



SOCIOLOGICAL APPRAISAL OF CULTURAL DIGITAL SKILLS GAP IN FREETOWN, SIERRA LEONE

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ABSTRACT: *The current technological and social panorama brings current benefits and threats that depend upon skills to conduct and achieve. Cultural digital skill is a call for benefiting from technology, and foremost cultural digital skills are imperative because they grant folks the ability to utilise technology in a transient's manner. Sierra Leonean universities and technical and vocational institutions endure advancing an Information Communications Technology labour pool that is neither modelled by policy nor well assigned to the industry requirements, exclusively at the great point. The Municipal's graduates are underprepared to accommodate the appeal of the current organisational structure and are incapable of establishing impressive results, progressing to a dearth of proficient and skilled labour pool appropriate for the Freetown cultural digital revolution. The paper anticipates appraising the foremost cultural digital skills evolvement procedure in higher learning institutions, the social reality of the process, and identifies possible challenges leading to the cultural digital skills gap. The paper utilised an archival research strategy and applied the design social reality gap framework with its optimistic record of social dimensions to appraise curriculum, staff, equipment, student enrollment, laboratory and graduation at the higher learning institutions in Freetown Sierra Leone that teach Information Communications Technology programmes. The research findings communicate that there is a low student enrolment in Information Communication Technology programmes resulting in a low number of graduates joining the municipal industry. The appeal for Information Communications Technology skills continues to expand while the industry complains that graduates are not well prepared to undertake projects from the industry forcing the Freetown municipality to rely on foreign expertise. The curriculum utilised in the learning institutions is mismatched, leading to inappropriate competencies to be evolved among the graduates. In spite of the prevalence of standards and protocols from the university regulator (Sierra Leone Tertiary Education Commission), they are not enthusiastically sanctioned due to challenges faced by the regulator and the institutions. A recommended operation strategy was evolved to bridge Freetown's cultural digital skills gap among government agencies, educators or trainers, and employers. The paper spotlighted skills evolvement in higher learning institutions, excluding the technology hubs and complementary programmes offering training programmes for advanced cultural digital skills in the Freetown Municipality. The paper confirmed that inappropriate competencies are being evolved among the graduates, making them unqualified for meeting the requirement of the industry and the Freetown municipality. The paper responds to the policies related to Information Communications Technology labour pool evolvement in the Freetown municipality. The paper will trigger the evolvement of current thinking or thought and social interactions among the learning institutions, academic staff or trainers, employers and government agencies to link the cultural skills gap leading to an empowered municipality competent of upspringing the economic expansion.*

KEYWORDS: Cultural, Appraisal, Digital, Skills Gap, Freetown



INTRODUCTION

The Freetown Municipality digital innovation hub was launched at the Bintumani Conference Centre in Freetown, Sierra Leone, in October 2020. The innovation hub is a flagship project by Freetown City Council and the municipal's contribution to the Africa Catalyst phase two, part five initiative, which is working to digitise the economies and the trade of municipalities across the African continent. This has five key pillars for achieving a vibrant digital economy in a developing trend: digital government, digital infrastructure, business, digital skills and values, and innovation-driven entrepreneurship, which is involved in the evolution of a digitally skilled human labour pool to ensure that municipalities have the digital know-how and literacy to participate in the "faster-accelerating digital economy" (Kim, 2014). The cultural digital skills pillar is focused on evolving Freetown's digital human capital to achieve the digital economy, which can only be realised if the human capital in the Freetown Municipality utilises technology with the appropriate threshold of social competency and expertise. They are key in implementing Freetown's digitised projects in the private and public categories. There are diverse cultural digital skills that range from basic cultural skills (skills for performing basic tasks) to intermediate skills (skills enabling the utilisation of digital technologies in a more encouraging and substantial path) to advanced skills (high-level skills needed by experts in Information Communications Technology professionals to deliver nationwide products and services. The concern of the pillar is to augment the figure of Freetown graduates trained in advanced digital cultural skills. Advanced cultural digital skills are a critical factor in building a digital municipal emblem and cultural society. They are cultural skills that allow Municipalities to utilise technology in a transient manner and include skills like Big data, Programming, and Coding in tools such as Mobile app evolution, Cyber security and the Internet of Things. While the paper focuses on advanced cultural digital skills, all forms of cultural digital skills are essential to the future labour pool in the Freetown Municipality, with basic cultural skills being the most critical. A dearth of competent and skilled cultural human capacity resides among the youth, and it is the primary cultural obstacle to their employment in the digital jobs category.

