Transversal Skills and Competences in Computing: A Shared Responsibility

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Abstract. In response to the evolving demands of the labor market, Higher Education Institutions (HEIs) increasingly emphasize the development of Transversal Skills and Competences (TSC). This study contributes to the dialogue on aligning academic curricula in a bachelor's degree in computer science with professional needs through collaborative efforts. The research combines a targeted literature review with two surveys targeting IT professionals, including alumni. The first survey identifies TSC prioritized during recruitment, while the second investigates IT-industry perceptions on responsibility for competence development between HEI and IT-industry. Drawing on literature and survey data, TSC were categorized into four competence domains: Inter-personal, Intra-personal, Digital, and Societal and Business. Results highlight Inter-personal and Intra-personal competences —such as Team collaboration, Problem-solving, Critical thinking, and Lifelong learning—as particularly valued TSC. Further findings point to a clear trend of shared responsibility in developing TSC. However, competences such as Critical thinking, Scientific methodology and Oral and written communication, are identified as primarily the responsibility of HEIs, while Lifelong learning and Project management are seen as more industry driven. This division reflects broader expectations: HEIs provide foundational competence development, while IT-industry ensures practical application and refinement.

Keywords: Transversal Skills and Competences · Soft Skills · Entry Level Expectations from IT-industry · Higher Educational Graduates · Employability

1 Introduction

In the context of Higher Education Institutions (HEIs) engineering education there's been a growing emphasis on soft skills due to their important role in increasing students employability. This is supported by London et al. who is emphasizing self-awareness including self-insight, reflection, teamwork and feedback (14). This is also the case for Shtaltovna and Muzzu (24) who focuses on soft digital skills for employability as digital communication, problem-solving, collaboration skills, digital content creation and media literacy. In (4) Bedoya-Guerrero et al. refer to the constant change in the labor market and the introduction of artificial intelligence has influenced the need for soft skills as self-regulation, effective communication, leadership and innovation. In this study, we adopt the term *Transversal Skills and Competences (TSC)* to encompass not only soft skills, but also broader societal competences that extend beyond the traditional scope of soft skills. This framing is based on the definition proposed by Hart et al (9) who describes TSC as "learned and proven abilities which are commonly seen as necessary or valuable for effective action in virtually any kind of work, learning or life activity". They further explain that these skills are considered "transversal" because they are not exclusively tied to any specific context - such as a particular job, academic discipline, or sector — but are applicable across a wide range of areas.

To facilitate analysis and discussions, TCS are categorized into four domains: Intra-personal, Inter-personal, Digital and Societal and Business competences.

Driven by IT-industry demands and the clear emphasis on the significance of TSC, HEIs have been actively integrating these skills and competences into their curricula. This means that a study program must ensure that learning outcomes are balanced against both TSC and hard skills to educate and prepare students with necessary competences to enter work-life (23).

In this paper we have explored how HEIs can promote the development of a suitable set of TSC within a bachelor's degree in computer science, to ensure employable students. Based on prior research, we have refined the definition and classification of TSC to better align with both curricular and IT-industry requirements. Furthermore we have tried to identify what responsibilities HEIs should take in the training of engineering students with respect to TSC, and what responsibilities IT-industry should take after hiring these graduates.

In this study we will examine the following research questions:

- RQ1: Which Transversal Skills and Competences are valued the most by the IT-industry for engineering graduates to enhance their employability?
- RQ2: How should the responsibility for developing Transversal Skills and Competences be distributed between the HEIs and the IT-industry?

2 Theory and Relevant Literature

This chapter aims to review existing research and literature, focusing on educational research. Our goal is to provide a comprehensive understanding of which TSC should be effectively embedded in HEIs programs. These theoretical explorations will form the foundation for addressing our research questions in this study.

