

Achieving the effectiveness of the Students Industrial Work Experience Scheme for sustainability of the Nigerian economy

OLUSEGUN EZEKIEL ALAO¹
JEMMY BOLANLE OSANYINRO
PRISCILLA ONYINYE ALAO
University of Lagos, Lagos, Nigeria

The increasing unemployment of graduates and its consequence on society make it imperative to examine the potential of the Students Industrial Work Experience Scheme (SIWES), as a work-integrated learning program, towards sustainability. This study adopts the descriptive survey design, with relevant research questions and hypotheses. The population of the study comprised all the 166 final-year students of vocational and technology education (business education, home economics education and technology education) undergraduates in the federal university in Lagos State, Nigeria. The sample size consisted of 132 randomly selected students from this cohort. The findings of this study can be generalized for other public universities in Nigeria on the assumption that they share similar characteristics. The findings showed that the inadequacy of SIWES duration, insufficient funding and poorly matched placements were some of the impediments to its effectiveness. The recommended strategy is an urgent improvement of the SIWES program for the attainment of sustainability in Nigeria.

Keywords: SIWES, effectiveness, vocational and technology education, sustainability, Nigerian economy

RATIONALE FOR THE EFFECTIVENESS OF SIWES IN NIGERIA

The accelerating incidence of unemployment and underemployment among youth and graduates in Nigeria shows the absence of employability competences necessary for the sustainability of the Nigerian economy in the twenty-first century. The current curricula of vocational and technology education programs at tertiary level seem to disagree with the employment demands in the workplace. Osinem (2016) reported that most youths and graduates in Nigeria lack the requisite skills for productive employment. One of the important attributes of an educated person is in their ability to solve personal and societal problems in a sustainable manner. Obtaining academic and professional certificates without a corresponding competence for adding value to society will only add to the existing social, economic and environmental maladies of our society, especially for developing countries. Therefore, one of the efforts made by the government to achieve the self-reliance and full employment goals of the Nigerian economy through education, was the introduction of the Students Industrial Work Experience Scheme (SIWES) in 1973 through the Industrial Trust Fund (ITF), into the curricula and programs of tertiary education (Babalola & Tihamiyu, 2013). It was expected that the scheme would bridge the skills mismatch gap between the school and industries and bring about sustainability, particularly in vocational and technology education (VTE) in Nigeria. SIWES, as a work-integrated learning scheme, plays an indispensable role in developing sustainable entrepreneurial competences in students (Pretti et al., 2020). SIWES is a skill-oriented scheme that is embedded into the formal academic programs of sciences, engineering, and vocational and technology education departments through which tertiary institution students are enabled to learn some specific competencies needed for productive and sustainable employment and entrepreneurial undertakings directly under industry professionals, before graduation. Chukwuedo and Omofonmwan (2015) also

¹ Corresponding author: Olusegun Alao, aalao@unilag.edu.ng

attested to the viability of SIWES as a sure mechanism to attain industrial and technological advancement in the nation. Therefore, realizing the goals of SIWES and the achievement of a sustainable economy is a function of effective collaboration between technology and vocational education and training (TVET) and industry.

VOCATIONAL & TECHNOLOGY EDUCATION AS A SOLUTION TO YOUTH UNEMPLOYMENT

UNESCO (2016) reveals that there is need for at least 475 million new jobs to be created to cater for the 73 million unemployed youth as well as 40 million annual entrants to the labor market in the world. Out of the number of youths that are employed, about 1.44 billion are engaging in vulnerable employment devoid of decent work. In order to respond to this identified and anticipated employment needs, UNESCO (2016) recognizes the indispensability of vocational and technology education to the creation of jobs and achievement of poverty eradication, decent work and entrepreneurship, as well as sustainable economic growth and development in any nation. Vocational and technology education (VTE) is practically-oriented programs in tertiary institutions under the faculty of education, that prepare learners for employability and self-employment through inculcation of requisite competences as the learners are exposed to balanced academic and industrial experiences (Audu et al., 2013, p. 1). SIWES is one of the major avenues for such academic versus industrial synergy in VTE program. SIWES is a mechanism through which the manpower needed for the economic, social and environmental transformation of the nation's economy is being trained. The essence of SIWES in vocational and technology education programs is to develop requisite competences that empower the learners towards attaining self-reliance. However, there are several obstacles and challenges hindering the ideal implementation of the SIWES program in Nigeria.