The youth unemployment rate in the Freetown Municipality is high (Mekennon, 2016), and it is estimated that the municipality will have 2 million unemployed youth by the year 2025. Social and digital skills are important to ensure that the youth contribute to the economic performance of the municipality now and in the future. This is more crucial in Freetown and the nation that is facing a demographic explosion that is expected to double the youth population by 2050 without enough jobs to cater for this growing youth population (UNFPA, 2018). Almost 60% of the Freetown population lacks digital skills, and only 1% know how to write a computer program. Higher education in Freetown has expanded in the number of institutions and student enrolments in the last two decades (Jackson, 2015) because it is conceived as an agent of economic development. After all, it plays a pivotal role in producing a trained workforce for the municipal economy.

Furthermore, cultural digital skills are directly linked to higher earning potential. As a result of the greater automation of internal processes by municipalities and districts, and enterprises to deliver social services, Freetown Municipality is seeing an increase in demand for skilled Information Communications Technology employees. In addition, significant multinational firms and Information Communications Technology companies that are establishing centres in the Freetown Municipality, such as AFRO Technology and Logistics, iDt labs, Sensi Tech Hub Freetown, TpISENT, KDC TELECOM, OnMobile Telecom (SL) Limited, are increasing their



demand for Information Communications Technology workforce (Barrie and Jackson, 2022). However, the higher education system has been criticised for producing ill-equipped graduates for municipal work forcing employers to invest in time-consuming and expensive exercises to overcome that. Graduates are ill-equipped to fulfil the skills demands of today's job and are unable to devise effective solutions to the most pressing socio-economic issues. The circumstance has been the same in the other districts, where businesses have regularly expressed their unhappiness with graduates' abilities (Raufflet and Lohmeyer, 2014). Furthermore, a sense of under-preparedness is experienced in Freetown, where young graduates are underqualified for their jobs and professional life in general (Turay, 2021). The ramifications of a cultural digital skills shortage are serious, and it could negatively influence Information Communications Technology operations in businesses as well as business growth. Furthermore, it may restrict the ability of local Information Technology enterprises to satisfy the demands of a quickly augmenting industry, resulting in lower economic performance (Clayton and Macdonald, 2013) at the company and municipal levels (Clayton and Macdonald, 2013). The availability of a reliable municipal pool of skilled Information Technology professionals is critical to building sustainable Information Technology industries (Conteh et al., 2019) and a sustainable municipality. Despite the social recognition of the existence of the cultural digital skills gap, local universities, training and vocational institutions continue to generate Information Communications Technology human social capital and labour pool that is neither guided by a human resource evolution policy nor adequately connected to businesses need (Priyashantha, 2022). Freetown Municipal learning institutions are rapidly expanding and face significant challenges in imparting learning, relevant education, and high-quality training (Umapathy, 2022).

Freetown Municipal Higher Learning Institutions

Freetown Municipal higher learning institutions in context consist of the University of Sierra Leone – (Fourah Bay College, College of Medicine and Allied Health Sciences, Institute of Public Administration and Management), Milton Margai Technical University, Limkokwing University, Institute of Administrative Management and Technology University and Njala University Postgraduate Freetown Campus. Due to employment market demands, many institutions have been established to meet the expanding need for higher education (Canals et al., 2018). Six institutions in the Freetown municipality's higher education system offer at least one Information Communications and Technology degree programme. These programmes can be classified as Electrical Engineering and its identical (computer engineering), Computer Science and its identical (Applied computer science) and Information Technology and its identical (Information systems). This higher education system also offers Diploma in Computer Engineering, Diploma in Information Technology, and Certificate in Computer Engineering. Graduates of any of the above programmes can work as high-end Information Communications and Technology experts in the Information Communications Technology industry in the Freetown Municipality, constructing, extending, and justifying sophisticated systems and networks (Harns and Friel, 2015). There is no Engineers Act that oversees the quality of engineering education in the Freetown Municipality. No legal or professional entity accommodates professional accreditation for computer science or information systems degree programmes, unlike engineering degree programmes. This demonstrates that the quality of computer science, information systems, or Information Technology Municipal graduates is singly dependent on an institution's own quality assurance mechanisms (Kabia et al., 2021).



