

Green Competency Education Mismatch Hypothesis: Evidence from a Pilot Study of Professional Accountants in Sri Lanka

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Abstract

The transition toward sustainability has reshaped labour markets, where green jobs are now a critical element in the quest to meet sustainability targets. However, a widening green competency gap, where workforce skills fail to meet employer expectations or green operationalisation of organisations, raises questions about how effective our sustainability education is. Therefore, we argue that the extent of the green competency mismatch in Sri Lanka remains underexplored. Drawing on Human Capital Theory, a pilot study was conducted among 29 professional accountants in Sri Lanka to examine the extent to which higher education interventions equip individuals with the necessary green competencies for the challenges posed by green operations in organisations. A structured online survey, employing the snowball sampling method, was used to collect data, and the analysis was conducted using SPSS Version 23, which facilitated hypothesis testing, leading to broader confirmatory investigations. The findings seek to provide useful directions for how education outcomes align with the labour market expectations, with practical suggestions for curriculum designers and education policy makers, accordingly, to more effectively build green competencies and bridge the gap of competency mismatch.

Keywords: *Green Competency Gap, Competency Mismatch, Green Jobs, Sustainability Education*

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Introduction

Are the necessary green competencies being developed through education? While educational qualifications often play an important role in employer hiring decisions, recent studies indicate growing concern among employers regarding whether formal education adequately develops green competencies. One of the most significant long-term developments shaping the current labour market is the shift towards green jobs, which has been facilitated by the introduction of green competencies (Bone et al., 2025). These developments are not only generating new job titles and roles but are also reshaping existing positions to align with sustainable and environmentally responsible practices.

Green competencies are commonly understood as a combination of skills, knowledge, values and attitudes (Chee Sern et al., 2021) related to sustainability that contributes to sustainability practices alignment with economic priorities. These competencies can be technical (e.g., installation of solar panels, implementing organic farming, operation of wind turbines) and transferable (e.g., compliance with environmental norms, sustainability reporting, stakeholder communication on ESG related topics) (Auktor, 2020). Critically, green competencies are no longer confined to explicitly 'green jobs' within environmental sectors but are increasingly required across mainstream roles in corporate services, industry, and data analytics that engage with sustainability-related activities (Centre for a Smart Future, 2024).

According to the Future of Jobs Report 2025, jobs particularly in renewable energy engineering, environmental engineering, and electric vehicle specialisations, are among the 15 fastest-growing green jobs, while environmental stewardship is listed as one of the top 10 fastest-growing skills globally. However, the report similarly highlights a green competency gap, emphasising a need for purposeful education and training development to meet future workforce demand (World Economic Forum, 2025). Furthermore, in 2023, 7.3% of job postings on LinkedIn were classified as green jobs or required green competencies, where in 2024 that figure increased to 7.7% (LinkedIn Economic Graph, n.d.). Despite this growth, forward estimates appear to predict that this gap between demand and supply will continue to widen. Green job vacancies are projected to increase to 241 million by 2030, from approximately 67 million at present, while green competency adoption is expected to grow by only 60% over the next five years, compared with a 260% growth in green jobs (International Energy Agency, n.d.). These facts reveal the necessity of developing green competencies to meet emerging labour market requirements.

This global trend equally applies to the Sri Lankan context, where 'green jobs' have developed and grown at a significant scale as 'sustainability' gains impetus (Centre for a Smart Future, 2024). However, the perennial mismatch between competencies demanded by employers and competencies supplied by job seekers can be interpreted as a green competency gap, which has been conceptualised through Human Capital Theory. This theory posits that labour market deficits arise when workers' skill levels do not align with the specific job requirements or the competencies expected by employers for organisational practices (Bone et al., 2025). Further, many scholars explained that, from the employer's perspective, both horizontal mismatches, where the competency does not align with a specific field, and vertical mismatches, where the level of competency is higher or lower than required, were becoming more common within the sector that offers green jobs (Park, 2021).

Addressing these concerns, sustainability education, which leads to the development of necessary green competencies, is widely acknowledged as a critical prerequisite for addressing the green competency gap. Further, supranational bodies have long emphasised the central role of education in achieving sustainability targets, noting that the limited success of

key initiatives such as Agenda 21 (1992) and the Millennium Development Goals (2000) was partly attributable to the absence of comprehensive sustainability education initiatives. This has led to a call on higher education institutions (HEIs) to enhance the relevance and responsiveness of their educational programs by incorporating education for sustainable development (Junghanns & Beery, 2020; Mburayi & Wall, 2018). In terms of professional accounting education, although sustainability principles have been progressively incorporated into curricula over the past two decades (International Federation of Accountants, 2006) such incorporation appears to lack sufficient depth and strong focus on the development of action-oriented green competencies, which is increasingly seen as critical by employers. Furthermore, professional accounting education appears to be focused more on compliance aspects such as carbon accounting, sustainability reporting, and ESG assurance while failing to develop competencies essential for embedding sustainability into strategic and operational decision-making process (International Federation of Accountants, 2024).

Nevertheless, empirical evidence remains limited regarding whether the green competencies developed in higher education are adequate to satisfy employer expectations for green jobs. Therefore, we contend that existing studies largely overlook the critical dimension of how competencies developed through education align or fail to align with the actual supply and demand dynamics of green competencies in the labour market, thereby contributing to persistent mismatches. This study particularly emphasises the accounting profession, which is increasingly expected to assist with sustainability reporting and sustainability-driven decision-making. Adopting a pilot study, aims to examine the perception of the accounting professionals working in Sri Lanka, regarding the progression, relevance and the significance of green competencies, and assesses whether these competencies meet employer expectations. The findings are intended to generate hypotheses for future confirmatory large-scale studies.