2.1 The Definition of Transversal Skills and Competences

Numerous studies offer varied definitions and categorizations of TSC, consistently emphasizing their critical importance (9; 12; 18; 22). Terms such as soft skills, engineering mindset, transferable skills, and 21st-century skills reflect the diversity in conceptual framing. While existing research agrees on the relevance of specific TSC, classifications differ. Intra-personal competences like problem-solving and critical thinking (1; 15; 26), and relational competences including teamwork, communication, and leadership (1; 10; 21) are frequently highlighted. Emotional empathy is also emphasized for its role in enhancing inter-personal dynamics (21; 10), alongside qualities like reliability and self-motivation, as noted by accreditation bodies (10). Digital competence is increasingly recognized, encompassing both general digital literacy and discipline-specific tool proficiency (22). Natland et al. (17) further classify soft skills into communication, independence, cooperation, and development potential, and raise the question of whether personal aptitude is "given by birth" or if it is a competence that can be learned.

2.2 Transversal Skills and Competences to Enhance Employability

The importance of TSC in employability and the hiring process is increasingly recognized across various industries. Multiple studies highlights the critical role of TSC, identifying gaps between employers expectations and graduate competences (7; 8). While academic qualifications and discipline-specific knowledge remain important, employers prioritize candidates who possess strong TSC alongside technical expertise.

Noah (18) and Jamieson et al. (12) indicates that a lack of TSC can significantly impact an individual's employability. Industry trends show a preference for candidates who excel in problem-solving and collaboration. Ahmad, F.S., et al (1), highlights that proficiency in communication, teamwork, leadership and innovation significantly enhances workplace performance. Additionally, it is evident that TSC are essential in enhancing the employability skills of graduates, especially within the computer science and engineering disciplines (5; 20). Noah et al. (18) emphasize that employers often prioritize TSC over academic qualifications when hiring. Despite graduates acquiring technical and discipline-related skills, they frequently lack essential TSC. Employers value not only technical proficiency but also work attitude, aptitude, and adaptability. This gap between employer expectations and the competences of recent graduates is a global issue.

TSC are further seen as crucial in hiring, reflecting employer priorities in candidate selection and career advancement(10). While employers are generally satisfied with the technical skills of engineering graduates, they express concerns about graduates' understanding of workplace norms, ethics, and interpersonal communication.

Noah et al.'s (18) findings highlight the necessity for HEIs to understand labor market demands to improve graduate outcomes. Hence collaborations between HEIs and industries are essential to align educational programs with the dynamic needs of the job market (18).

Succi and Canovi(25) offers another perspective, highlighting that students and employers often have differing views on the importance of TSC in general compared to hard skills. While employers rank TSC like being committed to work, adaptability to changes skills, being professionally ethical and teamwork as top priorities, students may place more emphasis on technical knowledge and academic success. Succi also found that context (age, nationality and company size) might affect the ranking of certain TSC.

2.3 Responsibility of Balancing Education of TSC

Succi and Canovi states the importance of building strong partnerships between HEIs and industry to guarantee that graduates are prepared for industry and meet employer expectations. Educating bachelor's students for the workforce is a collective responsibility, where students, the HEIs, and the IT-industry must each take their share of the responsibility and work together to achieve the desired outcome - employability (25). Another issue raised by Sandra et al. (23) is the importance of balancing hard skills and TSC to enhance the quality of higher education graduates. Strong technical competence alone is insufficient to ensure that employees are productive and effective. Unfortunately several HEIs and study programs, fall short in this area, as they have not balanced their education to include sufficient training in TSC (2; 22; 23). Furthermore, Sandra et al. (23) highlights that success in work life is not solely determined by technical knowledge but also by the ability to manage oneself and others effectively. This is supported by Barrera et al. in their study (3). They found that although graduates with high technical competence provide an immediate start-up effect, a candidate with slightly less technical competence but more extensive training in TSC will, over time, catch up on the technical shortfall and maintain their employment advantages over time.

3 Method

To support the investigation of the research questions, a targeted review of influential works, relevant academic sources, and national guidelines for engineering education contributed to the theoretical framework of the study. Furthermore, data were collected in two rounds using mixed-method surveys.

3.1 Literature review

To ensure relevance and quality, this study applied inclusion criteria focusing on peer-reviewed publications in English and Scandinavian languages, with a scope limited to higher education and published from 2019 onward.

