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Research Democratization and Quality Analysis for Local Content Development: The Place of the Academia.

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A B S T R A C T

This paper evaluates the quality of research in academic institutions in the light of research democratization and local content development. Purposive sampling was deployed to select participants for the study. Participants were assessed based on their engagement in research, academia and their access to grants from the Tertiary Education Trust Fund in Nigeria. Forty nine persons from the academia responded to an online survey instrument while eleven research reports of sponsored projects were evaluated and guided by four research questions.

A mixed-method approach which combined quantitative and qualitative data collection and analysis methods was used. Data were analyzed using descriptive statistics for frequencies and percentage compositions of the various factors analyzed.

One major finding of the study is that some of the research reports did not really capture the problem statements and detailed methodologies while some results appeared not relevant and/or usable thereby undermining the quality of the research output. It was also discovered that democratizing research involves conducting studies and/or investigations on focused areas that will comprise people-based content or include target beneficiaries in the research design and process which will translate to local capacity building, community development, socio-economic growth and nation building.

This study therefore recommended capacity building and stakeholder education and awareness to build a society that will produce quality research outputs with local contents for sustainable impacts which is the mandate of the academia. Also result dissemination channels should be accessible by target groups – the society, communities and the industry in usable formats for real-life applications.

Keywords: Research quality, Research democratization, Local content development, Academia, Participatory approach, local capacity building, community development, socio-economic growth, nation building.

1. Introduction:

Research democratization refers to the process of making research more accessible, inclusive, and participatory, especially for underrepresented groups [1] [2]. 'Democratization' is from the word democracy; meaning 'government of the people for the people and by the people', so when research democratization is considered, it entails modeling research to suit the people. In other words, it means projecting research designed to include the target groups in the project design and activities, solving peoples' problems. It therefore means, promoting people-based research, student-centered research or community-based projects. Emphatically, research is meant to solve problems and address issues surrounding people or community. This makes target beneficiaries key component in a research design which can lead to capacity building and socio-economic development for nation building.

Furthermore, research democratization according to Nielsen [3] refers to the increased accessibility and participation of diverse stakeholders in the research process. The author also stated that online tools quicken problem-solving process and increase the scope of problems that can be solved by the human mind inferring that gathering improved collective innovative ideas can be achieved within a short-term period that will in turn benefit an organization or a system if access and collaboration is enhanced. Hence, it involves increased data accessibility, participatory approach, adopting inclusive methodologies that permit diverse research methods/approaches which value local knowledge, experiences and perspectives, and also foster open collaboration and capacity building to enhance development of research skills and capacity among target groups while promoting diversity in research teams and leadership. Drivers of research democratization include digital technologies, open-access platforms, collaborative research models and citizen science which is a form of research collaboration that involves members of the public in scientific research projects to address real-world problems [4]. The benefits include increased diversity, inclusivity, and context-specific knowledge [5]. Notwithstanding, some challenges faced by this concept of democratizing research is quality control, credibility, and validity concerns according to Giles [6]. Thus, to ensure quality in research, the integrity of the study conducted must be based on the standard set for the conduct of such study.

Research quality assurance ensures the reliability, validity, and generalizability of research findings [7]. In research quality analysis, there is the need to state the problem to be solved, state questions that require answers otherwise known as research questions and also, set objectives that need to be achieved in the course of the study. The factors that influence research quality also revolve around methodology which includes sampling methods, data analysis, and peer-review processes as established by [7]. This author emphasized that a research design is based on bringing together assumptions about research, the specific strategies of inquiry, and research methods. Thus, decisions about choice of a design are influenced by the research problem (issue being studied), the personal experiences of the researcher, and the audience for whom the researcher writes [7], meaning, that these factors are controlled by the study objectives and target beneficiaries or end users. Thus, target beneficiaries of the research outcome also need to be identified and the study conducted using methods that are standard and validated. In a nutshell, research democratization and quality assessment involve analyzing how the objectives of the study have addressed the problems stated using validated methods and how it has impacted the target beneficiaries. Hence, it focuses on research output benefiting the target beneficiaries and made available and accessible for wider audience.