The Challenges of the Students Industrial Work Experience Scheme in Nigeria

Atakpa (2017) mentions several challenges encountered by students during SIWES including:

- the problem of poorly matched placement,
- frequent rejection of students by employer,
- little or no financial motivation for the exercise by the government or its agencies,
- employers' refusal to allow SIWES students to use the equipment at work for the fear of damaging them.
- poor supervision of students,
- unethical attitudes of students while on SIWES,
- lack of necessary tools to effectively implement SIWES at school, and
- failure of the institutions to handover job specifications of SIWES students to industry-based supervisors.

Ogbuanya et al. (2018) also mentioned some of the challenges of SIWES as: difficulty in getting a rightful organization for the exercise; lack of adequate financial motivation for students and supervisors; and inadequate training facilities, and so on. Similarly, Ogbuanya and Osuyi (n.d.) found out through their study on how SIWES was being implemented at technical colleges in Edo State, Nigeria, that there were a lot of deficiencies in the implementation of the SIWES program. This finding, therefore, led to their suggestion of alternative measures to SIWES at technical colleges in Nigeria, for better empowerment of graduates for sustainability of society. Agbonghale and Iserameiya (2017) also found that most students did their SIWES in organizations that contribute little or nothing to their entrepreneurial skills empowerment. Pitan (2016) identifies factors that hinder Nigerian graduates from being employable. Some of the factors identified are: obsolete and overloaded curricula; lack of adequate and quality

facilities for teaching and learning; lack of synergy between the school and the workplace; disparity in the employability competences views of the students and the employers; insufficient exposure of students during SIWES; students' poor attitudes to entrepreneurial skills acquisition, and lots more. The competences gaps have been responsible for the inability of vocational and technology education students to be qualified for lucrative and productive employment opportunities in the twenty-first century (Audu et al., 2013).

STRATEGIES FOR ACHIEVING THE EFFECTIVENESS OF SIWES IN VTE PROGRAMS

The management of the SIWES program needs to be revisited if Nigeria is to cease producing the work force of yesterday, instead of the work force of the future. Effort should be made by tertiary institutions' management to collaborate with industries, so that students can be up-to-date in their use of office equipment rather than learning through obsolete equipment that has no relevance in the twenty-first century world of work (Ogbuanya et al., 2018).

The Need for Collaboration among Institutions Industries and Communities During SIWES

It is also necessary for mutual collaboration to exist among the higher institutions (vocational and technology education departments), the industrial world, and the funding body (Industrial Trust Fund) in order to achieve the effectiveness of SIWES, and greatly promote the sustainability of our economy (Usman & Tasmin, 2015). However, the level of partnership and exposure that SIWES allows, coupled with the relevance of vocational and technology curricula, will determine the achievement of its aims and objectives. Fleming et al. (2018) also reinforced the notion that SIWES, as a work-integrated learning scheme, can only promote sustainability in society if there is a strong and mutual relationship among the institutions, communities and industries in such a manner that communication, commitment and compatibility, would be given utmost priority throughout the process of the relationships. Olorunnisola (2014) also exemplifies the necessity of collaboration between institutions and professionals in the workplace. Achieving the effectiveness of SIWES at tertiary education level is anchored on strategies such as ensuring both internal and external quality assurance, training of teachers, adequate funding, and the adequacy of training equipment and facilities.

Atakpa (2017) also suggests some strategies for achieving the effectiveness of SIWES as follows:

- improving the process and assessment strategies of SIWES, especially in vocational and technology education curriculum of tertiary institutions, to reflect the content and pedagogical approaches of the twenty-first century workplace competences,
- sufficient and practical-based assessment from both the institution-based and industry-based supervisors,
- there should be a ready-made job specification available to each industry-based supervisor to guide them on the training skills the SIWES students must be exposed to,
- collaboration between industries and the tertiary institutions should be strengthened through active and continuous involvement of industries in the training of students during SIWES,
- SIWES should be extended to a reasonable period in order to give room for adequate training and acquisition of skills required for productive employment, and
- enough capital should be expended on the implementation of SIWES both within and outside the institutions.