A systematic literature search was conducted using the Google Scholar database, as well as selected educational journals (IEEE Transactions on Education, ACM Transactions on Computing Education) and conference proceedings (IEEE EDUCON – Global Engineering Education Conference, UDIT – Norsk konferanse for utdanning og didaktikk i IT-fagene). Although the review was not exhaustive, it provided a representative overview of current discourse and practices, thus informing the investigation of the research questions addressed in this study.

3.2 Survey Design and Implementation

To examine perceptions of collaboration between HEIs and IT-industry in relation to TSC, a mixed-methods survey design was employed. Data were collected through two anonymous online surveys, each including both quantitative and qualitative open-ended questions. This approach enabled the capture of a comprehensive view of respondents' experiences and perspectives. Survey responses were compiled from two distinct professional groups. The first group consisted of IT-industry contacts ($n = 42$) affiliated with a workplace and IT-industry network connected to a faculty of information technology. The second group comprised individuals from a LinkedIn professional network who had completed bachelor's or master's degrees in computer science ($n = 160$). This recruitment strategy enabled access to participants with relevant academic backgrounds and IT-industry experience.

The first survey aimed to collect data addressing RQ1, where the respondents were to evaluate the significance of different TSC. The selection of TSC were informed by findings reported in the literature review. The second survey, informed by the results of the first survey, addressed RQ2: in which respondents were asked to assess distribution of responsibility between HEIs and the IT-industry in educating graduates with regards of TSC.

3.3 Data analysis

In Survey 1, Likert 5-point scale (13) (with one to five), was used to record the respondents' (n = 36) perceptions of the significance of each of the TSC.

To assess the reliability and interpretability of the Survey 1 data, a combination of descriptive statistics, one-way Analysis of Variance (ANOVA)(11; 19), and Tukey HSD test(16) was employed. Descriptive analyses provided an overview of response distributions and central tendencies, supporting internal consistency across items. The one-way ANOVA was used to identify statistically significant differences between respondent groups (private sector vs public sector, type of IT-business and number of years of experience), while Tukey's HSD test enabled pairwise comparisons to determine the nature of these differences. To account for differences in group sizes, the harmonic mean sample size was applied in the one-way ANOVA, thereby maintaining the robustness and accuracy of the analysis and ensuring reliable statistical comparisons.

In Survey 2, which used a scale from 0% (entirely the responsibility of HEIs) to 100% (entirely the responsibility of the IT-industry), was used to assess the respondents (n= 29) distribution of responsibility for the TSC between HEIs and the IT-industry. This survey was analyzed using the same methods as Survey 1. The one-way ANOVA were performed to assess statistically significant differences between group based on years of experience, with post-hoc comparisons conducted using Tukey's HSD test.

Together, these methods contributed to the validation of the data in both surveys by demonstrating that the observed patterns were not due to random variation, and that the survey instrument was sufficiently sensitive to detect differences in respondent perspectives.

The qualitative data from both surveys were analyzed using thematic analyses to identify patterns and insights across the datasets. Following Braun and Clarke's six step-process(6).

4 Results

The results presents key findings from the literature review and both surveys, including statistical comparisons using one-way ANOVA and post-hoc Tukey's HSD test, as well as insights from open-ended responses. Differences in respondents views on TSC are highlighted across respondent groups.

The use of the term TSC emerged from the literature review, reflecting terminology commonly used in educational and professional development contexts.

The survey questions were developed through thematic analysis of the literature, which identified recurring concepts and terminology used in educational and professional contexts. Drawing on these findings, along with national guidelines for engineering education, the study categorizes TSC into four domains, as outlined in Table 1: Digital, Intra-personal, Inter-personal, and Societal and Business competences. Each domain is further refined into specific categories.

