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Research Article

An Exploratory Study of the Expectation-Performance Skills Gap of Entry-Level IT Graduates in the Software Engineering Sector of Sri Lanka

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Abstract

The rapid evolution of the Sri Lankan software engineering sector has intensified the demand for highly proficient IT professionals, yet a significant disparity exists between graduates' performance and industry expectations. Utilizing the Bui and Porter (2013) framework, current qualitative study explores the Expectation-Performance Gap (EPG) by triangulating the perceptions of three stakeholders: educators, employers, and graduates within the non-state higher education institutions. Furthermore, current exploratory study maps the various obstacles faced during the shift from academic to professional settings, rigorously assesses perceived performance levels, and defines necessary technical and transversal (soft) competencies. The results show a misalignment of curriculum design with respect to industry benchmarks and substantial systemic inadequacies in competency evaluation. As a result, the study emphasizes the critical need for improved industry-academia collaboration, the incorporation of employer-sponsored training programs, and the establishment of strong policy frameworks to support iterative curriculum improvement. In Sri Lankan software engineering landscape, these deficits offer a strategic basis for evidence-based curriculum planning.

Introduction

The transition from university education to professional practice represents a critical milestone where academic theory and industrial application converge. The diverse knowledge of workforce directs the world into enormous opportunities in the relevant discipline. In the contemporary technological world, higher education institutions (HEIs) are increasingly tasked with equipping learners with a varied set of competencies that beyond just academic knowledge. The early understanding of the graduate's skill gap will lead to the improvement of the graduates' professionalism and engagement with the industry (David Lopez et al.,2025). The modern professional landscape requires a blend of interactive communication, cognitive adaptability, and technical proficiency. This transition is especially evident as global employers increasingly emphasize a comprehensive skill-set portfolio when evaluating potential hires who navigate opportunities in complex and rapidly changing work environments (Elena & Raquel, 2020)

The information technology (IT) sector has surfaced as a principal driver of innovation and economic growth within the global framework. In the specific context of Sri Lanka, the Information and Communication Technology Agency (ICTA) have acknowledged a remarkable extension of the digital economy. National statistics reveal that the IT workforce capacity escalated from 82,854 in 2014 to 124,873 by 2018 with a significant 50.7% growth rate. Projections suggested that this figure will exceed 146,000 by the end of 2019, illustrating the sector's swift maturation (Tharindu, 2019).

Currently, the Sri Lankan ICT sector services over 300 diverse enterprises and provides direct employment to more than 85,000 individuals (Sri Lanka Export Development Board, 2024). Most of these professionals possess formal academic qualifications, with a heavy concentration in the software engineering discipline, which serves as the backbone of the country's high-value service exports. Currently, over 300 diverse enterprises in the Sri Lankan ICT sector provides direct employment to more than 85,000 individuals (Sri Lanka Export Development Board, 2024). The

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majority of these individuals possess academic qualifications, with a heavy concentration in the software engineering discipline, which serves as the backbone of IT industry workforce.

The Software Engineering Workforce Pipeline

The pipeline for the Sri Lankan software engineering sector is essentially multifaceted, comprising diplomates, higher diplomates, and degree-holders from a variety of academic and vocational institutions.

the Economic and Social Statistics of Sri Lanka (2021) categorized the freshers in the workforce consists of four primary pillars state universities, private degree granting institutions, government vocational and tertiary training centers, and private diploma-awarding bodies. The University Grants Commission (UGC) data depicts the total undergraduate enrollment for computer science and related IT degrees reached 6,942 students within state universities, while private higher education institutes (HEIs) accounted for an even larger cohort of 7,990 students (UGC, 2024). Statistical reality highlights the critical role played by the private degree awarding institutions in fueling the nation's tech ecosystem. Consequently, these private degree awarding institutions manifest a reflective responsibility to ensure that the curricula dynamically aligned with evolving global software industry expectations rather providing theoretically sound. According to the standard Sri Lankan academic progression, typically IT learners mark their initial contribution to the industry by engage in professional internships during their second or third years of study while remain completing their formal education (Tharindu, 2019).

The Expectation-Performance Gap

The qualitative readiness of the workforce remains a significant concern when compared to the quantitative demand in the number of graduates. The IT-BPM Workforce Survey (2021) identified a critical operational bottleneck, although the demand for software engineering personnel is at an all-time high while the actual skills demonstrated by the new workforce do not satisfy the demanding expectations of the industry (Chamithri & Asanka, 2024).

This disparity between academic supply and labor market demand is not an isolated phenomenon. It is a systemic challenge that surpasses the software engineering sector. Research reveals that most of the higher education institutions frequently struggle to adapt their academic frameworks to the rapid technological alterations and agile methodologies which are demanded by modern IT industry (Harry & Panca, 2018).

