(50.0)	6(25.0)	2.08	0.88	Don't Apply
6	Earning to Learn	0(0.0)	2(8.3)	12(50.0)	10(41.7)	1.67	0.63	Don't Apply
7	Meta-Cognition	0(0.0)	6(25.0)	10(41.7)	8(33.3)	1.92	0.77	Don't Apply
8	Communication	0(0.0)	4(16.7)	10(41.7)	10(41.7)	1.75	0.73	Don't Apply
9	Collaboration	0(0.0)	0(0.0)	12(50.0)	12(50.0)	1.50	0.51	Don't Apply
10	Team Work	0(0.0)	2(8.3)	7(29.2)	15(62.5)	1.46	0.65	Don't Apply
11	Information Literacy	2(8.3)	8(33.3)	6(25.0)	8(33.3)	2.17	1.00	Don't Apply
12	ICT Literacy	2(8.3)	9(37.5)	7(29.2)	6(25.0)	2.29	0.95	Don't Apply
13	Citizenship	0(0.0)	2(8.3)	12(50.0)	10(41.7)	1.67	0.63	Don't Apply
14	Life Career	0(0.0)	4(16.7)	11(45.8)	9(37.5)	1.79	0.72	Don't Apply
15	Personal Responsibility	0(0.0)	4(16.7)	14(58.3)	6(25.0)	1.92	0.65	Don't Apply
16	Social Responsibility	0(0.0)	6(25.0)	9(37.5)	9(37.5)	1.88	0.79	Don't Apply
17	Cultural	0(0.0)	0(0.0)	22(91.7)	2(8.3)	1.92	0.28	Don't Apply
18	Awareness	0(0.0)	4(16.7)	10(41.7)	10(41.7)	1.75	0.73	Don't Apply
19	Competence	0(0.0)	2(8.3)	11(45.8)	11(45.8)	1.63	0.64	Don't Apply

Table 2, shows that employees (craftsmen) of Agricultural Equipment and Implement Mechanics Work do not apply the 21st century skill in the workplaces.

Research Question 3: To what extent does the curriculum of Animal Husbandry contain the 21st century skills?

Table 3: Animal Husbandry curriculum content of 21st century skills

S/N	21 st century skills	GE (%)	ME (%)	LE (%)	NA (%)	Mean	SD	Decision
1	Creativity	0 (0.0)	0 (0.0)	8 (28.6)	20 (71.4)	1.29	0.40	NC
2	Innovation	0 (0.0)	8 (28.6)	0 (0.0)	20 (71.4)	1.57	0.92	NC
3	Critical Thinking	0 (0.0)	8 (28.6)	12 (42.9)	8 (28.6)	2.00	0.77	NC
4	Problem Solving	0 (0.0)	4 (14.3)	8 (28.0)	16 (75.1)	1.57	0.74	NC
5	Decision Making	0 (0.0)	0 (0.0)	12 (42.0)	16 (57.1)	1.43	0.50	NC
6	Earning to Learn	0 (0.0)	4 (14.3)	24 (85.7)	0 (0.0)	2.14	0.35	NC
7	Meta-Cognition	0 (0.0)	8 (28.6)	12 (42.9)	8 (28.6)	2.00	0.77	NC
8	Communication	0 (0.0)	0 (0.0)	8 (28.6)	20 (71.4)	1.29	0.46	NC
9	Collaboration	0 (0.0)	8 (28.6)	20 (71.4)	0 (0.0)	2.29	0.46	NC
10	Team Work	0 (0.0)	0 (0.0)	12 (42.9)	16 (57.1)	1.43	0.50	NC
11	Information Literacy	0 (0.0)	0 (0.0)	20 (71.4)	8 (28.6)	1.71	0.46	NC
12	ICT Literacy	0 (0.0)	0 (0.0)	20 (71.4)	8 (28.6)	1.71	0.46	NC
13	Citizenship	0 (0.0)	0 (0.0)	12 (41.9)	16 (57.1)	1.43	0.50	NC
14	Life Career	0 (0.0)	0 (0.0)	8 (28.6)	20 (71.4)	1.29	0.46	NC
15	Personal Responsibility	0 (0.0)	8 (28.6)	0 (0.0)	20 (71.4)	1.57	0.92	NC
16	Social Responsibility	0 (0.0)	0 (0.0)	8 (28.6)	20 (71.4)	1.29	0.46	NC
17	Cultural	0 (0.0)	8 (28.6)	20 (71.4)	0 (0.0)	2.29	0.46	NC
18	Awareness	0 (0.0)	0 (0.0)	24 (85.7)	4 (14.3)	1.86	0.35	NC
19	Competence	0 (0.0)	0 (0.0)	8 (28.6)	20 (71.4)	1.29	0.46	NC