Skills Growth Policies

The Freetown Municipal policies, blueprints, standards and programmes are critical in the growth of digital skills. The main issue of interest for policymakers should be the gap between the cultural digital skills of current and future Information Technology employees and those sought in the market (Beer and Mulder, 2022). Information Communications and Technology policies direct labour pool growth to meet the industry demand for high-end talent. The research reviewed divergent policies developed by diverse stakeholders in cultural digital skills growth, ranging from the municipal government, regulators, standard bodies, and the private sector. The Sierra Leone Ministry of Tertiary and Higher Education (Kamara, 2019) is responsible for providing access to relevant higher education and training and access to employment, while the Sierra Leone Ministry of Information and Communications (Jackson, 2015) is tasked to evolve and administer Information Communications and Technology standards. The Freetown Municipal Information Communications Technology grand plan 2016 - 2018 aligned strategic documents such as the Constitution, and new laws such as Copyright Act 2011, Local Government Act 2004 and Universities Act 2005. This grand plan (Freetown Municipal Plan, 2016-2018) is built around three pillars and foundations. The grand plan's first foundation is Information Communications Technology human capital and labour pool evolution, which aims to build high-quality Information Communications Technology human resources as a precondition for the evolution of a successful Freetown Municipal Information Communications Technology industry. The other two foundations are Integrated Information Communications Technology infrastructure and integrated information infrastructure. E-Government services, Information Communications Technology as a driver of Municipal Industry, and evolving Information Communications Technology businesses are among the grand plan's pillars. This plan identifies cultural digital skills growth as one of the main focus areas that need to be evolved to assist the municipal's transformation and adoption of technology. It acknowledges that the new technological landscape brings new opportunities and challenges that will need 'Freetonian' skills to manage, operate, and understand at scale. Since the skills needed are new, municipal training and manpower evolution processes need to become responsive to these needs. The Office of the Freetown Mayor Innovation Hub (FCCDP, 2016-2018) intends to evolve Freetown such that every Municipal, business, and organisation has digital access and the ability to participate in and prosper in the digital economy. Digital government, digital business, infrastructure, innovation-driven entrepreneurship, and digital skills and values are proposed as foundations for the establishment of a digital economy in this crucial policy document. In particular, the cultural digital skills and values initiative strives to produce a digitally trained workforce based on strong ethical standards and socio-cultural values. This pillar focuses on digital skills training, ensuring that it is incorporated into educational institutions, is inclusive, and supports the other pillars of the innovation hub for achieving a municipal cultural digital economy.

The Mayor's innovation hub strategy 2018 aims to set the tone for Municipality to unlock new economic opportunities in order to boost labour productivity, diversify the Municipal economy, and position the Freetown Municipality as a source of stable economic growth with high-skilled talent (Freetown City Council, 2016-2018). Digital skills and values are one of the strategy's pillars, with the goal of enabling municipals to utilise Information Communications Technology to access information, equipping 'Freetonian' with cultural digital skills to utilise digital goods and services, and increasing municipals' competitive social advantage. The plan emphasises the value of cultural digital skills as well as the need for more responsible and



productive Information Communications Technology professionals. The Ministry of Education, Science and Technology 2008 Information Communications Technology Strategy intends for technology and a market-based economy. Information Communications Technology in education policy, digital equipment, connection and network infrastructure, access and equity, harnessing emerging technologies, capacity building, professional involvement, collaborations, and resource mobilisation are some of the components of the plan pertinent to this research. These strategies aim to provide exposure to information Communications Technologies through a reliable infrastructure to allow training and growth through collaborative effort and partnership (Arinaitwe, 2021) and cover manpower planning, involvement, employment and productivity promotion, which addresses skills mismatch through an industrial placement to allow graduates to gain hands-on experience in the municipal domain of work. The Ministry of Education, Science and Technology has evolved several policy documents to regulate higher education in Freetown. Ministry of Education, Science and Technology's goals and challenges in maintaining standards, quality, and relevance in all university education and training elements are presented in the strategic plan (FCCDP, 2016-2018).

Academic programme conception, implementation, quality assurance, and review are all covered by University Academic Programmes standards and guidelines. The guidelines for designing a curriculum for University Academic programmes indicate the basic information that should be included in a curriculum for academic programmes. Universities Act 2005 contains schedules that cover all aspects of university education, including academic programme standards. Through licensing, registration, and accreditation of programmes, institutions, the Freetown Tertiary Education Commission (2001) is responsible for regulating standards. The Tertiary Education Commission standards (Tertiary Education Commission, 2001) were created to provide a clear road map for the involvement of Tertiary Education Commission standards in Freetown and to assist the Municipality in achieving its competitive human capital goals. Implementing the standards will identify sector gaps and regulatory standards required in the Freetown Tertiary Education Commission sector. This will serve as a guide to ensuring that the standards set will improve the delivery of appropriate training that contributes to job creation and economic growth.

