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Assessing the relevance of the undergraduate Computer Science curriculum of Nigerian universities: insights from industry

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Abstract. This study investigated the degree to which the undergraduate educational programme prepares graduates of Computer Science with significant aptitudes for the working environment; it also examined the degree to which managers rate graduates as having suitable abilities for work. A sequential mixed-methods approach was employed, and the population comprises the graduates of Computer Science and their managers in South-West Nigeria. A convenience sampling technique was adopted to select a sample of interest from the managers and the graduates. The Graduates' Skill Assessment Questionnaire (GSAQ) and Managers' Graduate Skills Assessment Scale (MGSAS) were used to collect data from the respondents. The data were analysed descriptively and thematically, and the results show that the computer science curriculum successfully blends the development of hard and soft abilities, which is beneficial for preparing graduates for the demands of the industry. The managers also rated the graduates above average in all the skills that were assessed. This study recommends continuous updates of the undergraduate Computer Science curriculum by introducing more adaptable learning strategies, self-directed learning, group-based projects, peer reviews in the curriculum, and ethics modules in AI courses.

Keywords: Computer Science, curriculum, skills, graduates

1. Introduction

In today's rapidly evolving technological landscape, the alignment between Computer Science curricula and industry needs has become increasingly crucial. Students usually strive to develop and acquire employable skills that will make them readily employable after graduation [37]. The computing industry is a dynamic and ever-changing field, driven by continuous advancements in hardware, software, and emerging technologies [3]. Consequently, ensuring that educational programmes remain relevant and aligned with industry demands is a significant challenge faced by academic institutions worldwide, including Nigerian universities. The importance of aligning Computer Science curricula with industry needs cannot be overstated. A well-designed curriculum that reflects industry requirements equips graduates with the necessary skills and knowledge to transition into the workforce seamlessly [29]. This alignment not only enhances the employability of graduates but also contributes

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to the overall competitiveness and growth of the technology sector [1, 17]. Moreover, it fosters a symbiotic relationship between academia and industry, facilitating knowledge exchange and collaborative opportunities that drive innovation and economic development [39]. However, Nigerian universities often grapple with the challenge of keeping their Computer Science curricula up-to-date and aligned with industry trends. Several factors contribute to this challenge, including limited resources, inadequate industry collaboration, and the rapid pace of technological advancement [7, 33]. Additionally, the dynamic nature of the Nigerian job market, influenced by factors such as globalisation and evolving business models, further exacerbates the difficulties in maintaining curriculum relevance [2].

In light of these challenges, the primary objective of this study is to evaluate the relevance of the undergraduate Computer Science curriculum of Nigerian universities from an industry perspective.

Two research questions were raised and answered in this study:

I. To what degree does the Computer Science programme focus on significant skills for the working environment?
II. To what degree do managers rate graduates of Computer Science as having suitable abilities for work?

2. Related literature

2.1. Overview of Computer Science education programme of universities

Computer Science education in universities has undergone significant transformations over the years, reflecting the increasing demand for skilled professionals in the technology sector. However, despite these changes, the curriculum and educational approach often face scrutiny concerning their relevance and alignment with industry needs. The history of Computer Science education in Nigeria can be traced back to the 1960s when the first Computer Science programme was introduced at the University of Ibadan [7]. Since then, the number of universities offering Computer Science programmes has steadily increased, with both public and private institutions recognising the growing importance of this field. Nonetheless, the quality and effectiveness of these programmes have been the subject of ongoing debates and evaluations [7, 36]. Some of the significant challenges faced by Nigerian universities in delivering Computer Science education are the limited resources and infrastructural constraints. Many institutions struggle with inadequate computing facilities, outdated hardware and software, and limited access to cutting-edge technologies [42]. This resource deficit can hinder the practical training and hands-on experience essential for Computer Science students, potentially creating a gap between their skills and industry expectations.

Furthermore, the rapid pace of technological advancement poses another hurdle for universities. The computing industry is constantly evolving, with new programming languages, frameworks, and paradigms regularly emerging [10]. Keeping up with these changes and incorporating them into the curriculum promptly can be a daunting task, particularly in resource-constrained environments.

In an attempt to address these challenges, some Nigerian universities have established collaborations and partnerships with industry stakeholders [33]. These partnerships aim to facilitate knowledge exchange, provide opportunities for internships and industry exposure, and ensure that the curriculum remains aligned with current industry practices. However, the extent and effectiveness of such collaborations vary across institutions, and a more systematic approach may be required to achieve widespread impact.

It is worth noting that the Nigerian government and relevant regulatory bodies have recognised the importance of aligning Computer Science education with industry

needs. Initiatives such as the National Universities Commission's (NUC) Benchmark Minimum Academic Standards (BMAS) have been implemented to provide guidelines and requirements for Computer Science programmes [31]. However, the effectiveness of these guidelines and their implementation across universities remains a subject of ongoing evaluation and discussion.