Table 3, shows that Curriculum of Animal Husbandry does not contain of the 21st century skills

Research Question 4:

Table 4: Employees of animal husbandry application of 21st century skill in workplaces

S/N	21 st century skills	GE (%)	ME (%)	LE (%)	NA (%)	Mean	SD	Decision
1	Creativity	0	3 (8.3)	26 (72.2)	7 (19.4)	1.89	0.52	Don't Apply
2	Innovation	2 (5/6)	7 (19.4)	22 (61.1)	5 (13.0)	2.17	0.73	Don't Apply
3	Critical Thinking	4 (11.1)	10 (27.8)	8 (22.2)	14 (38.9)	2.11	1.06	Don't Apply
4	Problem Solving	0	11 (30.6)	16 (44.4)	9 (25.0)	2.06	0.75	Don't Apply
5	Decision Making	2 (5.6)	12 (33.3)	18 (50.0)	4 (11.1)	2.33	0.75	Don't Apply
6	Earning to Learn	0	2 (5.6)	23 (63.9)	11 (30.6)	1.75	0.55	Don't Apply
7	Meta-Cognition	4 (11.1)	8 (22.2)	20 (55.6)	4 (11.1)	2.33	0.82	Don't Apply
8	Communication	0	5 (13.7)	24 (66.7)	7 (19.4)	1.94	0.58	Don't Apply
9	Collaboration	0	4 (11.1)	21 (68.3)	11 (30.6)	1.81	0.62	Don't Apply
10	Team Work	0	4 (11.1)	13 (36.1)	19 (52.8)	1.58	0.69	Don't Apply
11	Information Literacy	6 (16.7)	9 (25.0)	10 (27.8)	11 (30.6)	2.28	1.08	Apply
12	ICT Literacy	11 (30.6)	15 (41.7)	8 (22.2)	2 (5.6)	2.97	0.87	Apply
13	Citizenship	0	10 (27.8)	19 (52.8)	7 (19.4)	2.08	0.69	Apply
14	Life Career	0	13 (38.1)	19 (52.8)	4 (11.1)	2.25	0.64	Apply
15	Personal Responsibility	0	7 (19.4)	19 (52.8)	10 (27.8)	1.92	0.69	Don't Apply
16	Social Responsibility	4 (11.1)	8 (22.2)	17 (47.2)	7 (19.4)	2.25	0.90	Apply
17	Cultural	0	3 (8.3)	23 (63.9)	10 (22.8)	1.81	0.57	Don't Apply
18	Awareness	0	8 (22.2)	13 (36.1)	15 (41.7)	1.81	0.78	Don't Apply
19	Competence	0	6 (16.7)	16 (44.4)	14 (38.9)	1.78	0.72	Don't Apply

As presented in Table 4, the result shows that employees (craftsmen) of Animal Husbandry applies only 4 of the 21st century skill representing 21.05% in the workplaces while 15 of the skills representing 78.95% were not applied by the employees in Animal Husbandry workplaces

Research Question 5: To what extent does the curriculum of Fisheries Craft Practice contain the 21st century skills?

