Leveraging University-Industry Collaboration for Youth Skills Development:  
A Case Study of Tanzania Higher Technical Education

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Abstract
Youth unemployment and skills mismatch constitute a challenge for Sub-Saharan African countries, including Tanzania where approximately 900,000 youth enter the job market annually. With rapid technological advancements, fostering higher technical skills for the youth becomes exigent in Tanzania on its path from an agricultural economy to a semi-industrialized country. Previous studies indicate that equipping youth with high-level skills requires endeavours beyond university campuses. In the context of Tanzania, there is a dearth of literature on university-industry collaboration (UIC) for youth higher technical skills development. This paper presents a study of Tanzania higher technical education and examines the socio-political environment for UIC with a policy review, analyses the mechanisms of existing training-focused university-industry collaborative initiatives through website discourse analysis, and provides recommendations in leveraging UIC for youth high-level skills development.

Keywords
University-Industry Collaboration; Higher Technical Skills; Tanzania; Higher Education; Youth;

I. Introduction and research questions
Higher education institutions (HEIs), besides the conventional roles in generating knowledge and enabling learning, have taken on a socioeconomic mission for development. The third mission, propelled by national pursuits for knowledge economies and an international agenda in achieving the Sustainable Development Goals, requires HEIs to move beyond the academic arena to buttress national development strategies. The Tanzania Development Vision 2025 (United Republic of Tanzania [URT], 2000) highlights that the 21st century rewards countries “with advanced technological capacity, high productivity, modern and efficient transport and communication infrastructure and, above all, highly skilled manpower imbued with initiative”. Training highly skilled graduates is increasingly considered as one key responsibility of HEIs in contribution to the economic transformation of Tanzania (Mkude et al., 2003). Rapid technological developments also push higher technical education institutions to the fore to create “highly skilled manpower”.

Statistics reveal sectorial employment shifts in Tanzania, but the transformation has not been substantial. According to the Integrated Labour Force Survey 2020/2021 conducted by the National Bureau of Statistics of Tanzania, 61.8% of the labour force is employed in agriculture, forestry, and fishing, 11.3% in the manufacturing industry, and 26.8% in services. Compared with 2014, 2021 marks a 2.8% decrease in labour share in the primary industry, 1.5% increase in manufacturing, and 0.9% increase in services (National Bureau of Statistics [NBS], 2021). The slight transfer of labour from agriculture to manufacturing and services indicates changing employment structures in line with the industrialization agenda. Upgrading the national skills profile benchmarked for a semi-industrialized economy takes effort. Approximately 900,000 youth, including university graduates, enters the job market annually in Tanzania (Gregory, 2017). 80% of graduates become jobless fresh from universities while employers claim that the graduates are not competent to merit the job offers. From 2014 to 2021, the general unemployment rate in Tanzania decreased, but the youth unemployment (age 15-35) rate increased from 12.1% to 12.6% (NBS, 2021). Numerous studies lead to a compelling conclusion that graduates struggle to meet industry requirements in Tanzania (Munishi & Emmanuel, 2016).

While higher technical education institutions are expected to be the main driver in elevating youth skills, industries need to be engaged to create opportunities where graduates polish their skills through work-based learning. University-industry collaboration, driven primarily by mutual benefits in knowledge exchanges and innovation (Bekkers & Freitas, 2008; Siegel et al., 2003), has a role to play. Training-focused UIC provides an effective solution to enhance graduates’ employability competencies (Borah et al., 2021). A study by Cyert and Goodman (1997) demonstrated that university scientists found UIC effective in testing new theories, honing their skills, and training students. Whereas the origins, models, antecedents, and outcomes of UIC have been widely studied in developed contexts (e.g., Bennett, 2019), it is insufficiently explored in Sub-Saharan African countries (Ankrah & Omar, 2015), nor in the higher technical education field. Certain studies of UIC identified in the context of Tanzania show a focus on tourism industry (Anderson & Sanga, 2019), and agriculture (Mgumia et al., 2015). The mechanisms of collaboration are not systematically inspected, leaving its role on youth skills development unaccounted for.