To address the challenges and gaps in Computer Science education in Nigerian universities, a comprehensive approach involving various stakeholders is essential. This approach should encompass curriculum updates, resource allocation, industry partnerships, and continuous professional development for educators [9, 11, 12, 43]. By fostering a collaborative environment and embracing industry insights, Nigerian universities can better equip their Computer Science graduates with the skills and knowledge necessary to thrive in the ever-evolving technology landscape.

2.2. Comparison of the Computer Science curriculum in Nigeria with international standards and best practices

In an increasingly globalised world, it is crucial to evaluate the Computer Science curriculum in Nigerian universities against international standards and best practices. This comparison allows for the identification of gaps, areas for improvement, and potential opportunities for alignment with globally recognised frameworks and guidelines. One of the widely adopted international standards for Computer Science education is the Computer Science Curricula 2013 (CS2013) developed by the Association for Computing Machinery (ACM) and the IEEE Computer Society (ACM/IEEE-CS Joint Task Force on Computing Curricula 2013 while the latest iteration is CS2023) [21]. This comprehensive document outlines the body of knowledge, curricular guidelines, and recommended pedagogical approaches for undergraduate Computer Science programmes. Comparing the Nigerian curriculum with the CS2013/23 guidelines can provide valuable insights into the coverage of core concepts, emerging topics, and the emphasis placed on various subject areas.

Furthermore, organisations such as the National Centre for Women & Information Technology (NCWIT) and the Computing Alliance of Hispanic-Serving Institutions (CAHSI) have developed best practices and recommendations for promoting diversity, inclusivity, and equity in Computer Science education [30, 32]. Evaluating the Nigerian curriculum through the lens of these best practices can help identify areas where greater inclusivity and representation can be fostered, ensuring that Computer Science education is accessible and engaging for a diverse student population.

In addition to these international standards and best practices, it is essential to consider the specific context and needs of the Nigerian technology industry. While aligning with global frameworks is important, the curriculum should also reflect the unique challenges, opportunities, and technological landscapes specific to the Nigerian market [6]. This can involve collaborating with local industry stakeholders, analysing job market trends, and understanding the specific skill sets and competencies demanded by managers in the Nigerian technology sector.

Moreover, the comparison of curricula should extend beyond the content and subject matter covered. Pedagogical approaches, assessment methods, and the integration of practical experiences, such as internships and capstone projects, are equally important factors to consider [25, 41]. Many international institutions have embraced innovative teaching methodologies, such as project-based learning, flipped classrooms, and active learning strategies, which have proven to be effective in enhancing student engagement and industry preparedness [5].

It is worth noting that while international standards and best practices serve as valuable references, it is essential to approach the comparison process with a critical and contextual lens. Cultural, socioeconomic, and institutional factors may influ-

ence the applicability and feasibility of specific curricular components or pedagogical approaches [8]. Therefore, the evaluation should strive to strike a balance between global alignment and local relevance, taking into account the unique challenges and resources available within the Nigerian higher education landscape. By actively engaging in this comparative analysis, Nigerian universities can identify areas for curricular enhancement, adopt effective pedagogical strategies, and establish collaborations with international institutions and organisations. This process can ultimately contribute to the development of a Computer Science curriculum that not only aligns with global standards but also addresses the specific needs of the Nigerian technology industry and fosters a skilled and globally competitive workforce.

2.3. Studies on managers' ratings of Computer Science graduates

Evaluating the employability and industry readiness of Computer Science graduates is a critical aspect of assessing the effectiveness of the curriculum and educational programmes. In Nigeria, several studies have been conducted to gauge managers' ratings of Computer Science graduates, providing valuable insights into the perceived gaps and areas for improvement.

Recent research emphasises the value of employability skills for Computer Science and STEM graduates. Employers constantly emphasise teamwork, communication, problem-solving abilities, and interpersonal skills [22, 28]. While academic staff value problem-solving and critical thinking, there is a gap between industry demands and graduate skills [22, 40]. IT skills training can boost employment, with certain gender inequalities observed in specific skill areas [40]. Even at prestigious universities, U.S. seniors studying Computer Science do better than their colleagues in China, India, and Russia [26]. Educational institutions should review their curricula and work with industry partners to integrate pertinent employability skills to close the skills gap [28]. This strategy can enhance graduates' career prospects in the cutthroat global market and better prepare them for the changing demands of the STEM industry in the twenty-first century.

The employability of 204 Information Technology education graduates from a state university in the Philippines [4] shows that a higher number of the graduates believed their college curriculum was relevant to their job. The managers believed the graduates were employable with jobs that were mostly related to their field of study. However, soft skills such as entrepreneurial, problem-solving, and critical thinking need to be enhanced. The study did not include feedback from managers or industry experts. Therefore, graduate perception alone could not be relied upon to determine employability. Hence, this study attempts to bridge this gap.