The human capital and labour pool growth standard (Bawono, 2021) aims to establish standards for technical Information Communications Technology professionals in the public sector, Information Communications Technology end-users, and Information Communications Technology training. Information Communications Technology Professionals in the public sector; capacity growth for end users; capacity growth for municipal competency; accreditation of Information Communications Technology institutions or training providers; accreditation of Information Technology Professionals are among the standards for this strategy. These standards are relevant to this research since they all attempt to help Information Communications Technology professionals improve their skills. Sierra Leone Vision 2025 aims to evolve the Municipality into a newly industrialised middle-income Municipality that provides all its residents with a high-quality life by 2030. Vision 2025 (Pillar One) and human resource involvement are two foundations of the vision that are pertinent to this paper (Pillar One). These foundations aim to provide 'Freetonians' with globally competitive quality education and training, improve or raise education quality and relevance, revise university curricula to include more science and technology subjects, and increase school enrolment and student transition to technical institutions and universities. Because of the pivotal function in



evolving human resources with appropriate innovative and competitive skills, universities were identified as one of the critical stakeholders in accomplishing the vision (Wagner, E et al. 2010).

In 2020, the Ministry of Education, Science and Technology, now partitioned into the Ministry of Tertiary and Higher Education and the Ministry of Basic and Senior Secondary School Education, conducted a high-level analysis of the demand for cultural digital skills in Sierra Leone, which included Freetown, Bo, Kenema, Bombali, and Kono. The five districts have a huge unmet demand for cultural digital skills. In the future decade, there will be a boom in demand for cultural digital skills training. The COVID pandemic has accelerated the rate of social change in these districts, and by 2030, all professions in Freetown, Sierra Leone, will require some threshold of cultural digital skills (World, 2016). The bulk of demand for cultural digital skills will come from occupations other than Information Communications Technology, and most training possibilities will come from public-private partnerships. The Survey on the development of Information Communications Technology skills and jobs in Freetown and other districts (World Bank Survey Report, 2007) looked into the source, nature, and magnitude of the cultural digital skills gap and the likely demand from local and international companies. The poll looked at the availability of cultural skills in Freetown, Sierra Leone and the demand for the huge outcome of transformation in the technological landscape, which indicate the need for cultural digital skills evolvement, specifically in advanced Information Technology. The function of the Office of the Mayor's Innovation Hub fostering Information Technology talent in Freetown to give technology companies access to a high-skilled resource pool was examined in a case study conducted by the hub (2016-2018). By investing in people and ensuring that participants are job-ready, the hub is solving the municipal cultural digital skills deficit that employers face. The LinkedIn research, titled "New LinkedIn Research: Upskill Your Employees with the Skills Companies Need Most in 2020" (Nuys, 2019), focused on the cultural digital skills that are in high demand by businesses versus their supply from educational institutions. The lack of cultural digital skills can severely impact municipal or national productivity and the ability to innovate and adopt new technologies. The policies, standards, and recommendations addressed the municipal's skill shortages and mismatch. Both the public and private sectors must make far-reaching decisions about how to address the cultural digital skills gap. Higher learning institutions have a key role in evolving skills, as highlighted by the World Bank Information Communications Technology Survey (2016); however, their quality is slipping and has accelerated in the past 20 years (Nishimuko, 2007).

Municipal Digital Skills Evolvement Initiatives

Information Communications Technology personnel must have cultural digital skills in order to perform their jobs effectively (Stokker and Haslan, 2009). The Freetown Municipality has emphasised skills growth among the municipals because "human capacity remains the biggest strength that a municipality can harness in its development" (Mayor Aki Sawyer, 2022). It has been argued the best approach to satisfy future cultural digital skills demand is through the domestic supply (Feijao, 2021), and that is why the Freetown Municipal Council started a few initiatives to provide skills and knowledge for operationalisation within the Municipality. Some of the initiatives include:



Innovation Directorate

The innovation trainings are implemented by the Directorate of Science, Technology and Innovation in partnership with the Government of Sierra Leone Ministry of Information and Communications. It aims to “bridge the gap between skills demand and the lack of jobs in the country”. By 2025, the project's main goal is to make Sierra Leone a freelance centre and a global destination for online work. The project will teach basic soft skills, online work skills, digital marketing skills, and basic financial management skills to young people who have never worked online before. And “Conducting Practical Training for students with an introduction to 4Air skills (data science, software development, artificial intelligence...” (DSTI Sierra Leone Archives). Furthermore, the directorate aims to teach experienced online work freelancers so that they can grow their firms into agencies and find more work to share with new online workers. The Directorate has managed to train a total of 400 youths. Most trainees have successfully signed up on the different online platforms and have their work profile accounts approved. Some have started bidding for online work, and others have won bids and started earning from online work. The cumulative earnings from the bids have surpassed thousands of leones. However, the changing dynamics of education and skills have affected the jobs offered to trainees. The jobs are always transforming and require more skills and better education qualifications that the trainees or graduates in Information Communication Technology do not have.