Literature Review

Green Competency Mismatch Towards Sustainability Education

The drive towards achieving sustainability targets has led to significant transformation across many traditional landscapes, with the labour market being among the sectors most deeply impacted (Aneesh et al., 2023; Sulich et al., 2023; Nikoloski et al., 2024). A notable shift is the emergence of green competencies and green jobs, which are now recognised as vital to developing human capital capable of tackling complex environmental, social, and economic challenges in an integrated manner.

Traditionally, the workforce could be assessed based on two broad categories of skills: technical skills and transferable or soft skills (Chee Sern et al., 2021). Technical skills are job-specific, practical skills, whereas more transferable skills are the generalised capabilities that enable individuals to collaborate effectively and perform across contexts, such as communication, teamwork, problem-solving and critical thinking (Zhang, 2012; Fajaryati et al., 2020). The requirement of training workers in both technical and transferable skills has historically been relevant but is no longer adequate in today's labour market (Chee Sern et al., 2021). As the labour market evolved, employers are increasingly looking for candidates who possess green competencies, which are aligned with the objectives of sustainable development to execute green practices in an organisation (Nikoloski et al., 2024; Vona et al., 2015).

These green competencies are not merely theoretical concepts but are widely considered competencies required to solve complex sustainability problems. The discourse on competencies within the literature presents a range of conceptualisations, from inherent traits

to dynamic, situational capabilities that influence performance in diverse contexts. Consistent with these underlying assumptions, recent studies are increasingly highlighting the critical role of green competencies in addressing the multidimensional complexity of sustainability issues. D'Souza et al. (2019) suggest the need for pioneering approaches and a holistic comprehension of the complex interaction of social, economic and environmental forces, calling for a link between theoretical knowledge for practical action. In a similar vein, Alberton et al. (2020) presented an alternative perspective, arguing that sustainability capabilities enable individuals to adopt a holistic decision-making perspective that reconciles economic, environmental, and social considerations. Complicating the discussion further, Venn et al. (2022) indicate that green competencies are essential for sustainability practitioners, not only equip individuals with knowledge as to how to maneuver the multi-faceted of sustainability, but also because they enable effective interaction with stakeholders, build capacities, develop and execute strategies and efficiently address political spaces and problems associated with sustainability. This diverse range of scholarly arguments together supports the centrality of green competencies in advancing sustainable futures. Further, the literature claims that learners not only acquire knowledge but also deeply internalise competencies essential for navigating the complex interplay between human and ecological systems across environmental, social, and economic dimensions (Alberton et al., 2020; Molderez & Ceulemans, 2018). Mastering these competencies is crucial for making informed decisions and taking responsible actions in the face of the intricate challenges posed by sustainable development (Brundiers et al., 2021).

The expanding body of literature on green competencies, summarised in Table-01, provides a comprehensive overview of the key competencies identified by researchers as mostly developed through different education processes. Although scholars have identified various competencies necessary for individuals to make informed decisions supporting sustainable development (De Haan, 2006; Rieckmann, 2012; Wesselink et al., 2009), only a limited number have attempted to conceptualise and systematically structure these competencies. One of the most prominent frameworks was developed by Wiek et al. (2011), which has been widely used and modified in various scholarly discourses. Consistent with this framework, five core competencies have been repeatedly identified as essential for achieving sustainability outcomes; systems-thinking competence, anticipatory competence, normative competence, strategic competence, and interpersonal competence as core green competencies (Brundiers et al., 2021; Rieckmann, 2012). Each of these competencies represents a different, though related, realm of action and understanding. Systems thinking concerned with understanding the interconnections of complex systems (Garrett & Roberson, 2008); anticipatory thinking involves the use of scientific methods to envision future scenarios and challenges (D'Souza et al., 2019); normative thinking associated with moral obligations in balancing socio-ecological and economic activities (Wiek et al., 2011); strategic thinking, pertains to developing solutions to sustainability problems and facilitating transformative changes (Loorbach, 2007); and interpersonal thinking refers to the skills required to motivate and facilitate cooperative and participatory approaches to sustainability research and problem solving (Wiek et al., 2011). Based on the above analysis of green competencies, we contend that these five key competencies offer a structured underpinning for sustainability learning, which empowers individuals to be agents of green practices within organisational and societal contexts.

[illegible][illegible]

6. Interdisciplinary Work Competency	X		X			X	X		X	X	
Includes: Interdisciplinary work, working across disciplines, and embracing diversity and interdisciplinarity.											
7. Participatory and Cooperative Action Competency	X		X			X	X				
Includes: Participation, cooperative action, and conflict resolution.											
8. Empathy, Compassion, and Solidarity Competency	X				X	X					X
Includes: Empathy, compassion, change of perspective, and solidarity.											
9. Reflection Competency	X				X			X			
Includes: Reflection on personal views, cultural models, and experiences.											
10. Evaluation and Critical Thinking Competency						X					
Includes: Critical thinking and evaluation.											
11. Communication and Media Competency						X					
Includes: Competency in communication, use of media, and conveying complex information.											
12. Handling Uncertainty and Ambiguity Competency		X			X	X					
Includes: Dealing with uncertainty, ambiguity, and frustration tolerance.											
13. Value-Driven and Ethical Competency					X			X			
Includes: Personal value-driven competencies, normative competence, and ethical frameworks.											
14. Sustainability Knowledge Competency		X			X						X
Includes: Knowledge of sustainability principles, issues, and problems.											
15. Implementation and Action Competency					X						
Includes: Taking action to bring change, planning and realising projects, and implementation skills.											