Achieving the effectiveness of a work-integrated learning scheme such as SIWES requires practical demonstration of certain professional development attributes in the implementation process. Some of

these professional attributes and needs highlighted by Zegwaard et al. (2019), were engaging with industry/workplaces, enabling effective student reflection, evaluation of the impact of the program, and the best way to match students to workplaces, among others. The professional needs and attributes highlighted by Zegwaard et al. (2019) rightly portray the indispensable practices that must constantly characterize the practices of SIWES towards sustainability particularly in Nigerian tertiary institutions. Usman and Tasmin (2015) also recommended that SIWES should be reviewed to practically produce entrepreneurial skills that can empower the vocational and technology undergraduates for job creation, poverty eradication, economic and social transformation of the nation. Pedagogical strategies and SIWES procedures should promote lifelong learning and training in order to achieve the sustainable development of our economy. The development of entrepreneurial intentions and behavior should be clearly evident among the products of an effective SIWES program in order to ascertain the recipients' actual empowerment level for innovative job creation (Usman & Tasmin, 2015). Ayonmike and Okeke (2016) also discussed the need for strong and continuing partnerships between industries and institutions of learning, in order to bridge the skills gap and to reduce the increasing unemployment problem that pervades society today. Ikechukwu (2016) declared that SIWES processes should be restructured so that the Industrial Trust Fund (ITF) enforces policy that guarantees appropriate posting of students to organizations with full assurance of acceptance.

Ogbuanya et al. (2018) suggest the following strategies for achieving effectiveness of SIWES in VTE programs:

- institutions and industries should collaborate to ensure students are placed in appropriate places for SIWES,
- there should be financial motivation for both the students and institutions supervisors, and
- financial support should be given to students who show the intention and capacity to establish laudable business enterprises.

UNESCO (2016) highlighted strategies such as provision of adequate funding, curriculum reformation, quality assurance, professional development of teachers, constant monitoring and effective evaluation, provision of workplace training and collaboration for capacity building, and creation of business incubators beneficial for achieving the effectiveness of SIWES and the sustainability of the economy. Another important strategy that can achieve the effectiveness of SIWES is to make vocational and technology education easily accessible and highly responsive in order to empower the vulnerable in society. The VTE programs, through SIWES, should create avenues to reach the vulnerable in communities, through capacity building programs that will empower the vulnerable to become catalysts and agents of transformation in society. Realizing this feat will demand strong collaboration between the Industrial Trust Fund, VTE students and teachers, school/institution management, the community, the government, and non-governmental organizations in society. Such an empowering program should be integrated in SIWES, and made compulsory for TVET students, while the students should be assessed based on their contribution and the impact of the program on recipients in the communities. This empowering program could complement the existing SIWES programs that fail to contribute directly to the social, economic and environmental wellbeing of people in the communities. If this initiative is approved and implemented accordingly, VTE programs through SIWES, will contribute substantially to the achievement of sustainability in the Nigerian economy, as well as other developing countries in the world.

Another strategy for achieving the effectiveness of SIWES in VTE programs for the sustainability of the Nigerian economy, is focusing students' career and employment opportunities on green jobs and

digital technologies during SIWES. Choosing these new and emerging career paths would increase employment opportunities in the nation and, particularly, for VTE students to meet the current and future economic, social and environmental demands of the twenty-first century (UNESCO, 2016).

Audu et al. (2013) suggested collaboration with industries and ongoing organization of workshops and seminars, as strategies to bridge the knowledge and competences gaps. The essence of SIWES is to bridge the gaps between theory and practice through the inculcation of sustainable business and enterprise skills. SIWES should expose students to opportunities to experience real-life job experiences while in school. However, Ibegbulam et al. (2017) came up with the research findings that SIWES failed to impart twenty-first century competences to students due to insufficient modern equipment and infrastructure in most of the organizations. Oviawe et al. (2017) discovered that technology education students were not fully exposed to twenty-first century competences through ongoing collaboration with industries. The SIWES exposure, apart from being haphazardly implemented, is also not enough to prepare students for the current and future challenges of employment and technological advancement in the 21st century. Olumese and Edigbonya (2016) reported that business education students' skills acquisition through SIWES was great, but the scheme was not well funded in the Edo and Delta States of Nigeria. Ideally, the curriculum of vocational and technology education should constantly reflect and incorporate twenty-first century competences, which are attainable through SIWES. Pitan (2016, p. 5) lays emphasis on the need for the effectiveness of SIWES to impart generic skills, emotional intelligence, self-awareness, and other employability competences to students. Irukaku (2018, p. 202) also added competences such as problem-solving skills, creativity skills, communication skills, collaboration skills, flexibility, and critical thinking skills, as part of the sustainable competences expected to be demonstrated by SIWES students.