Nigerian graduates face difficulties in acquiring employable skills, especially in Computer Science. Poor learning settings, a shortage of employees with industry experience, and excessive dependence on theoretical content make it difficult for higher education institutions (HEIs) to teach generic skills [18]. Industry and HEIs rarely work together, and many institutions lack the infrastructure, resources, and pedagogy needed to teach employability skills [33]. Students frequently think that a degree certificate alone is adequate proof of aptitude, demonstrating a mismatch between academic knowledge and actual skills [35]. IT skills training has been suggested as a remedy for these problems, and studies have shown that it can increase employability in some areas, such as teamwork, computer proficiency, and professional ethics [40]. To improve the employability of graduates, stakeholders recommend curriculum restructuring and greater cooperation between HEIs, industry, and the government [33].

Another notable study by Onifade et al. [38] investigated Computer Science students' perceptions of their curriculum's relevance to industry needs and technical skill

development. The results showed a significant positive relationship between students' perceptions of the curriculum and their acquired technical skills. This study concludes that the curriculum effectively aligns with students' technical skill requirements and industry needs. However, an inclusive approach to curriculum design and development is recommended to ensure a seamless transition from academia to the workforce upon graduation. Lawal et al. [24] surveyed Nigerian academics to identify the most important graduate attributes for computing graduates' employability and entrepreneurship. The researchers used the Computing Disciplines' Graduate Attributes Scale (CDGAS) to assess the importance of attributes such as effective communication, leadership, teamwork, lifelong learning, cognitive ability, practical skills, problem-solving, creativity, and innovative thinking. The findings showed that these attributes are crucial for both employability and entrepreneurship in computer-related disciplines. However, the study found no significant correlation between the two. The authors recommend incorporating career development support into the curriculum to help students understand how their graduate attributes can impact their employability and entrepreneurial prospects.

In addition to these sector-specific studies, broader investigations have been conducted into the overall employability of Nigerian graduates, including those from Computer Science programmes. For instance, a report by the NUC [34] highlighted concerns about the disconnect between the skills acquired by graduates and the requirements of the job market. The report called for greater collaboration between universities and industry stakeholders to bridge this gap.

It is important to note that the studies mentioned above often employ a variety of data collection methods, including surveys, interviews, and focus group discussions with managers. This multifaceted approach helps to capture a comprehensive understanding of managers' perspectives and provides a solid foundation for data analysis and interpretation. Furthermore, these studies not only identify perceived gaps and shortcomings but also offer valuable recommendations for improving the Computer Science curriculum and enhancing the industry readiness of graduates. Common recommendations include incorporating more hands-on projects, fostering industry partnerships for internships and collaborative learning opportunities, and emphasising soft skills such as communication, teamwork, and problem-solving abilities. By carefully considering and acting upon the insights gained from these studies, Nigerian universities can take proactive steps towards aligning their Computer Science programmes with industry needs and expectations. This alignment not only benefits the graduates by increasing their employability but also contributes to the overall growth and competitiveness of the Nigerian technology sector.

3. Methods

A sequential mixed-method approach was employed in this study. The population encompassed all Computer Science course graduates from the universities in South-West Nigeria and all managers of Computer Science graduates in the region. A convenient sample size of 160 alumni was chosen from 80 IT organisations, with two graduates selected from each organisation. The convenient sampling technique was used because of its cost-effectiveness, less time consumption and the challenges of accessing respondents [15]. Two structured questionnaires, the Graduate Skills Assessment Questionnaire (GSAQ) and the Managers Graduate Skills Assessment Scale (MGSAS), were utilised to gather primary data from the selected participants.

The GSAQ evaluated the degree to which a bachelor's degree in Computer Science imparted skills and knowledge pertinent to the workplace. The MGSAS also drew from previous studies to evaluate how managers perceive the ability of Computer Science

graduates to meet workplace requirements. The questionnaires were categorised into soft and hard/technical skills.

A total of 108 of the 160 GSAQ questionnaires administered were returned and analysed. Also, a total of 74 of the 80 MGSAS questionnaires were returned and analysed. To support the quantitative data, all the managers in the study were contacted for an interview, but only 10 were responsive and consented to participating in the interview about their opinions regarding the skills of the Computer Science graduates. The data was analysed descriptively using frequency and percentage, and the qualitative data was analysed thematically.

Validation of the instruments involved consultations and discussions with experts in test and measurement, Computer Science, software development, and other IT fields. Following validation, necessary adjustments were made. The internal consistency of the instruments was assessed using Cronbach's alpha, yielding values of 0.76 for GSAQ and 0.72 for MGSAS during the pilot test, which were considered good for the study.

4. Results

4.1. Research question I: To what degree does the Computer Science programme focus on significant skills for the working environment?

Figure 1 depicts the degree to which the Computer Science program emphasises soft skills. The findings show that the curriculum emphasises abilities including the ability to work well in both digital and textual forms, the ability to integrate data into understandable representations, and the capability to recognise significant problems and provide appropriate answers. The curriculum also emphasises building the ability to express concepts and have a significant influence on projects effectively.