In addition, democratization of research should be integrated in the research design to ensure inclusiveness, community participation and co-management where the target beneficiaries are considered or prioritized to benefit from the research output. This can be seen in cases of products and/or prototype development to solve locally generated problems. This strategy can help in local content development. Examples can be seen in cases of reduction in importations due to focused research to develop products or fabricate equipment that will tackle issues within a community via research. Also in agriculture, tackling food insecurity challenges should arouse curiosity in researching on strategies to produce foods locally by community people using locally sourced materials and equipment to tackle food importation and hunger. Local content plays a crucial role in community development and nation building for global impact. Thus, research democratization offers opportunities for increased participation and diversity; there is a need to investigate research democratization and quality analysis in the context of local content development within the academia as the hub of knowledge and skills.

Emphatically, through focused research by the academia, local issues can be solved through local content development and industrial revolution. Unfortunately, there seems to be a challenge with target groups accessing the knowledge produced by the academia. Thus, to tackle this problem of non utilization/application and inaccessibility of research findings which results to the disconnection between research, the academia, the industry and the society, analyzing the state and content of research activities, methods/approach of research conducts and channels of dissemination of research outputs is imperative. The study will reveal areas of poor methodologies, non-pivotal objectives and disconnected linkages with industries and target beneficiaries.

This study therefore will contribute to the development of strategies for promoting research quality and democratization for local content development in institutions. To explore the impact of democratization on local content quality, the findings of this study will be invaluable for the academia, researchers, policymakers, and stakeholders seeking to harness the potentials of research for sustainable development and local problem-solving in Africa. This is where the quadruple helix structure comes in to foster collaboration between institutions, the academia, the industry and Government. The quadruple helix model and local content development are interconnected concepts that foster innovation, economic growth, and sustainable development according to [8]. The Model combines the effort of the Public Sector (Government), the Private Sector (Industry), the Academia (Research and Education) and the Civil Society (Institutions/Community). Although factors such as limited resources, limited expertise/skilled manpower and other institutional factors (funding and infrastructure) influence access to quality research [9] [10], the objectives, methods and including end users in the research design is key to drive quality and utilizable outputs.

This study therefore aimed to address the following research questions:

1. How can the quality of a research be assessed with respect to addressing problems?

2. What are the key factors influencing research democratization and quality impact?

3. How does research democratization impact the quality of local content development?

4. Will capacity building programmes influence the factors positively?

The Objectives therefore focused on the following;

1. To assess the quality of research work conducted by staff using the institution-based research (IBR) grants in terms of research conduct procedures, outcome and communication

2. To evaluate the quality of research output from TETFund grants in terms of contribution to knowledge & development, their relevance, usability and real-life applications, products/prototype development, entrepreneurship impact and factors influencing their effectiveness

3. To analyze the trend of research projects in the target institution in the light of inclusivity (people-centeredness) and local content development

4. To identify gaps for capacity building to improve quality research and local contents.

2. Methodology:

Study area

The study was conducted by the Directorate for Research and Development of the Federal Polytechnic Ekowe, Bayelsa State, Nigeria. The survey drew the sample size from the four schools (faculties) in the institution namely, School of Applied Sciences, School of Agricultural Technology, School of Engineering Technology and School of Management Sciences.

Research design

The study was conducted using a survey instrument to generate data and projects reports submitted to the Directorate were assessed to collect data on the quality and focus trend of the research activities.

Data collection

A mixed-method approach **[7]** which combined quantitative and qualitative data collection and analysis methods was used. Purposive sampling was adopted for the research where selected participants were assessed based on their engagement in research, academia and access to TETFund grants. Past research reports were evaluated for content analysis. Forty-nine (49) responses by academics from the online survey instrument and eleven (11) research reports of TETFund funded projects were evaluated. The survey study was conducted using online survey questionnaire to gather data on research quality, local content and impact, research tools and methods deployed and access to research grants.