Industry employers constantly highlight that entry-level graduates lack the necessary competencies, market-ready required to contribute for immediate solution development (AL-Hashimi et al., 2020). This creates severe tension within the tech ecosystem. Although the industry remains dissatisfied, the educators report that they are producing high-quality graduates with required competencies and often feel confident in their abilities. This discrepancy is formally defined as the "Expectation-Performance Gap" and is one of the phenomena that directs to high unemployment or underemployment among entry level graduates. It directly leads prevent industry from its full economic potential.

The Knowledge Gap in Current Literature

The motivation for this study arises from a significant gap in academic research focused on the Sri Lankan software engineering sector. Despite the sector's goal to achieve USD 5 billion in export income by 2025, there remains a persistent skills gap that lacks sufficient empirical explanation.

This study highlights a critical knowledge gap: the lack of a comprehensive, triangulated investigation that concurrently captures the views of the three main stakeholders, employers (demand side), educators (supply side), and entry-level graduates (the product). Additionally, there is limited research concentrating on private higher education institutions in Sri Lanka, which, according to UGC data, have become the primary source of IT professionals. The study aims to examine the discrepancy between perceptions of performance and expectations among these groups. This research aims to fill that void by offering a holistic, multi-stakeholder analysis of the software engineering landscape in Sri Lanka.

Research Objectives

The study is structured to focus on four primary objectives to systematically address the identified problem and bridge the knowledge gap.

1. To explore the expected performance levels of entry-level IT graduates' skills as perceived by key stakeholders (employers, graduates, and educators) in the Sri Lankan software engineering industry. This aims to establish a common viewpoint for what each stakeholder considers as success.
2. To contrast the different perspectives of employers and educators about the actual performance of entry-level IT graduates.
3. To evaluate the magnitude of the perceived expectation-performance gap among key stakeholders. This implies discovering which specific soft and technical skills exhibit the largest divergences.
4. To appraise the systemic challenges and support mechanisms required to bridge the identified gaps.

Significance of Study

The findings of this research will contribute significantly to the body of knowledge concerning workforce development in Sri Lankan software industry. Further this study will serve as a vigorous outcome for curriculum developers and policymakers since it is lack in comprehensive studies regarding stakeholder perceptions of software engineering expertise in South Asian region. Ultimately the outcome of the research directs to the national conversation about the importance of curriculum alignments with skill, product and market of the learners in the private higher education institutions. It will benefit not only graduates to find a sustainable opportunity, also for the software engineering industry to hire multiskilled qualified industry ready graduates by contributing the Sri Lankan economy with billions of dollars. This platform will transform the IT industry, importantly the software engineering industry, into the top service industry in the country by ensuring long-term technological autonomy.

Literature Review

This section focuses primarily on existing studies to understand the prevailing gaps in the body of research and to articulate the specific areas where the present study seeks to advance. The software engineering sector is defined by accelerated technological transformation, necessitating a systematic review of stakeholders' interaction. This review discusses the specific skills required for entry-level graduates, the stakeholders involved, and the performance gap between employers, students, and educators.

Employability

Employability is fundamental to comprehending the transition from academia to industry. Anushka outlined employability as the enhancement of a graduate to gain employment and achieving success in their selected professions through a comprehensive set of skills, understandings, and personal attributes (Anushka et al. 2023). The various existing researchers who supported this definition suggest that employability is a dynamic capability rather than static achievement. Findings show that university students acquire numerous skills beyond academic curriculum, which is crucial for employers to consider during the recruitment process. When entering industry for an entry-level occupation as freshers, success is highly dependent on the skills that graduates possess (Chowdhury & Miah, 2019).

However, in the research landscape there is a discrepancy. Studies on employability skills are conducted in developed countries focus less on students' perception while focusing heavily on employers' perceptions (Ali Rizwani al., 2018). The current study addresses this disparity by reviewing the expectation-performance gap among all stakeholders' students, employers, and educators regarding skills, knowledge and attitudes for IT professions.

The Expectation-Performance Gap in Sri Lanka

In Sri Lanka, as in many other nations, there is a large divergence between the skills that employers expect and the capabilities that entry-level IT graduates possess upon securing their certificates in academia. This discrepancy is not limited to the software engineering industry but extends across various IT roles. This disparity impacts multiple parties, including educators, student workforce and industries across multiple dimensions (Chamithri & Asanka, 2024).

The discrepancy often promotes the lack of job-readiness of the entry-level graduates. IT industry employers frequently convey the message of displeasure with the skills that fresh graduates bring to the profession. Employers expect entry-level IT graduates to be competent in job-specific skills with required hands-on experience right away (Abbasi & Naila, 2018). Nevertheless, employers reported that industries increase the amount of time and money needed for individuals training and adaptation with the reflection of devoid of these abilities in graduates.