Generation Unlimited Initiative

Digital or innovative Talent is an Exhibition and Boot Camp programme for fresh Information Communication Technology graduates designed to build their Information Communication Technology capabilities through a rigorous training process preparing them for the Information Communication Technology market (GovSLDsti, 2022). A partnership between the Government of Sierra Leone Directorate of Science, Technology and Innovation and the public and private sector players leads the initiative. The Ministry of Information and Communications implements it. The interns are placed in government ministries and the private sector for one year. During their placement, they are given a holistic understanding of how Information Communication Technology works in both sectors. This exposure helps them to acquire and apply digital skills for effective service delivery and efficient implementation of projects. This programme has assisted in digitising government records such as in the Ministry of Education, Ministry of Finance and Economic Development, Ministry of Lands, and Ministry of Foreign Affairs. The challenges of this initiative have been the limited number of trainees taken every year. The programme currently takes fifty fresh graduates every year, which is a small number compared to the number of graduates from the Information Communications Technology programmes in higher learning institutions.

Digital Inclusion

According to the Directorate, this initiative was rolled out in 2018 to promote access to technology, digital skills, and knowledge to the Municipality to ensure digital inclusion to all ‘Freetonians’ through a network of information facilities across the Municipality (GovSLDsti Archives, 2018). The Directorate has had several benefits, such as employing young people in the Municipality and helping improve business skills and knowledge. Lack of business and entrepreneurial capacity and capability, quality and expense of Internet bandwidth in municipal locations, lack of technical support, and inadequate marketing techniques have been some of



the obstacles to cultural digital programmes. Due to these challenges and past performance, the directorate was put on hold in implementation, and it has now been active since 2019.

Municipal Challenges of COVID-19

The COVID-19 epidemic has posed a danger to education. However, those shocks can be mitigated, and crises can be turned into opportunities. Countries should use their universities and other post-secondary institutions to provide technical support for remote learning, rapid training, and global knowledge access (Marginson, 2010). The COVID-19 pandemic has forced Sierra Leone universities to shift from traditional classrooms to virtual learning environments, requiring academics, support personnel, and students to retrain in the necessary knowledge, competencies, abilities, and attitudes. Many colleges have used online platforms to continue their education; some have even held virtual meetings. The University of Sierra Leone has trained its teaching and support personnel and students to use synchronous and asynchronous learning tools for curriculum delivery (USLHR, 2020).

The University of Sierra Leone, for example, has reported advancements such as the production of ventilators and modified Covid-19 testing swabs (Russell 2022) and found that there was a very low degree of satisfaction with the internet connection, cost and reliability in their study on teacher and student preparedness for online learning in the Freetown Municipality. They suggested that because the majority of students own smart phones and laptop computers, universities should make the most of mobile technologies to teach and enhance online learning. Rather than depending on campus Information Communications Technology, universities should transform their focus from centralised Information Communications Technology investment to off-campus empowering the learner and instructor.

Furthermore, colleges should fight for subsidised internet bundles from internet providers, and governments should lower tax levies on internet service providers so that learners and instructors off-campus may access reasonable and dependable internet connections.

Digital Skills Gaps

The Government of Sierra Leone categorises the cultural digital skills gap as the limited supply of sufficiently trained personnel for Information Communications Technology companies or organisations. According to the findings of Desjardins and Rubensons (2020), skills mismatch is often ascribed to shortcomings in the education and training system. A report by the Sierra Leone Sensi Tech Hub Project (2022) established that divergent cultural digital skills are lacking within the Municipality, forcing the country to rely on foreign expertise to deliver on Information Communication Technology projects. The circumstance is similar in districts such as Makeni and Bo, which do not have sufficient skilled Information Communications Technology practitioners and are dealing with the cultural digital skills shortage through the utilisation of temporary Information Technology experts snap visitations but they foresee that not being adequate for their future Information Communications Technology demands (Zhang et al, 2021). A research by (Sebat et al., 2020) on the digital skills shortage in the technology sector results in employers struggling to find workers with digital skills, and concerns are growing over graduates leaving “the learning institutions without up-to-date technical skills to be effective in the workplace”.



Employer Efforts to Bridge Cultural Skills Gap

Skills are a critical component of a company's competitiveness and success. Employers find the education system, technical training and vocational institutions produce graduates without the required skills, which are business constraints. Employers are investing in a variety of initiatives to overcome the cultural skills gap. They have modified their expectations of graduates and are now concentrating on paths to promote employee learning, skill acquisition, and skill adaptation (Puffer, 2020). In Sierra Leone, only around a third of companies provide training to their employees, either on the job or through external training possibilities (Walter and Rodriguez, 2017). Most businesses have unrealistic job requirements and are unwilling to pay for training for individuals they hire, preferring instead to hire people who have worked before (Hernandez-de-Menendez and Menendez, 2016). Larger companies expect hiring to be difficult due to fierce competition for talent and prefer to up-skill and retrain their workforces rather than employ them (Cubitt, 2011). Grief et al. (2021) agreed, emphasising the importance of focusing efforts on improving the digital skills of a broad portion of the workforce in order to ensure that the advantages of technological breakthroughs benefit ordinary workers.