Content analysis **[11]** of research reports of selected academics/researchers and faculty members was conducted by a review committee in the institution using likert model for evaluation based on development orientation, people-based content, innovativeness, entrepreneurial impact, local content and relevance, currency, result accessibility and usability, real-life applications, socio-economic impact potentials, product-development status, general contribution to knowledge and global competitiveness.

Data analysis

Data were analyzed using descriptive statistics for frequencies and percentage compositions of the various factors analyzed.

3. Results and analysis

Technical reports of some academic staff awarded TETFund grants to conduct institution based research (IBR) were evaluated and the result is as follows;
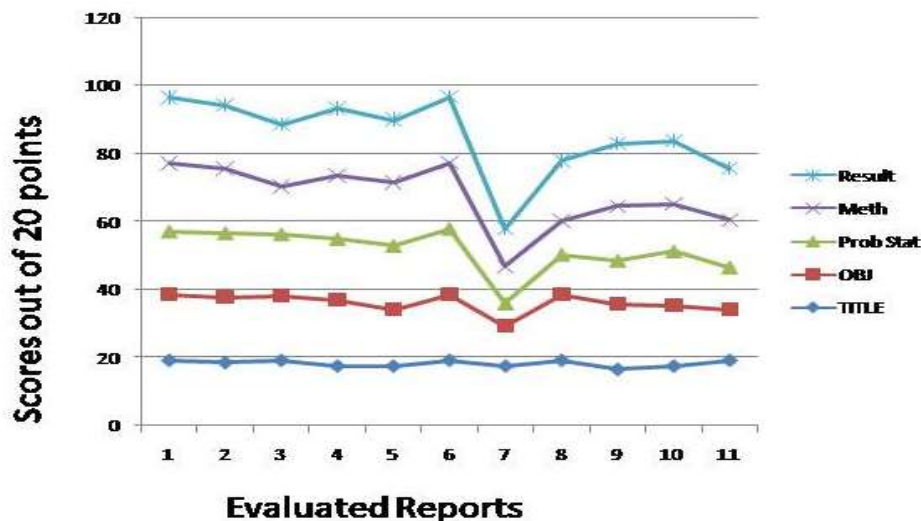

Fig. 1 - Evaluation scores of eleven reports out of 20 points scores

The chart in Figure 1 shows the scores of the evaluated reports on the basis of research quality after assessing the titles, objectives of study, problem statements, methodology and results of the eleven technical reports of some academic staff awarded TETFund grants to conduct institution based research (IBR). From the chart, it can be seen that the titles scores were all aligned along the score line (20) which indicate that the project titles scored close to 20 which is the highest score obtainable showing good project titles. It is good to note that research title is a snapshot of a research idea and should be able to communicate that in one sentence which these project topics did from the evaluation.

There was a little deviation along the score line at points 5 and 7 which indicates that reports 5 and 7 did not clearly or in details capture the research objectives which should reflect the hypotheses or research questions to be addressed by the study. Thus, a quality research should clearly state SMART (Specific, Measurable, Achievable, Realistic and Time bound) objectives for a quality research which should be easy indicators to monitor and evaluate. However, 63.6 % of the reports scored 20 out of 20 points (Fig. 2).
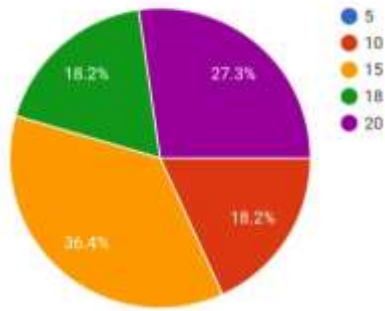
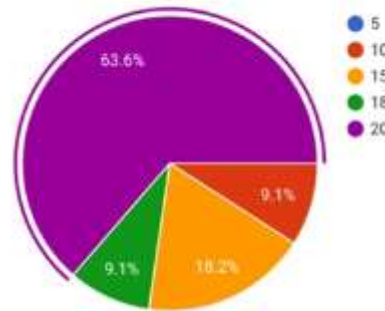**Fig. - 2: Scores on objectives of study out of 20**