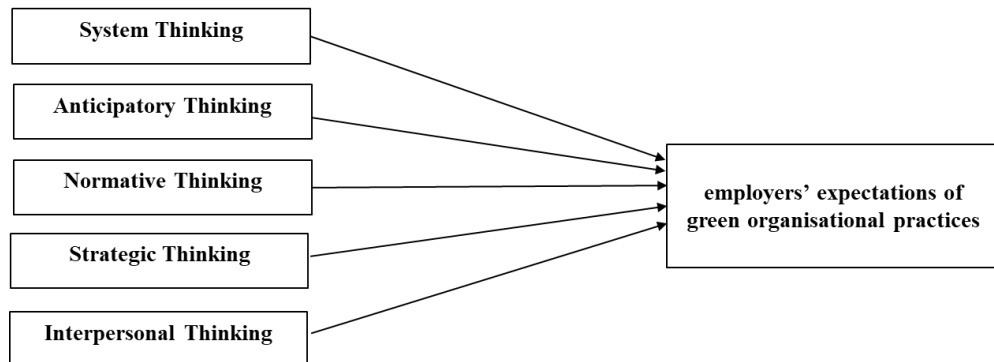
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Nevertheless, ongoing discussions indicate a misalignment between what individuals acquire through the educational system and what employers expect from a particular job role, known as a competency mismatch (Park, 2021; Siuta-Tokarska et al., 2022). This gap is especially discussed with regard to green competencies, resulting in a green competency mismatch. Studies highlight consistent discrepancies between employer expectations for organisational green practices and employees' green competencies (Siuta-Tokarska et al., 2022; Popkova & Sergi, 2024). This green competency mismatch is reflected by the number of vacancies that employers struggle to fill due to a lack of required green competencies (Nikoloski et al., 2024; Auktor, 2020). In other words, there is a gap between the supply and demand of green competencies within labour market. Moreover, evidence from other countries highlights employee dissatisfaction with individuals, especially recent graduates, where competency sets fall short of employer expectations (McMurray et al., 2016). Similarly, some employers claim that competencies required in the organizations have not been developed in the formal learning process (McCarthy & Eagle, 2021). Similarly, other studies related to developing countries in South Asia also emphasised that sustainability education remains largely theoretical and insufficiently aligned with labour market transitions toward green jobs (Hinduja et al., 2023; Nnam et al., 2025). These findings either reveal certain uncertainty about the employer expectations on green competencies and contend that green competencies expected by the employers are not well defined or clearly understood.

In the Sri Lankan context, an independent study conducted by the Centre for a Smart Future (CSF) in August 2024 reported emerging evidence of green job demand based on an analysis of job advertisements published on five of the country's most popular job portals (TopJobs, JobPal, XpressJobs, IkmanJobs and DreamJobs) and found that nearly 75 green-related job listings during one particular week (chosen randomly). These job listings also covered sectors such as environmental management, environmental sustainability, electric vehicles and renewable energy. 40 listings featured solar and renewable energy, followed by 19 environmental sustainability and 13 environmental management, which were among the most popular sectors. Additionally, interviews have been conducted with 15 companies that participated in a green economy trade exhibition held in Colombo. These companies operating in sectors ranging from water treatment to solar energy to EVs estimated to create at least 27 new jobs in the near future. While sample selection from the Green Economy Trade Exhibition caters to the sector's relevance, it also presents a potential sampling bias, since these organisations may be comparatively more sustainability-oriented than the wider population. However, findings from the interviews showed that the majority of the firms preferred potential candidates with competencies suited to sustainability-oriented sectors (Centre for a Smart Future, 2024).

This phenomenon is highly aligned with the core principles of Human Capital Theory, which points out that skilled individuals contribute more effectively to economic activities and that both individuals and societies gain economic benefits by investing in education and competency development (Tan, 2014). Supporting this view, Bone et al. (2025) argue that green competencies are now more valuable in the labour market in some instances surpassing the importance of traditional forms of formal education. Further, some authors argue that green competencies encompassing both sustainability-related technical knowledge and transferable skills, constitute critical forms of human capital that increase firm productivity and competitiveness (Ehnert et al., 2014; Vona et al., 2015). Accordingly, Figure 01 presents the conceptual framework, which illustrates the green competencies developed through Sustainability Learning in shaping employers' expectations of green organisational practices.

Figure-01: Conceptual Framework



Source: Developed by the author based on the Key Competency Framework by Wiek et al., 2011

In synthesising the reviewed literature, several recurring limitations emerge: (1) a lack of empirical studies directly measuring green competency mismatches in professional education; (2) insufficient focus on the accounting sector despite its growing sustainability obligations; and (3) minimal exploration of developing country contexts. These gaps justify the need for the present pilot study, which serves as a preliminary step toward systematically examining how green competencies acquired correspond to employer expectations.

Methodology

This study employed an exploratory pilot study design to investigate whether green competencies developed through sustainability education adequately meet the challenges of employer expectations in green practices and green job requirements among accounting professionals in Sri Lanka. This professional segment is increasingly recognised for its critical role in improving sustainability practices within organisations (Makarenko & Plastun, 2017). In this context, the study aims to generate the Green Competency Education Mismatch Hypothesis for future quantitative research examining competency mismatches in sustainability education. Accordingly, this paper explores two main research questions: 1. To what extent do green competencies developed in accounting education align with organisational needs for implementing green practices? 2. What are employers' perspectives on the relevance of these green competencies developed by accounting professionals in supporting green practices within organisations?

A self-administered questionnaire was used to address the research question, and the target population was accounting professionals in Sri Lanka who have obtained their accounting professional qualifications from CA Sri Lanka, CIMA, CMA Sri Lanka and ACCA. The snowball sampling method was used to select accounting professionals, as it was the most viable technique in studies where formalised participant lists are inaccessible or where peer referral mechanisms enhance response rates and data richness (Heckathorn, 2011; Mahlaole, 2025). However, it is inevitable that the limitations, such as potential selection bias toward participants who are already engaged with more sustainability-related activities. The questionnaire was generated on the Microsoft platform. The contents of the questionnaire include three parts, which have been validated in past studies, and a variety of proxy questions are used to measure each variable. Part A covered demographics and general sustainability

knowledge questions; Part B dealt with green competencies acquired through sustainability education, and Part C dealt with organisational green practices expected by employers. All data analyses were performed using SPSS version 23.