According to (Li, 2022), most businesses want to reskill and upskill their existing employees to assist them in adapting to current and emerging technologies in their industry. Many Information Communication Technology businesses have established academies to help employees get skills and certifications in their technologies, while the education industry has been working on building curricula to boost graduate employability.

Dimensions of the Design Reality Gap

The design reality gap framework and its optimism checklist of elements were employed in the research, which has been used in similar studies. Bass and Heeks (2011) utilised the framework to explore the implementation of international computing curricula in Ethiopian higher education and discovered that, despite significant growth, significant gaps between design and reality prevailed, requiring specific engagement along specific proportions such as technology to precise design-reality gaps and ensure greater implementation. To inspire achievement, (Dasuk et al., 2015) used the optimism thoughts of the design reality gap scheme to explore the contrariety of implementing British computing degree programmes in a private university setting in Nigeria. They ascertained that there is a demand to stopgap ahead of the upfront application of such curricula to reconcile them to the local cultural, institutional, social, and political context. The framework will be utilised in the research to identify useful gaps between the design and reality of digital skills growth in the Municipality and particular steps to close such gaps.

Sampling Mode

Purposive sampling was utilised in this research, which was acknowledged for the purposeful selection of secondary data. It is a low-cost, convenient (Dudovskiy, 2022), and time-saving method that is likely to yield valuable data to meet the research's objectives (Todd, 2018). For this research, a minimum of forty distinct secondary resources was gathered.



DISCUSSION

Looking at the actual supply of cultural digital skills, the learning institutions in Sierra Leone produce over 10,000 graduates but only 1,214 from the Information Communication Technology cluster. This is a low percentage, and it is evidence of the institution's incapability to evolve future human resources with the qualified knowledge and skills that the industry and municipality require. National Council of Technical and other Vocational Award institutes have a low enrolment rate as a result of a negative recognition that the National Council of Technical and other Vocational Awards is just for Municipals or folks who have failed academically. There is an immense distinction between the enrolment and graduation for Information Communications Technology programmes suggesting that skills demand greatly outstrips the skills stock. The distinction between enrolment and graduation can be ascribed to student dropout due to minimum mentorship conveniences.

A survey by Milton Margai, the University of Technology anticipated the number of graduates in Information Communication Technology will expand to 14,231 by 2025 and that the industry will require 40,000 Information Communications Technology professionals by the end of the same year as a result of increasing requests for advanced skills (Ra S et al., 2019). By 2025, 50-55% of all jobs in Freetown will require cultural digital skills, motivated by a flourishing Information Communications Technology sector and start-up ecosystem (Subramanya, 2022). Furthermore, there is a concern of the Information Communications Technology graduates being absorbed in non-Information Technology professions after graduation, contributing further to the skills supply gap.

Student enrolment and graduations are highly skewed towards Humanities and Social Sciences instead of Information Communications Technology. A focus on the Humanities and Social Sciences at the expense of science-based programmes has disadvantaged key municipal growth sectors that demand advanced digital capabilities. Low enrolment in Information Communications Technology programmes is attributed to the negative perceptions of students about Information Communications Technology such as Information Communications Technology professions are difficult, boring, not respected, involve no interaction with 'Freetonians', unemployment concerns and long hours of work.

Graduation-to-enrollment ratios in Information Communications Technology are low, which can be attributed to student dropout as a result of minimum mentorship opportunities. Despite the anticipated growth of the graduates, the number is still very low and will not meet the anticipated demand of the industry by 2025. The regulators predict an increased enrollment by 2023. General enrolment in National Council of Technical and Other Vocational Awards and universities seems to have improved, with 50,831 candidates being placed in universities and 40,724 in National Council of Technical and Vocational Awards institutions based on the (2021 Placement Report). Higher learning institutions need to find means of offering more Information Communications Technology programmes, increasing enrolments in Information Communications Technology and retaining students after enrolment to align with the evolvement demands of the Freetown municipality.



Social Processes and Expectations

An adequate curriculum assures that the graduates have extensive laboratory exercises and student projects to evolve the right hands-on experience. The curriculum transformation engagement is expected to be conducted in all subject areas for higher education (Annala, 2016) to ensure that emerging technologies are embraced in the curriculum. A university shall faithfully monitor its formulated programmes through divergent internal appraised engagements to examine the relevance of the programmes.