Fig. - 3: Scores on the methodology

About 18.2 % (Fig. 3) scored 10 points and below which is average. Fig. 5 presents the level of result dissemination showing that about 36.4% were not sure of proper publication. It was observed that the avenues for communicating these results were mostly journals; about 63.6 % of recorded disseminated research findings confirmed it. A number of target beneficiaries do not have access to journals, other communication channels such as extension guides, newsletters, charts, laboratory/workshop exhibits and teaching aids should be developed as research communication channels to aid accessibility.

Again, questions such as, "Does the project contribute to any form of development? Who will benefit from the research outcome? Will people, communities, students, women, youth etc. benefit from the output? Can the outcome lead to development of businesses or products/prototypes? Does it have real-life applications and socio-economic potentials? Does it address local content development and people based content?" etc., should reflect in the research quality assessment instruments to capture the level of innovativeness, development potentials and stakeholder engagement to ensure a quality and democratized research.

These factors were used to assess the project reports and the results are presented in the following charts representing likert scales of points 1 – 5 (1 - totally agree, 2 - agree, 3 - not sure, 4 - disagree, 5 - totally disagree)
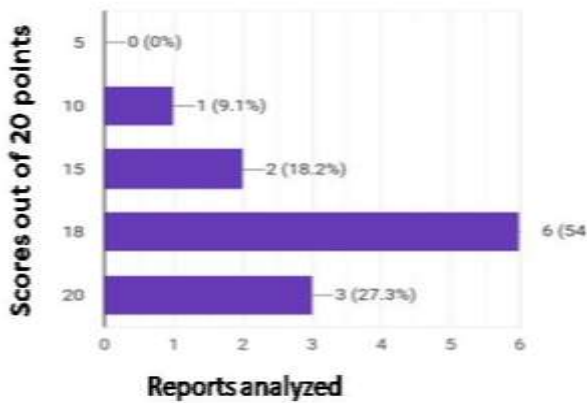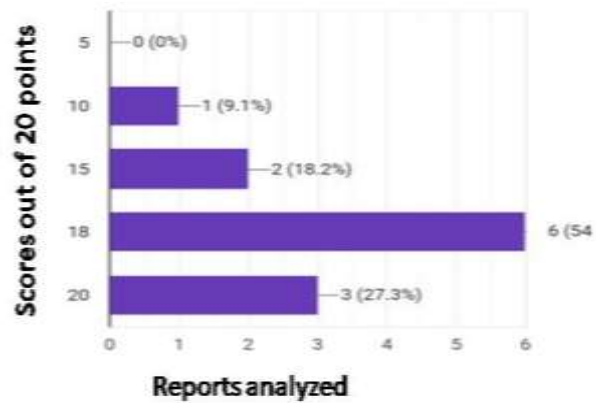

Fig. 4:   Scores on results/findings

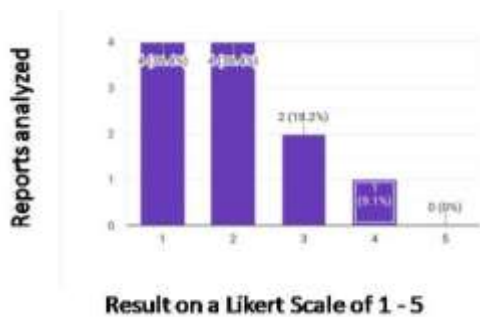**Fig. 5: Scores on result dissemination**
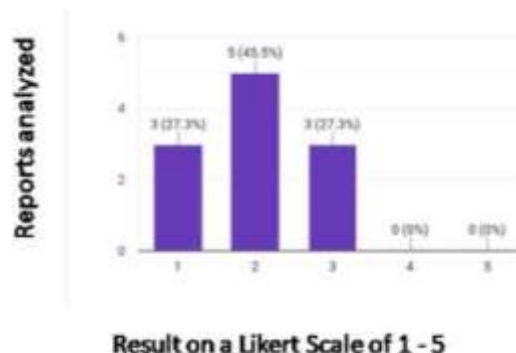