Findings

Descriptive Analysis

A total of 29 valid responses were included in this pilot study. Although the sample size is relatively small, this is not unusual in empirical research, and useful inferences can still be made from such samples (Chouinard et al., 2016; McCarthy & Eagle, 2021). The participants were derived from the population of accountancy professionals in Sri Lanka, including individuals who had obtained internationally recognised accountancy professional qualifications. Notably, this sample included professionals holding qualifications from Association of Chartered Certified Accountants (ACCA, n = 2), Institute of Certified Management Accountants of Sri Lanka - (CMA, n = 6), Institute of Chartered Accountants of Sri Lanka (CA Sri Lanka, n = 8), and Chartered Institute of Management Accountants (CIMA, n = 12). Importantly, all participants completed their qualification after 2000, a time by which sustainability discourse had gained more presence in accounting and business education, suggesting that participants may have been exposed to some albeit to a limited extent to sustainability-relevant content during their professional accounting learning and training.

In terms of organisational hierarchy, respondents belonged to different positions, such as top management (n = 6), senior level management (n = 15), middle level management (n = 7) and junior level management (n = 1). Participants were also asked to indicate the perceived value of sustainability to their careers. Among 29 respondents, 41% (n = 12) rated sustainability as "very important", 38% (n = 11) as "important", 14% (n = 4) as "moderately important" and 7% (n = 2) as "somewhat important". Notably, none of the respondents chose "not important". With regard to familiarity with the United Nations Sustainable Development Goals (SDGs), half (n = 15) claimed "moderately familiar", 17% (n = 5) "slightly familiar", 14% (n = 4) "quite familiar" and 7% (n = 2) "very familiar". Nevertheless, 10% (n = 3) of the overall sample indicated that they were "not familiar at all with the SDGs". With respect to gender distribution, 45% of the sample were male (n = 13) and 55% were female (n = 16). In terms of age, 4% (n = 1) were aged 25–30, 40% (n = 12) were aged between 31 and 40, 35% (n = 10) were in the age group of 41–50, 21% (n = 6) were aged 51 and above. Overall, the sample shows reasonable representation of Sri Lankan accounting professionals in terms of demographic data, management status, and professional background.

To what extent do green competencies developed in accounting education align with organisational needs for implementing green practices?

The first research question is, to what extent green competencies developed in accounting education align with organisational needs for implementing green practices? was investigated using one-sample t-tests. Respondents were asked to rank each competency using a five-point Likert scale ranging from "completely disagree" (1) to "completely agree" (5). The results are summarised in Table 02. As noted by various scholars, the one-sample t-test method is the most suitable method for the analysis with small sample sizes (less than 30), especially when normality assumptions cannot be confidently satisfied (Sauro & Lewis, 2016; McCarthy & Eagle, 2021).

As per the results of the one-sample t-test, it is evident that the five green competencies are perceived as important by professional accountants in Sri Lanka. Among these, anticipatory thinking was the most highly rated competency ($M = 4.53$, $SD = 0.50$), indicating very high consensus around its importance and high agreement among respondents. Similarly, normative thinking ($M = 4.12$, $SD = 0.39$), strategic thinking ($M = 4.20$, $SD = 0.65$), and interpersonal thinking ($M = 4.13$, $SD = 0.55$) showed strong agreement, having mean scores significantly above the neutral point of 3.0, with strong consensus of their relevance to sustainability-related professional roles. In contrast, system thinking contributed a mean of 2.99 ($SD = 0.74$), while slightly lower than the neutral point. Taken together, these findings suggest that although the majority of green competencies are perceived as being acknowledged and valued by accounting professionals, systems thinking may need to be given further attention in educational curricula in order to increase perception of its relevance and application in professional practice.

Table-02

	N	Mean	Std. Deviation	Std. Error Mean
System Thinking	29	2.9914	.73643	.13675
Anticipatory Thinking	29	4.5259	.50154	.09313
Normative Thinking	29	4.1207	.38742	.07194
Strategic Thinking	29	4.1983	.64910	.12054
Interpersonal Thinking	29	4.1293	.55348	.10278

What are employers' perspectives on the relevance of these green competencies developed by accounting professionals in supporting green practices within organisations?

To examine employers' perspectives on the impact of green competencies in implementing green practices (managing sustainability), respondents were asked to indicate level of agreement with organisational sustainability practices. A Spearman Correlation analysis was applied to investigate the interconnection between the green competencies developed and the perceived ability to implement green practices in organisations, as expected by employers. Responses were measured using five Likert-scale items anchored on a 5-point scale from "completely disagree" to "completely agree". It was found that normative thinking demonstrated the strongest association with organisational green practices ($\rho = .479$, $p = .009$), suggesting that value-oriented sustainability plays a central role in shaping accountants' engagement with sustainability within organisations. Moreover, as shown in Table-03, strong interrelationships were observed among normative, strategic, and interpersonal competencies, indicating that these competencies could bolster each other in predicting sustainability practices. Conversely, systems thinking did not exhibit significant associations with either other competencies or with the organisational perspective, potentially indicating a lack of emphasis or formal integration of this competency within organisational practice.