This research aims to deepen the understanding in university-industry collaboration for youth skills development, in the context of Tanzanian higher technical education, particularly in subjects of applied sciences, engineering, and technology, answering two questions. Firstly, how are universities and industries collaborating for youth skills training in higher technical education? Secondly, what are the existing mechanisms and organizational obstacles in leveraging university-industry collaboration for youth skills development? Incorporating political, academic, and practitioner perspectives, the study seeks to elicit discussions in an area in lack of empirical
evidence and inform practical initiatives in leveraging university-industry collaboration for skills development in Tanzania.

The remainder of this paper is organized as follows: Section II outlines the methodology. Section III discusses findings, starting by examining relevant national priorities and policies, before discussing mechanisms and obstacles to leveraging UIC for higher technical skills development and concluding with policy implications.

II. Methodology

This study began with a policy review and narrative literature review to synthesize existing knowledge for the identification of areas worthy of further exploration (Palmatier et al., 2018). A narrative literature review methodology was adopted due to its strengths in identifying themes, theoretical foundations, and contextual nuances relevant to the research (Ward et al., 2009). The literature review examines specifically university-industry collaboration and youth skills development in the Tanzanian higher technical education, whereas the policy review maps the political agenda in skills development that involves universities and industries.

Building on the literature review and policy review, a thematic analysis was further conducted by analyzing the university discourses around UIC. The objective is to examine examples of existing mechanisms of collaboration as presented by the university websites to the public and how such initiatives are represented as beneficial to skills development. The thematic analysis approach is utilized to detect and analyse patterns (Braun & Clarke, 2012). 12 public full-fledged universities recognized by the Tanzania Commission for Universities (TCU) as of August 2022 are included in this study, out of a total of 34 full-fledged universities in Tanzania (Tanzania Commission for Universities [TCU], 2019). Out of the 12 universities, 2 are excluded because neither offers programmes in higher technical fields examined in this study.

Collecting information from university websites has its strengths and weaknesses. Systematic mapping from the university websites reaps the benefit of assessing what universities regard as presentable in UIC. Web discourses also reveal values underpinning how universities approach UIC. On the flip side, the websites might not be regularly updated and considering only information presented on websites misses informal collaboration at the personal level. For this study, primarily formalized UIC arrangements are considered. Informal approaches, such as individual-led consultancy, are often not directly related to skills training or teaching (Borah et al., 2021). Informal arrangements are not substantially examined also because skills development hinges more on stable formalized relationships in which both parties contribute organizational resources for a common goal (Barringer & Harrison, 2000).
Table 1: Public full-fledged universities recognized by the Tanzania Commission for Universities, with 10 included in this study

| Name of University                                      | Year Founded | Head Office       |
|---------------------------------------------------------|--------------|-------------------|
| University of Dar es Salaam                            | 1961         | Dar es Salaam     |
| Mzumbe University                                      | 1972         | Morogoro          |
| Sokoine University of Agriculture                      | 1984         | Morogoro          |
| Open University of Tanzania                            | 1992         | Dar es Salaam     |
| State University of Zanzibar                           | 1999         | Zanzibar          |
| Nelson Mandela African Institution of Science and Technology | 2005       | Arusha            |
| Ardhi University                                       | 2007         | Dar es Salaam     |
| University of Dodoma                                   | 2007         | Dodoma            |
| Mbeya University of Science and Technology              | 2012         | Mbeya             |
| Mwalimu Julius K. Nyerere University of Agriculture and Technology | 2012       | Musoma            |
| Muhimbili University of Health and Allied Sciences*    | 2007         | Dar es Salaam     |
| Moshi Cooperative University*                          | 2014         | Kilimanjaro       |

* Universities not considered in this study

III. Discussion and Synthesis of Findings

3.1 Review of national development priorities and policies

Tanzania Development Vision 2025 sets a strategic agenda to transform the economy “from a low productivity agricultural economy to a semi-industrialized one led by modernized and highly productive agricultural activities which are effectively integrated and buttressed by supportive industrial and service activities in the rural and urban areas” (URT, 1999), characterized by 54% lower-level skills, 34% medium-level skills, and 12% high-level skills in the workforce. The Vision warrants political endeavours in human resource formation and education sector reform for youth skills development.