Table 1: TSC in a bachelor's degree in computer science

TSC Domain	Abbreviation	Category
Digital competence	DC1	Use of Professional Tools within the Academic Discipline
	DC2	Professional use of AI
	DC3	Use of e-portfolio to describe own competence
Intra-personal competence	IAC1	Problem-solving skills
	IAC2	Critical thinking
	IAC3	Lifelong learning
	IAC4	Independence and confidence
	IAC5	Professional ethics
	IAC6	Awareness of own competence
	IAC7	Ethical reflections
Inter-personal competence	IPC1	Team collaboration
	IPC2	Oral and written communication
	IPC3	Discipline collaboration methods
	IPC4	Team establishment
	IPC5	Scientific methodology
	IPC6	Project management
Societal and business competence	SBC1	Innovation and entrepreneurship
	SBC2	Sustainability analyses

4.1 Quantitative Key Findings

This section summarize key findings from the two surveys conducted, highlighting statistical patterns and differences relevant to the study's research questions.

Survey 1

The first survey aimed to identify and rate various TSC on a 5 point Likert scale. Figure 1 illustrates the distribution of responses across 17 competence categories within the four domains - DC, IAC, IPC and SBC, using a stacked bar chart to visualize the proportions of Likert-scale ratings within each category.

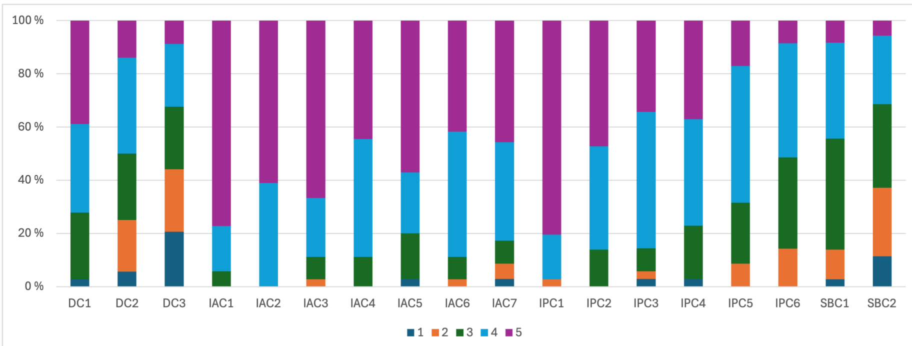

Fig. 1: The percentage distribution of responses regarding the perceived importance of various TSC (1=To a small extent, 5= To a large extent)

As described in Section 3.3, one-way ANOVA analyses were conducted to examine whether statistically significant differences existed between responses from three different groups. No significant differences were found in the first two cases; however, the third—number years of experience— showed a borderline significant result for one variable. Consequently, we pursued this further, and Table 2 presents the results of the one-way ANOVA focusing on number of years of experience in the IT-industry. The table shows the F and P values for each of the professional TSC categories, grouped by domain. The F-value is the ratio of the variance between the groups[1] to the variance within the groups. A higher F-value indicates that there is more variance between the groups compared to within the groups. The p-value indicates whether there are statistically significant differences between the group means. Low p-value (<0.05) suggest that at least one groups mean-value is significantly different from the others. A higher p-value (>0.05) implies that there is no significant difference between the group means. In essence, the p-value helps determine whether the observed differences in group means are likely due to random chance or reflect true differences in the population.

Table 2 shows that there are no significant differences revealed in our analyses. This suggests that the number of years in the IT-industry does not have a substantial impact on the rating of the selected variables. However we observe that three of the variables p-levels are close to the significance level of 0.05

[1] Groups are categorized by number years of experience in the IT-industry: less than 1 year, 1-5 years, 6-10 years, 11-15 years, and more than 16 years

with high corresponding F-values, marked in Table 2 using italics and color for emphasis. Although the p-level is not low enough to conclude that there is a statistically difference between the groups, there is a weak indication of a possible differences. Therefore a post-hoc Tukey HSD analysis was conducted; however, it did not reveal any statistically significant differences. This suggests that the number of years of experience in the IT industry did not have a measurable impact on the ratings of the variables.

