

Employability Skills Required by Entry-Level Engineers in Sri Lanka

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Abstract: Entry-level engineers mostly get opportunities to join private sector organisations at the initial stages of their careers. Hence, they should be equipped with a set of competencies and skills required by the industry. This study aims to identify the employability skills expected by leading employer engineers in Sri Lanka from entry-level engineers. Face-to-face semi-structured interviews were held with purposefully selected 22 senior engineers who worked as Managing Directors (MD)/Chief Executive Officers (CEO) of the private sector engineering firms. Audio recorded interviews were transcribed and analysed employing the inductive thematic analysis method. As per the analysis, major themes like soft skills, technical knowledge, personality traits, ethics, values in life and extra-curricular activities were identified as employability skills expected by leading employer engineers from an ideal fresh engineering graduate to offer an engineering job in Sri Lanka. The findings of this study are highly beneficial for engineering undergraduates to adopt, as well as their teachers to teach the required competencies to students to satisfy the industry expectations of the private sector.

Keywords: Entry Level Engineer, Employer Engineer, Employability Skills, Thematic Analysis, Sri Lanka

1. Introduction

High competition can be observed among the graduates in Sri Lanka to secure a good job opportunity either in private or state sectors in Sri Lanka [1]. In the engineering sector, over two thousand engineering graduates currently pass out from Sri Lankan state and private sector universities [2]. Hence, the competition for entry-level engineering job positions is high among fresh engineering graduates in Sri Lanka. Employers do not hesitate to hire the right candidate for their engineering firms if the candidates possess the expected employability skills and competencies [3], [4].

Employers are the key personnel who know about the employability skills required of entry-level engineers. A few studies have been done in the Sri Lankan engineering sector to identify the ideal engineering graduate profile [1], [3]. However, those studies do not reflect the employer engineers' expectations on fresh engineering graduates sufficiently. Hence, this study aims to identify the employability skills required by entry-level engineers as expected by leading employer-engineers in Sri Lanka. The findings of such a study are beneficial for all the stakeholders of engineering undergraduates to develop the required competencies and skills to make them fit for employment.

2. Literature Review

2.1 Engineering Graduates

In most of the countries, engineering undergraduates should follow an accredited engineering degree program to get the formal registration or the licence to practice as an engineer [5]. Recently introduced Engineering Council Sri Lanka (ECSL) Act also emphasises the legal requirement of following an accredited degree program to be eligible as a practising engineer in Sri Lanka [6]. The Institution of Engineers Sri Lanka (IESL), as the apex body for professional engineers in Sri Lanka, is responsible for the accreditation of local undergraduate engineering degree programs, considering the quality of education [7]. An engineering graduate completing a Washington Accord accredited degree program should demonstrate the following 12 attributes:

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knowledge base for engineering, problem analysis, investigation, design, use of engineering tools, individual and team works, communication skills, professionalism, impact of engineering on society and the environment, ethics and equity, economics and project management and life-long learning [8].

The engineers graduating with a Washington accord accredited degree are anticipated to be well-rounded engineers in the 21st century [5]. Still, studies are being conducted to identify unattained skills of graduates of accredited engineering degree programs as per industry expectations. Such studies have discovered that engineering degree programs accredited by Washington accord comprise teaching courses on soft skills such as communication, teamwork, entrepreneurial, problem solving, decision making, ethics, self-management, lifelong learning, and creativity/innovation [8]. However, the industry has found that graduate engineers of these degree programs are competent in the soft skills like interpersonal skills, flexibility, teamwork, decision making, problem-solving, and self-management skills [8]. Although students are taught soft skills like communication skills, ethics, and entrepreneurial skills in the university, attainment of such skills by the graduate engineers is not matched with industry expectations [8]. It was suggested to revise the existing engineering curricula to meet the industry expectations after a proper study [8].

2.2 Employability Skills

The literature has various definitions for the term employability skills [9]. An available scholarly definition highlights it as "those basic skills necessary for getting, keeping, and doing well on a job". Similarly, some others have defined it as "skills that can be teachable and transferable for better employment" [10]. Literature comprises studies on the employability skills of various graduates in various countries, including engineers. Most studies attempted to investigate the research question, 'what types of skills and abilities are needed in the workplace.'

