Shodh Sari-An International Multidisciplinary Journal

@2024 International Council for Education Research and Training 2024, Vol. 03, Issue 02, 417-437
ISSN: 2959-1376 DOI: https://doi.org/10.59231/SARI7711

INDUSTRY-ACADEMIC PARTNERSHIP AND ITS IMPACTS ON SPECIALIZED EDUCATION IN SOUTHWEST NIGERIA

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Abstract

The inseparable needs for close collaboration between institutions offering mechanical technology education and allied industries was the focus of the study. Occupationally, contents of courses offered in this field and similar other are supposed to be industry-derived and society needs-compliant. This has for some time, not been seen to be so, and has therefore, created some input-output deficits that have not only affected students' performance and society benefits, but have significantly affected students' enrolments into the programmes negatively. Two research questions and two research hypotheses were raised to guide this study. Survey design using structured research instruments were developed by the researchers on collaboration between academic institutions and industries. Population of this study will be 50 Lecturers in Mechanical and Automobile Technology drawn from Universities, Polytechnics and Colleges of Education in the Southwest, Nigeria, alongside 42 industry practicing experts in the same fields were involved in this study. Research questions were answered with Mean and Standard Deviation while t-test was used for the hypotheses. Based on the emanating outcomes of the analysis and discussions followed, it was recommended that functional channels of communication should be opened between academia and industry for meaningful interaction, make partnership an occupational policy and constantly share resources among others.

Keywords: Partnership, specialized education, collaborative initiative, Mechanical Technology.

@2024 International Council for Education Research and Training
ISSN: 2959-1376
2024, Vol. 03, Issue 02, 417-437
DOI: https://doi.org/10.59231/SARI7711

INTRODUCTION

Human life is tied to various enabling dynamics which are subject to periodic physical, scientific, socio-economic or political emergencies. These are apart from any known challenges that human race may be currently experiencing and both of which constitute some existential problems. Since such existential problems are not desirable realities in a man's life, there is always the need to find solutions to mitigate, if not completely eradicated, their negative consequences for man to have a conducive atmosphere to live within. Therefore, the best solution to such problems emanates from education. According to the New Thesaurus Advanced English Dictionary (2019), education is a process of learning and training, instruction as imparted in schools, colleges or universities, a course or type of instruction, theory and practice of teaching. Also, Ajao (2023) reported that education is a learning process which results in change in behavior that enables man to legibly take some actions or make some decisions that bother on society's development, human convenience and environmental sustenance which hitherto he was not able to do prior to teaching/learning process. Therefore, the main essence of education is to enlighten man to a level where ignorance and illiteracy in particular subject areas will be reduced to the barest minimum if not completely eradicated. This occurs when there is positive change in behavior of a learner after undergoing a learning process. In support of the foregoing statements, UNESCO (2015) described Technical Vocational Education and Training (TVET) as a new holistic, humanistic and sustainable developmental approach that comprises education, training and skills development relating to a wide range of occupational fields, production, services and livelihood and which is part of the lifelong learning continuum. This type of learning is a specialized form of education. There are many types of specialized education programmes in the Nigerian Colleges of Education, Polytechnics and Universities, one of these education areas is Mechanical Technology. Mechanical Technology Education is one of the TVET programmes offered in the Nigerian Polytechnics, Colleges of Technology, Colleges of Education and Universities.

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ISSN: 2959-1376
2024, Vol. 03, Issue 02, 417-437
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The National Policy on Education (FGN, 2014) stated the objectives of TVET as to provide trained manpower in applied science, technology and commerce, particularly at sub – professional levels; provide technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development; provide people who can apply scientific knowledge to the improvement and solution of environmental problems for use and convenience of man among others. Also, Oviawe (2022) averred that the success of TVET students in their quests for skills competences largely depends on the human and material facilities provided for teaching and learning at school level as well as quality of industry experience which the students are supervised to acquire in the course of their studies.