Fig. 6: Development orientation analysis

Fig. 7: General contribution to knowledge

From Fig 6, four projects out of 11 (36.4%) were totally agreed to contribute to development, other four were agreed to also contribute while two projects were not certain of their contribution and one did not impact development at all. In Fig. 7, about eight of the projects were agreed to contribute to knowledge at varying degrees while three of them did not make meaningful contributions meaning that over 8 (70 %) out of 11 reports had contributions to knowledge which is good.
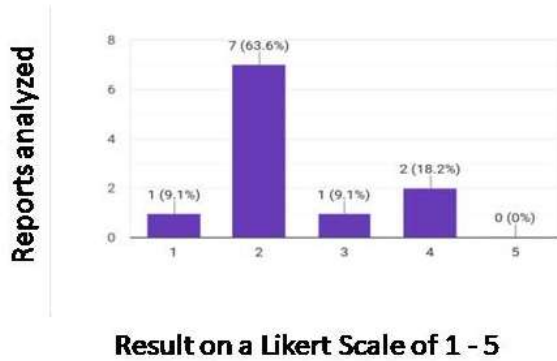

Fig. - 8: Relevance and currency   analysis   **Fig. - 9: Result accessibility and usability assessment**

Over 72.7% of the assessed reports (8 out of 11) were agreed to be accessible and useable (Fig. 9), however, the formats and avenues of communication is very crucial to ensure that the end users/beneficiaries have access to such research outputs for real-life application. About five projects were adjudged not sure of their relevance and place in the current trend of life (Fig. 8). This is very important in the choice and design of any research project in the 21st century. About three of the research projects had no way to use them from the assessment (Fig. 9) while about five of them could not be ascertained about their real-life application from the evaluation of their contents (Fig. 10). Six on the other hand were useful and could be applied in real time as laboratory/workshop exhibits and charts (as teaching aids), weather data collection system, biogas production system, etc.
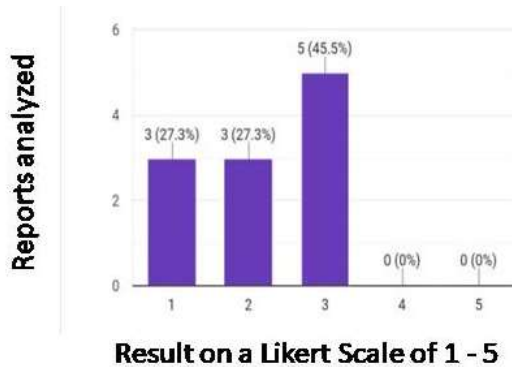