Skill Requirements for Entry-Level Software Engineers

A skill set for entry-level IT graduates in the software engineering sector is essential for enduring success in their careers. The SLASSCOM Employability Skills Survey (2024) depicted that software engineering has become the topmost profession in the IT industry and anticipated it would remain at the top for the next 18 months. The survey records the most crucial competencies required from recent graduate hires based on employer priority.

Table 1: Top priority skills

Priority Rank	Skill Dimension	Description
1	Teamwork	Ability to work in collaborative agile environments
2	Problem solving	Critical thinking
3	Communication skills	Oral, written, and specially presentation skills
4	Learning agility	The ability to acquire new knowledge rapidly
5	Innovation	Generating new ideas and solutions
6	Decision making	Self-reliance and accountability

Source: SLASSCOM 2024

Additionally, the industry requires highly sought-after digital skills that are currently in practice, including programming literacy, cybersecurity literacy, the Softw are Development Life Cycle (SDLC), data analysis, statistics, data science, AI, IoT, and computational / algorithmic thinking.

The analysis by R. Heldal et al. (2024) categorized these required skills into two categories Soft Skills and Technical Skills: Soft Skills: common sense, problem-solving skills, Teamwork; Technical Skills: Knowledge of architectural design, software quality, system thinking, data management

Similarly, V. Garousi et al. (2020) specified that soft skills like leadership, teamwork, critical thinking and communication are important for entry-level graduates, while maintaining the hard skills as project management and software engineering professional practice. Numerous existing studies advocate that these two sets of subject-oriented and general skills must be present for successful industry placement of individuals (Chowdhury & Miah, 2019).

Technical Proficiencies and Industry Standards

The Sri Lanka Association for Software and Services Companies stated the list of basic technical skills expected from entry-level It graduates by IT companies as Software engineering skills, Programming language proficiency, Domain knowledge, Information/cybersecurity, Process automation, Business analysis, UI UX design, Machine Learning (ML), Artificial Intelligence (AI) and Analytical skills and data interpretation.

The study by Kosala and Dinesh validated these expectations by analyzing Sri Lankan job advertisements with "Determine the Knowledge, Skills, and Abilities (KSA) that are currently in demand". They stated that candidates should possess technical expertise, soft skills pertinent to the software engineering environment, and professional credentials and concepts. This study exploited a Natural Language Processing (NLP) framework to enable the Sri Lankan IT industry to identify KSAs using the European Skills/Competences, Qualifications, and Occupations framework (Kosala & Dinesh ,2024).

Significantly, their findings show that a strong knowledge base across-the-board design patterns, algorithms and object-oriented programming (OOP) is pivotal, along with automation, version

control, application deployment and cloud practices. (Chamithri & Asanka, 2024).

Categorization of Hard and Soft Skills

There are two types of fundamental skill sets: hard and soft skills. All technical competencies, including solution design skills, knowledge of programming languages, analytical skills, software engineering, project management, database administration and web development belong to the category of hard skills while communication skills, teamwork, and accountability belong to soft skills (Munirah et al., 2019).

Recent research exploring IT competencies and the readiness of entry-level IT graduates for the industry with hard skills like agility. Under the category of soft skills, honesty was identified as a top priority. The study was conducted for students in an Indonesian university relating to Industry 4.0, the findings regarding entry-level IT graduates can be applied to the current research as they are validated from the industry end (Arifin et al., 2020).

Stakeholder Perspectives

Students who are pursuing degrees believe that their education w ill equip them with the skills necessary to obtain employment fas t. However, they face major complications upon entering the software engineering workforce, lacking the technical know-how, flexibility, and problem-
solving skills required by the company (Neha, 2021). The study has identified that communication skills make a significant impact on employability. Furthermore, the discrepancy between the employer expectation and the knowledge entry-level IT graduates possess directly impact to the country's intellectual capital. In Sri Lanka, due to specific skill shortages the recent entry-level graduates face the unemployment or underemployment in the software engineering industry. Crucially, the skillful educators should guide learners to transform theoretical knowledge into real-world application. Furthermore, IT educators require improvements in their teaching strategies with continuous assistance and resources to ensure that graduates encounter industry expectations (Neha, 2021).

To ensure curriculum content is relevant to the current industry trends, there should be a greater relationship between higher education institutions and industry participants. Al-Hashimi et al. (2020) demonstrated that employers evaluate the ability to make correct decisions, operate in a team and handle business risks. They suggest the requirement of long-lasting relationships with universities and employers. This research aims to analyze these relationships to direct the curriculum development for IT programs in Sri Lanka.

Identifying the Performance Gap

This review summarizes important findings regarding the perceived requirements of entry-level IT graduates, educators and employers. The employer expectations for entry-level IT graduates have been examined by several scholars, and they have been connected the identified success factors to the degree programs. The previous studies examined expected competencies in other fields, such as accounting, and differed them with what was taught in degrees (Nadana & Kim, 2014).