However, it may be difficult for the students in this category of learning to achieve the stated objectives as a result of either complete lack of requisite industry training or porously arranged one where industry training students are posted loosely; not supervised, posted to irrelevant organizations or just awarded the necessary academic credits not actually earned through the required supervised industry works experience (SIWES) (Umaru, 2016). (UNESCO-LASG, 2012). UNESCO had outlined the central objectives of TVET to include; promoting reform of TVET systems and policy dialogue among UNESCO members; Improving the quality of TVET programmes through the diversification of contents and methods; establishing monitoring strategies; and providing vocational skills development through requisite industry work experience to reach and empower the marginalized population.

Whereas, UNESCO (2001) defined TVET as a comprehensive term referring to those aspects of the educational process in addition to general education, "the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life", UNESCO (2015) described TVET "as a new holistic, humanistic and sustainable developmental approach that comprised education, training and skills development relating to a wide range of

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occupational fields, production, services and livelihood" and which is part of the lifelong learning continuum., learning achievement of Mechanical Technology programmes as a component of TVET in most Nigerian institutions is a far cry from expectation. These objectives were to be further domesticated with real needs of individual locality to ensure conformity with community needs by empowering willing individuals, reduce the increasing unemployment rate, raise community and industrial production and improve the living standard of citizens while also ensuring global quality standard.

Uwameiye (2010) stated some of the problems impeding the growth of TVET programmes in Nigeria, even from pre-vocational level to include; take-off problems, inadequate funding, inadequate technical teachers, lack of workshops, tools and practice equipment, lack of requisite industry exposure. Experience has shown that educational programmes fail at implementation stages due to lack of appropriate skills on the part of the graduates, leading to visible unemployment, armed robbery, kidnapping, youth restiveness and other criminal inclinations. It is worthy of note that among these objectives, domestication in the Nigeria's TVET programmes, Mechanical Technology in particular, has either been handled as a political project or has not been objectively addressed. To this end, actions based on national involvements as regards fore-going comments are currently lacking.

Industry-Academic Partnership in Mechanical Technology Education

The study of any of the TVET programmes in each of the formerly accredited institutions is mainly for skill acquisition at the end of which the holders of such skills are expected to be involved in society-beneficial practice while they also earn their living and protect the industry's ethical identities. To achieve this, it must be agreed, according to Onwuchekwa (2011) that products of TVET programmes in any of the educational institutions are like raw materials which needs to go through the further process of concentrated industry-based training or internship where they will be exposed to the real economic and production-based situation. Onwuchekwa went further to liken TVET programme products to raw corn or yam tuber which

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only becomes eatable when appropriately boiled, but even when attractively harvested, cannot be eaten raw and supported by Ajayi and Ogunleye (2017), Babalola and Olaleye (2019), Ibrahim and Mohammed in their various studies

A report by Lagos State Government put a question mark on the quality and quantity of both human and equipment resources made available to give TVET students primary or institution-based training which would prepare them for lifelong work-ready training through the industry (LASTVEB, 2010). It has been common experience to have TVET teachers, lecturers or instructors being paired to handle students in courses/subjects where they were not only unqualified, but also lack the practical proficiency to help such students achieve the curricular objectives. Ironically, the informally trained artisans are not only making their money in these skill areas, but are also at the mockery of those claiming or seen to have acquired both theoretical and practical instructions through schools that ought to make them stand out in real practice. Laughably, some of the informally trained artisans have been found not able to read or write, but able to give to the society what it domestically needs, as and when and where needed, though with some inherent ethical errors.

Curriculum Development in METE

The success or otherwise of an academic programme to a large extent, depends on its enabling curriculum which is similar to an architectural drawing handed over to a builder for implementational guide (Eze and Okoli, 2020**),** (Ogundele & Adebayo, 2012), (Adeniyi & Ayoola, 2018). Among the sub-heads in curriculum planning are; objectives or goals, methods, resources and evaluation (Smith & Johnson, 2019), (Okafor, 2007). A question arises from here, "who are the stakeholders responsible for TVET; inclusive of METE programmers' curriculum planning and implementation? How much of the TVET curriculum planning and development are given to the industry experts and how often is this done? What percentage of real industry involvement do the various academic programme curriculum planners and regulators ensure from planning-designing-implementation to evaluation stages?