Table 5: Fisheries Craft Practice curriculum content of 21st century skills

S/N	21 st century skills on Fisheries	GE (%)	ME (%)	LE (%)	NA (%)	Mean	SD	Decision
1	Creativity	0	2(10.0)	16(80.0)	2(10.0)	2.00	0.45	Not Contained
2	Innovation	0	0	10 (50)	10 (50)	1.50	0.51	Not Contained
3	Critical Thinking	0	10(50.0)	6(30.0)	4(20.0)	2.30	0.80	Not Contained
4	Problem Solving	0	0	16(80.0)	4(20.0)	1.80	0.41	Not Contained
5	Decision Making	0	12(60.0)	4(20.0)	4(20.0)	2.40	0.82	Not Contained
6	Earning to Learn	0	6(30.0)	4(20.0)	10(50.0)	1.80	0.89	Not Contained
7	Meta-Cognition	0	2(10.0)	8(40.0)	8(40.0)	1.90	0.96	Not Contained
8	Communication	0	4(20.0)	10(50.0)	6(30.0)	1.90	0.71	Not Contained
9	Collaboration	0	4(20.0)	12(60.0)	4(20.0)	2.00	0.64	Not Contained
10	Team Work	0	10(50.0)	2(10.0)	8(40.0)	2.10	0.96	Not Contained
11	Information Literacy	0	0	12(60.0)	8(40.0)	1.60	0.50	Not Contained
12	ICT Literacy	0	2(10.0)	6(30.0)	12(30.0)	1.50	0.68	Not Contained
13	Citizenship	4(20.0)	0	6(30.0)	10(50.0)	1.90	1.16	Not Contained

S/N	21 st century skills on Fisheries	GE (%)	ME (%)	LE (%)	NA (%)	Mean	SD	Decision
14	Life Career	0	0	8(40.0)	12(60.0)	1.40	0.50	Not Contained
15	Personal Responsibility	0	2(10.0)	12(60.0)	6(30.0)	1.80	0.61	Not Contained
16	Social Responsibility	0	2(10.0)	4(20.0)	14(70.0)	1.40	0.68	Not Contained
17	Cultural	0	2(10.0)	12(60.0)	6(30.0)	1.80	0.61	Not Contained
18	Awareness	0	6(30.0)	4(20.0)	10(50.0)	1.80	0.89	Not Contained
19	Competence	0	10(50.0)	6(30.0)	4(20.0)	2.30	0.80	Not Contained

Table 5 shows that Fisheries Craft Practice curriculum does not contain all the 21st century skills.

Research Question 6: To what extent are the employees (craftsmen) of Fisheries Craft Practice applying 21st century skills in workplaces?

Table 6: Employees of Fisheries Craft Practice application of 21st century skill in workplaces

S/N	21 st century skills	GE (%)	ME (%)	LE (%)	NA (%)	Mean	SD	Decision
1	Creativity	0 (0.0)	1 (3.1)	23 (71.9)	8 (25.0)	1.78	0.49	Not Applied
2	Innovation	0 (0.0)	5 (15.6)	20 (62.5)	7 (21.9)	1.94	0.61	Don't Apply
3	Critical Thinking	0 (0.0)	11 (34.4)	11 (34.4)	10 (31.3)	2.03	0.82	Don't Apply
4	Problem Solving	0 (0.0)	4 (12.5)	22 (68.8)	6 (18.8)	1.94	0.64	Don't Apply
5	Decision Making	0 (0.0)	6 (18.8)	20 (62.5)	6 (18.8)	2.00	0.62	Don't Apply
6	Earning to Learn	0 (0.0)	8 (25.0)	16 (50.0)	8 (25.0)	2.00	0.71	Don't Apply
7	Meta-Cognition	0 (0.0)	11 (34.4)	18 (56.3)	3 (9.4)	2.25	0.62	Don't Apply
8	Communication	0 (0.0)	2 (6.3)	19 (59.4)	11 (34.4)	1.72	0.58	Don't Apply
9	Collaboration	0 (0.0)	5 (15.6)	17 (53.1)	10 (31.3)	1.84	0.67	Don't Apply
10	Team Work	0 (0.0)	1 (3.1)	16 (50.0)	15 (46.9)	1.56	0.56	Don't Apply
11	Information Literacy	0 (0.0)	7 (21.9)	11 (34.4)	14 (43.8)	1.78	0.79	Don't Apply
12	ICT Literacy	3 (9.4)	19 (59.4)	4 (12.5)	6 (18.8)	2.59	0.91	Apply
13	Citizenship	0 (0.0)	5 (15.6)	16 (50.0)	11 (34.4)	1.81	0.69	Don't Apply
14	Life Career	0 (0.0)	5 (15.6)	24 (75.0)	3 (9.4)	2.06	0.50	Don't Apply
15	Personal Responsibility	0 (0.0)	1 (3.1)	16 (50.0)	15 (46.9)	1.56	0.56	Don't Apply
16	Social Responsibility	0 (0.0)	1 (3.1)	23 (71.9)	8 (25.0)	1.78	0.49	Don't Apply
17	Cultural	0 (0.0)	4 (12.5)	19 (59.4)	9 (28.1)	1.84	0.62	Don't Apply
18	Awareness	0 (0.0)	8 (25.0)	16 (50.0)	8 (25.0)	2.00	0.71	Don't Apply
19	Competence	0 (0.0)	2 (6.3)	18 (56.3)	12 (37.5)	1.69	0.59	Don't Apply