Previous studies have identified that engineers are conscientious, extroverted, emotionally stable, and autonomous than the general population [3], [11]. Furthermore, these studies have recommended that engineers should learn to be more agreeable in professional communication situations. However, young engineers are less conscientious and

autonomous when compared to senior engineers [11]. Generally, engineers need soft skills also to find suitable employment. A study conducted in four Asian countries, Hong Kong, Singapore, Japan and Malaysia, identified communication, problem solving, teamwork and information technology as the critical employability skills [10]. Out of them, most of the components belong to the soft skills category. Engineering graduates and other graduates including in business and management disciplines, also require soft business-related skills and competencies [9]. In earlier days, people believed hard business-related skills were more than enough to perform in the business domain. Over time, this belief has changed. This soft skills requirement was further confirmed by a study conducted on entry-level managers in the hospitality management field [12]. Though engineering and hospitality management fields are not similar, most job positions in society require soft skills to enhance the chances of being recruited.

Several studies have been conducted in various contexts to investigate the employability skills of engineers from multiple perspectives [10], [13], [14]. A study conducted in India on the employability and skill set of newly graduated engineers revealed that most employers were not satisfied with the skill set of fresh engineering graduates [14]. Further, they identified that the skill gaps are particularly severe in the higher-order thinking skills, ranked according to Bloom's taxonomy. Communication in English is a highly expected soft skill from fresh engineering graduates in India [14].

A Malaysian study conducted in 2012 revealed that most employers in the engineering sector prioritise soft skills rather than technical skills when selecting suitable engineering graduates for entry-level job positions [15]. A similar study conducted in 2013 in Malaysia focusing on the employability skills required by technical students like engineering and IT undergraduates has revealed that problem-solving, tool handling competency, and presentation skills feature highly among the skills demanded by employers [16].

A study has identified that most commonly associated traits of engineers are thoroughness, commitment, curiosity, persistence, and high expectations. In contrast, engineers' least commonly associated traits were sensitivity,

empathy, fairness, tolerance, and positivity [17]. In India in 2018, it was identified that the gap between the pass-out ratio and placement ratio among the engineering graduates was alarming and indicated the engineers' poor skill set [18]. Further, this study recommends organising structured practical sessions, application-oriented training, strict evaluation systems, and options for improvement to help the students realise and learn the required skills and improve employability among the engineering graduates in the sample [18].

Civil is an essential engineering discipline for any country. It was identified that there is a skill gap between the engineering workforce and requirements of the employers in the construction sector of the European countries [19]. Hence, it requires efficient training programs to bridge the prevailing skill gap in the civil engineering sector in European countries. Another recent Indian study conducted in the IT field has revealed the most recognised ten employability skills identified by the IT employers and graduate software engineering students [20]. According to that, employers believe entry-level graduate software engineers should possess the skills like reliability, integrity, teamwork, willingness to learn, entrepreneurship, self-discipline, communication, self-motivation and flexibility. In contrast, graduate students believe they should possess basic computer skills, technical skills, use of modern tools, advanced computer skills, system design, communication, responsibility, verbal communication, application of knowledge and creativity [20]. It was clear from the above findings that although employers prioritised behavioural skills, graduate students prioritised technical skills in their learning.

The majority of engineering employers seek soft skills rather than technical skills when recruiting fresh engineering graduates for their firms [11-15]. Most of the studies focusing on the employability skills of fresh engineering graduates have identified a deficiency in the attainment of the industry expected skills by new engineering graduates [14-16]. Therefore, these studies have recommended various strategies such as revision of engineering curricula of universities and organising training sessions to upskill and reskill the fresh graduates. Most of the studies conducted in this domain recommend that engineering educators should conduct research to investigate the contemporary employability skills expected by

the engineering employers from the fresh engineering graduates to fill the gap if there is any [14-16]. However, such studies are scarce in the Sri Lankan context when referring to the literature. Hence, this study was designed to ascertain the employability skills and traits expected by the engineering employers in Sri Lanka from fresh engineering graduates.