Table 2: One-way ANOVA on TSC vs. number of years in IT-business

Category	**F-Value**	**p-Value**	**Category**	**F-Value**	**p-Value**
DC1	0.562	0.692	IAC7	1.232	0.318
DC2	1.012	0.416	IPC1	0.830	0.516
DC3	0.851	0.505	IPC2	0.933	0.458
IAC1	0.708	0.593	IPC3	1.969	0.125
IAC2	0.128	0.971	IPC4	0.780	0.547
IAC3	*2.505*	*0.062*	IPC5	0.107	0.979
IAC4	0.572	0.685	IPC6	0.669	0.619
IAC5	*2.363*	*0.076*	SBC1	0.932	0.458
IAC6	0.295	0.879	*SBC2*	*2.386*	*0.052*

Survey 2

Survey 2 explored perceptions of educational responsibility for various TSC, comparing the roles of HEIs and IT-industry. Figure 2 illustrates the distribution of responses using a box-plot, highlighting how responsibility is perceived to be shared or divided across different TSC. The scale ranges from 0 (entirely the responsibility of the HEIs), 50 (shared equally) to 100 (entirely the responsibility of the IT-industry.

Items with medians closer to 0 like DC3 and IAC1, indicate that the responsibility is perceived to lie primarily with HEIs. Items such as IPC3 and SBC2 have medians closer to 50, indicating that these TSC are perceived as an equally shared responsibility between HEIs and IT-industry. There is strong agreement (narrow boxes and short whiskers) on items like DC2 and IAC4, whilst items like SBC2 and IPC3 reflects more diverse views. Outliers indicate that while general trends are clear, some individuals hold strongly differing views.

The one-way ANOVA analysis as presented in Table 3, revealed a statistically significant difference in IPC1 scores across the groups defined by Number of years of experience, highlighted in red.

This indicates that the mean values of IPC1 vary meaningfully between the groups, suggesting that group membership has a notable influence on IPC1. Given that the p-value is below the conventional threshold of 0.05, we reject the null hypothesis of equal group means and conclude that at least one group differs significantly from the others in terms of IPC1. Post-hoc analysis using Tukey's HSD test (Table 4), revealed a statistically significant difference in IPC1 scores between participants with 1–5 years (n=10) of experience and those with more

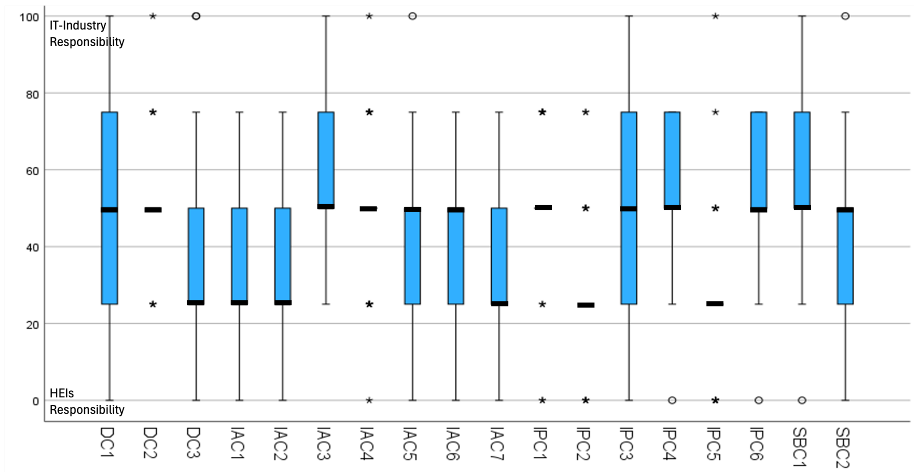

Fig. 2: Response variation across TSC categories, showing perceptions of responsibility for fostering competences— from 0% (HEIs) to 100% (IT-industry)

Table 3: Survey 2 - one-way ANOVA results

Cat.	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Cat.**	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
DC1	1640.749	3	546.916	0.759	0.528	IAC7	1031.664	3	343.888	0.906	0.452
DC2	632.543	3	210.848	0.953	0.430	IPC1	3487.981	3	1162.660	**4.464**	**0.012**
DC3	1088.859	3	362.953	0.574	0.637	IPC2	244.115	3	81.372	0.216	0.884
IAC1	26.028	3	8.676	0.031	0.992	IPC3	2824.851	3	941.617	1.614	0.211
IAC2	1972.480	3	657.493	1.840	0.166	IPC4	954.907	3	318.302	0.739	0.539
IAC3	857.593	3	285.864	0.721	0.549	IPC5	981.101	3	327.034	0.587	0.629
IAC4	1358.256	3	452.752	1.078	0.376	IPC6	1390.501	3	463.500	1.294	0.298
IAC5	2097.480	3	699.160	1.985	0.142	SBC1	859.499	3	286.500	0.476	0.702
IAC6	359.251	3	119.750	0.480	0.699	SBC2	1542.938	3	514.313	1.164	0.343