Fig. 10: Real-life applications analysis
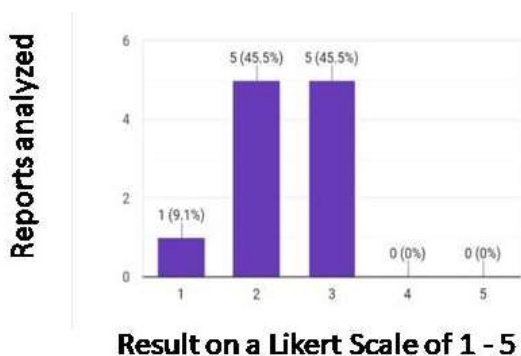
Fig. 11: Product-development status   **Fig. 12: Entrepreneurial tendency**
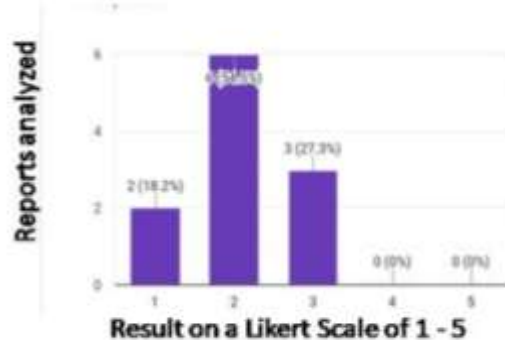
From the assessments, the reports presented projects that have potentials to get products developed from their outputs and for business development as well. Entrepreneurship content was identified in the reports rated at 72.7% giving suggestions for new businesses to erupt; however, none was physically projected for real-life application from the reports. Although about 45.5% do not present tangible products for development (Fig. 11) or potentials for business start up from the outcome (Fig. 12), 54.5% do, few products (goods and/or services) have been developed from the output benefiting the

Polytechnic while some other outputs are yet to be commercialized for societal consumption even when they have the potentials for both products and business development and this is a factor to consider.

From the survey conducted, forty-nine (49) responses of the academics showed that they do not usually integrate in their research designs, potentials for products or entrepreneurship; rather they focus more on publishing papers in journals for promotion. They do not also align with research trends such as the use of artificial intelligence (AI) (Fig. 13) and sourcing for research grants to boost quality of research for advancement. Over 55% do not know how to use AI as a research tool and only about 4.1% of the respondents have sourced research grants (possess >75 % knowledge) while 36.7% have no idea on research grant proposal writing. This is an identified gap for capacity building and there should be a mindset shift towards problem solving and innovativeness to achieve breakthrough research that meets societal needs.

Do you use artificial intelligence (AI) in your researching? if YES, Which AI app have you used?
49 responses

Fig 13a: Survey responses of staff on research activities

How much knowledge do you have about grant proposal before now? Categorise it
49 responses

Fig. 13b: Survey responses of staff on research activities

Fig. 14: Socio-economic impact potentials analysis   Fig. 15: People-based content analysis

From Fig. 14, it can be deduced from the scale that close to half of the projects were reported not impacting the socio-economy of the people from the outputs (45.5%). On the other hand, the research projects from the result (Fig. 15) focused more on people although over 27 % where not certain if the outputs can benefit people. Research outputs should drive social and economic development at local, national or global level depending on the target beneficiaries. The analysis of how the projects affect people is key to community development and nation building which also result to man power development and livelihood support.

Looking at the chart in Fig. 1 again, it can be deduced that some of the reports did not capture well the problem statements, methodologies and results as some of the points deviated from the score lines in each category. This could mean that the problems were not stated in the report which is a very important item to capture, and should include the target audience and beneficiaries of the project. This is where research is also adjudged democratized. Questions such as; what problem does the research aim to solve? Who will benefit from it?, are very crucial in any proposed project in order to proffer solutions to local problems, address global issues or initiate and drive community and/or national development.

The research methodology covers the materials and validated methods used in the study, procedures used in data collection and analysis. These should be clearly stated in the methodology section. However, the deviation of the score points from the line (Fig. 1) shows failure to capture the above features of this section. It has been emphasized by Creswell [7] that the factors that influence research quality revolve around methodology which include sampling methods, data analysis, and also peer-review processes. The methods should be able to be copied and replicated anywhere to support adaptive research and copy technology for local situations.

From the charts in Figs. 6 & 7, it can be traced that contribution to knowledge and development were positive from the likert scale analyses. Also, potentials for product and business development focusing on the people and socio-economic impacts were also positive although conscious efforts need to be made to apply research outputs for optimal societal benefits. What is the essence of a study if the findings are just shelved and not used? Over 45.5% of the reports were adjudged not posing real-life application (Fig. 10). This means that applied research is to be projected in our institutions if we must have impact in community development and nation building. According to OECD [12] report, China and other Asian countries invested in research and development to address economic issues to reflect development for businesses and workforce, addressing certain challenges including ICT infrastructure, enhancing teachers' capacity, curricula adaptation and lifelong learning and assessing the role of TVET. This way China strategically developed and surpassed many nations and Africa can tow same line.