The findings of Nadana Abayadeera about the skill gap expectations in accounting filed which highlighted the development of curricula based on industrial requirements, can be applied to software engineering since the core concept is similar. There were no comparable studies specifically for graduates in Sri Lankan software engineering, which is a major gap that this study attempts to remedy.

Chowdhury and Miah suggested multidimensional employability skills indices for students and employers. The current research expands this to include educators as a stakeholder. Prior studies suggested a set of competencies that employers and students should possess, such as integrity, goal-oriented thinking, and reliability. Because these expectations are derived from widely accepted information, they can be applied in a variety of circumstances. (Chowdhury & Miah, 2019).

Table 2: Summary of stakeholder expectation gaps

Stakeholder	Expectation	Perceived Gap
Employers	Practical skills, Immediate job-readiness, soft skills	High training costs, ack of real-world experience,
Educators	Theoretical foundation, Academic excellence	Need for industry collaboration and resources
Students	Toolkit for success, Immediate employment	Disparity between theory and practice

Source: Own elaboration

Theoretical Frameworks for Analysis

The skill gap is analyzed using diverse theoretical frameworks including Job Matching Theory and Human Capital Theory.

Job matching theory

The degree to which a person's abilities and competences align with industry demands is determined by the Job Matching Theory. In order to prepare graduates for future responsibilities, Barnard et al. (2001) looked at the importance of education-based abilities. Productivity and employment expectations may be impacted by differences between graduates' and required competencies (Tachibanaki, 1994). It is crucial that the topic of study closely aligns with the specialism of the position.

Human Capital Theory

A framework for measuring skill gaps and examining graduate-employer mismatches is provided by human capital theory. It looks into how education and professional experience affect the development of skills (Dorn et al., 2025). The study emphasizes the rate of skill learning over time and the connection between skill development and income.

The Bui and Porter Model

By contrasting the expected competences from the employer's point of view with the actual competencies held by graduates, Bui and Porter's (2013) approach examined the skill gap among accounting graduates. The Bui and Porter model can be

reorganized to address the differences between educational achievements and industry demands because the current study concentrates on three stakeholders: employers, graduates, and educators. It offers a methodical approach to gathering and evaluating stakeholder input (Bui & Porter,2010).

This study is mainly supported by the Bui and Porter (2013) Model, however Job Matching Theory and Human Capital Theory offer fundamental insights into labor market alignment and individual productivity. The Bui and Porter framework, in contrast to more general economic theories, is intended to close the "expectation-performance gap" by combining the viewpoints of several stakeholders. By modifying this paradigm, the current study incorporates the crucial role of educators in addition to a binary employer-graduate comparison. Because it enables a methodical assessment of how institutional curricula (the supply) interact with both graduate competencies and the changing expectations of the software engineering industry (the demand), this tripartite approach is especially well-suited to the private higher education context of Sri Lanka.

In conclusion, a number of studies demonstrate a persistent gap between the skills that companies need and what entry-level graduates have mastered. According to Draus et al. (2022), the majority of respondents said that young IT professionals lacked sufficient practical experience in domains such as cybersecurity. This suggests that more hands-on training and experience learning are desperately needed in educational institutions.

Developing educational programs requires an understanding of corporate requirements. Both hard skills like coding and soft skills like collaboration are valued by employers (McGowan, 2019). Aligning the software engineering curriculum with industry demands is a recurring problem in literature. Only 45% of schools consistently changed their curricula in response to employer feedback, according to Roberts and Martinez's (2022) research. Industry and academia must create effective channels of communication, including advisory boards, to close these gaps (Garcia & Patel, 2022). Standardized evaluation frameworks are required to better match stakeholder expectations, as indicated by significant discrepancies in assessments (Nguyen & Tran, 2020).

In order to close the gap between expectations and performance for all parties concerned, this study particularly targets the paucity of information on Sri Lankan private universities that provide degrees in software engineering.

Methodology

This section will discuss the research design, data collection and data analysis of the current study.

Research philosophy and design

The complication of the "expectation-performance gap" in the software engineering sector demands a research design that can delicate subjective experiences.

Accordingly, this study belongs to interpretivist paradigms to adapt to qualitative research design. In contrast to quantitative methods, interpretivism enables the researcher to examine the social reality of stakeholders, graduates, employers, and educators through their unique perspectives and professional context.

The current study articulates the Expectation-Performance Gap Model, originally conceptualized by Bui and Porter (2013) which was initially developed to analyze discrepancies within accounting background. The model is highly adaptable to the software engineering discipline due to its structural soundness (Bui & Porter,2010)..

The SE industry is known for its "hyper-volatility," where the pace of technical obsolescence frequently surpasses the cycles of standard curriculum reviews.