than 16 years(n=13) These finding suggests that perceptions regarding who holds responsibility for fostering skills on team collaboration, as measured by IPC1, vary with professional experience. The more experienced tended to view these skills as primarily belonging to IT-industry, whereas the less experienced group were more likely to see it as the responsibility of HEIs. While some outliers exist, particularly in the early-career group, they do not undermine the overall pattern and instead highlight the diversity of views within this segment. No other group comparisons yielded statistically significant differences.

Furthermore, results from the post-hoc Tukey HSD tests indicate that respondents with more than 16 years of professional experience provided notably more homogeneous responses across multiple TSC categories. This was evidenced by consistently lower standard errors in comparisons between the *1–5 years* and *>16 years* groups, particularly for foundational and personal development competences such as IPC1 and IAC6. In contrast, comparisons involving mid-range experience groups (e.g., *6–10* or *11–15 years*) often exhibited higher variability. These findings suggest that highly experienced professionals may share more aligned perceptions regarding the distribution of responsibility between HEIs and IT-industry in competence development, potentially reflecting accumulated consensus through long-term exposure to both educational and professional environments.

Table 4: Post-hoc Tukey HSD comparison for IPC1

Group I	**Group J**	**Mean Diff.**	**Std. Error**	**Sig.**	**Lower Bound**	**Upper Bound**
1–5 years	6–10 years	-21.25	9.55	0.144	-47.51	5.01
1–5 years	11–15 years	-27.50	12.50	0.151	-61.89	6.89
1–5 years	**>16 years**	**-22.69**	**6.79**	**0.013**	**-41.37**	**-4.02**
6–10 years	11–15 years	-6.25	13.98	0.970	-44.70	32.20
6–10 years	>16 years	-1.44	9.23	0.999	-26.83	23.94
11–15 years	>16 years	4.81	12.26	0.979	-28.91	38.53

4.2 Qualitative results

Qualitative insights from the two surveys reveal critical gaps and priorities in IT education. Respondents identified missing competences in systems thinking, business literacy, communication, and change management, suggesting current curricula may not fully prepare students for professional demands. Collaboration, problem solving, adaptability, and communication emerged as the most valued workplace skills, underscoring the importance of holistic competence development. Additional comments emphasized the need for better alignment between academic content and IT-industry expectations, advocating for modernized curricula that integrate agile methodologies and design thinking, and promote mutual engagement between HEIs and IT-industry partners.

5 Discussion

This study examined two key dimensions: The TSC deemed most valuable for enhancing the employability of bachelor's degree in computer science graduates; and second, from the perspective of the IT-industry, the perceived responsibility(HEIs versus IT-industry) for fostering these competences among graduates.

To address the first research question, a targeted literature review was conducted to establish a unified definition and classification of TSC within the context of a bachelor's degree in computer science program. The review revealed significant variation in how TSC are defined and categorized across existing studies (5; 12; 18). In response, the selection and structuring of TSC were aligned with the National Guidelines for Engineering Education (27), ensuring relevance to the educational context. Literature shows consensus on intra- and inter-personal competences, while digital competences vary(21). National guidelines mandate inclusion, supporting the integration into the TSC framework in this study. The adopted framework organizes the competences into four distinct domains, as outlined in Section 1 and presented in Table 1. This structure integrates widely recognized TSC such as problem solving, team collaboration, and critical thinking, alongside use of professional tools and sustainability analyses. The IT-industry complied to chosen definition when responding to our surveys, and noted that the missing competences were primarily related to technical skills rather than TSC.