Table 6 shows that employees (craftsmen) of Fisheries Craft Practice apply only one of the 21st century skills, representing 5.26% in the workplaces while 18 skills representing 94.74% were not applied in the workplaces.

Discussion on Findings

The result obtained from the research questions show that the curriculum of Agricultural Equipment and Implement Mechanics Work, Animal Husbandry and Fisheries Craft Practice contain the 21st century skills to a little extent. This is in line with CEDEFOP, (2011) which

posited that skills identified for industry have not been addressed by TVET programmes to ensure capacity growth of youths to be ready for the industry. The findings were in agreement with NBTE (2017) who reported that the Curriculum of Fisheries Craft Practice (FCP) was designed to acquaint students with the general principle of agriculture particularly as it affects warm water fish species, basic design and construction of simple fish culture facilities and how to maintain them and to have the knowledge of fish handling, preservation, processing and marketing. This implies that the learning objectives of the curriculum do not contain 21st century skills; therefore trainees of the TVET colleges invariably will not possess 21st century skills. Another implication is that the 21st century skills are not integrated in the assessment and certification of trainees since the examination syllabus and training manuals were derived from the curriculum. This creates serious concern on the employability and job retention of the TVET graduates.

The results obtained from employers of NTC holders in Agricultural Equipment and Implement Mechanics Work, Animal Husbandry and Fisheries Craft Practice respectively indicated that the employees do not apply the 21st century skills in the workplaces. This concern was corroborated by an employer of NTC holder of Agricultural Implements and Mechanic Works who stated that their employee had to be trained to cope with the 21st century skills demands of their company. Binkley, Erstad, Herman, Raizen, Ripley, Miller-Ricci, and Rumble, (2012) also supported this view with the remarked that 21st century skills are competencies a person needs to survive in a future society which should be included in the contents of national curriculum. NBTE (2017) position that graduates of TVET institutions should be able to diagnose faults, carryout repairs and maintenance to tractors, agricultural equipment and their implement, the trainee should also have an in-depth theoretical knowledge of its operations are

all hard skills which in addition need 21st century skills to be able to fit into the 21st century industries. Foundation for Young Australians (FYA, 2017) that students will need a range of skills and capabilities, including creative skills, critical thinking and problem solving skills in order to thrive in the future world of work.

Conclusion

The study concluded that the curricular of agro-based trades: Agricultural Equipment and Implement Mechanics Work, Animal Husbandry and Fisheries Craft Practice do not contained most of the 21st century skills. It is also conclude that the NTC holders of the trades do not possess 21st century skills since the examination syllabuses used for teaching, learning and assessment of the trades were derived from the curricular. So, most of the employees (certified craftsmen) of agro-based trades do not apply the 21st skills in their workplaces.

Recommendations

To improve the teaching and learning of the 21st century skills in TVET institutions, the following recommendations were made:

1. Government and other relevant stakeholders should ensure that the curricula and examination syllabuses are reviewed to meet the skills needs of the 21st century industries.
2. Curricula developers should ensure that the 21st century skills should be embedded in the curricular
3. Government and relevant stakeholders should strengthen monitoring and evaluation mechanism for ensuring the effective application of 21st century skills in training centres.

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