3. Methodology

Research areas which lack previous systematic studies have been mainly investigated qualitatively to identify the novel insights hidden in the field, which cannot be done from a quantitative study [21], [22]. Although international studies exist on the employability skills of fresh engineering graduates as expected by employers, scarcity of such analyses can be observed in the Sri Lankan context. Hence, this study has been designed as qualitative research. Purposive sampling, a widely employed sampling strategy in the qualitative domain, was selected as the sampling method. Researchers utilise pre-determined criteria purposefully when selecting a sample for data collection [23]. Hence, the authors decided to choose only the professional engineers who served in Managing Director (MD)/Chief Executive Officer (CEO) positions in small, medium and large scale engineering firms in the private sector in Sri Lanka.

Data was collected by holding face-to-face semi-structured interviews with the selected employer engineers regarding the research question being investigated. Twenty-two employer engineers with chartered engineer status participated in the study. They belonged to various engineering disciplines and served as MD/CEO at the time of the interviews. Most of the employer engineers were the owners of those firms. They had industrial experience of over ten years and had employed several engineers in their firms. Out of the 22 firms, 77% were belonged to the small and medium enterprise category whose total employee count was less than 250 and 23% belonged to the large scale category with a higher than 250 staff count. To assure confidentiality, the authors have assigned pseudonyms to each participant from the English alphabet commencing from 'A'. All the firms were established within the period from 1978 to 2019 and are still in operation.



Table 1 - Engineering Discipline of the Participants

Discipline of the employer engineer - based on the 1 st degree	Participants
Civil Engineering	A, C, D, E, K, L, N, R, S, U, V, W
Electrical Engineering	F, G, M, O, P, T
Mechanical Engineering	J, Q
Chemical Engineering	B, H

All the interviews were voice recorded with the consent of the participants and transcribed verbatim for the analysis purpose. The Inductive Thematic Analysis (ITA) method, a flexible and convenient method in the qualitative domain, was used to analyse the interview transcriptions to identify key themes that emerged from the data relevant to the research question [21], [24]. In ITA, researchers should thoroughly familiarize with the data as the first step. Then, the steps like generating initial codes, searching for themes, reviewing the themes and defining the themes should be followed without considering the existing findings in the literature relevant to the study field. All the themes, including discrepant data, should be discussed in the final discussion section of the report while incorporating the relevant narrative evidence from the interview transcripts to enhance the credibility of the study. For qualitative studies, large samples are not required to achieve the study's objectives [24], [25]. Hence, data were collected only from 22 employer engineers in Sri Lanka, and the authors have identified that no new themes emerged from the interviews held in the final stage of the study.

4. Results & Discussion

NVivo software was employed to analyse the data conveniently. After familiarizing with the interview transcripts, initial codes for the data were generated. Then, initial codes were categorized to major themes based on their meanings and patterns. The analysis was done inductively with an open mind, without incorporating the findings of previous studies into the analytical steps of generating initial codes, searching and reviewing the themes as per the ITA methodology. Review of the generated themes have revealed that the employer engineers' expectations on employability skills of fresh engineering graduates were mainly concentrated on themes like soft skills, technical knowledge, personality traits, ethics, family background and extra-

curricular activities to offer an entry-level engineering career opportunity. The following section describes each theme in detail, with the support of the narrative evidence from the interviews.

4.1 Soft Skills

All the participants (100%) have highlighted that they are looking for fresh engineering graduates with various soft skills. They have given greater priority to soft skills than other qualities and traits. Previous studies conducted in foreign countries also have found that soft skills are a significant employability skill for entry-level engineers [11-14]. Out of the various types of soft skills, communication skills get the priority.

Participant R has emphasised, "*Sometimes engineers lose a lot, although they know the subject matters. Unfortunately, they find it very difficult to present. So I don't consider much about their degree and how they have passed. I focus on their communication skills*". Participant R has observed that many engineers lose opportunities due to a lack of communication skills. According to him, some engineers know the subject well. Unfortunately, they cannot present things effectively and defend verbal arguments, not because of lack of facts but due to lack of communication skills. Here, communication skills mean both spoken and written. Hence, Participant R is looking for fresh engineering graduates having excellent communication skills. Participant V has highlighted, "*Presentation skills are the most important for engineers. So I always look for their presentation skills*." Presentation skills are a hot topic in the engineering education sector worldwide since industry expectations on presentation skills have not been met yet by engineering educators [26].