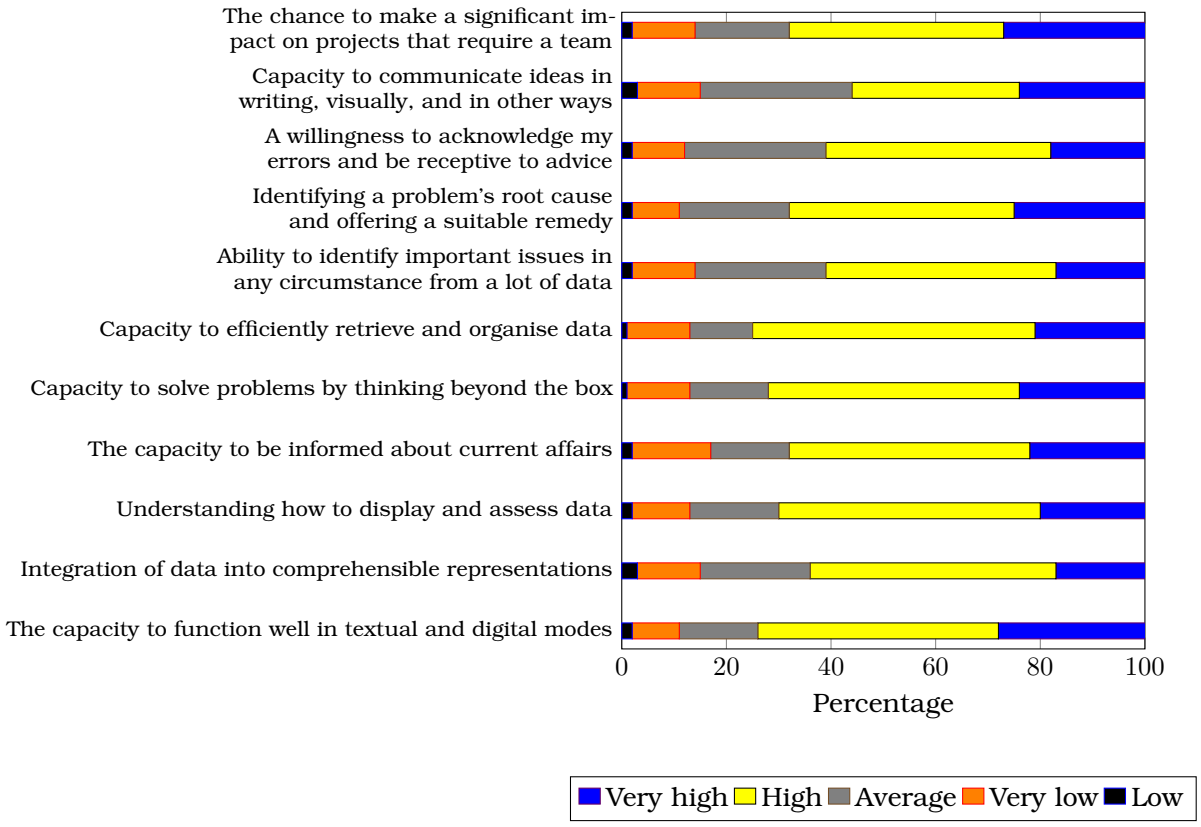

Figure 1: The degree to which the Computer Science programme emphasises soft skills.

With abilities like "identifying a problem's root cause" and "thinking beyond the box" scoring highly, the curriculum places a strong emphasis on problem-solving and critical thinking. This aligns with the growing demand for graduates capable of addressing complex, real-world challenges in fields like artificial intelligence and data science. Skills like "communicating ideas in writing or visually" and "making a significant impact on team projects" receive only moderate attention, indicating a gap in preparing students for collaborative, multidisciplinary environments. Nevertheless, the program's emphasis on interpersonal and reflective competencies seems uneven.

Emotional intelligence is often marginalised in technical education, and this is evident in the undervaluation of traits like "acknowledging errors and receptiveness to advice", which are crucial for developing resilience and adaptability. These findings highlight the necessity of incorporating pedagogical strategies like project-based learning and peer review mechanisms to develop holistic professionals who are skilled at both technical and human-centred challenges.

Figure 2 looks at how much emphasis the Computer Science program places on hard skills, and the findings indicate that the program emphasises the importance of having a solid foundation in fundamental theories, understanding current technologies, and having the requisite knowledge of computer hardware and networks. It also highlights the importance of database knowledge and mathematical skills, as well as the ability to create graphical user interfaces that work.