The current study systematically classifies the "Expectation Gap" and the "Performance Gap" which identifies the difference between what educators believe is necessary and what the industry requires and the difference between the standards expected by employers and graduates who possess the skills by employing the Bui and Porter framework. In the context of private higher education in Sri Lanka, this dual-focus method offers a thorough lens through which to assess the alignment or lack thereof between academic output and industry demand.

Conceptual Framework

This study's conceptualization is represented as a tripartite interaction between three main stakeholders. According to the paradigm, “Gap" is a complex mismatch that happens at various points during the information transmission process rather than a single, monolithic phenomenon.

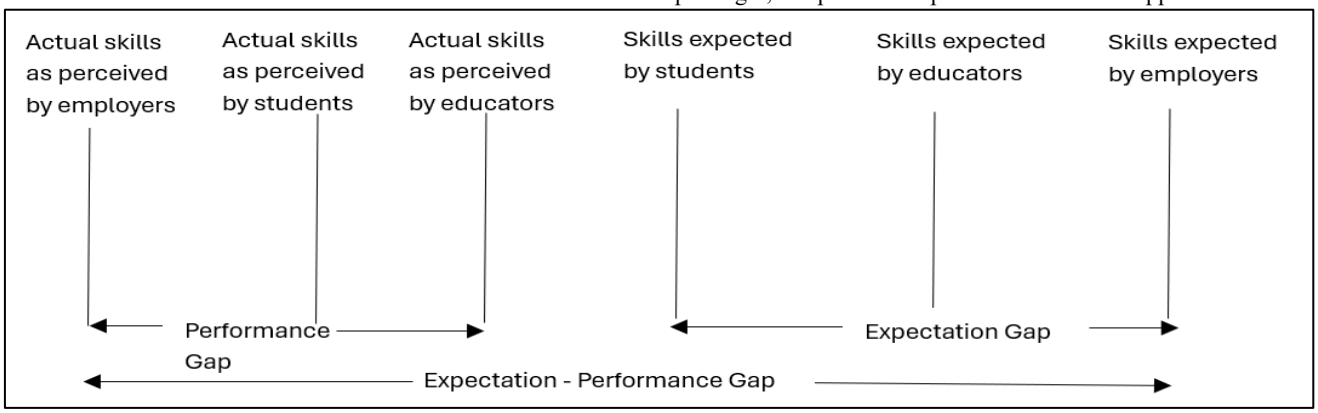

Figure 1: Conceptual Framework

- The Employers' Perspective: driven by the need for "soft" or "transversal" abilities, project-specific technical requirements, and market competition.
- The Educators' Perspective: manipulated by pedagogical theories, institutional constraints and accreditation standards.
- The Graduates' Perspective: representing the actual experience of moving from a regulated academic setting to a demanding professional world.

Specifically focusing on the Sri Lankan non-state higher education institutions, the research moves beyond identifying *that* a gap exists and begins to explore *why* it persists by employing this framework.

Data Collection

In order to guarantee construct validity and academic rigor the semi-structured interview guide is used as the primary instrument for data collection. Semi-structured interviews were chosen strategically because they offer a consistent framework for participant comparison while providing for the freedom to delve further into emerging themes.

The rigorous triangulation process for the interview guide development,

- Industry Benchmarking: To ensure the interview questions reflect current industry requirements, the competency frameworks and current IT job adverts were examined.
- Curriculum Mapping: to establish a baseline for intended learning outcomes, existing software engineering modules in private higher education institutes were reviewed.
- Literature Synthesis: to ensure that the study is in line with the established academic discourse on skill gaps, questions were transformed from verified doctorate instruments.
- Expert Validation: A panel of software engineering industry experts reviewed the guide drafted as a pre-test to ensure the questions were professionally determined with the correct terminologies.

Population and Sampling Strategy

By aspiring the information richness, this study utilizes a non-probability purposive sampling technique in qualitative research design. The interview participants were selected based on their direct involvement in the software engineering pipeline.

The sample Composition of the study consists of 35 participants across three stakeholders

- Category A: Employers (n=10): CEOs, Tech leads, HR managers from small to medium and large-scale multinational corporate enterprises in Sri Lanka.
- Category B: Educators (n=10): Department heads, academic consultants and senior lecturers from non-state higher education institutions. The requirement for the selection is at least five years of experience in curriculum design or delivery.
- Category C: Graduates (n=15): Entry-level graduates in software engineering within the last 24 months. This period guarantees that their memory of the shift from academia to industry is clear and pertinent.

The professional networks and official institutional outreach made the sample more accessible. The main gatekeepers for hiring professionals in the field were human resources departments. A "snowball" sampling component was added for graduates, in which original participants assisted in finding classmates who fit the inclusion requirements. Reaching graduates who might not have stayed in touch with their alma mater was very successful with this approach.