The results of any research should be addressing research objectives and/or answering research questions to solve the problems stated in the study. From Fig. 1, the score points also deviated from the score line which showed that the results presented for some reports did not address the research questions or the stated objectives of the study. This reflects poor research quality in conduct and communication. Notwithstanding, some of the reports scored 18 out of 20 points (Fig. 4) which shows good presented findings, that is, 9.1% of the assessed report scored average while 90.9% presented findings systematically. Not presenting well defined results is tantamount to not conducting the research. Every study should have target beneficiaries and stated problems to solve and objectives to strategically meet the goal of the research and answer the research questions at the end of the study by the results/findings. Therefore, for quality research assessment, the title, problem statement and the research objectives (or questions) should clearly state the study in a snapshot, the problem to tackle and the strategies to achieve them respectively while the methodology should state clearly the materials and validate methods used, how data were collected and analyzed while the results systematically present the findings and how they tackled the problems stated in the study and achieved its objectives.

It has also been noted that institutional factors, such as funding and infrastructure, influence research quality [12], however, with TETFund grant supports, other factors such as policy and regulatory frameworks in promoting research quality and local content development have been identified to be another crucial factor that should be considered and enforced. In addition, research quality should be accompanied by strategic and problem solving approach in the research conduct and dissemination. This means that, for a nation to deal with economic, socio-cultural or technological issues, research is key and the approach should be community based or people based with local content included in the research design, methods and output management. There are core skills necessary to conduct systematic research designed to empower communities and promote social change [1] and stakeholder facilitation is one of them to enhance optimal engagement and participation of the target groups.

Research must align with current research trend if it must be relevant to yield invaluable outputs. About 45.5% of the reports appeared not to be very relevant in the 21st century clime (Fig. 8). To tackle current issues, challenges at local, national and international must meet with strategies that present the capacity to tackle the challenges using cutting edge technologies, innovative strategies and approaches. The target beneficiaries of any research should be able to access the research outputs and in formats useful and accessible for them if not, the research is as good as not conducted. Local content should be integrated in the current research models for local relevance and global recognition. Local content development involves creating culturally relevant and context-specific knowledge, products, and services that address local needs and challenges, foster community engagement and participation, support local economic growth and promote sustainable development [13].

From Figs. 6 -12 and Figs. 14-15, this study focused on how the institution-based research funded by the government using the TETFund has contributed to local knowledge, skills and general development being a focused research fund to boost institutional growth and advancement. It is remarkable to note that this goal has been optimally realized in most institutions using this study area as an example. The academia generally has been identified by Okorie [13] to play a crucial role in local content development by conducting focused research on local issues ensuring relevance and applicability of findings, disseminating research findings through local channels and languages, developing local curricula, building capacities of local researchers and scholars, training experts to drive local content development and building partnerships for collaboration with local communities, industries, organizations and stakeholders to ensure relevance, sustainability and impact. Engaging local communities to promote participatory research and development, offering

expertise and services to aid them is a factor to consider. To attain global competitiveness, there must be local impact before a research can have global recognition. About 6 out of 11 reports (54.6%) evaluated in this study were not satisfied to have any potential for global impact. Solving local problems project strategies for global solutions and thus leads to adaptive and collaborative research, partnerships with national and international funders and the industry.

For Africa to develop, research focus must be tailored to suit national and regional priorities and solve local problems. Nigerian government through TETFund has made huge investments into research and efforts must be made to attain self-reliance and self-sufficiency in the various sectors in the country ranging from power, technology, to agriculture and food security, education focusing on STEM, health, infrastructure and economic growth. It has been firmly established that there exists a relationship between local content development and research quality in the academia [5] [6] thus research and development is key. Strategies for promoting research quality in local content development are capacity building and fostering collaborations [14], hence, the place of the academia to provide capacity building and create knowledge and awareness among local community.