Table-03

Variable Pair	Correlation (p)	Significance (p)	Interpretation
System Thinking ↔ Anticipatory Thinking	-0.399	0.032	Moderate negative correlation, suggesting an inverse relationship between perceptions.
Anticipatory Thinking ↔ Normative Thinking	0.394	0.035	Moderate positive correlation, showing aligned perceptions.
Normative Thinking ↔ Strategic Thinking	0.450	0.014	Strong positive correlation, indicating perceived synergy.
Normative Thinking ↔ Interpersonal Thinking	0.460	0.012	Strong positive correlation, co-developed or closely valued.
Normative Thinking ↔ Organisational Perspective	0.479	0.009	Strongest correlation with economic perspective, highly aligned.
Strategic Thinking ↔ Interpersonal Thinking	0.534	0.003	Very strong correlation, indicating synergy in practice.
Interpersonal Thinking ↔ Organisational Perspective	0.350	0.063	Marginally non-significant, moderate positive trend.
System Thinking ↔ Organisational Perspective	-0.263	0.169	Non-significant, possibly underemphasized competency.
Anticipatory Thinking ↔ Organisational Perspective	0.042	0.830	No meaningful relationship.

Discussion and Implications

One of the aims of this study was to investigate the perceived gap between green competencies acquired by accounting professionals and the expectations of employers regarding green practices. The rationale for this study is based on the fact that sustainability-oriented organisations seek to balance economic efficiency with the principles of sustainable development in line with global environmental and social expectations. In this context, earlier scholars identified five key green competencies as essential for professionals who engaged in sustainability, namely Systems Thinking, Anticipatory Thinking, Normative Thinking, Strategic Thinking, and Interpersonal Thinking (Wiek et al., 2011; Brundiers et al., 2021). However, the findings of the present study reveal that, except for system thinking, the other four competencies, such as anticipatory, normative, strategic and interpersonal thinking, are particularly permeating among the accounting professionals, whereas system thinking appears to be absent. Such a lack may be attributed to several factors, including potential measurement errors, limitations in pedagogical strategies, or a disjunction between educational content and

professional application. Nevertheless, it is worthy of further exploration as systems thinking is the theoretical core approach to addressing complex, multi-layered, sustainability problems.

A salient observation from this research is the less significant impact on systems thinking competency among accounting practitioners, beyond its strong theoretical prominence found in the literature. This supports the results of McCarthy & Eagle (2021), who reported that although the ability to analyse the interdependencies was considered the main component of systems thinking and also it is rated as the most important attribute by employers, it has received the lowest satisfaction score by graduates, indicating a gap between academic training and workplace requirements. Similarly, Jelonek and Urbaniec (2019) have also highlighted that, although green competencies are increasingly included in higher education curricula, the application of systems thinking in real-world situations is yet to be developed. Further, they argue that organisations or employers still struggle to recruit graduates who can apply complex systems reasoning, which is an essential requirement for operationalising green transformation strategies. Moreover, from the theoretical standpoint, system thinking applies to holistic views that go beyond organisational boundaries (Meadows, 2008). However, within the accounting profession, practitioners typically operate within highly specialised, compliance-driven roles, which may constrain opportunities to apply such holistic competencies in practice.

The key question that the present study sought to answer from the perspective of the employer was, are these competencies influenced in green organisational operations? In this research, organisational practices were operationalised as green practices to enhance profitability while ensuring environmental and social sustainability, thereby constituting what may be termed as “green performance.”

The results of the empirical analysis suggest a limited correlation between most of the green competencies and organisational expectations. Only Normative Thinking showed a statistically significant relationship with green practices. This outcome points to a significant mismatch between the green competencies developed through sustainability learning and those expected by employers for effective green operations. This finding is in line with Vidican Auktor's (2020) arguments that while technical green competencies are crucial, values-based competencies such as ethics, responsibility, and social sustainability, which are key components of Normative Thinking, are increasingly prioritised by employers due to their perceived role in facilitating transformational change within organisations.

Nevertheless, these findings offer two important inferences. First, it showed that other competencies (system, anticipatory, strategic and interpersonal thinking) are neither aligned with current employer expectations nor critical within the accounting profession. Second, this finding might imply that literature-based models may not reflect the real-world demands placed on accounting professionals in green practices, particularly in accounting functions where sustainability integration is still evolving.

Supporting this interpretation, some scholars provide empirical evidences that green jobs are quite different from non-green jobs due to their more pronounced importance of cognitive and interpersonal competencies, even though the formal education system is rarely able to produce theses competncies at the level demanded by the industry (Consoli et al.,2016).

employers increasingly seek graduates with strong decision-making abilities, ethical judgement, and stakeholder management capabilities Moreover, other studies argued that while technical and scientific skills are required, employers increasingly seek graduates with strong decision-making abilities, ethical judgement, and stakeholder management capabilities,

which are strongly related to normative competence (Lacy, 2011). Further, Consoli et al. (2016) present additional empirical evidence in support of this conclusion, extending it to the case that green jobs are more likely to require higher cognitive and interpersonal skills than non-green jobs, yet formal education fails to produce such skills at industry-ready levels. Similarly, Lacy (2011) asserts that employers seek graduates with strong decision-making abilities, ethical reasoning, and stakeholder engagement skills, which closely align with normative competence. With these findings, our preliminary results support complex relationships between green key competencies developed through education and employers' perceptions of green practice readiness. Accordingly, we hypothesise that;

H1: A significant mismatch exists between green competencies developed through sustainability learning and employers' expectations of green organisational practices.