Even when and where some learning facilities are made available, they could be

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utilized for other purposes than teaching and learning, students can be effectively mobilized and supervised to engage and gain from the practical skills of artisans, more so, that the primary objective of facility provision is instructions dissemination to the students to develop their learning interest as well as increase their skills acquisition capacity, averred Umaru (2016). Further, the practice of using general educators to plan and develop TVET curriculum is not only wrong, but also counter-productive (Uwameiye, 2010). As a specialized type of education, METE curriculum planning, design and implementation should be the sole professional responsibility of Specialists in the concerned subjects who are academically qualified, theoretically and practically competent with some occupational commands, ethical prudence of their chosen fields, this engagement should not be used to favor or compensation because of the eventual negative consequences it may have on the educational recipients on one hand and the larger society on the other hand (Adewale & Olufemi, 2021)

Internship and Co-operative Education

According to Omoh (2023), co-operative education is a structured study programme, particularly, in TVET subjects where students' learning is dualized between the classroom and the appropriate industry. This type of study model can be obtained in any of Universities, Polytechnics, Colleges of Education and Technical Colleges in Nigeria. It is a learning method where classroom learning and concentrated practical acquisition among others are key. The key elements of co-operative education are; positive interdependence, individual accountability, promotive interaction, social skills and group processing (https//www.intechopen.com.chap.).

According to the European Commission (https//www.europal.europa.eu, co-operative education is the foundation for functional learning.

Omoh (2023) listed the objectives of co-operative education to include; building and sustaining the faith of co-operative members, development of right attitudes and good leadership quality, development of requisite skills and abilities among others.

The German dual system in which TVET-related programme students attend classes

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for a specified number of days and conclude their learning experience in the assigned industry for the remaining days in the week. This not only prepares them better for real work lifelong employment, but also enhances their financial capabilities since they are indentured and are paid some stipend to cushion the effect of learning time and efforts. In Nigeria according to (LASVEB, 2012), (Abubakar & Bello, 2020) companies such as Leventis Motors, UAC, UTC, NITECO, Volkswagen/ ANAMCO/Berliet/Leyland vehicle assembly plants among others did offer co-operative learning facilities through either students' industrial experience works or absorption of worthy final year students for further training with attractive monetary and non-monetary incentives, and a high possibility of outright employment at the end of the training spanning between one and two years (Ajao, 2018). Unfortunately, today, such opportunities like these are not only scarce to come by, but also distributed among the society's elites where and when available as political or business favor.

Academia-Industry Collaboration in METE Learning and Practice

For any nation to emerge, develop and sustain such developmental strides, such a nation must always be up and doing in the heavy inclusion; if not wholly, of its local content in any production activities that lead to essential consumption by its citizens and possibly for exports as supported by the Nigerian Content Development and Monitoring Board (NCDMB; FRN,2020), Enebong (2023) and Oguagha (2017). To achieve this, the primary sector to embark on its possibility should be through valid and reliable identified needs or problems in a particular society.

This can be best done in institutions that are validly equipped and staffed to embark on meaningful research works that are objectively premised on prudently identified societal needs in a timely, cost-effective and objective-focused manner. These institutions are "academia and Industry". It is therefore, necessary that allied industries partner with academic institutions offering mechanical technology and any of its occupational branches, especially in the area of staff development synergies, research and development activities, tools/equipment sharing, skill and competency exchanges, students'

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grants, off-classroom trainings to pave the primary way for students' and teachers' solid grasp of the subject-matter to conform with industry practices, finding enduring, valid and globally acceptable solutions to identified societal problems which in turn help people in the concerned society to live in peace, good health and other life conveniences and also, assist the industry in manpower development and ethical character building.

Academic institutions can seize the available opportunities for collaboration between them and the requisite industries either in the area of professional development, further education, product value enhancement through synergy of ideas among others. Students can also be made products' Ambassadors not only on their campuses, but also in other institutions through social interactions (Okoye and Okafor, 2018). The primary enabling fact remains that a good rapport needs to be established between the academic and industry players, not seeing each other as either separate entities or independent social being, but as an indivisible techno-development entity.