Attaining research democratization consciousness and local content awareness is solution to update knowledge and upgrade in the right direction for research application culture. Most Asian countries today prioritized STEM, teacher capacity development, cutting edge technology such as artificial intelligence, biotechnology, clean and renewable energy, and government-industry partnerships to foster commercialization of research findings [15]. It encourages collaboration among local stakeholders to enhance collaboration and knowledge sharing, foster innovation and entrepreneurship, build local capacity and expertise and promote sustainable development [8]. The concept of Quintuple Helix Model allows the analysis of the interactions and mutual influence between the academia, industry (business), government, civil society and the natural environment [16] and the conclusion is that within the Quintuple Helix Model, the central role in the development of the economy is given to knowledge (generated by the academia) and their transfer between the various sub-systems of the Model.

Research democratization and people centered research emphasizes the importance of inclusivity which means, involving the people in the research process to ensure their voices are heard, conducting research with the people, rather than on them, to foster ownership and empowerment which is participatory approach, collaborating with the community to design, implement, and disseminate the research to foster co-creation and ensure it is meaningful and useful to them. Finally, it is important to address specific needs and challenges of the community to make the research findings more applicable and effective to ensure contextual specificity and relevance, prioritizing the needs and goals of the target community, rather than that of the academic or other external interests fostering a community-driven research, sustainability and co-management. The "Helix models" have proved that the academia can play an enhanced role to drive innovation and local content development in increasingly knowledge-based societies.

Finally from the survey conducted, forty-nine (49) responses (Fig. 13) of the academics showed that they do not usually integrate gaps for products development, local contents and/or entrepreneurship development in their research designs; rather they focus more on publishing papers in journals for promotion. This is an identified gap for capacity building for the academic community to enhance productivity and innovation. The academia is about developing people (scholars and local experts), therefore, activities should be focused to achieve this mandate of teaching, research and community service/development. This will drive local content development to solve local problems and challenges starting from the institutions.

Conclusion

It has been noted that quality of research outputs can be compromised by various factors, which include, lack of expertise and resources, limited access to quality journals and publications, insufficient peer-review processes and other factors, however from this study, research quality can also be compromised by poor research design, invalidated methods, poor data collection and analysis, not developing good objectives/research questions and also lack of clearly stated problems to be tackled by the study with the target beneficiaries. It was discovered that democratizing research also involves focusing studies, investigations and/or enquiries on some strategic areas that will solve people's problems which translates to local content development, local capacity building, entrepreneurship development, community development, socio-economic growth and nation building for global impact. The evaluated reports did not show full compliance towards meeting local needs being a focused research (institution-based). This shows that research democratization should be termed a new normal and area for current focus if development and growth, empowered communities and sustainable impacts must be achieved. Thus, quality research leads to applicable findings and effective solutions for real-life situations, anything outside this maybe termed, bad quality research. The academia has been identified to have role to play through inclusive research designs and conducts, focusing dissemination of findings on target groups including the industry and the society for good outcome and also in capacity building and societal education. This institution studied in this research therefore requires more focused and collaborative research designs and activities to maximize funds for optimal outcome through innovation.

Recommendations

- The academia should therefore adopt participatory approach in research to foster community engagement, generate context specific knowledge that will be relevant and address local issues.

- In adopting the quadruple or quintuple helix model in research and development, the academia need to collaborate with the industry involving the target groups in the research design and conduct to foster inclusivity, co-management and sustainable management of research outcome and new skills developed in the process.

- Research should be focused on developing local content to solve locally based problems for economic growth and nation building.

- There is need for capacity building and awareness creation in the academia to drive a mindset shift from researching to publish for promotion; to researching to drive local content, entrepreneurship and community development for socio-economic growth.

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