Anchored to the Vision are the Five-Year Development Plans (FYDP), the most recent being FYDP II (2016/2017 - 2020/2021) that accentuates the need to link industrialization to human development, and FYDP III (2021/2022 - 2025/2026) in the realization of industrialization by increasing efficiency and productivity in manufacturing (URT, 2021b).
Building on the FYDPs, the Education Sector Development Plans (ESDP, 2016/2017 - 2020/2021, 2021/2022 - 2025/2026) and the National Skills Development Programme (2016 - 2027) uphold progressive expansion of Technical and Vocational Education and Training (URT, 2016a; URT, 2021a; URT, 2021b), as well as national efforts to align curricula to the labour market needs. Yet, no comparable level of emphasis is put on tertiary education for higher technical skills training although the government recognizes a wide gap between the share of the current high-skill workforce (3.3%) and the target of 12.1% by 2025 (URT, 2016a). This is justified by the difficulty in catering to competing priorities simultaneously due to financial constraints and heightened needs in prioritizing the universal basic education in Tanzania. The FYDPs and ESDPs manifest a misalignment between what is needed to boost the skills profile at the higher level and the insufficient policy support rendered to higher education financially and technically. In general, scarce emphasis is found on policy enablers to incentivize university-industry collaboration for skills development.

A review of the national development priorities and policies reveals that the training of higher technical skills is a missing element in the national policy framework. The mismatch between higher education outputs and labour market needs has not been adequately addressed at the policy level with dedicated resources. The technological upskilling needed for a semi-industrialized country requires an expansion of not only the TVET (technical and vocational education and training) sector at the secondary level to fill in short-term skill shortages, but also higher technical education at the tertiary level to meet high-level skills demands in the long run. A study of the Tanzania Enterprise Skills Survey (Tan et al., 2016) indicated a positive correlation between a high share of tertiary-educated workers and firm productivity, while no impact was found significant on productivity from secondary education and TVET qualifications. However, the evidence has not yet compelled substantial policy support and investment in higher technical skills training in Tanzania.

Considering the constraints in public resources, opportunities need to be identified elsewhere. Policy incentives to engage industries in youth skills development are essential to mobilize private sector resources. Ankrah and Omar (2015) demonstrated a myriad of outcomes of UIC in their study, including economic benefits to societies, institutional benefits to universities and industries, and social benefits to communities. It is, however, inferable from the policy documents (URT, 1999; URT, 2013; URT, 2016b; URT, 2021b) that industries are still perceived mainly as consumers of skills. A shift in perceptive to regard the industry as training co-providers is also fundamental in the policy formulation process to change discourses and galvanize momentum in UIC for skills development.
3.2 Representation of Mechanisms in UIC for higher technical skills development

University-industry collaboration is motivated primarily by knowledge and technology exchanges between higher education institutions and the industry (Bekkers & Freitas, 2008). The last decade witnessed a surge in UIC initiatives in developed countries driven by the pressure to enhance innovation and competitiveness at institutional levels (Perkmann et al., 2013). There is also a corresponding growth in studies on UIC clustering in developed contexts (Teixeira & Mota, 2012). In comparison, universities in the Sub-Saharan Africa (SSA) lack network with the productive sector (Ssebuwufu et al., 2012) and studies in the region are scarce and less visible. According to a systematic literature review by Zavale and Langa (2018), out of a total of 230 studies identified on UIC in SSA, 12 were related and conducted in the context of Tanzania as of 2018. There are dominant interests on the determinants of UICs, scattered explorations on surrounding structural conditions of UIC, institutional capabilities, and rare cases examining mechanisms of interaction between universities and firms.