Social Reality

The current Ministry of Tertiary and Higher Education and Tertiary Education Commission recognise the existence of a cultural skills gap caused by higher learning institutions failing to appropriately address present and future Information Communications Technology demands, resulting in a shortfall in the country's high-end talent pool of Information Technology trained workers. There is a lack of a standard Information Communication Technology curriculum across the universities. The existing curriculum is misaligned with the technical needs of the municipality. As a result of obsolete courses taught at colleges, the Ministry of Tertiary and Higher Education (2020) determined that the existing supply of digital skills does not fulfil the needs of the employing institutions. Universities offer curricula that are out of sync with the needs of the industry, and they have been slow to catch-up with the evolving demand for Information Communications Technology skills (Saghafi, 2021). In addition to that, most universities in Sierra Leone have failed to provide programmes tailored to emerging technologies (Philip, 2022). Individual departments and schools determine the university curriculum, meaning that the quality of computer science, information systems, and Information Technology graduates is singly dependent on the institution's internal quality assurance methods in Universities (Ferdousi et al., 2022). The curriculum has not been regularly reviewed to introduce modern technologies such as network engineering and mobile computing. With changing technology, the high-end skills required are continuously expanding, requiring a rapidly evolving curriculum to ensure that they are integrated into educational institutions, inclusive, and significant. Inappropriate competencies are established as a result of a mismatched computer curriculum, and imperative skills and information are not taught (Wang, 2018). Employers have repeatedly claimed that graduates lack critical skills (Flores, 2010). Taking an example of the academic Programme for Computer Science offered at the University of Sierra Leone, none of the modern technologies identified by the LinkedIn survey and Digital Economy Blueprint, such as Cyber Security, Big Data, and Robotics, is being taught. That is similar to the equivalent programmes offered at Njala University, Sierra Leone Canadian College of Technology, Sierra Leone Methodist University and the University of Makeni. Some universities teach programming languages like C++ in some of their courses like OOP when companies are looking for graduates with in-depth knowledge of Python and Scala programming languages. Programmes offered by these institutions teach very basic and or general knowledge regarding computing, mathematics and business concepts. While their curricula offer security, networking, mobile computing and AI courses, they are only introductory courses into those crucial concepts with minimum lab activities. Similarly, due to the lack of a relationship between the institutions and the sectors, the National Council of Technical and other Vocational Awards institutions offer a curriculum that is primarily theory-based and unrelated to market needs. The current National Council of Technical and other Vocational Awards curriculum is inadequate and inflexible in light of technological advancements. It is based on a rigid supply-driven structure with little, if any, linkage or



relevance to labour market needs, resulting in graduates lacking the imperative skills, knowledge, and competencies (Flores, 2010). While content-based curriculum is becoming more popular across the country, higher education institutions continue to prioritise content-based curriculum, which emphasises knowing rather than doing (Amimi, 2021). Learning institutions' curricula are nearly entirely focused on course material and information rather than skills training, resulting in graduates lacking the abilities required to fulfil the expectations of future employers. Despite this, universities continue to generate Information Communication Technology human capital and a labour pool that is neither guided by a Human Resources development policy nor adequately connected to industry demands. They continue to impart organisation-specific training and professional development programmes that are neither responsive nor adaptive to new technology or industry demands. Higher education, specifically tertiary education, is intended to contribute to municipal involvement and the achievement of Vision 2025; as a result, programmes must be tailored to the municipal's development demands and evolved in collaboration with stakeholders in charge of labour market data from both the private and public sectors. Furthermore, universities should assist educational systems in the utilisation of digital or online learning. In response to the COVID-19 epidemic, the World Bank report (World Bank, 2020) notes that universities can conduct focused applied research and foster local innovation. Some universities may have the connections needed to quickly disseminate and utilise the knowledge on how to deal with the circumstance from around the world. Furthermore, the report suggests that higher education universities provide their students with focused online training for high-demand professions in pandemic coping and recovery. They can also provide short-term training in skills for expedited digital transformation in other industries, which are in high demand right now.