It is therefore, important to clearly design an implementable communication strategy that is capable of constantly allowing the academia to functionally interact with the industry in research and development (R & D), for products' design, production and post-production management with all the global trends, which are the basic existential parameters required by the larger society. It is only by rendering these obligations that both the academia and industry may be seen to be fulfilling the expectation of the environments in which they are domiciled, and perhaps, beyond.

Review Of Related Literature

The review of literature for this study was adapted from the work of Ahmed, Fattani, Ali and Enam (2022), which was titled "Strengthening the Bridge Between Academic and the Industry Through the Academia-Industry Collaboration Plan Design Model ".

According to Ahmed et al, universities serve the industry in two ways. they provide the workforce necessary to run the industry, and two, it furnishes innovative ideas to start new business ventures. For these roles to be effectively played by the concerned entities, the inherent problems militating

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ISSN: 2959-1376
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against the collaboration possibility need to be identified. This apparent simplistic relationship does not work so simplistically because of the inherent differences between the two. Universities are saddled with propounding and helping to apply theories, principles, laws, rules and models while industries are mainly concerned production, management and marketing of goods and services.

However, Farah et al further stressed that both academia and industry have their unique constraints, just as they also have their major objectives. While the academia desires to contribute to the theory and new idea discoveries with funding constraints to a large extent, the industry is constrained by profitability function. Therefore, academia and the industry are analogous to two sides of a river that must flow independently. As far as science and engineering disciplines are concerned, creating linkages between the two sides of the river has the potential to contribute to the betterment of both the industry and universities, as concluded by Ahmed et al (2022)

Therefore, there is the need to create and maintain a solid and workable link between the two entities of development. Accordingly, it has been remarked by the Organization for Economic Co-operation and Development (OECD, 2017), that the industry carries out about two-thirds of research and development (R & D) activities in science and technology-related studies, while the academia is responsible for about 20% and government handles about 10%, particularly, in areas of policy formulation, implementation and control.

From the foregoing, the importance of academia-industry collaboration can be deduced.

OECD averred that “it is an irony” that an established line of communication between the academia and industry for purposes of training, research and development activities in Nigeria has been difficult to come by, bearing in mind that the industry practitioners are products of the various universities and colleges”. Whereas, top-notch research-inclined institutions who have developed constant collaborations with the allied industries have always enjoyed various grants from industries in some parts of the globe. Further, when there is meaningful collaboration between academia and industry, cross transfer of idea and knowledge becomes easier and

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better concluded Nigerian Content Development and Monitoring Board (NCDMB, 2020). There is therefore, a clear existence of skill gap between academic outputs in Mechanical Technology Education programmes in Nigeria and what the industry and society need for subsistence and development.

In addition, the research studies carried out by most academics in Nigeria are seldom put into any industry or production use. (Umaru, 2016) found out that most of these research studies do not align with industry or production realities, mostly carried out as academic exercise. It should be averred that when a research study in METE or any other allied fields, findings are listed in some encoded manners. These encodings are seldom decoded for useful practical purposes by necessary end-users. Recommendations are also seldom implemented, learning students are in this system watching and growing up in the haphazard learning arrangements. As these students grow and graduate from the system, some of them are recycled back to work in the skewed system, the vicious cycle continues (Ogundele and Adebayo, 2022)

These problems were the fulcrums of this study with an endeavour to proffer some empirical solutions to them.

Research Questions:

1. What collaborative synergies do schools and industries require for purpose-focused students' training for sectoral advancement?
2. How much shared resources can school and industries grant as mutual assistance for sectoral advancement?

Research Hypotheses

1. There will be no significant differences in the mean responses of academic and industry job-holders in Mechanical Technology on the needed collaborative synergies between schools and industries for sectoral advancement
2. There will be no significant differences in the mean responses of academic and industry job-holders in Mechanical Technology on the needed shared resources between schools and industries for sectoral advancement

Methodology

Survey research design was used for this study. Uzoagulu (2011) stated that survey research is focused on people and their opinions, attitudes, beliefs, characters and

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2024, Vol. 03, Issue 02, 417-437
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motivation. These attributes made the survey design suitable for the current study. The survey sought to obtain data from Mechanical Technology Lecturers and Instructors from Universities and Colleges of Education/Technology, Engineers and Technologists in allied industries who are actively engaged in the MET and related functions in Southwest, Nigeria. Use of these categories of these practitioners was considered because of the need for clear understanding of the study parameters and individuals' expected roles. The study was conducted in the Southwest Region of Nigeria with respondents drawn from Universities of Technology, Polytechnics and Colleges of Education where Mechanical Technology (Engineering), Automobile Technology programmes are offered. Population for the study was 50 Lecturers selected from five academic institutions from Mechanical/Automobile Technology Departments, using purposive sampling technique, 48 industry practitioners from seven firms, using convenient sampling system.