Various typologies exist in conceptualizing UIC mechanisms, yet few tackle those specifically for skills development. For instance, Santoro and Gopalakrishnan (2000), by classifying UIC into research support, cooperative research, knowledge transfer, and technology transfer, emphasize innovation while leaving invisible how UIC affects training. Broadly speaking, trainings through UIC occur on universities campuses, in industrial settings, and in hybrid occasions such as technology parks. According to Borah et al. (2021), teaching or training focused UIC, concerns industry’s involvement in university settings, such as curricula development, industrial-specific courses, and collaborative labs construction. This conceptualization regards university as the main arena where skills are developed, leaving student placements in industrial and hybrid settings unexamined. Although teaching and training form the primary function of universities, scholarly research on UIC, comparatively speaking, falls short of examining UIC mechanisms for teaching and training purposes (Ankrah & Omar, 2015; Perkmann et al., 2013). This is partly due to the fact the motivators of UIC are primarily institutional pursuits for resources and innovation instead of skills training. However, neglecting the potential of UIC on higher technical skills development is a missed opportunity.

Table 2 summarises existing UIC mechanisms found in 10 out of the 12 fully-fledged public universities of Tanzania. The information was obtained from an analysis of university web texts and strategy documents. Analyses of university strategies and development plans reveal that university-industry collaboration was not motivated primarily by higher technical skills development. Rather, the collaboration is valued by universities in generating revenue (through consultancy services), fulfil social responsibilities, increase research capacities, and deepen engagement with the community. Researchers take advantage of UIC as opportunities for joint
research with the industry, whereas industrial actors utilize UIC to access knowledge, encourage innovation, and commercialize technologies.

The web analysis and narrative literature review on training focused UIC demonstrate that the mechanisms of collaboration in Tanzania remain traditional. In the 10 universities examined, contracted research, joint research, and consultancy services are major UIC mechanisms. 6 out of 10 universities established units dedicated to consultancy services, while others assign the task of coordinating consultancy to relevant offices in charge of academic, collaborative, or partnership affairs. The Mode II (Gibbons et al., 1994; Etzkowitz & Leydesdorff, 2000) collaboration is the most common form in which the research is concerned with the practical application of knowledge and technologies. Contracted research forms a significant source of funding for universities in Tanzania, following that from international development partners and domestically from the Tanzania Commission for Science and Technology (COSTECH). However, not all joint research involves students, and its impact on skills remains unknown.

As related to higher technical skills training, 8 universities out of 10 claimed to be linking UIC to their students. The training-focused university-industry collaboration is organized in the form of field placements, scholarship programme, internships, apprenticeships, and exchanges. More project-based collaborations (where students get placed in industries) are found than course-based collaborations (where industries contribute directly to teaching on campus). Not surprisingly, the two most time-honoured universities in Tanzania, the Sokoine University of Agriculture and the University of Dar es Salaam, present closely knitted collaboration with the industry. The Ardi University and the University of Dodoma institutionalized industrial training into the curricula, and fieldwork is explicitly mentioned in the timetables of term arrangements. The Mbeya University of Science and Technology (MUST) also stands out with its institutionalized arrangements in enhancing industry linkages for skills and entrepreneurship. MUST also pioneered a database on students’ industrial practical training, the only one found among all 10 universities. It is evident that the universities in Tanzania are increasingly leveraging UIC for the benefit of their graduates with awakening awareness on the potential of UIC for higher technical skills development.