Design Social Reality Gap

The rising demand for higher education has resulted in the establishment of a slew of current institutions and delivery methods, some of which are of questionable quality. Academic programmes on offer are highly skewed towards Humanities and Social Sciences instead of Information Communications Technology. The current Information Communications Technology programs offered in educational institutions do not meet the demands of a scientific and technology-driven economy. The curriculum taught in the institutions is not up to date and does not provide the graduates with the relevant skills needed in the Information Communications Technology market. There is a need to update, strengthen and grow Information Communications Technology academic programmes that support the national priority and strategic areas. Many aspects of the courses are out of sync, including technology, industry changes, and teacher knowledge. Because of the misaligned curriculum, graduates from formal educational institutions lack the necessary skills for the industry. The learning institutions should continually undertake programme reviews to determine their currency and effectiveness. Moreover, they must continuously identify programmes that address the changing workforce needs to keep pace with the technological changes and trends. Regular programme reviews will ensure graduates have the requisite skills and industry knowledge to guarantee market responsiveness. Regarding curriculum growth and knowledge exchange, employers indicate that they do not have regular and relevant connections with general education and technical training institutes (Tripney and Hombrados, 2013). Interactions between them are about giving internships, arranging training for current employees, or recruiting new employees. These exchanges do not address issues about educational quality. The learning institutions need to establish more meaningful interactions with the industry to



acquire labour market information to address quality concerns such as guiding the curriculum evolution. The industry will impart the Imperative mediations to ensure the relevance of skills evolved will not only ameliorate the delivery of training to the graduates but will guarantee the relevance of their skills and hence excellent chance at employability. When formulating digital skills courses, institutions should concentrate on graduate employability. To guarantee that graduates get the skills imperative for the business, they must ensure that the courses are aligned with market demand and employer expectations. Because of the ever-changing nature of Information Technology, the curriculum should be revised on a standard basis to ensure that it is associated with current and future market demands while also assuring quality delivery.

FINDINGS

While Freetown's Municipality's higher education regulators have the authority to implement published principles and standards for higher learning institutions completely, they are limited in their budget, resulting in graduates with cultural digital skills that are irrelevant to market needs. The student enrollment and graduation analysis for Information Communications Technology programmes make a strong case for a big increment in both the number of students and programmes from the current 15.97% and 11.3% levels, respectively. There is a need to address the disparity between the number of students enrolled in Information Communications Technology and those that graduate. Learning institutions and the industry will need to improve the perception of the Information Communications Technology profession to improve enrolment in Information Communications Technology programmes. Key stakeholders in the Freetown Municipality (Sierra Leone Chamber of Commerce and Industry) give the least information about cultural digital skills market demands. Employers want graduates, but they are worried about the lack of practical experience and skills supplied by education and training institutions, which could lead to a cultural skills gap.

To address the mismatch of the curriculum with industry demands, there is a need for universities in Freetown to update their Information Communications Technology curriculum to cope with the growing and changing demands of the Information Communications Technology landscape to impart a hands-on technical and industry-related curriculum to guarantee market receptiveness, the relevance of skills and employability of the graduates. An implementation strategy has been proposed to bridge the digital skills gap in the Freetown Municipality among government agencies, educators or trainers, and employers. The strategy is broken down into six broad themes: Enrolment and Graduation, Learning Curriculum, Laboratory and Learning Equipment, Policies and the Regulators, Academic Staff and Skills, and Learning Institutions-Industry Partnership.



CONCLUSION

The design reality gap framework was utilised in the research to acquire an in-depth understanding of the design, reality, and gaps associated with the evolvement of advanced cultural digital skills in Freetown learning institutions. The application of this structure brought out key challenges and opportunities affecting and contributing to the development of the advanced digital skills gap in the Freetown Municipality. The main challenge is a mismatched curriculum which instigates unfitting competencies to evolve among the graduates, making them underprepared and unqualified to address the industry's demand.

Furthermore, poor enrolment and graduation rates from Information Communications Technology programmes are a committing element to the skills gap in the Freetown Municipality. Inadequate staff and limited digital equipment in the learning institutions contribute further to the poor quality of the graduates. Policy evolvement and enforcement by the regulators are crucial in the institutions' operations and training of students. The regulators need to take a vigorous role in regulating learning in the institutions. While the research identified initiatives towards training academic staff in the wake of the COVID-19 epidemic, the concentration has been on the evolvement of online platform skills to aid remote learning; curriculum delivery remains dependent on individual faculty competencies.

Further training and assistance are required to ensure that academic staff delivers the requisite skills to the graduates. The research identified opportunities such as the availability of academic staff for the Information Communications Technology programmes, existing networks between the industry and the learning institutions and the presence of standards and guidelines for the operations of the learning institutions. An implementation strategy was evolved outlining possible initiatives to bridge the digital skills gap in Freetown among government agencies, educators or trainers, and employers. Skill gaps arise from technological advancements which are constantly occurring. This implies that organisations will always face some skill gaps occasionally. However, the strategy evolved by this research will assist in minimising that gap and will aid in the evolvement of appropriate competencies among the 'Freetonian' (Municipals of Freetown) graduates.

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