Participant T mentioned his requirement: "*We pay a higher attention to oral communication and languages. Of course, we are working with English, and fresh engineering graduates should be fluent in English*." Participant T gives a higher weightage to the oral communication skills of fresh engineering graduates during the recruitment process. In a similar way, fluency in English is also essential, even for engineers who work in the local context. Studies conducted in other non-English speaking countries like Malaysia and India have revealed the requirement for being fluent in English by young engineers at the time of job hunting [13], [14]. However, Participant V has explained his concern, which

is somewhat contradictory to the above findings as *"We don't look at their English knowledge always. But a certain amount of communication skills have to be there. Engineers always communicate with drawings and sketches. So, if you have that ability, with some communication in English, it is ok."* As per the above claim, it is clear that Participant V is not looking for higher proficiency in English. For his firm, young engineers with some command in English and communication skills are sufficient. Hence, it is clear that certain entry-level engineering jobs require higher proficiency in English while others do not. It depends on the type of work they are doing.

Other than the communications skills, participants have confirmed the requirements of other interpersonal skills like leadership, team working skills and management capabilities to offer a job for young engineers on their firms. Participant U has mentioned, *"We check their team working skills, leadership, management capabilities and interpersonal skills."* Since engineers have to work in teams, most of the time; they should be capable of functioning as team leaders and members [4]. Both these aspects are required in professional life. Participant N has stressed that he is looking for interpersonal skills: *"Then we see how he is building his interpersonal relationship. Because, how he is going to handle a worker or a client and other things is important for me as his employer."* Fresh engineering graduates should have the potential to deal with their clients and staff management activities [27]. As per Participant N and Khoo et al.[27], employers are in trouble if they recruit fresh engineering graduates who do not possess such skills. Hence, as per employer engineers' interviews, soft skills are a must for entry-level engineers in Sri Lanka.

4.2 Technical Knowledge

The second major theme identified from the interviews was technical knowledge. 77% of respondents have mentioned various opinions on the necessity of checking the technical expertise of the fresh engineering graduates during an interview. Most participants do not check the technical knowledge of the fresh engineering graduates, assuming they have sufficient engineering expertise from the university education.

Participant C has mentioned, *"I don't expect them to be technical experts. I am not recruiting first-class people here. I am not recruiting people with very low grades also here. But even a general degree person is very much comfortable for me as I*

can train him." The above excerpt extracted from Participant C's interview clearly demonstrates his technical knowledge perception. He prefers to recruit general degree holders in engineering more than first-class degree holders or graduates with significantly lower grades, as he can train them. However, most engineering graduates believe employers prioritise technical knowledge when selecting suitable employees from just passed out engineers [20]. Participant D confirmed the same: *"We know from practice that people without first classes perform well in the industry. This is because, a degree is only one indication of the talents."* According to him, technical knowledge is not the only success factor to perform well in the industry. As identified in the previous studies, fresh engineering graduates should possess balanced skill levels in both soft and technical aspects [13], [14]. Participant K also carries a similar idea in his viewpoint: *"First I check the practical knowledge of the graduates. Degree certificate is checked mostly for the documentary purposes only"*. Since all the engineering graduates have degree certificates, most employers do not check the degree certificate even at the interview. Nowadays, it has become a non-essential component to check during the interviews.

Participant D explained the reasons for not checking the technical knowledge of a fresh engineering graduate during an interview: *"I first see their behaviour and attitudes. I don't check the knowledge. Actually, knowledge is something that we can always give."* As engineers are lifelong learners [28], Participant D expects that a young engineer can always learn things while on the job, if they have the right attitude and behaviour. Participant W highlighted, *"From fresh graduates, I am not asking any technical questions. There is no meaning to ask technical things from them. I will ask a few questions about their training if they have completed it in a similar field"*. Participant W asks questions from the fresh engineering graduates regarding their training experience during the interviews. However, he does not intend to ask any technical questions, as fresh engineering graduates lack the technical experience. Like Participant W, many other participants ask various questions from fresh graduates regarding their training experience to check the candidates' knowledge and attitudes. Participant U stated, *"Fresh graduates don't have much practical knowledge in engineering. But during their industrial training, they do some projects. We are asking them to discuss their projects and training activities."* As per U, direct



theoretical questions from the syllabus are not asked from the fresh graduates during an interview. Instead, employer engineers investigate what fresh engineering graduates have done for final year undergraduate projects and during the industrial training. By that, employer engineers try to assess the technical capabilities of young engineers.