On the other hand, these UIC arrangements remain mostly ad hoc and dependant on funding driven by external partners, especially international development agencies. University-industry collaboration, in general, remains fragmented and distant from being institutionalized for skills development purposes. Additionally, the existing functional UIC mechanisms indicate relatively independent relationships of the parties involved. Benchmarked to the common forms of teaching-focuses UICs proposed by Kuntuu (2017), i.e., student projects, thesis projects co-supervised by academic and industry staff, tailored degree programme and jointly organized courses co-designed
and co-taught, universities and industries stand separate in their joint teaching efforts in Tanzania. There is no systematic approach to incorporate industrial demands to the university programmes, nor industrial efforts made to enhance the teaching and training activities of universities in assuring the quality of educational services and preparing skilled graduates (Manarbek et al., 2020).
### Table 2: Mapping of UIC mechanisms relevant to skills development in Tanzania (10 fully-fledged public universities)

| University                                      | UIC-related unit                                                                 | Mechanisms                                                                                                                                 |
|------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| University of Dar es Salaam                     | Bureau for Industrial Cooperation (based in the College of Engineering and Technology) Technology Development and Transfer Centre | - consultancy  
- technology transfer  
- contracted research  
- professional services  
- professional development courses to industries |
| Mzumbe University                               | Directorate of External Linkages and Community Engagement                         | - student exchange scholarships  
- research project                                                                 |
| Sokoine University of Agriculture               | Directorate of Postgraduate Studies, Research, Technology Transfer and Consultancy  
Departmental Outreach Committees  
Local Outreach Stations  
Bureau of Agricultural Consultancy and Advisory Services | - student research activities and awards  
- consultancy services  
- investment strategy to complement public funding  
- patented innovations and technology transfer  
- student ICT training/working laboratories, connected in a local area network  
- exhibitions on higher education, science, and technology  
- student internship and exchange programme |
| Open University of Tanzania                     | Consultancy Bureau Board                                                          | - collaborative research and development projects  
- consultancy                                                                 |
| State University of Zanzibar                    | Directorate of Graduate Studies, Research and Consultancy                          | - consultancy  
- outreach programmes  
- joint skills development programme with industry partner |
| Nelson Mandela African Institution of Science and Technology | No specific unit found, but officers dedicated to intellectual property, research and innovation led by Deputy Vice-Chancellor on Academic Research and Innovation | - incubation centers  
- collaborative research projects  
- technology transfer and commercialization  
- intellectual-property management  
- scholarship and partner-driven training project for youth |
|   | University Name                          | Department/Unit | Services and Activities                                                                 |
|---|-----------------------------------------|-----------------|-----------------------------------------------------------------------------------------|
| 7 | Ardhi University                        | Consultancy Unit | - consultancy project<br>- industrial training and field work imbedded into curriculum |
| 8 | University of Dodoma                    | Directorate of Research, Publications and Consultancy | - innovation competitions<br>- joint research<br>- consultancy<br>- practical training sessions with a particular industry/company integrated into programme<br>- field attachment<br>- community services, research fieldwork and practical training opportunities for students |
| 9 | Mbeya University of Science and Technology | Directorate of Postgraduate Studies, Research and Publications, Directorate of Public Services and External Links, Centre for Innovation and Technology Transfer, Consultancy Bureau | - collaborative project<br>- consultancy services<br>- apprenticeship programme<br>- technology transfer<br>- innovation and incubation<br>- students entrepreneurship<br>- database of Students’ Industrial Practical Training<br>- fieldwork and students research programs<br>- industrial linkages for students |
| 10| Mwalimu Julius K. Nyerere University of Agriculture and Technology | Institute for Outreach & Technology Transfer | - support students to acquire skills with industrial placement<br>- alignment of curricula with the industry demands<br>- technology transfer<br>- consultancy services |
3.3 Obstacles to UIC for youth skills training in higher technical education

A policy review implies insufficient funding and weak technical support to incentivize universities and industries to engage in collaboration focused on higher technical skills development. The formation of collaboration remains fragmented, motivated more by short-term interests than long-term plans to serve the national development strategy. The lack of initiatives to work together for skills formation translates into employers’ dissatisfaction with the competencies of graduates, and mounting pressure on universities to respond to a rapidly changing labour market. Without policy instruments favourable to cross-institutional arrangements that facilitate graduates’ transition from universities to the world of work, the massification of higher education might further exacerbate problems arising from an oversupply of graduates to the labour market (Bennett, 2019; Brown et al., 2011).