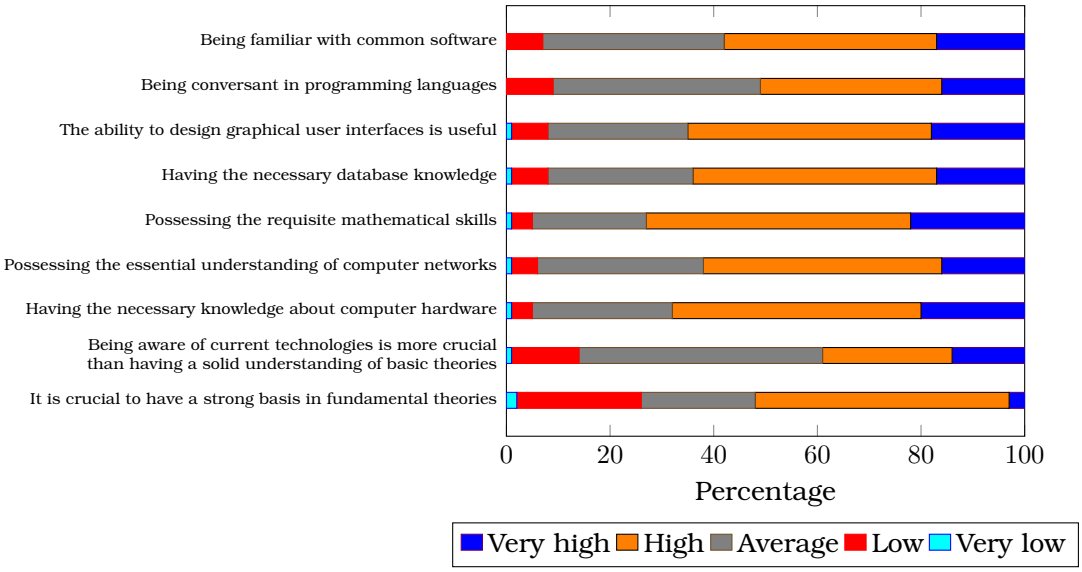

Figure 2: The degree to which the Computer Science programme focuses on hard skills.

The curriculum is dominated by technical skills, especially highly ranked applied competencies like database administration and programming expertise. The prioritisation of "awareness of current technologies" over "fundamental theories" demonstrates this pragmatic focus on immediate employability. Although this method guarantees that graduates are prepared for the workforce, it runs the danger of producing a workforce that lacks the potential for sustained innovation since it pays little attention to fundamental concepts in mathematics and theoretical Computer Science. Additionally, despite their importance to domains like IoT and UX/UI development, new subjects like hardware design and graphical user interfaces (GUI) receive only a moderate amount of attention. The discrepancy draws attention to a conflict between providing students with the conceptual depth required to handle upcoming technology revolutions, such as quantum computing or ethical AI governance, and accommodating

existing industry tools.

An analysis was conducted on the twelve variables for soft skills and the nine variables for hard skills to determine the skills included in the curriculum and those needing more attention. Average responses were categorised as "moderate extent", very low and low were categorised as "low Extent", and high and very high responses were categorised as "high extent". The results indicate that both hard and soft skills necessary for the industry were highly addressed in the curriculum (figure 3).

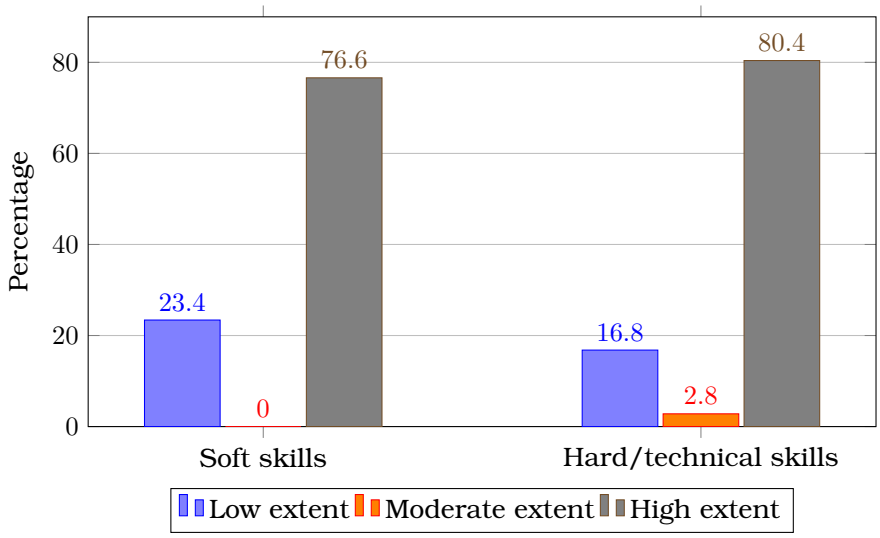

Figure 3: Frequency analysis of the sub-scale of the degree the Computer Science programme focuses on significant skills for the working environment.

4.2. Research question II: To what degree do managers rate graduates as having suitable abilities for work?

Figure 4 illustrates a frequency analysis of managers' assessments of different soft skills among Computer Science graduates. The assessments are divided into three categories: low, average, and high. The soft skills assessed include a variety of competencies like communication, problem-solving, data integration, and emotional maturity.

Skills such as "The capacity to function well in textual and digital modes" and "Capacity to solve problems by thinking beyond the box" received high ratings, indicating that managers perceive graduates as being proficient in these areas. This suggests that Computer Science programs are effectively equipping students with the ability to navigate digital environments and think critically.

Skills like "Understanding how to display and assess data" and "Capacity to communicate ideas in writing, visually, and in other ways" received average ratings. This implies that while graduates possess these skills, there is room for improvement, particularly in data visualisation and multi-modal communication.