Study Limitations and Directions for Future Research

We need to recognise, however, that limitations are inevitable in any empirical study, stemming from methodological, practical or contextual challenges. In the current study, the principal limitation is the small sample size that resulted from the use of snowball sampling. Although this non-probability sampling method is convenient for exploratory or pilot work, the lack of diversity and representativeness in the sample precludes generalisation of the results to a larger population of accounting professionals. For example, McCarthy and Eagle (2021) used a similar pilot study with 29 business graduates to find the skills gaps in management education. Acknowledging its limitations, this exploratory study offers preliminary empirical evidences of a green competency mismatch in the context of the Sri Lankan accounting profession, a context that has received limited scholarly attention to date. These results provide a basis for subsequent confirmatory research. Future studies should employ large more representative sample, including job types that are closer to sustainability-oriented functions, such as Corporate Sustainability Manager, Green Architect, Environmental Scientist, and Environmental Engineer, etc. Further, Sri Lanka is a developing economy, and the diverse results may differ from developed countries. In the future, cross-national comparisons might allow more diverse and generalisable findings, thereby enhancing the robustness and policy relevance of sustainability education and the green workforce.

These insights indicate important directions for further research: first, reassessing the relevance and applicability of green competencies developed through accounting education. Particularly in terms of whether the competencies embedded in current curricula remain adequate for addressing the increasingly complex sustainability challenges faced by professionals. Second, comparative research across industries and job categories could illuminate sector-specific expectations and identify persistent gaps that exist even after educational interventions. This cross-country comparison may reveal how employer demand for green competencies varies across institutional and organisational contexts (Nikoloski et al., 2024). Third, it is important to investigate why certain competencies, despite being embedded in curricula, fail to translate into observable organisational behaviours. Since these are being identified as key competencies, hindrances to effectiveness may be due to pedagogical deficiencies, organisational barriers, or cultural reasons. To gain a deep understanding of this, further empirical investigation will be required. The employer's perspective of green competencies is also an important area to address (McCarthy & Eagle, 2021), as employers might understand competencies needed in green jobs differently from how they are taught/developed in education. This divergence stands out as an area for future research and creates space to investigate what forms of competency application is expected by the employers through the developed green competencies (Auktor, 2020). Moreover, policy

makers, professional bodies and curriculum designers must work collaboratively to ensure the alignment of the development of green competencies with contemporaneous workforce dynamics. As mentioned in the Green Skills analysis of Vona et al. (2015), training policies need to adapt to the technological and organisational changes forced by environmental regulations; otherwise, the human capital being developed may not meet the requirements of the future green workforce.

Conclusions

This study may represent one of the first empirical attempts to evaluate the extent to which green competencies acquired by accounting professionals in Sri Lanka align with employer expectations of green practices. The key finding of this research provides empirical evidence of a green competency mismatch while drawing attention towards the critical need to revisit the accounting education for sustainability in terms of curriculum design and faculty capacity to explicitly embed the necessary green competencies to meet the challenges of sustainability. Furthermore, the study raises three critical questions: 1) Is normative competence alone sufficient for accounting professionals to drive green practices within organisations? 2) Are other key competencies underdeveloped, overlooked, or insufficiently recognised within current accounting curricula as sustainability-related capabilities? 3) Are there additional competencies that need to be developed via accounting education? These insights call for deeper reflection and targeted action in the design and delivery of sustainability education. The study concludes that a reframing of sustainability education is required, ensuring closer alignment between the competencies developed through accounting education and those increasingly sought by employers to support sustainability-oriented organisational practices.

References

- Alam, A. (2022). Mapping a Sustainable Future Through Conceptualization of Transformative Learning Framework, Education for Sustainable Development, Critical Reflection, and Responsible Citizenship: An Exploration of Pedagogies for Twenty-First Century Learning. *ECS Transactions*, 107(1), pp.9827–9840. doi:<https://doi.org/10.1149/10701.9827ecst>.
- Alberton, A., Kieling, A.P., Lyra, F.R., Hoffmann, E.M., Lopez, M.P.V. and Stefano, S.R. (2020). Competencies for sustainability in hotels: insights from Brazil. *Employee Relations: The International Journal*, ahead-of-print(ahead-of-print). doi:<https://doi.org/10.1108/er-01-2019-0093>.
- Betsill, M.M. and Bulkeley, H. (2004). Transnational Networks and Global Environmental Governance: The Cities for Climate Protection Program. *International Studies Quarterly*, 48(2), pp.471–493. doi:<https://doi.org/10.1111/j.0020-8833.2004.00310.x>.
- Bone, M., González Ehlinger, E. and Stephany, F. (2025). Skills or degree? The rise of skill-based hiring for AI and green jobs. *Technological Forecasting and Social Change*, [online] 214, p.124042. doi:<https://doi.org/10.1016/j.techfore.2025.124042>.