Focus of the Study

Vocational and technology education is believed to be a panacea for diverse social, economic and environmental problems as well as an instrument par excellence to achieve the United Nations Sustainable Development Goals (SDGs) 2030 (United Nations, n.d.). The increasing evidence of lack of employability competences and low entrepreneurial capability among youths and graduates of vocational and technology education poses serious concerns to stakeholders in the education system (Ibegbulam et al., 2017; Pitan, 2016; Usman & Tasmin, 2015). This unemployment and underemployment situation of youth and graduates has brought many social crises into Nigeria, such as kidnapping, armed robbery, hooliganism, prostitution, and other demeaning employment that lower graduates' self-esteem and suppress them below the poverty line. Since SIWES is meant to empower students with necessary employability and self-employment competences for the sustainability of the economy, there is an urgent need to examine whether the ideal implementation of SIWES has been compromised, especially VTE programs at university level, in Lagos State, Nigeria.

Research Questions

1. What is the perception of university students on the adequacy of SIWES duration in VTE university programs for sustainability of the Nigerian economy?
2. What are the challenges encountered by university students during SIWES that impede its effectiveness in VTE programs in Lagos State, Nigeria?
3. What strategies are needed for achieving effectiveness of SIWES in VTE university programs to promote sustainability of the Nigerian economy?

METHOD

The research design adopted for the study was a case study, since it was limited to the federal university in Lagos State, Nigeria. The population of the study comprised all the 166 vocational and technology education (i.e. business education, technology education, home economics and economics) final-year students of the University of Lagos, Nigeria. The sample size consisted of 132 (approximately 80% of the population) of these vocational and technology education final-year students. Purposive and random sampling techniques were used to select the programs under vocational and technology education and students of each program respectively. The research instrument was mainly a questionnaire, which was developed by the researcher and the questions items were formulated from the reviewed literature. Some experts in the fields of vocational education and measurement and evaluation validated the research instrument. Having obtained the ethical approval to carry out this study from the Heads of Units and the Departments, the researchers were granted permission to administer the questionnaires to the respondents in their various departments. While the majority were returned immediately, some were returned later by the lecturers, who had also assisted in the administration of the research instrument to the respondents. The internal consistency of the research instrument was determined using the Cronbach Alpha correlation coefficient and it yielded an average index of 0.82, which suggests that the reliability of the instrument was good. The statistical tools that were used for this study were mean, frequency count, and standard deviation, while t-test and analysis of variance (ANOVA) statistical tools were used to test the research null hypotheses at 0.05 level of significance, at relevant degrees of freedom using Statistical Package for Social Sciences (SPSS). The decision rule was based on any calculated mean scores, in a four rating scale, such as 3.5 and above is for "strongly agree"; 2.5-3.49 is for "agree"; 1.5-2.49 is for "disagree"; while below 1.5 is for "strongly disagree". Further, the value (p) was used in taking the decisions on the hypotheses. If the p-value is less than or equal to 0.05, the null hypothesis is not retained, but if the p-value is greater than 0.05, the null hypothesis is retained.

RESULTS

As shown in Table 1, the majority of student respondents (least $\bar{x} = 3.05 > 2.50$) indicated that the duration of SIWES, which is currently a maximum period of six months in the VTE programs at university level, should be extended to a year, in order to acquire adequate industrial entrepreneurial competences and experience for sustainability. However, a majority of the student respondents (Item 1: $\bar{x} = 2.61 > 2.50$) still agreed that the period allotted for SIWES was adequate.

TABLE 1: Perception of university students on the adequacy of SIWES duration in VTE university programs for sustainability of the Nigerian economy.