Uncertainties in the macro-economic environment is also unconducive to the development of university-industry collaboration. Tanzania discouraged the private sector until the 1990s when the liberalization policy came into effect. Domestic firms, currently at an early stage of development, could barely spare extra capacity to manage partnerships indirectly linked to profit-making. Training talents is off the business horizon, and industries perceive it as a state or academic responsibility. Meanwhile, foreign firms find it challenging to hire local professionals that meet their requirements (Vaaland, 2015), and opt for flying employees from their home countries as a quick fix instead of partnering with universities to train skills for the future. As the extractive industry in Tanzania is dominated by foreign companies (Ishengoma & Vaaland, 2016), there is a foregone opportunity for youth employment. Foreign firms also perceive universities as unprepared to handle challenges in the knowledge economy (Goedhuys, 2005), which is related to another obstacle.

Academic capacities are constrained in Tanzania, limiting collaboration with the industry for skills development. The higher technical skills training system itself is not anchored to the objective of training science, technology, and engineering skills (Wangwe, 1995). Such phenomenon is partly attributable to the short history of development for most universities. The early stage of development is challenged by a lack of human resources, infrastructure, financial resources, and weak management capacity (Makulilo, 2012). The push for university to collaborate with the industry seems to originate from government and donor pressures instead of from innate motivation to respond to economic realities (Mwamila & diyamett, 2009). With growing enrolment, the university faculty grapple with daily teaching and management tasks, which deprives them of the time and energy to foster UICs. Yet, UIC linkages are necessary as the Tanzania Commission for Universities requires new programmes to be established with
systematic industry analysis, which could not be completed without collaboration with the industry.

These obstacles, by no means, should be taken as a deterrent to UIC but need to be factored into designing mechanisms for the universities and industries to join efforts and overcome limitations in productive relationships. In contexts with constrained resources and capacities, collaboration serves to pool resources among stakeholders to create opportunities that neither party can address individually (Anderson & Sanga, 2019).

IV. Recommendations

An enabling policy environment and engaged industrial players, are indispensable in connecting universities to the world of work to enable individual flourishment, and to cement the foundation for socio-economic transformation with skilled graduates. Leveraging university-industry collaboration for skills development requires a multi-faceted approach. The policy implications from this study are as follows.

To form a base for collaboration, stronger information intelligence is essential. Labour market analysis, employer surveys, academic research, and tracer studies constitute informative sources of evidence to enhance information channels between universities and industries. A collaborative platform is needed for employers, universities, training providers, and policymakers to deliberate on skills requirements and ways to boost higher technical skills training on a regular basis. Mutual trust and understanding built with transparent information and established platforms of dialogues will form a foundation for collaboration.

National development priorities should be matched with resources and technical support to both the industry and universities to enable their contribution to the Tanzania Vision 2025 and beyond. Although Tanzania envisions science and technology skills to be an indispensable part of industrialization, only a quarter of the enrolment is in science-related subjects. The national training policy should grant equal weight to TVET skills and higher technical skills to upgrade the national skills profile in response to technological development. Policy incentives should also be crafted in a way that incentivize the private sector to engage in skills training in collaboration with universities.

Universities and industries should make full use of platforms provided by the government (i.e., National Skills Development Fund) and take initiatives to seek resources from local, regional, and international development partners to complement institutional resources for higher technical skills training initiatives. In productive networks, collaboration cannot be unidirectional. UIC needs to be institutionalized into the strategic plans of universities and
industries for higher technical skills development geared towards Tanzania’s socioeconomic transformation.