A hybrid method was used for the interviews, combining in-person conversations with online conferencing tools (such Zoom or Microsoft Teams). This adaptability was necessary to meet the rigorous schedules of specialists in the field. The duration of each session ranged from thirty to forty-five minutes. All interviews were audio recorded with express consent and then verbatim transcribed in order to preserve the data's integrity. To ensure a clean dataset for thematic analysis, the transcription process employed "denaturalized" procedures, which kept the focus on the speech's content while eliminating fillers that did not add to its meaning.

Data Analysis: Thematic Framework

Thematic Analysis (TA) will be used to assess qualitative data in accordance with the six-phase framework made popular by Braun and Clarke (Braun and Clarke, 2006). This technique makes it possible to find patterns (themes) throughout the varied sample.

Table 3: Phases of thematic framework

Phase	Action Taken
Familiarization	immersion in the data by repeatedly reading the transcripts and making notes about preliminary concepts.
Coding	Generating initial codes across the entire transcripts.
Theme Development	combining codes into possible themes that correspond with the elements of the Bui and Porter model.
Reviewing	determining whether the themes apply to the overall data set and the coded extracts.
Defining/Naming	continuous examination to improve each theme's details and the analysis's overall narrative.
Reporting	involves choosing striking examples and connecting them to the study objectives.

Source: Adapted from Braun and Clarke (2006)

Ethical Considerations

Several precautions were implemented to protect the rights of the participants with the adaptation in international research ethics standards (Braun and Clarke, 2006). The informed Consent was prepared for all the participants to outline the purpose of the study. The Plain Language Statement was provided to the participants prior to the commencement of interview recording as a written consent. All data was pseudonymized to avoid professional consequences, especially for educators and graduates. Generic descriptors took the place of institutional names to achieve confidentiality and anonymity. The standard data security mechanisms were applied to protect responses. All digital recordings and transcripts are preserved on password-protected, encrypted disks while data will be retained for the duration of the study and deleted after the thesis has been finalized. Furthermore, participants were made fully aware of their freedom to leave the study at any time, without consequence or explanation.

Methodological Rigor

In order to address the reviewer's concern about 'appropriate methodology,' this study uses Lincoln and Guba's standards for reliability in naturalistic inquiry. The credibility is achieved through the triangulation of the viewpoints of several stakeholders. The transferability is provided possible by 'thick descriptions' of the Sri Lankan software engineering context, which enable other scholars to assess if the findings hold true in their own contexts. The preservation via an audit trail of research notes, coding logs, and raw data lead the dependability. Confirmability is constructed possible by reflexivity, in which the researcher reduces and admits personal prejudices throughout the interview and analysis stages.

Results and Discussion

This section discusses the results and findings of the exploratory study based on thematic analysis of semi-structured interviews conducted with key stakeholders in the software engineering industry: employers, entry-level IT graduates and educators.

The analysis focuses on determining stakeholder expectations, assessing graduates' actual performance, and investigating apparent discrepancies between performance and expectations. In order to situate the results within the larger discourse on graduate employability and industry requirements in the software engineering area, the findings are arranged in accordance with the four research objectives of the study and analyzed in reference to current literature.

Stakeholder Expectations

The analysis revealed that stakeholders anticipate that entry-level IT graduates in the software engineering field will have a well-rounded set of technical and soft skills. Strong programming expertise, problem-solving skills, and familiarity with contemporary development approaches have all been highlighted by employers. Employers noted that although many graduates show a grasp of academic principles and programming syntax, there is still a lack of practical application of these talents.

According to a senior software engineer:
"…usually, we can find graduates who know the syntax two write a program but struggle with applying it to real-world problems. Debugging and system design are areas where they fall short".

Employers emphasized that graduates must be able to swiftly adjust to contemporary development environments and tools in addition to being proficient in programming. Object-oriented design principles and familiarity with software engineering approaches like Agile and DevOps were often cited as essential requirements. Additionally, employers stressed the increasing significance of new technology fields including machine learning (ML), data science, and artificial intelligence (AI). One senior software engineer claims that:
"it's must have even the conceptual knowledge about the emerging technologies like AI, ML for recent graduates".

While acknowledging these industry aspirations, educators have pointed out a number of obstacles to integrating quickly developing technologies into academic programs. Limitations like inadequate industry participation, limited resources, and the sluggish pace of curriculum revision were highlighted by numerous professors. As one instructor pointed out:
"We try to include modern tools into graduates' curriculum, but resource constraints and lack of industry input make it difficult to stay updated".

All stakeholders consistently emphasized the importance of soft skills in addition to technical competencies for success in the workplace. Problem-solving, cooperation, flexibility, and communication skills were often emphasized. These results corroborate the research done by Chowdhury and Miah (2019), who suggested multifaceted employability frameworks that incorporate communication, interpersonal, and self-management skills.