Some skills, such as "A willingness to acknowledge my errors and be receptive to advice" and "Capacity to remain calm during difficult situations or unexpected occurrences" received lower ratings. This indicates a potential gap in emotional intelligence and resilience, which are increasingly important in collaborative and high-pressure work environments.

The managers' evaluations of Computer Science graduates on a range of hard skills, which are more technical and knowledge-based, are shown in the figure 5. These skills include familiarity with software and hardware, awareness of current technologies, programming proficiency, and a basic understanding of Computer Science theories.

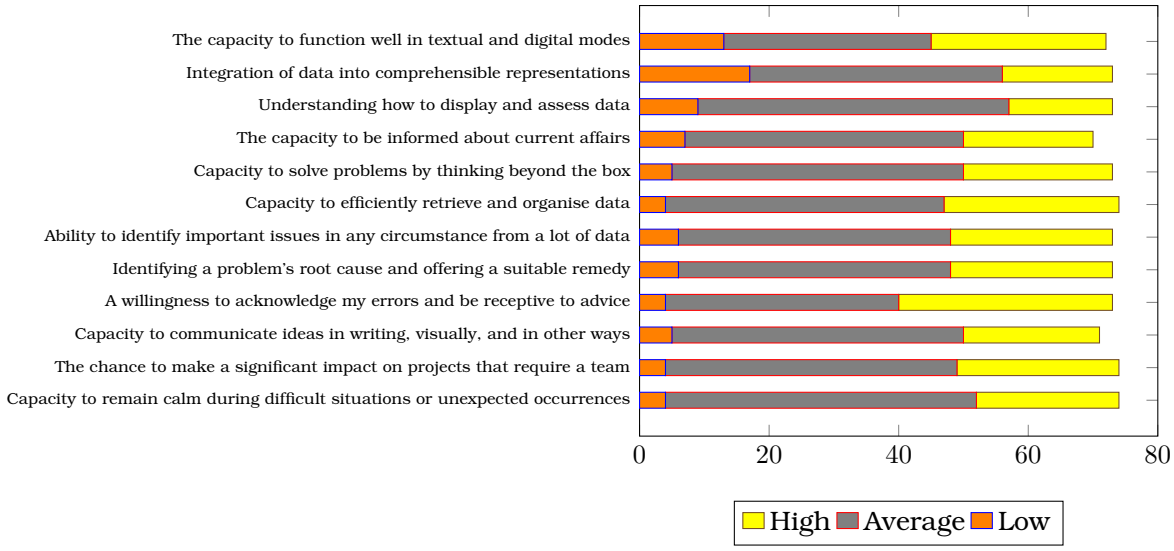

Figure 4: Frequency analysis of the managers' rating of soft skills of Computer Science graduates.

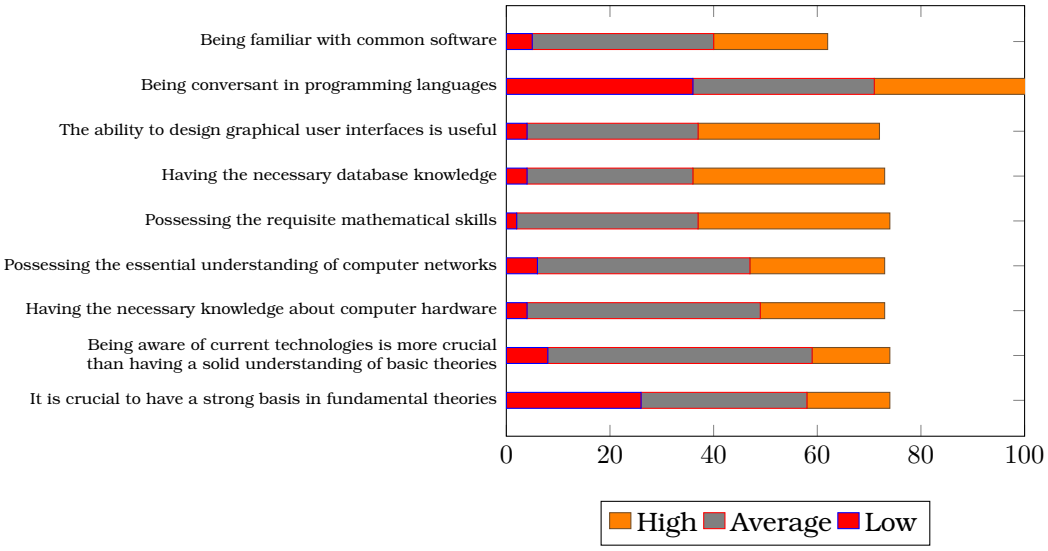

Figure 5: Managers' rating of Computer Science graduate on hard skills.

Skills such as "Being conversant in programming languages" and "Having the necessary database knowledge" received high ratings. This reflects the strong technical training that Computer Science graduates receive, particularly in programming and database management, which are critical for many roles in the industry.