V. Limitation of Study

This study is not without limitations. Firstly, the sampling of only public universities misses a mushrooming population of private institutions. Although private institutions, in general, demonstrated rare trace of collaboration with the industry (Makulilo, 2012), their constant growth might usher in a new age that merits increasing attention. Secondly, the study, with a focus on youth technical skills development, did not deal sufficiently with the issue of insufficient absorbing capacity of the Tanzania labour market and entrepreneurship training in universities, both of which deserve elaborated in-depth discussions. Thirdly, the study could have been complemented with stakeholders’ perspectives drawn from interviews and focus group discussions. Further research could shed light on gauging the views of stakeholders involved in the UIC process to guide policy and practices in higher technical skills training.
Reference

Anderson, W., & Sanga, J. (2019). Academia-Industry Partnerships for Hospitality and Tourism Education in Tanzania, *Journal of Hospitality & Tourism Education*, 31:1, 34-48, DOI: 10.1080/10963758.2018.1480959.

Ankrah, S., & Omar, A. T. (2015). Universities-industry collaboration: A systematic review. *Scandinavian Journal of Management*, 31(3), 387-408.

Barringer, B., & Harrison, J. (2000). Walking a tightrope: Creating value through interorganizational relationships. *Journal of Management*, 26, 367-403.

Bekkers, R., & Freitas, I. M. B. (2008). Analysing knowledge transfer channels between universities and industry: To what degree do sectors also matter? *Research policy*, 37(10), 1837-1853.

Bennett, D. (2019). Graduate employability and higher education: Past, present and future. *HERDSA Review of Higher Education*, 5, 31-61.

Borah, D., Malik, K., & Massini, S. (2021). Teaching-focused university-industry collaborations: Determinants and impact on graduates’ employability competencies. *Research Policy*, 50(3), 104172.

Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57-71). American Psychological Association.

Brown, P., Lauder, H., & Ashton, D. (2011). *The global auction: The broken promises of education, jobs and incomes*. Oxford University Press.

Cyert, R. M., & Goodman, P. S. (1997). Creating effective university-industry alliances: An organizational learning perspective. *Organizational Dynamics*, 25, 45-57.

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From National Systems and “Mode 2” to a Triple Helix of university-industry-government relations. *Research Policy*, 29, 109-123.

Gibbons, M. and Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M. (1994). *The new production of knowledge, The dynamics of science and research in contemporary societies*, Sage, London.

Gregory, S. (2017). Life after university: What’s next for the new graduates? *The Citizen*.

Kunntu, L. (2017). Educational involvement in innovative university-industry collaboration. *Technology Innovation Management Review*, 7(12), 14 -22.

Makulilo, VB. (2012). The Proliferation of Private Universities in Tanzania: Quality compromised? *Wudpecker Journal of Educational Research*, 1(4):51-66.

Manarbek, G., Zhakupova, G., Kaliyeva, A., & Hezi, H. (2020). The university-industry cooperation: The role of employers in quality assurance of Education. In *E3S Web of Conferences* (Vol. 159, p. 09010). EDP Sciences.

Mgumia, A. H., Matte, A. Z., & Kundi, B. A. (2015). Contribution of innovation intermediaries in agricultural innovation: The case of agricultural R&D in Tanzania. *African Journal of Science, Technology, Innovation and Development*, 7(2), 151-160.
Mkude, D., Cooksey, B., and Levey, L. (2003). *Higher education in Tanzania: A case study*. Oxford: James Currey.

Munishi, D., & Emmanuel, J. (2016). *Factors contributing to lack of employable skills among technical and vocational education (TVET) graduates in Tanzania*. College of Business Education.

Mwamila, B. L., & Diyamett, B. D. (2009). Universities and socio-economic development in Tanzania: Public perceptions and realities on the ground. *Science and Public Policy*, 36(2), 85-90.