Structured survey instruments comprising sections A & B, 15 items on collaborative synergies and 14 items on possible shared resources were developed to obtain data with regards to research questions. Each item was assigned a four-point response scale of highly required, (HR), required (R), seldom required (SR) and not required (NR) with values 4, 3, 2, 1 in that order. The acceptance criteria were that any item that scored 2.50 and above was regarded as required, while item below 2.50 was not required. Experts from University and College faculties validated the instrument items. Cronbach alpha method was used to obtain items' reliability. Co-efficient of 0.81 was obtained, making the items suitable for use in the study. 98 copies of the instruments were administered to the respondents by research assistants. 92 of these **2**instruments representing 94% were retrieved while six respondents representing 6% did not submit.

Data obtained from the survey were analyzed using mean and standard deviation for research questions, while statistic t-test was used for the hypotheses at a probability level of 0.05 and 90 degree of freedom.

Data Analysis

@2024 International Council for Education Research and Training 2024, Vol. 03, Issue 02, 417-437
ISSN: 2959-1376 DOI: https://doi.org/10.59231/SARI7711

Table 1: Mean responses of respondents on collaborative synergies. 2

$N_1 = 50$, $N_2 = 42$

	Instrument Items A	School		Industry		Remark
		X_1	SD	X_2	SD	
1	Curriculum and course contents of Mechanical Technology programmes need holistic review in line with contemporary global industry realities	3.460	0.524	3.723	0.495	
2	Local contents in Mechanical Technology programmes will encourage indigenous inventions and productivity	3.352	0.542	3.381	0.538	
3	Entrepreneurial skill aspects could help technology graduates towards self-employment	3.742	0.503	3.643	0.513	
4	Institutions can partner allied industries in student/staff training exchange programmes aside the traditional SIWES	3.240	0.551	2.92	0.612	
5	Graduates of any of Mechanical Technology programmes should be regarded as raw-materials requiring further job-ready trainings	3.652	0.501	3.740	0.52	
6	Specialization should be encouraged early enough during academic programmes to allow for theory/practical blending needs	3.34	0.451	3.623	0.532	
7	Employment policy regarding academic staff in Mechanical Technology programmes should attract qualified industry practitioners for cross-knowledge transfer.	3.840	0.471	3.562	0.551	

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8	Schools or department should institute affordable reward system to encourage existing and prospective students	3.123	0.582	3.561	0.552	
9	Students in Mechanical Technology programmes should be encouraged to join professional associations	3.210	0.571	2.673	0.732	
10	Students in Mechanical Technology programmes should be encouraged to associate with workers in similar fields, formal or informal sector	4.381	0.391	3.760	0.491	
11	Compromise of syllabus-based practical works in school works needs to be abolished if learning objectives are to be achieved	2.34	0.782	3.52	0.573	
12	Students' own opinions for study purpose realization should be sought through structured survey to help the authorities move forward periodically.	3.653	0.553	4.231	0.412	
13	Through school/industry collaborations, students'-made products from workshop or laboratory should be exhibited periodically	3.469	0.572	4.121	0.422	
14	Schools/departments should lead advocacy for students' internship and employment after graduation	2.431	0.712	3.354	0.592	
15	Post-graduation evaluation of industry employed graduates of Mechanical	4.136	0.401	4.321	0.394	

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	Technology programmes can help to improve content and performance.					
	Averaged total	**3.43**	***0.54***	**3.61**	***0.529***	

t-test for hypothesis 1:

$t = X_1 - X_2 / \sqrt{(S^2_{1/} N_{1)} + (S^2_{2/} N_{2)}}$

$X_1 = \mathbf{3.43}$, $S^2_{1} = 0.54.$, $N_1 = 50$

$X_2 = 3.61$, $S^2_{2} =$,0.529, $N_2 = 42$

$t- = 3.43-3.61/\sqrt{(0.54 \div 50) + (0.529 \div 42)}$

$t = -0.18/\sqrt{0.01 + 0.013}$

$t = -0.18/\sqrt{0.023}$

$t = -0.18/0.152$

$t = 1.18$

t-cal =1.18, t-table = 1.671

Std Error $= /\sqrt{S^2_{1/} N_1 + S^2_{2/} N_2}$

$= /\sqrt{0.023}$

=0.152

Table 2

t-test table

Respondents	Mean	STD Deviation	n	Df	STD Error	t-cal	t-table
Academic	**3.43**	**0.54**	**50**	**90**	**0.152**	**1.18**	**1.658**
Industry	**3.61**	**0.53**	**42**				

Decision:

Since the value of t-cal (1.18) is less than that of t-table (1.658) as shown in Table 2, the Null hypothesis that states that “there is no significant difference in the mean responses of academic and

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industry job-holders in Mechanical Technology on the needed collaborative synergies between schools and industries for sectoral advancement" is retained.

Mean responses of respondents on possible shared resources

$N_{1 = 50}$, $N_{2 = 42}$

Table 3

		Schools		Industry		Remarks
		X_1	SD	X_2	SD	
16	Practical session contents in Mechanical Technology workshop/laboratory should be derived from current industry practice	3.90	1.14	3.98	1.01	
17	Institutions/departments can approach industries for shared equipment when possible	3.91	1,08	3.87	1.05	
18	Institutions can grant concessional fee or waiver to industry-sponsored personnel for further studies as an exchange	3.64	0.96	3.40	0.92	
19	An industry can embark on dedicated supply of tools/equipment to Mechanical Technology departments in collaborating schools	3.92	1.08	3.52	1.04	
20	Tenured training programmes can be organized jointly by industry and school personnel	3.30	0.84	3.20	0.80	
21	Schools can name a part of Mechanical Technology dept after an industry	3.14	0.88	3.54	0.89	
22	Best performing students may be assisted with basic tools or more for performance enhancement while in study	3.91	1.03	3.50	1.01	

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23	Industry may assist school staff with foreign training and allied assistance on contemporary technologies	3.90	1.34	3.96	1.02	
24	Highly experienced industry staff with good track records, but low education can be conferred with appropriate certification/awards	2.98	0.72	2.83	0.68	
25	Schools and industry can collaborate on subject-to-subject incentives to deserving students in areas of interest	3.23	0.84	3.11	0.76	
26	Industry practicing professionals who have on-the-job practical experience should be included in accreditation teams of Mechanical Technology programmes	3.30	0.84	3.20	0.80	
27	Periodic interactive sessions among school and industry practitioners should be encouraged	3.01	0.67	3.10	0.78	
28	Schools should update and confirm the validity of tools and equipment in their workshops from the right industry to make students updated	3.22	0.84	3.20	0.81	
29	Industries and schools need to assist graduating students against possible discrimination by professional bodies for required registration.	3.75	1.0	3.54	1.02	
	Averaged Total	**3.48**	**0.95**	**3.43**	**.89**	

t-test for hypothesis 2:

$t = X_1 - X_2/\sqrt{(S^2_1 \div N_1) + (S^2_2 \div N_2)}$

$X_1 = 3.48$, $S^2_1 = 0.95$, $N_1 = 50$

$X_2 = 3.43$, $S^2_2 = .89$, $N_2 = 42$

$t = 3.48 - 3.43/\sqrt{(0.95 \div 50) + (0.89 \div 42)}$

$t = 0.05/\sqrt{.019 + .021}$

$t = 0.05 + \sqrt{0.04}$

$t = 0.05 + 0.2$

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t = 0.25

Table 4

t-test table

Respondents	Mean	STD Deviation	N	Df	STD Error	t-cal	t-table
Academic	3.48	0.95	50	90	0.2	0.25	1.658
Industry	3.43	0.89	42				

Decision:

Since the value of t-cal (0.25) is less than that of t-table (1.658) as shown in Table 4, the Null hypothesis that states that "there is no significant difference in the mean responses of academic and industry job-holders in Mechanical Technology on the needed collaborative synergies between schools and industries for sectoral advancement" is retained.