Skills like "Possessing the essential understanding of computer networks" and "Having the necessary knowledge about computer hardware" received average ratings. This suggests that while graduates have a foundational understanding of these areas, there is potential for deeper specialisation or practical application.

The skill "Being aware of current technologies is more crucial than having a solid understanding of basic theories" received a low rating. This indicates that managers value a strong theoretical foundation over mere awareness of the latest technologies, emphasising the importance of depth in knowledge over breadth.

An analysis of the frequency of the twelve variables for soft skills and nine variables for hard skills was conducted to evaluate the level of skill possessed by Computer Science graduates from the managers' perspective (figure 6). Responses falling under

"very low" and "low" were categorised as low skills, while average responses were classified as average skills, and responses falling under "high" and "very high" were categorised as high skills. The findings reveal that managers rated the soft/non-technical skills of Computer Science graduates in their organisations as high (86.6%). In terms of hard/technical skills, the managers rated Computer Science graduates in their organisations as high overall (70.3%), with only a small percentage rated as average (6.8%), while 23.0% were rated as having low skills in hard/technical skills.

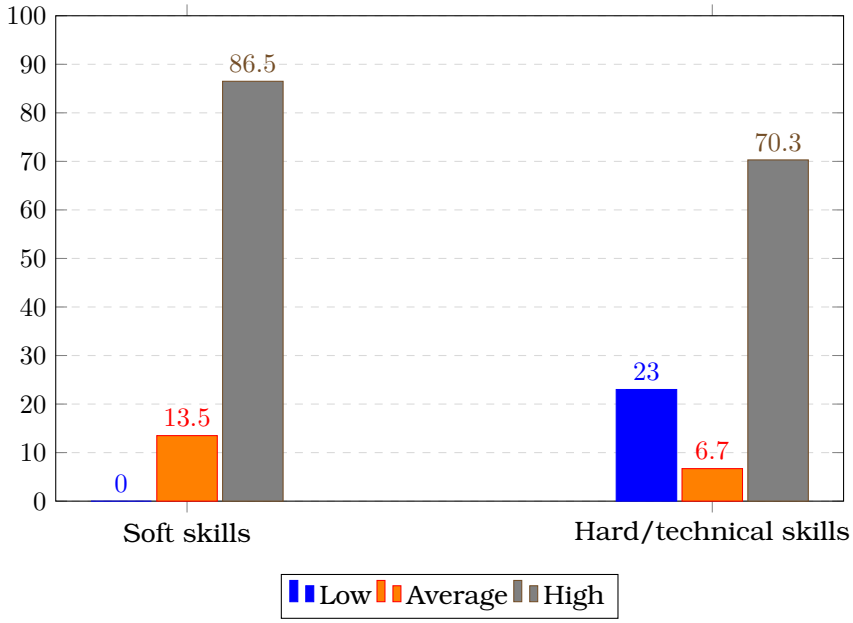

Figure 6: Frequency analysis of sub-scale rating of skills by managers.

Further analysis of an interview with the managers on the skillfulness of the graduates in the workplace, ten managers were selected randomly and were individually interviewed. The interview concentrated on whether they were satisfied with the skills of the fresh graduates of Computer Science in their workplace, whether the graduates possessed the required skills for their work, and their thoughts on the adequacy of what is taught in the universities in response to the demands of the workplace.

The majority of the managers interviewed who are majoring in information technology services reported that they were satisfied with fresh intakes into the workplace. Some of the responses are captured as follows.

> Well, as you know, we appoint based on performance during interviews, and most of them are tested based on what the organisation is looking for, but generally, they are all doing well based on the work assigned to them so far. (Respondent 1)

> Some of the basic skills expected of graduates are found in them; they can relate, they are teachable and require minimal training to catch up with their peers at work. (Respondent 5)

On the thought of managers on the adequacy of what is taught in the universities and what is demanded at the workplace, all the respondents stated that the schools need to do more, particularly for courses like Computer Science that require more practical skills. Below are some of the responses:

> The IT/ICT field is ever evolving and it demands skill upgrade often, what you know today may be out of date tomorrow, however, once you have the

> foundational knowledge which the schools provide, its easy to navigate. (Respondent 4)
>
> Hmm, the schools can't teach all, it self development that is important and once any graduate can do this, he/she will be fit in any area. (Respondent 1)
>
> We are seeing development in schools now, as some of them are allowing the students to specialise from undergraduate rather than before when all of them offer general courses. Now we have people specialising in software engineering, others in security, etc. There is an improvement. (Respondent 9)