Participant S has mentioned his opinion on the technical knowledge as follows. *"By going through the educational performance, consistency will be evaluated. Candidates with consistent results can be considered capable of learning and easily grasp the new things. They have to learn many things as our employees."* Not like other participants, Participant S is checking the consistency of educational qualifications of the fresh engineering graduates to assess their learning skills. Fast learners are required in the engineering field to grasp anything quickly [11]. Participants C and D hesitated to recruit first-class degree holders for their companies. Still, Participant R chooses fresh engineering graduates with good results for specific job opportunities in his firm, like 'design engineer' posts where higher engineering knowledge is required. *"Sometimes I sit in the interview board to select design engineers. We recruit engineers with second upper or a first class. We don't take any other party"*. These shreds of evidence show that employer engineers check the technical knowledge of young engineers from different perspectives based on their job requirements. For job positions which require higher technical knowledge, i.e., as design engineers or research and development (R & D) engineers, employers are looking for degree holders with good results. Conversely, for other engineering job positions where people-handling skills are required the most, employers are not giving priority to first-class degree holders. Further discussions have revealed that employer engineers have a perception that engineering graduates with higher marks lack the majority of soft skills essential for better performance in the job. However, most engineering students in Sri Lanka assume that they only need expertise in engineering to discharge their duties as competent engineers in any organisation. This can be observed in other Asian countries like India, too [20]. But, when they join the industry, they realise the requirement of having a balanced skill profile, including soft and hard skills [29].

4.3 Personality Traits

Almost 68% of employer engineers are more concerned about fresh engineering graduates' personality characteristics. Most of them prefer to recruit hard workers with positive attitudes willing to learn as entry-level engineers in their firms.

Participant M emphasised his observations: *"Actually I looked at soft skills and attitudes: especially attitudes, most importantly, because attitudes can't be changed. If I could get the person with the right attitude with the willingness to learn and dedication to work and with trust, I can keep that person. Most people don't have them."* Participant M observes that recruiting a suitable person for his company has become complicated since the attitudes of the fresh engineering graduates do not match the industry expectations. Similarly, he highlighted that fresh engineering graduates should be more willing to learn and dedicated to work. Participant D also mentioned the same thing: *"I first see their behaviour and attitudes. If their attitude is good and they are keen to learn something, that is what I check."* An American study reveals that the majority of engineers have dedication to work. However, they lack positive attitudes [17]. In Sri Lanka too, employer engineers are looking for the graduates with right attitude to recruit for their firms. Participant F also highlights the same, confirming that most employers are looking for the young engineers with the right attitudes as *"I normally look for good people who are not lazy"*.

Fresh engineering graduates may have various attitudes about the industry and engineering careers from the student period. Perhaps they cannot identify the right attitudes and traits expected by the industry. In that case, they will probably remain unemployed as they lack the expected employability skills [8]. Willingness to learn new things is crucial for every engineer for their success. Participant M has highlighted, *"If someone is a real learner, if they are willing to learn, I think we can teach technical things to any person very quickly."* As highlighted, fast learning skills are essential for young engineers. Entry-level engineers have to learn many things from the industry, primarily the practical applications of the theories they studied during the undergraduate period. They should be able to transition from university to industry life soon with fast learning skills. This skill is also identified in other countries as an essential employability skill for entry-level engineers [10]. Participant C wants to recruit fresh

engineering graduates who are quick learners. He highlighted it: *"I am looking for people who are quick learners and can undertake the duties soon."* Participant J is also looking for similar engineering graduates to recruit for his company. He highlighted it: *"One thing I checked is whether they are interested in working, whether they will grab the knowledge"*. A lazy person is not the right candidate to recruit as an engineer for a competitive private sector organisation. That's why Participant J checks the candidate's willingness to learn.