Discussion of Findings

The findings in respect of hypotheses one and two agreed variously and individually with the findings of Ajayi and Ogunleye (2017), Okoye and Okafor (2018), Yusuf and Sani (2017), who in their separate studies found out that there were skill gaps between what institutions disseminate to their students in Mechanical Technology Education and the occupational needs in the corresponding industries.

These findings were also corroborated in the studies of Eze and Okoli (2020), Babalola and Olaniyan (2019). Ibrahim and Mohammed (2019), Okafor and Eze (2018) when they identified the inalienable needs for continued collaboration between institutions offering METE programmes and the industries that into METE production, assembly, maintenance among others. Further, Oladipo and Ogundele (2020), Smith and Johnson (2019), Smith and Hamed (2016) in their studies reported the need for enhancement of collaboration between schools and industries if the society would not be denied its deserved benefits of social investments. These views were supported by the submissions of Enebong (2023), Oguagha (2017) and the Nigerian Content Development and Monitoring Board (FRN, 2020) in their advocacy for need for technological

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collaboration as a step towards the building of local contents in Nigeria.

Recommendations

Based on the findings in this study, following recommendations are made**:**

1. There is the need to create and maintain a functional channel of communication between academia and industry on need for effective collaboration
2. Academia and industry should see partnership as an ethical policy to help develop and promote their lifelong profession in a sine-biotic manner
3. Industries should devote both financial and non-financial resources to contribute to academic institutions while the academia should reciprocate in a like manner through their resources
4. Both academia and industry should see each other as a partner in occupational development, but not as a rival.

References

1. Abubakar, M. S., & Bello, A. I. (2020). Enhancing Student Learning through Industry-Sponsored Internship Programs in Mechanical Technology Education in Nigeria. International Journal of Cooperative Education, 14(3), 101-115.

2. Adeniyi, O. S., & Ayoade, O. A. (2018). Industry-Academic Collaborations and the Quality of Specialized Education in Nigerian Universities. Journal of Education and Practice, 9(1), 101-110.

3. Adewale, K. O., & Olufemi, T. A. (2021). Industry-Driven Curriculum Development in Mechanical Technology Education: A Comparative Analysis of Nigerian Polytechnics Journal of Technical Education and Training, 8(1), 78-89.

4. Ahmed, F., Fattani, M.T., Ali, S.R., & Enam, R.N. (2022). Strenghtening the bridge between academic and industry through academia-industry collaboration. Doi: 10.3389/fpsyg.2022.875940. PMID

5. Ajao, A.S. (2023). Relationship between parental background and students' performance in automobile mechanic works in Technical Colleges in Lagos State, Nigeria. Department of Technical Education, Faculty of Education, Ambrose Alli University, Ekpoma, Nigeria. Unpublished Doctoral Thesis.

6. Ajao, A.S. (2023). Critical competences' needs in heavy-duty diesel engine repairs/maintenance for youth

@2024 International Council for Education Research and Training
ISSN: 2959-1376
2024, Vol. 03, Issue 02, 417-437
DOI: https://doi.org/10.59231/SARI7711

employment in Lagos State-Nigeria. Journal of Industrial Education and Training. 5 (1) 139-150.

7. Ajayi, I., & Ogunleye, A. (2017). Industry-Academic Collaboration and Its Impact on the Quality of Graduates in Nigerian Tertiary Institutions. Journal of Education and Practice, 8(6), 146-154.

8. Babalola, Y. M., & Olaniyan, D. O. (2019). Enhancing Specialized Education through Industry-Academic Partnerships: Lessons from Selected Nigerian Universities. Journal of Higher Education in Africa, 1(2), 78-92.

9. Cambridge Advanced Learners' Dictionary and Thesaurus. (2018). Meaning of "Problems". References Scientific Research Publishing.