- Brundiers, K., Barth, M., Cebrián, G., Cohen, M., Diaz, L., Doucette-Remington, S., Dripps, W., Habron, G., Harré, N., Jarchow, M., Losch, K., Michel, J., Mochizuki, Y., Rieckmann, M., Parnell, R., Walker, P. and Zint, M. (2020). Key competencies in sustainability in higher education—toward an agreed-upon reference framework. *Sustainability Science*, 16(1), pp.13–29. doi:<https://doi.org/10.1007/s11625-020-00838-2>
- Caniglia, G., Schäpke, N., Lang, D.J., Abson, D.J., Luederitz, C., Wiek, A., Laubichler, M.D., Gralla, F. and von Wehrden, H. (2017). Experiments and evidence in sustainability science: A typology. *Journal of Cleaner Production*, [online] 169, pp.39–47. doi:<https://doi.org/10.1016/j.jclepro.2017.05.164>.
- Centre for a Smart Future (2024) Prioritising green jobs in Sri Lanka's economic recovery. Available at: <https://www.csf-asia.org/prioritising-green-jobs-in-sri-lankas-economic-recovery/> (Accessed: [insert date you accessed it]).
- Chouinard, H.H., Wandschneider, P.R. and Paterson, T. (2016). Inferences from sparse data: An integrated, meta-utility approach to conservation research. *Ecological Economics*, 122, pp.71–78. doi:<https://doi.org/10.1016/j.ecolecon.2015.11.019>.
- Colombo, E., Trentini, F. and Santo, A.D. (2025). Let's Get Green: Understanding Green Skills and Jobs Through Online Job Advertisements. [online] doi:<https://doi.org/10.2139/ssrn.5137315>.
- D'Souza, C., McCormack, S., Taghian, M., Chu, M.-T., Sullivan-Mort, G. and Ahmed, T. (2019). Influence of sustainability scholarship on competencies – an empirical evidence. *Education + Training*, 61(3), pp.310–325. doi:<https://doi.org/10.1108/et-08-2018-0184>.
- de Haan, G. (2006). The BLK '21' programme in Germany: a 'Gestaltungskompetenz'-based model for Education for Sustainable Development. *Environmental Education Research*, 12(1), pp.19–32. doi:<https://doi.org/10.1080/13504620500526362>.
- Ehnert, I. (2015). *Sustainability and human resource management*. Springer.
- Embalil Mathachan Aneesh, A.N. Anoopkumar, Madhavan, A., Sindhu, R., Parameswaran Binod, Kuddus, M., Ruiz, H.A., Pandey, A., Mukesh Kumar Awasthi and Pau Loke Show (2023). Inferences on bioengineering perspectives and circular economy to tackle the emerging pollutants. *Environmental Technology and Innovation*, 30, pp.103116–103116. doi:<https://doi.org/10.1016/j.eti.2023.103116>.
- Fajaryati, N., Budiyo, Akhyar, M. and Wiranto (2020). The Employability Skills Needed To Face the Demands of Work in the Future: Systematic Literature Reviews. *Open Engineering*, [online] 10(1), pp.595–603. doi:<https://doi.org/10.1515/eng-2020-0072>.
- Fleury, B., Rakotonanahary, D., Petelle, B., Vincent, G., Fleury, N.P., Meyer, B. and Lebeau, B. (2004). Mandibular Advancement Titration for Obstructive Sleep Apnea. *Chest*, 125(5), pp.1761–1767. doi:<https://doi.org/10.1378/chest.125.5.1761>.
- Gerstenberger, B. and Weber, T. (2023). Changing labour markets: How to prevent a mismatch between skills and jobs in times of transition - Background paper. [online] Policycommons.net. Available at:

<https://policycommons.net/artifacts/3936858/changing-labour-markets/4743337/>
[Accessed 1 May 2025].

Heckathorn, D.D., 2011. Comment: Snowball versus respondent-driven sampling. *Sociological methodology*, 41(1), pp.355-366.

Hinduja, P., Mohammad, R.F., Siddiqui, S., Noor, S. and Hussain, A., 2023. Sustainability in higher education institutions in Pakistan: a systematic review of progress and challenges. *Sustainability*, 15(4), p.3406.

International Energy Agency (n.d.) Sustainable recovery: World energy outlook special report in collaboration with the International Monetary Fund. Available at: https://iea.blob.core.windows.net/assets/c3de5e13-26e8-4e52-8a67-b97aba17f0a2/Sustainable_Recovery.pdf (Accessed: 21 October 2025).

International Federation of Accountants (2006) Sustainability and the role of professional accountants in business (PAIBs) – Business & sustainable development: The role of PAIBs. Available at: <https://www.ifac.org/news-events/2006-08/sustainability-and-role-professional-accountants-business-subject-two-new-ifac-papers> (Accessed: 21 October 2025).

International Federation of Accountants (2024) Educating accountants for a sustainable future: A literature review of competencies, educational strategies, and challenges for sustainability reporting and assurance. Available at: <https://ifacweb.blob.core.windows.net/publicfiles/2024-01/IFAC-sustainability-education-literature-review.pdf> (Accessed: 21 October 2025)

Junghanns, J. and Beery, T. (2020). Ecological Sanitation and Sustainable Nutrient Recovery Education: Considering the Three Fixes for Environmental Problem-Solving. *Sustainability*, 12(9), p.3587. doi:<https://doi.org/10.3390/su12093587>.

Lai Chee Sern, Noordiana Baharom, Lee Ming Foong, Muda, W., Rosli D'oria Islamiah and Ana, A. (2021). Integrating Green Skills into TVET Curricula in Polytechnics Malaysia. *Journal of technical education and training*, 13(3). doi:<https://doi.org/10.30880/jtet.2021.13.03.002>.

Lambrechts, W., Gelderman, C.J., Semeijn, J. and Verhoeven, E. (2019). The role of individual sustainability competences in eco-design building projects. *Journal of Cleaner Production*, 208, pp.1631–1641. doi:<https://doi.org/10.1016/j.jclepro.2018.10.084>.

Le Blanc, D. (2015). Towards Integration at Last? The Sustainable Development Goals as a Network of Targets. *Sustainable Development*, [online] 23(3), pp.176–187. doi:<https://doi.org/10.1002/sd.1582>.

LinkedIn Economic Graph (n.d.) Global green skills report 2024. Available at: https://eleticomagazine.it/wp-content/uploads/2024/12/Global-Green-Skills-Report-2024_compressed.pdf (Accessed: 21 October 2025).

Mahlaole, S.T., 2025. Education for sustainable development's role in influencing sustainable consumption behaviour among international students: a multi group analysis. *Discover Education*, 4(1), p.104.

Makarenko, I. and Plastun, A., 2017. The role of accounting in sustainable development. *Accounting and Financial Control*, 1(2), pp.4-12.