S/N	Statement	Mean	Remark
1	The period allotted for SIWES is adequate.	2.61	Agreed
2	SIWES is an indispensable/integral aspect of VTE, therefore, adequate time should be allotted to it.	3.11	Agreed
3	The indispensability of SIWES to VTE should compel the school authority and government to make it a year industrial experience.	3.11	Agreed

As shown in Table 2 there were diverse challenges encountered by students of vocational and technology education in the sampled university during SIWES. Several stakeholders such as the

Industrial Trust Fund (ITF), Employers at SIWES Organizations, and the SIWES Office at the University, failed to support students either financially or morally, where necessary, during SIWES [Item 4: $\bar{x} = 3.04 > 2.50$]; and (Item 5: Yes(58.3%); Item 6: Yes, 109(82.6) in Table 2]. However, a minority of the student respondents (Item 3: $\bar{x} = 2.30 < 2.50$) disagreed that their SIWES organizations were not relevant to their course of study.

TABLE 2: Challenges encountered by university students during SIWES that impede its effectiveness in VTE programs in Lagos State, Nigeria.

S/N	Statement	Mean	Remark
1	I found it difficult to get a befitting placement for my SIWES.	3.08	Agreed
2	Transport fare to and from my SIWES venue was a challenge to me	3.20	Agreed
3	Where I eventually did my SIWES was not very relevant to my course of study.	2.30	Disagreed
4	The money I was given by my employer during SIWES was below my expectation.	3.04	Agreed
		YES(%)	NO(%)
5	I was not given any money by my employer during the SIWES.	77(58.3)	55(41.7)
6	I was not given any money by ITF after my SIWES.	109(82.6)	23(17.4)

The results shown in Table 3 revealed there are certain strategies that a majority of student respondents agreed upon, that should be employed in the SIWES program for the sustainability of VTE at university and tertiary institutions in general. Some of these strategies are assisting students to secure relevant places for SIWES (Item 1: $\bar{x} = 3.63$); financial aid should be made available for SIWES students (Item 2: $\bar{x} = 3.64$; Item 4: $\bar{x} = 3.60$); and the extension of SIWES duration to a year in order for the adequate acquisition of entrepreneurial and workplace competences (Item 3: $\bar{x} = 3.36$).

TABLE 3: Strategies needed for achieving effectiveness of SIWES in VTE university programs to promote sustainability of the Nigerian economy.

S/N	SIWES Strategies for Sustainable VTE	Mean	Remark
1	The school should assist students to secure befitting places for SIWES.	3.63	Strongly Agreed
2	Some money should be paid to all SIWES students to ease their transportation burden.	3.64	Strongly Agreed
3	The duration of the SIWES should be extended to a year for intensive and comprehensive acquisition of entrepreneurial skills and experiences.	3.36	Agreed
4	Employers should be encouraged to support all SIWES students financially.	3.60	Strongly Agreed
5	ITF office should be encouraged to pay all SIWES students	3.60	Strongly Agreed

An independent-samples t-test was run on a random sample of 132 to determine if there was a mean difference in the perception of vocational education ($\bar{x} = 8.24$, Sd = 2.06) and technology education ($\bar{x} = 7.89$, Sd = 2.21) on the adequacy of SIWES duration in Lagos State. As shown in Table 4, the results were found to be non-significant ($t = 0.90$, $df = 130$, $p > 0.05$) as the Sig value of 0.37 was greater than 0.05 level of significance. Therefore, the null hypothesis was not rejected. This implies that both

vocational and technology education students share similar views on the adequacy of SIWES duration in Lagos State.

TABLE 4: The perception of vocational and technology education university students on the adequacy of SIWES duration for sustainability in Lagos State.

Students	N	Mean	Sd	df	Md	t	Sig	Decision
Vocational education	88	8.24	2.06	130	0.35	0.90	0.37	NS
Technology education	44	7.89	2.21					

Md= Mean difference; NS = Not Significant when $p > 0.05$

The result presented in Table 5 shows that business education students have the lowest perceived entrepreneurial intention ($\bar{x} = 12.18$, $Sd = 3.53$) followed by home economics education students ($\bar{x} = 12.23$, $Sd = 3.33$) while technological education students ($\bar{x} = 12.34$, $Sd = 3.40$) have the highest perception. Hence, analysis of variance was run to determine if there is significant difference in the perception of business education, technology education and home economics education university students on the challenges encountered during SIWES. This is shown in Table 6.