The importance of these abilities in hiring selections was clarified by an HR manager from a top software company:
"…we look into graduates who can collaborate, communicate clearly, and think critically".

Similarly, the evidence from a recruitment officer of a tech company,
"*Technical skills get graduates the interview, but soft skills get graduates the job. Especially good communication skills, teamwork and creative thinking".*

Educators stated that these competencies are frequently developed through group-based academic initiatives. Collaborative assignments assist students develop their communication, time management, and teamwork skills, according to more than half of the educators surveyed. One instructor clarified:
"Group projects improve their teamwork, punctuality and communication skills".

Graduates, however, shared a slightly different viewpoint. Although they acknowledged that group projects were a part of their academic degrees, several believed that these exercises did not sufficiently replicate the complexity of actual industrial settings. A graduate made the following comment:
"*I had group projects, but they didn't really prepare us for the dynamics of a real team in a company".*

This perception draws attention to a significant disconnect between industrial expectations and academic learning experiences, especially with relation to collaborative work methods.

The significance of industry preparation, which includes hands-on experience through internships, real-world projects, and professional development activities, was also stressed by employers. According to a software architect:
"it's better that the lecturers can direct students to make projects to solve the real-world problems".

Another employer proposed that colleges assist recent grads by setting up career-preparation exercises and simulated interviews during the academic year. These recommendations are a reflection of more general worries about how well academic programs match the demands of business. Roberts and Martinez (2022) found that just 45% of universities routinely revise their courses based on employer feedback, which lends credence to this claim.
Furthermore, employers remarked,
"If lecturers can arrange the mock interviews to make".

Table 4: Summary of the stakeholders' expectations

Stakeholder	Key expectation
Employer	Proficiency in programming languages, Agility, technical competencies, teamwork, real-world project experience, problem solving
Educator	Balance curriculum, critical thinking
Entry-Level IT graduates	Industry readiness

Source: Own elaboration

Actual Performance

Findings revealed that companies and educators had different opinions about how well entry-level IT graduates actually performed. The broad consensus among educators was that graduates had sufficient basic knowledge to start their professional lives and met the academic criteria set by colleges. However, when graduates enter the workforce, employers find a number of skill gaps.

Employers found that programming expertise, debugging abilities, system design skills, and the capacity to convert theoretical knowledge into workable software solutions were the biggest areas of weakness. Additionally, employers identified behavioral and professional deficiencies, such as issues with time management, professionalism at work, innovation, and teamwork. These results are consistent with the study of Nguyen and Tran (2020), which presented differences between employers' assessments of graduates' real IT sector competencies and educators' assessments of graduate preparation.

The lack of structured feedback systems for recent grades into the industry was another problem brought up throughout the interviews. During their move into industry employment, graduates frequently receive insufficient or ambiguous performance feedback, according to numerous participants. This absence of rigorous review could impede graduates' ability to properly address their inadequacies and impede ongoing skill development. In order to enhance professional development and improved alignment with industry expectations, the findings point to the necessity of organized feedback mechanisms that facilitate collaboration between companies, educators, and graduates.

Perceived Expectation–Performance gap

The study unequivocally found that there is a gap between expectations and achievement in both the technical and soft skill categories. Employers often blamed this disparity on academic curriculum constraints and inadequate hands-on training during college. While acknowledging these difficulties, educators focused on structural limitations including resource scarcity and a lack of industry cooperation. This scenario was described by an educator as follows:

"*We teach what's in the curriculum, but the industry moves faster than we can adapt".*

Similarly, a graduate revealed the challenges experienced during the transition to workforce:

"I feel ready, but interviews make me doubt myself".

The results indicate that the gap has a substantial impact on graduates' employment. According to Draus, many firms are reluctant to hire recent graduates who don't have any concrete work experience (Draus et al.,2022). This view is supported by the current survey, since a number of businesses have voiced reservations about recruiting graduates who haven't worked on actual software development projects.

However, graduates frequently voiced dissatisfaction when their academic success did not result in job prospects. This suggests that employability in the software engineering industry may not be guaranteed by academic achievement alone.
The three stakeholder groups' opinions emphasized that they had different ideas about graduation competencies. Employers continued to have doubts about graduates' preparedness for professional employment, while graduates typically expressed confidence in their skills and educators said that academic instruction offers a solid basis. The intricacy of the expectation-performance gap is brought to light by this triangulation, which also underscores the necessity of cooperative solutions including all relevant parties.

Challenges and Support Strategies

The study identified that the graduates face several challenges when transforming academia to industry, including rapid adaptation for the workplace culture and fulfilling the employer expectations. The academia remarked,

"We need advisory boards and curriculum co-design. Otherwise, we're just guessing what the industry wants".

Stakeholders suggested several support tactics to deal with these issues. These include internship opportunities, university-industry collaborations, mentorship initiatives, and organized onboarding programs for recent graduates. Employers indicated a desire to support these kinds of efforts. As an illustration, one employer presented

"we are willing to provide our support by arranging filed visits and workshops for the graduates".