5. Discussion

The primary aim of this research was to assess the extent to which the Computer Science programme focuses on the skills needed in the workplace and how the managers rate the graduates of the Computer Science programme in South-West Nigeria. The findings on how well the Computer Science program in universities prepares graduates for the workforce revealed that Soft skills development is emphasised heavily in the curriculum, and skills like communication, problem-solving, and project impact are highly rated. This indicates that the curriculum values these transferable abilities for workplace success, which is critical for computer science graduates. Maintaining and expanding this emphasis on soft skills is important because these abilities complement technical knowledge and enable graduates to work successfully in groups, communicate ideas, and solve complex problems. Additionally, the program places a strong emphasis on the development of technical skills and basic computer science knowledge, including programming, database and data management, and an awareness of computer hardware and networks. This robust foundation in key computer science ideas and practical abilities is essential for graduates to be well-prepared for technical jobs and problem-solving in the industry. The results show that the computer science curriculum successfully blends the development of hard and soft abilities, which is beneficial for preparing graduates for the demands of the industry. This balanced approach can help the program remain current and generate highly skilled computer science workers. The findings of Exter, Caskurlu and Fernandez [14] differ as they revealed that many essential workplace skills are inadequately covered in undergraduate curricula, as graduates felt unprepared for some specific soft and technical skills. Our finding is corroborated by an investigation of the Computer Science industry professionals by Iniesto et al. [19], which shows that graduates are well prepared with technical skills such as software development and usage, and also can interact with clients and customers. The inconsistency could be recognised in the respondents' locations and the content of their respective curricula. Nonetheless, it is crucial to regularly update the curriculum to keep pace with the rapidly evolving IT industry, ensuring that Computer Science graduates remain globally competitive.

The study's second objective focused on evaluating how managers perceive the skill level of Computer Science graduates for employment purposes. The results of the study indicate that the graduates were valued as above ordinary in all the skills that were assessed. Among the soft skills, the graduates were particularly praised for their willingness to confront and learn from mistakes, as well as their ability to identify the key aspects of any given situation. In terms of technical skills, the graduates excelled in user-friendly graphical interface design, database knowledge, and numerical skills, which were highly regarded. On the other hand, their understanding of fundamental theories received the lowest average rating.

The discovery aligns with the research conducted by Lundberg, Krogstie and Krogstie [27]. The study's results indicate that employers generally found the competence of Computer Science and Informatics graduates to be adequate for entry-level IT roles. Although the study was conducted in different climes, the Computer Science curriculum is similar globally. However, this contrasts with the findings of Goulart, Liboni and Cezarino [17], Edmondson, Formica and Mitra [13] and Kocsis and Pusztai [23] who reported deficiencies in soft skills or mismatches in the workplace skills of Computer Science graduates. Employers in Pakistan also believe that computer science graduates need a broader set of skills beyond just technical knowledge to be employable [20]. Gope and Gope [16] reported a gap between the skills taught in computer science curricula and the skills required for successful job performance in industry. The discrepancies in the findings could be methodological or theoretical. While soft skills were not explicitly addressed in the curriculum, they could be inferred from the teaching methods used in specific courses. For example, skills related to teamwork can be developed through collaborative projects and group assignments. Similarly, communication skills can be honed through interactions with classmates and delivering presentations. On the other hand, problem-solving and critical thinking skills are cultivated through completing assignments, participating in class activities, and undertaking various tasks.

To summarise, the results indicate that over 70% of the managers in the industries surveyed assessed the graduates as possessing the necessary soft and hard skills for the workplace. It is worth noting that this study did not identify any disparity between the skills taught in the curriculum and the skills demanded in the workplace.

6. Conclusion and recommendations

According to the results of this research, the Computer Science program is good at producing technically skilled graduates but less adept at developing flexible, morally driven innovators. By shifting its emphasis to balance soft skills, foundational knowledge, and emerging technologies, the curriculum can better prepare students to lead in a rapidly changing digital landscape, which is in line with calls from organisations such as the IEEE and ACM for a comprehensive education in Computer Science that bridges technical mastery.

The managers acknowledged that graduates in Computer Science are typically technically equipped, especially in database administration and programming. Soft skills like communication, emotional intelligence, and resilience, which are becoming more and more crucial in the ever-evolving IT world, are noticeably lacking, however. Furthermore, although graduates have a firm grasp of fundamental theories, they might still do better in areas like hardware and networking. However, it is important to consider other factors such as organisational or environmental influences that may contribute to the employability of these graduates.

The study suggests that efforts should be focused on regularly updating the curriculum of universities by introducing more adaptable learning strategies, self-directed learning, group-based projects, peer reviews in the curriculum, and ethics modules in AI courses. Adopting a blended approach, as advocated by ACM/IEEE guidelines to bridge the gap between theory and practice, would foster adaptability. These will make the skill development of students align with the evolving trends in the IT industry and ensure that learners are consistently equipped with the skills demanded by the workplace. Additionally, universities should collaborate with tech companies to provide mandatory industry internships, and students should also be encouraged to possess a continuous learning mindset and pursue professional certifications such as AWS and Cisco, to enhance their competence continuously.

Further studies may be carried out using different research methods to generalise the findings to all Computer Science graduates and managers. Similar studies may be carried out on other university programmes to get appropriate feedback on the curriculum and track the performance of their graduates. Other researchers may consider tracing the graduates of specific universities to get feedback from them, and the Computer Science curriculum in Nigeria can be benchmarked with the CS 2013/23 ACM curricula. The study could also be carried out in other regions of the country.

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