TABLE 5: Descriptive statistics for perception of business education, technology education and home economics education university students on the challenges encountered during SIWES.

	N	Mean	Sd
Business Education	40	12.18	3.53
Technological Education	44	12.34	3.40
Home Economics Education	48	12.23	3.33
Total	132	12.25	3.39

TABLE 6: Analysis of variance for difference in the perception of business education, technology education and home economics education university students on the challenges encountered during SIWES.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.609	2	.305	.026	.974
Within Groups	1506.141	129	11.676		
Total	1506.750	131			

Analysis of variance was run on a random sample of 132 to determine if there was a mean difference in the perception of business education, technology education and home economics education university students on the challenges encountered during SIWES. The difference was not significant ($F = 0.26$, $df = 2, 129 \text{ \& } 131$, $p > 0.05$) as the Sig value of 0.97 was higher than the 0.05 level of significance. Thus, the null hypothesis was not rejected. This implies business education; technology education and home economics education university students shared the same challenges in the course of their SIWES program.

DISCUSSION

Inadequacy of the Period Allotted for SIWES Programs and the Need for Extension

The findings in this study describe the current situation concerning the effectiveness of SIWES in vocational and technology education (VTE) of the sampled federal university in Nigeria. The results of the study as presented in Table 1, show the inadequacy of the period allotted for the SIWES program and the need for its extension to a year's duration, to facilitate the proper acquisition of requisite competences, and the positioning of the VTE program for sustainability in the sampled institution (least $\bar{x} = 3.05 > 2.50$). This finding corroborates that of Atakpa (2017) and Ogbuanya and Osuyi (n.d.) who also discovered that the period of six months allotted for the SIWES program was not enough if VTE is to contribute productively to the sustainability of the Nigerian economy. Surprisingly, more than the average number of respondents (Item 1: $\bar{x} = 2.61 > 2.50$) still agreed that the six months allotted for SIWES is adequate in the VTE programs of the sampled institution. The reason for this expression of student responses could be because of the challenges and inconveniences students encountered during SIWES (see Table 2) which they would not want to continue to experience for a year. In a 4-year undergraduate program in vocational and technology education, allowing only 6 months duration for SIWES cannot adequately provide students with the necessary industrial exposure and entrepreneurial involvement for the achievement of the United Nations Sustainable Development Goals (SDGs 2030). Attaining the sustainability of the Nigerian economy also demands that innovative practices of empowering the vulnerable in the community should be integrated in the existing SIWES. This would improve the potential of SIWES as a work-integrated learning program to substantially contribute to nation building and the sustainable development of Nigeria. Therefore, it is advisable that the Government extend the duration of SIWES in vocational and technology education at universities to a full-year in order to prepare students adequately towards sustainability.

Challenges of Effectiveness of Students Industrial Work Experience Scheme in VTE

The results of the study as presented in Table 2 show a clearer picture of the challenges that inhibit the effectiveness of SIWES in vocational and technology education programs in contributing towards sustainability of the Nigerian economy in the sampled institution. Students found it difficult to get a relevant placement for their SIWES, because the SIWES office in the sampled institution, as well as the ITF office, failed to properly assist them into an appropriate posting (Item 1: $\bar{x} = 3.08$). Students on SIWES were not adequately supported, either financially or non-financially. The majority of the students were also not supported with adequate funding to cater for their expenses and upkeep during SIWES (Item 2: $\bar{x} = 3.20$; Item 4: $\bar{x} = 3.04$; Item 5: $\bar{x} = 2.84$; Item 6: $\bar{x} = 3.30$). The findings of Olumese and Edidiagbonya (2016) and Ogbuanya et al. (2018) corroborate these findings. A hungry student cannot learn effectively during a critical period when they are supposed to acquire industrial skills and competences for sustainable development. Therefore, there is a need for a major improvement or modification of the SIWES program in VTE at tertiary institutions if it is to fulfil its mandate in society. Even though the minority of student respondents (Item 3: $\bar{x} = 2.30 < 2.50$) disagreed on the relevance of their SIWES organizations, lack of proper guidance from the necessary stakeholders could limit their proper understanding on the appropriateness of their SIWES organizations. The challenges faced by students on SIWES as revealed in this study could be resolved through the mutual collaboration and commitment of all the stakeholders. The Industrial Trust Fund (ITF) should provide adequate funding for all students to enhance their productive contribution and optimum entrepreneurial achievement during SIWES. Management in-charge of the SIWES programs at tertiary institutions should embark on rigorous pre-SIWES collaboration with industries in order to render prompt assistance to students