Analysis of the survey responses indicates that, with the exception of DC3 and SBC2, all TSC were generally rated positively. The three TSC identified as most valuable by IT-industry respondents were Team Collaboration(IPC1), Problem-Solving Skills(IAC1), and Critical Thinking(IAC2). These competences received the highest overall ratings, indicating strong alignment with national guidelines and IT-industry expectations and perceived relevance to professional practice in a bachelor's degree in computer science program. Furthermore, indicators within the IAC domain received consistently high ratings (4–5), suggesting that these competences are perceived as particularly valuable. In contrast, greater variation was observed in responses related to the DC and SBC domains (Figure 1).

Previous research indicates that factors, such as years of experience in the IT-industry may influence how different TSC are valued by the industry (25). This is also confirmed by this study. As described in Section 4.1, more experienced IT professionals tend to place a higher value on lifelong long learning skills compared to those with less experience, possibly due to their accumulated experience and awareness of the need for continuous skill development in a rapidly evolving field. In contrast, sustainability-related skills were rated more highly by professionals with less than 10 years of experience, which may reflect generational shifts in priorities or increased exposure to sustainability topics in recent education.

Furthermore, survey results indicate that IT-industry partners generally prioritize intra-personal (IAC) and inter-personal (IPC) competences over digital competences. This likely reflects the industry's emphasis on problem-solving, critical thinking, and collaboration—skills essential in agile, cross-functional environments. These findings align with Montandon et al., who identified communication, collaboration, and problem-solving as the most valued TSC (15), consistent with our respondents' ratings.

The second research question target the balance between the HEIs responsibility for teaching TSC and the IT-industry's responsibility. Data-analyses as presented in section 4.1, reveals a nuanced perception regarding the distribution of educational responsibility for the various TSC. Rather than viewing responsibility as a split between HEIs and IT-industry, the responses suggests a range of perceptions of shared responsibility between them. A notable trend is the clustering of responses around the midpoint of the scale, which implies a general consensus that both sectors play complementary roles in TSC development. This may reflect the increasing integration of academic and professional environments, especially in the computer science domain where theoretical foundation and practical application are both essential. However, the variation in median values across specific TSC, points to differentiated expectations. For instance, competences such as IAC7 and IPC2 are seen as primarily academic responsibilities, possibly due to their foundational or reflective nature. In contrast, competences like IPC3 and SBC2, are viewed as joint ventures, suggesting that both HEIs and IT-industry engagement are critical for their development.

Respondents express concern about curriculum focus and graduate readiness. While TSC are important, there is a strong belief that HEIs should prioritize theoretical depth, leaving some TSC to be developed in the workplace. This highlights the need for clearer boundaries and better alignment between academic goals and IT-industry expectations.

Limitations

This study has several limitations. The sample size was small and unevenly distributed across respondent categories, which limits statistical power and generalizing despite the use of multiple analytical approaches. Additionally, the classification of digital competence as a professional skill may not be directly applicable across disciplines. The limited inclusion of literature from the Scandinavian context may also constrain the regional relevance of the findings.

6 Conclusion

This study highlights the critical need for collaboration between HEIs and the IT-industry in the development of TSC. Such collaboration should focus on identifying and cultivating the most relevant TSC to ensure alignment between educational outcomes, national guidelines for engineering education and IT-industry expectations.It is noteworthy that IT-industry recognizes that graduates are not expected to enter the workforce with fully developed TSC. Rather, these competencies are expected to grow throughout their careers. Industry stakeholders also call for HEIs to place greater emphasis on developing TSC such as reflective thinking, scientific reasoning, and communication skills. These expectations should guide the design of study programs and learning outcomes in HEIs.

The rationale for the collaboration between IT-industry and HEIs is twofold. First, employability: HEIs depend on continuous dialogue with IT-industry to ensure that their graduates possess the competences required in the labor market. Second, on-boarding: the IT-industry relies on HEIs to lay the foundation for TSC that can be further developed through structured on-boarding processes. A shared understanding of competence priorities enables a smoother transition from academic education to professional practice, ultimately benefiting both sectors and the graduates themselves.

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