According to employer engineers, fresh engineering graduates should be hard workers. A demanding field like engineering always welcomes hard-working young professionals for junior positions. Participant M has highlighted his expectation: *"I want to check whether he is a hard worker. Actually, I like people like 'go getters'. Some engineers have made some restrictions to their work, like time limits, and I am an electrical engineer, and I don't want to do other things like that. I don't like that kind of mentality. I want a person with a mentality who can accept any challenge, ready to go with any hardships"*. This excerpt is more than enough to understand the employer engineer's expectation of the hard-working skills of young engineers. Though this is not formally investigated in Sri Lanka, it can be observed that most fresh engineering graduates are not willing to do hard work in the industry, claiming they are engineers. Senior engineers in the industrial sector also confirmed this mentality of the young generation. Young engineers expect to do a white-collar job in the industry as an engineer. However, employers expect a hard-working professional. Engineering includes a lot of fieldwork, which will not be a pleasing experience for most fresh engineering graduates. Working environment, working hours and type of work to be performed are challenging for most engineers [11]. Hence, they should have the ability to accept challenges as young engineers. Participant O has confirmed that *"I check whether he or she is suitable for the type of work to be done here. Because in the private sector, they must be willing to work hard"*. Hence, the entry-level engineer should be a hard worker who can accept challenges.

Furthermore, the entry-level engineer should have a good personality. Participant W mentioned: *"Only thing that I can check during the interview is their personality"*. Participant C also confirmed the same: *"He should be a person, stronger person and dynamic person, physically*

strong person." Based on the nature of field work to be done in Participant C's firm, he expects to recruit a dynamic and physically strong person. Unlike Computer engineering, other engineering disciplines require physical strength to some extent to discharge the duties entrusted to young engineers. Moreover, the personality of any person is further portrayed by their self-confidence and personal grooming practices. Participant V has highlighted this: *"Firstly, I look at how they approach us, how they behave in the interview and their confidence, the way they dress and how they walk and how they look at things, how they see me. I look at their confidence."* It is evident that most employers thoroughly examine employees' personalities, including the external appearances during the interviews. A neatly dressed, a self-confident young engineer is more likely to be recruited in the private sector organisations in Sri Lanka.

4.4 Ethics

Ethics is essential to an engineer's professional life [30]. As per the interviews, 41% of employer engineers have a high concern to identify ethical people to recruit to their firms. However, identifying the ethicality of the young engineers during the interview is difficult for employer engineers. Participant M has highlighted the requirement of choosing trustworthy persons: *"He or she should be a person I can trust. The most important thing is the 'trust', right? So it is challenging to examine that on the first day. But I can get some feel about that, OK?"* Unlike other participants, Participant M prioritised the trustworthiness of the candidates. If an employer recruits an unethical and untrustworthy person to his firm, that person can finally do a huge damage to the firm. Participant E's choice is as follows *"I always like to have honest people and dedicated people. They should have some respect for their seniors"*. The ethical engineer should be an honest employee dedicated to working for the employer within limits. Furthermore, employer engineers expect that junior engineers may pay respect to senior professionals in the industry.

As Participant M highlighted, it is difficult to identify the morality of the candidates during the interview. Participant T mentioned it: *"Well, the problem is, at the recruitment level, it is very hard to judge the ethics, because most of them are fresh graduates. But for a fresh graduate, it is very hard to ask questions and get relevant answers about the candidates' ethical behaviour. It is difficult to find."* Participant R investigates the ethical side of the fresh graduates as follows. *"Definitely, it is very difficult to identify ethical people. Sometimes*



when we talk with a person, we can find something. Sometimes we look for the referees and check it with them." Participant R goes for referee reports when he needs to find the ethical side of the candidate. Most of the time, fresh engineering graduates include the names of their university teachers and training engineers of their industrial training as the referees for their curriculum vitae. If engineering graduates have had an unethical life, referees may reveal the truth to the prospective employers. Therefore, engineering students should try to lead an ethical life to get positive referee reports to enhance their employability.

4.5 Values in Life

About 36% of employer engineers focus on the values in life of the fresh engineering graduates to check their upbringing during the interview process. Participant S stated, *"Family background will indicate the upbringing which links to their values in life. It also helps us gauge how important this employment is to the candidate."* Since the living environment could significantly impact the ethical development of any person, getting to know the family background is essential for any employer before making any recruitment decisions on fresh graduates. Participant W also checks the family background of the fresh engineering graduates. He has highlighted it: *"Furthermore, I am checking their family background, their difficulties and reasons for applying for this vacancy by asking several questions."* According to Participant W, he does this to identify the candidate's difficulties and family commitments. This reveals that some employer engineers, like Participant W, assume that if the candidate has a considerable family commitment, they may consider their first job an essential component in life and discharge their duties in a responsible manner without losing it as they need to help the family. In most of the interviews, employers examine the family background of the candidates as a general practice to get an idea about the person.