The stakeholders rationalized the importance of self-directed education, continuous learning through certification and upskilling. This reflects the agility framework proposed by Katarina & Vjeran (Katarina & Vjeran ,2020), about rapid knowledge acquisition and problem-solving. To make a sustainable transformation the policy and institutional support are essential. Crucially, stakeholders encouraged the stronger collaboration between universities and industry, aligning with

recommendations given by Garcia & Patel (Garcia & Patel ,2022) for curriculum co-development and advisory boards.

Curriculum Relevance and Industry Integration

The findings revealed that curriculum relevance is a significant concern in bridging the expectation-performance gap. The stakeholder, Employer invariably noted the gap between academic programs and the evolution of the technologies in the industry. One of the senior software engineers stated,

"The academic curriculums often lag behind the pace of industry evolution".

Similarly, a team leader commented:

"By the time new modules and the technologies introduce in higher education institutes, it has already been replaced by something else in the industry".

Educators acknowledged this concern with the institutional policies and regulatory requirements. The educator noted,

"*Normally we are revising curriculums every two years in private universities, but lot more rules and regulations are behind that process".*

Concerns about the limited opportunities for real-world industrial exposure during their academic programs were also voiced by graduates. One graduate, for instance, clarified:

"I learnt the agile as a theory, but I had to wait until I join the company to practice it".

These findings emphasize how crucial it is to improve collaborations between academic institutions and business stakeholders. Participants recommended a number of possible activities, such as faculty training programs, internships, guest lectures by professionals in the field, and joint research collaborations. Such programs could guarantee that graduates get practical skills in line with industry demands and improve the relevance of academic curricula.

Technological Adaptability and Lifelong Learning

The software engineering sector has undergone a substantial transformation due to the quick development of cutting-edge technologies including artificial intelligence, machine learning, cloud computing, augmented reality, and virtual reality. Thus, during the investigation, lifelong learning and technological adaptability became another important theme.

Employers stressed that mastery of particular programming languages is not as valuable as the capacity to consistently learn new technologies. A project manager clarified:

"It's not about knowing computer languages and other theories anymore; it's about how quickly they can learn something".

Educators acknowledged this perspective and emphasized universities increasingly motivate learners for self-learning. one lecturer cited,

"We are giving the concepts, next we ask them to complete the given task by adding self-learning, only few of them take the opportunity".

Graduates confirmed the necessity of self-learning, with one remarking,

"Lot of online courses are there to learn new tools and technologies to polish our knowledge with the technological transformation, I completed few".

Similarly, they revealed that *"learning is a never-ending task, software engineering industry is one of the best examples for that, since always tools and technologies are getting update".*

The adaptability and lifelong learning skill of entry-level graduates supports the progression of the software industry.

Conclusion

This exploratory study examined the expectation-performance gap in the skills of entry-level IT graduates within the software engineering sector in Sri Lanka with respect to the non-state higher education institute. The qualitative study conducted semi-structured interviews with all stakeholders, employers, educators, and graduates in the software engineering sector. The current study explores the gap between the skills expected by the industry and those possessed by graduates.

The findings demonstrate the importance of technical skills and soft skills shared by the stakeholders with a common understanding. The study revealed that there is a significant discrepancy in how these skills are developed and assessed. All the interviewees in employer category highlighted the importance of practical competencies like coding proficiency, real-world project experience, quick adaptability, lifelong learning. The educators explained theoretical knowledge and academic achievement. Graduates often supposed themselves as prior preparation for the industry by highlighting the need for industry exposure in academic period.

The study explored the systemic challenges contributing to the gap, including outdated curricula, limited industry exposure, and insufficient feedback mechanisms for learners. Furthermore, it emphasized the potential solutions, like strengthening university-industry partnerships, enhancing mentorship and onboarding programs, and promoting continuous learning through certifications and self-directed education.

The triangulation of viewpoints of key stakeholders illuminated that the current research contributes to a deeper understanding of the skills mismatch in entry-level IT graduates in software engineering sector in Sri Lanka. It emphasizes the importance of collaborative efforts to align educational outcomes with industry expectations. The insights explored will contribute to curriculum development, revolutionizing institutional strategies, implementing continuous feedback loops with industry and academia for better policymaking. It addresses the lack of employment or underemployment of entry-level IT graduates in the software engineering sector while strengthening the industry by fulfilling the demand in the country with a skilled workforce.

To improve the generalizability of these findings, future research projects should expand the existing scope by incorporating state-sector universities and a wider range of IT specializations. To assess the effectiveness of integrated pedagogical interventions in reducing the skills gap and promoting graduates' sustainable career advancement in the global digital economy, longitudinal studies are advised.

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