National Bureau of Statistics. (2021). *Integrated labour force survey 2020/21*. Dodoma, Tanzania.

Palmatier, R. W., Houston, M. B., & Hulland, J. (2018). Review articles: Purpose, process, and structure. *Journal of the Academy of Marketing Science*, 46, 1-5.

Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D’este, P., ... & Sobrero, M. (2013). Academic engagement and commercialisation: A review of the literature on university–industry relations. *Research policy*, 42(2), 423-442.

Santoro, M. D., & Gopalakrishnan, S. (2000). The institutionalization of knowledge transfer activities within industry-university collaborative ventures. *Journal of Engineering and Technology Management*, 17, 299-319.

Siegel, D. S., Waldman, D. A., Atwater, L. E., & Link, A. N. (2003). Commercial knowledge transfers from universities to firms: Improving the effectiveness of university–industry collaboration. *Journal of High Technology Management Research*, 14, 111-133.

Ssebuwufu J., Ludwick T., Béland M. (2012). *Strengthening University-Industry Linkages in Africa: A Study on Institutional Capacities and Gaps*, Association of African Universities, Accra, Ghana.

Tan, H., Bashir, S., & Tanaka, N. (2016). Skill use, skill deficits, and firm performance in formal sector enterprises: evidence from the Tanzania enterprise skills survey 2015. *World Bank Policy Research Working Paper*, (7672).

Tanzania Commission for Universities. (2014). Quality assurance general guidelines and minimum standards for provision of university education in Tanzania. Dar es Salaam, Tanzania.

Teixeira, A. A. C., & Mota, L. (2012). A bibliometric portrait of the evolution, scientific roots and influence of literature on university-industry links. *Scientometrics*, 93, 719-743.

United Republic of Tanzania. (2016). *Education sector development plan 2016/2017-2020/2021 (ESDP)*, Dar es Salaam: Ministry of Education, Science, and Technology.

United Republic of Tanzania. (1999). *National development vision 2025*, Dar es Salaam: Ministry of Finance and Planning.

United Republic of Tanzania. (2016a) *National skills development strategy 2016-2027 (NSDS)*. Dar es Salaam: Ministry of Labour and Ministry of Education, Science and Technology and Vocational Training.

United Republic of Tanzania. (2016b). *National five years development plan 2016/17-2020/21*, Dar es Salaam: Ministry of Finance and Planning, Dodoma, Tanzania.

United Republic of Tanzania. (2017). *National internship guidelines*. Dodoma: Prime Minister Office.

United Republic of Tanzania. (2021a). *Education sector development plan 2016/2017-2020/2021 (ESDP)*, Dar es Salaam: Ministry of Education, Science, and Technology.
United Republic of Tanzania. (2021b). *National five years development plan 2021/22-2025/26*, Dodoma: Ministry of Finance and Planning.

United Republic of Tanzania. (2013). *Technical and vocational education and training development programme (TVETDP) 2013/2014 - 2017/2018*, Dar es Salaam: Ministry of Education and Vocational Training.

United Republic of Tanzania. (2014). *The study on national skills development to facilitate Tanzania to become a strong and competitive economy by 2025*, President’s Office, Planning Commission. Dar es Salaam, Tanzania.

Vocational Educational and Training Authority. (2014). *VETA catalogue 2014*. VETA, Dar es Salaam, Tanzania.

Wangwe, S. (1995). *Fostering technological capacity building in Ethiopia and the United Republic of Tanzania*. ESRF, Research Report D95-006.

Ward, V., House, A., & Hamer, S. (2009). Developing a framework for transferring knowledge into action: A thematic analysis of the literature. *Journal of Health Services Research & Policy, 14*(3), 156-164.

Zavale, N. C., & Langa, P. V. (2018). University-industry linkages’ literature on Sub-Saharan Africa: systematic literature review and bibliometric account. *Scientometrics, 116*(1), 1-49.