4.6 Extra-Curricular Activities

Engaging in extra-curricular activities helps any professional improve employability skills such as soft skills. It applies to engineers as well [4]. 32% of employer engineers prefer to select fresh engineering graduates who have engaged in various extra-curricular activities. Although only 32% of employer engineers directly check the fresh engineering graduates' involvement in extra-curricular activities, it should be understood that without participating in such activities, it is hard to develop the soft skills of

any professional, which is the essential employability skill of fresh graduates [1]. Participant S has emphasised it: *"Extra-curricular activities will indicate their soft and physical skills beyond studies. We could gauge how active they would be on the field"*. Since the priority is given to the soft skills of fresh engineering graduates, as mentioned in most of the studies conducted in other contexts [14], [15], checking the engagement in extra-curricular activities is also understandable in the Sri Lankan context. In this study also, employer engineers have given priority to the soft skills of fresh engineering graduates.

Participant L too checks the extra-curricular activities of the fresh engineering graduates. *"I am asking about the extra-curricular activities. That means, if that engineer is having some sports or any other social activities done during the university or during school time"*. Here, Participant L has utilised the term 'extra-curricular activities, not only to refer to sports activities but also to highlight the social activities done as engineering undergraduates. Other participants have revealed that the engagement in debate teams, drama and musical works, organising committees of events and playing leadership roles in various clubs can be considered as other effective social activities which can help improve the soft skills of anybody. Unlike other employers, Participant R prioritises fresh engineering graduates who have engaged in team sports. He has highlighted it: *"When I take people for our company, I look at whether they have done sports, but not carrom and chess and badminton and like that, not even cricket. Cricket is also sometimes seen as a selfish game. I look for team games like Basketball, Soccer, Rugby, and Hockey, where you have a team spirit, and your target is to have a goal. There you have a leader in the team and you have to play as per his guidance for the target. Finally, you achieve the target. You may win, or sometimes you may lose. For the construction industry, if someone has done a team sport, I will take them."* As he highlighted there, he is looking for such people mostly for the construction industry, which is a very challenging field in engineering where engineers have to deal with various people to achieve the targets [31]. Engaging in team sports guides team members to work towards a common goal to achieve it within a given time frame while having a lot of opportunities to develop leadership skills. Completing a construction project in the current competitive environment is also similar to playing a team sport expecting a victory.

Engineering educators, such as university academics and training engineers who supervise engineering undergraduates during their six months industrial training, should utilize above findings to guide engineering undergraduates to develop the necessary skills and traits within themselves. Such initiation will enhance the employability of engineering undergraduates.

5. Conclusions

Engineering is a challenging profession in society. Nowadays, a rising competition can be witnessed among fresh engineering graduates to secure a suitable entry-level job opportunity in the Sri Lankan industrial sector. Fresh engineering graduates should know what engineer employers expect from them to offer an entry-level job position. A study conducted based on the viewpoints of several employer engineers in Sri Lanka has revealed the following facts. Employer engineers' have expectations on employability skills of fresh engineering graduates concentrated on key themes of soft skills, technical knowledge, personality traits, ethics, values in life and extra-curricular activities. Technical knowledge is only one aspect checked among others during an interview for fresh engineering graduates. Knowing the expectations of employer engineers beforehand will be highly beneficial for young engineers to face interviews successfully and secure job opportunities amidst huge competition while developing the required employability skills at undergraduate stage. Engineering educators can also use these findings to guide young engineering students in developing employability skills.

This study has several limitations. Data was gathered only from employer engineers who served in MD/CEO positions in private sector engineering firms. However, including information collected from the state sector senior engineers and human resources professionals of such firms will add more value and accuracy to this study. Since the findings from qualitative studies cannot be generalised to the whole population, quantitative studies should be developed to gather data from a larger sample while covering all the areas relevant to the employability skills of engineering undergraduates to generate an accurate and a generalisable result.

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