10. Enebong, E. (2023). A critical review of the legal framework for local content in Nigeria. Nigerian Content Development and Monitoring Board (NCDMB). FCT-Abuja, FRN Press.

11. Eze, J. U., & Okoli, C. I. (2020). Enhancing Specialized Education through Industry-Academic Partnerships: Perspectives from Nigerian Polytechnics. International Journal of Educational Research and Innovation, 13, 45-57.

12. Federal Republic of Nigeria (2014). N*ational policy on education*. Lagos: NEDRC

13. Ibrahim, A., & Mohammed, S. (2019). Industry-Academic Partnerships and Skills Development in Nigerian Technical Colleges. Journal of Vocational Education and Training, 6(2), 78-89.

14. Ogundele, O. J., & Adebayo, T. (2022). Challenges and Opportunities of Industry-Academic Partnerships for Specialized Education in Nigeria: A Qualitative Study. Nigerian Journal of Educational Management, 15(3), 201-215.

15. Oguagha, U.O. (2017). A critical evaluation of the effectiveness of local content policy in: http://rgu.repository.worktribe.com .

16. Okafor, C. N., & Eze, U. C. (2018). Industry Sponsorship and Research Collaboration in Mechanical Technology Education: Perspectives from Nigerian Technical Colleges. Journal of Applied Research in Engineering, 5(2), 201-215.

17. Okoye, P. N., & Okafor, C. E. (2018). Industry-Academic Partnerships and Employability of Engineering Graduates in Nigeria. International Journal

@2024 International Council for Education Research and Training
ISSN: 2959-1376
2024, Vol. 03, Issue 02, 417-437
DOI: https://doi.org/10.59231/SARI7711
of Educational Development, 5(3), 211-225.

18. Oladipo, O. A., & Ogundele, O. J. (2020). Bridging the Gap: Aligning Specialized Education with Industry Needs through Collaborative Partnerships in Nigeria. Journal of Vocational Education and Training, 12(4), 321-335.

19. Omoh, D. (2023). Co-operative education, jigsaw as important teaching methods for electrical/electronic technology students in Colleges of Education, Southwest, Nigeria. Department of Technical Education, Faculty of Education, Ambrose Alli University, Ekpoma, Nigeria. Unpublished Doctoral Thesis

20. Oviawe, J.I. (2020a). Influence of teacher quality and professional development on the students' academic performance in technical drawing in technical colleges. *Australian Journal of Science and Technology*, 4 (1), 242-249.

21. Onwuchekwa, A.K. (2011). Relevant qualities of a technology teacher in an evolving nation. Lecture notes in Professional Technical Teachers' programme. Department of Automobile Technology Education, Federal College of Education (Technical), Lagos-Nigeria. in

22. Smith, J., & Johnson, R. (2019). Enhancing Mechanical Technology Education through Industry-Academic Partnerships: A Case Study of Nigerian Universities. Journal of Mechanical Engineering Education, 12(2), 45-58.

23. Smith, T., & Ahmed, A. (2016). Industry Engagement and Curriculum Development in Nigerian Polytechnics: A Case Study of the Engineering Sector. African Journal of Technical Education, 3(1), 45-58.

24. Umaru, M.Z. (2016). Relationship between religiosity and academic performance among accounting students. *International Journal of Evaluation and Research in Education (IJERE)*, 5(2), 165-173.

25. UNESCO-UNEVOC (LASG, 2012). *International development on technical vocational education and training (TVET). DFID partnership with Lagos State Government on graduates' employability apprenticeship programme.* Alausa-Lagos: Coffey publications.

26. UNESCO (2015). TVET Strategy for 20-2021. *Report of the UNESCO-*

@2024 International Council for Education Research and Training
ISSN: 2959-1376
2024, Vol. 03, Issue 02, 417-437
DOI: https://doi.org/10.59231/SARI7711

UNEVOC conference. Bonn, Germany: UNESCO-UNEVOC International Center for Technical Education and Training.

27. Uwameiye, R. (2010). *Essentials of Technical and Vocational Education*. Benin City: Ambik Press.

Received on Feb 11, 2024
Accepted on March 15, 2024
Published on April 05, 2024