- Mburayi, L. and Wall, T. (2018). Sustainability in the professional accounting and finance curriculum: an exploration. *Higher Education, Skills and Work-Based Learning*, 8(3), pp.291–311. doi:<https://doi.org/10.1108/heswbl-03-2018-0036>.
- McCarthy, B. and Eagle, L. (2021). Are the sustainability-oriented skills and competencies of business graduates meeting or missing employers' needs? Perspectives of regional employers. *Australian Journal of Environmental Education*, pp.1–18. doi:<https://doi.org/10.1017/aee.2021.11>.
- McClelland, D.C. (1973). Testing for competence rather than for 'intelligence.' *American Psychologist*, 28(1), pp.1–14. doi:<https://doi.org/10.1037/h0034092>.
- Meadows, D., 2008. *Thinking in systems: International bestseller*. chelsea green publishing.
- Molderez, I. and Ceulemans, K. (2018). The power of art to foster systems thinking, one of the key competencies of education for sustainable development. *Journal of Cleaner Production*, 186, pp.758–770. doi:<https://doi.org/10.1016/j.jclepro.2018.03.120>.
- Nikoloski, D., Sulich, A., Sołoducho-Pelc, L., Mancheski, G., Angelski, M. and Petkoska, M.M. (2024). Identifying green skills gaps through labor market intelligence. *Journal of Infrastructure, Policy and Development*, [online] 8(6), p.4868. doi:<https://doi.org/10.24294/jipd.v8i6.4868>.
- Nnam, I.J., Eneh, S.N., Ozoji, A.P., Nwekwo, M.N., Udefi, G.N., Okobo, M.M. and Chukwunwike, O.D., 2025. Integrating Sustainability in Accounting Curricular of Higher Education Institutions: Analyzing Universities in an Emerging Economy. *Sustainability*, 17(13), p.5763.
- O'Connor-Felman, M., 2003. *American Corporate Governance and Children: Investing in Our Future Human Capital During Turbulent Times*. S. Cal. L. Rev., 77, p.1255.
- Park, K. (2021). Education-Job Mismatch and Gender Wage Gap: Evidence from Recent College Graduates in Korea. *Asian Women*, 37(1), pp.1–24. doi:<https://doi.org/10.14431/aw.2021.3.37.1.1>.
- Ploum, L., Blok, V., Lans, T. and Omta, O. (2017). Toward a Validated Competence Framework for Sustainable Entrepreneurship. *Organization & Environment*, 31(2), pp.113–132. doi:<https://doi.org/10.1177/1086026617697039>.
- Popkova, E.G. and Sergi, B.S. (2024). *Esg Management of the Development of the Green Economy in Central Asia*. Springer.
- Rieckmann, M. (2012). Future-oriented higher education: Which key competencies should be fostered through university teaching and learning? *Futures*, 44(2), pp.127–135. doi:<https://doi.org/10.1016/j.futures.2011.09.005>.
- Salas-Velasco, M. (2021). Mapping the (mis)match of university degrees in the graduate labor market. *Journal for Labour Market Research*, [online] 55(1). doi:<https://doi.org/10.1186/s12651-021-00297-x>.
- Sern, L.C., Zaime, A.F. and Foong, L.M. (2018). Green Skills for Green Industry: A Review of Literature. *Journal of Physics: Conference Series*, 1019, p.012030. doi:<https://doi.org/10.1088/1742-6596/1019/1/012030>.

- Siuta-Tokarska, B., Kruk, S., Krzemiński, P., Thier, A. and Żmija, K. (2022). Digitalisation of Enterprises in the Energy Sector: Drivers—Business Models—Prospective Directions of Changes. *Energies*, 15(23), p.8962. doi:<https://doi.org/10.3390/en15238962>.
- Sulich, A. and Zema, T. (2023). The Green Energy Transition in Germany: A Bibliometric Study. *Forum Scientiae Oeconomia*, [online] 11(2), pp.175–195. doi:https://doi.org/10.23762/FSO_VOL11_NO2_9.
- Sulich, A., Zema, T. and Kulhanek, L. (2023). Towards a Secure Future: A Bibliometric Analysis of the Relations Between Cybersecurity and Sustainable Development. *Procedia computer science*, 225, pp.1448–1457. doi:<https://doi.org/10.1016/j.procs.2023.10.133>.
- Tan, E. (2014). Human Capital Theory: A Holistic Criticism. *Review of Educational Research*, 84(3), pp.411–445. doi:<https://doi.org/10.3102/0034654314532696>.
- Venn, R., Perez, P. and Vandenbussche, V. (2022). Competencies of Sustainability Professionals: An Empirical Study on Key Competencies for Sustainability. *Sustainability*, 14(9), p.4916. doi:<https://doi.org/10.3390/su14094916>.
- Vona, F., Marin, G., Consoli, D. and Popp, D. (2015). Green Skills. *SSRN Electronic Journal*. doi:<https://doi.org/10.2139/ssrn.2639099>.
- Wegenberger, O. and Ponocny, I., 2025. Green Skills Are Not Enough: Three Levels of Competences from an Applied Perspective. *Sustainability*, 17(1), p.327.
- Wesselink, R., de Jong, C. and Biemans, H.J.A. (2009). Aspects of Competence-Based Education as Footholds to Improve the Connectivity Between Learning in School and in the Workplace. *Vocations and Learning*, 3(1), pp.19–38. doi:<https://doi.org/10.1007/s12186-009-9027-4>.
- Wiek, A., Withycombe, L. and Redman, C.L. (2011). Key Competencies in sustainability: a Reference Framework for Academic Program Development. *Sustainability Science*, [online] 6(2), pp.203–218. doi:<https://doi.org/10.1007/s11625-011-0132-6>.
- World Economic Forum (2025) The future of jobs report 2025. World Economic Forum. Available at: <https://www.weforum.org/publications/the-future-of-jobs-report-2025/> (Accessed: 21 October 2025).
- Zhang, A. (2012). Peer Assessment of Soft Skills and Hard Skills. *Journal of Information Technology Education: Research*, 11, pp.155–168. doi:<https://doi.org/10.28945/1634>.