who find it difficult to secure an appropriate placement for SIWES. Industry-based employers must endeavor to support students with financial reward, and expose them to adequate experiences, in order to empower them for sustainability in this twenty-first century era.

Strategies for Promoting the Effectiveness of SIWES in VTE at Tertiary Institutions

The findings of the study as shown in Table 3 indicate the strategies necessary for promoting the effectiveness of SIWES as a work-integrated learning program in vocational and technology education at tertiary institutions. Relevant stakeholders such as the Industrial Trust Fund (ITF) and industry-based employers should be required to support students financially during SIWES for them to fully acquire the requisite industrial experience with less stress and distraction (Item 2: $\bar{x} = 3.64$; Item 4: $\bar{x} = 3.60$). The majority of the student respondents (Item 3: $\bar{x} = 3.36$) also agreed that the duration of SIWES should be extended to a year for intensive and comprehensive acquisition of entrepreneurial skills and experiences. University management in-charge of SIWES programs should be instructed to assist students to secure an appropriate placement for SIWES (Item 1: $\bar{x} = 3.63$). The findings of Ikehukwu (2016), Usman and Tasmin (2015) and UNESCO (2016) also agreed with this finding on the need to restructure SIWES to enhance financial motivation, appropriate posting, and empowerment for sustainable development of society. It is therefore necessary, in the pursuit of vocational and technology education towards sustainability of the Nigerian economy, for students to carry out some of their SIWES training with non-governmental organizations (NGOs) that empower the vulnerable in communities, through green entrepreneurship, social entrepreneurship, and digital technologies. These forms of training will empower VTE students to become sustainability citizens. That is, citizens who are economically, socially and environmentally knowledgeable, skilled and competent to contribute productively to the achievement of the United Nations SDGs 2030 in the twenty-first century. Students of vocational and technology education at tertiary institutions should always make a conscientious effort, through proper attitudes to learning, before, during and after SIWES, to become sustainability citizens who can adequately contribute to the economic, social and environmental development of society.

Further, the results shown in Table 4 ($p = 0.37 > 0.05$) revealed that there was no significant difference between the perception of vocational or technology education university students on the adequacy of SIWES duration. In other words, both the vocational and technology education students in the sampled institution had similar views on the adequacy of SIWES duration. In addition, the findings presented in Table 5 and Table 6 ($p = 0.97 > 0.05$) showed that there was no significant difference in the perceptions of business education, technology education and home economics education students on the challenges encountered during SIWES, that impede its effectiveness in the VTE programs of the sampled institution. This means that all student respondents from the three areas of specialization encountered similar challenges during SIWES. This further proves the generality of the challenges and the need to adopt similar strategies across the areas of specialization in VTE to improve the SIWES program for the attainment of the sustainability of the Nigerian economy.

CONCLUSION

This study has discovered the need for major improvement or modification of the Students Industrial Work Experience Scheme (SIWES) to enhance its effectiveness in vocational and technology education programs of the sampled federal university in Nigeria. The study also concluded that the duration of SIWES is not long enough for the adequate empowerment of VTE students towards the sustainability of the economy. In addition, the relevant stakeholders such as the Industrial Trust Fund (ITF),

management in-charge of SIWES in the sampled institution, and industry-based SIWES employers have not supported VTE students with enough funds and appropriate placements to reduce unnecessary stress, and to enhance the optimum achievement of industrial-based experiences and entrepreneurial empowerment during SIWES. It is therefore recommended that all the stakeholders of SIWES in vocational and technology education programs at tertiary institutions should strengthen their commitments and responsibilities to achieve the ultimate goals of SIWES and the sustainability of the Nigerian economy.

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