The Construction of Soft Skills Scale Targeted Generation Z For IT Sector

Orkun Yildiz,[1, 2, 3, 4] Tuğba Elif Toprak-Yildiz[5, 6]

[1] Izmir Democracy University, Faculty of Economics and Administrative Sciences, Izmir, Turkiye
yildiz.orkun@gmail.com
[2] METU, Faculty of Informatics, Ankara, Turkiye
yildiz.orkun@gmail.com
[3] Saarland University, The European Institute for Advanced Behavioural Management (EIABM), Saarbrücken, Germany
yildiz.orkun@gmail.com
[4] UNMSM, Department of Industrial Engineering, Lima, Peru
yildiz.orkun@gmail.com
[5] Izmir Democracy University, Faculty of Arts and Sciences, Izmir, Turkiye
tugbaeliftoprak@gmail.com
[6] Saarland University, The Institute of Language and Communication, Saarbrücken, Germany
tugbaeliftoprak@gmail.com

This research focuses on the increasing importance of soft skills in the Information Technology sector. The rise of new job roles, evolving work structures, and greater customer engagement necessitate soft skills in potential employees. Additionally, global competition, higher demands for workforce skills, and more diverse and virtually connected work environments have spurred interest in soft skills. These changes underscore the value of creativity, social, emotional, organizational, teamwork, and problem-solving abilities, collectively referred to as soft skills. Both industry and academia acknowledge that technical skills alone are insufficient in the workplace. Recognizing the importance of soft skills, this study aims to develop a scale to assess relevant soft skills within the IT context. The research involves several phases, including defining the construct, item development, scale construction, pilot testing, and performing exploratory and confirmatory factor analyses. The developed soft skills scale is anticipated to be beneficial for educators, researchers, and professionals in the IT field.

DOI
https://doi.org/10.18690/um.fov.4.2025.19

ISBN
978-961-286-998-4

Keywords:
soft skills,
information technology,
measurement,
scale development,
generation Z

University of Maribor Press

1 Introduction

Information Technology (IT) job advertisements usually categorise skill requirements into hard and soft skills (Ahmed et al., 2012). While hard skills require technical knowledge and skills to perform specific tasks, soft skills relate to personality traits and attitudes that impact an individual's behaviour, complementing and enhancing technical skills. Soft skills are not meant to substitute for technical skills (Cacciolatti et al., 2017). However, ideally, a candidate is expected to have a balance of both skills. There is also a growing awareness in industry and academia that more than hard skills are needed to lead to desired outcomes and employability (Ahmed et al., 2012; Dogara et al., 2020; Joseph et al., 2010). Particularly due to the emergence of new occupations, work organization methods and the growing involvement of customers, employers these days require soft skills when they consider prospective workers (Bailly & Léné, 2012). With increasing global competition and demand for higher workforce skills, businesses have grown more interested in soft skills (Cacciolatti et al., 2017). Moreover, within the last decade, workplaces have become increasingly multicultural and virtually dispersed (Castro et al., 2022). While these drastic changes take place, there has been an anticipation of shifting skill requirements, placing considerable emphasis on creativity, social, emotional, communication, critical thinking, and problem-solving skills of individuals, in other words, their soft skills (Alshare et al., 2011; Batista & Romani-Diaz, 2022).

Therefore, being a team member, operating independently, working with and without supervision is assumed to increase the demand for social and emotional skills (Green, 2004) while a growing number of studies report that employers' demands for these skills are on the rise and possessing soft skills is regarded to be crucial to employability and success in work life (Albandea & Giret, 2018; Cuesta & Budría, 2017; Deming, 2017; Ito & Kawazoe, 2015). Moreover, as the competition in the IT market increases, possessing these skills, leading to improved job performance, becomes more crucial (Bailey & Mitchell, 2006).

Despite their centrality to success in the workplace, research also reports that the skills that particularly recent graduates lack are not technical but soft skills, which feature attributes such as leadership, problem-solving and time management (Andreas, 2018). Furthermore, survey results obtained from businesses and college

graduates indicate a common belief that colleges are falling short in adequately preparing their students for the workforce (Andreas, 2018; Antón-Sancho et al., 2021; Farner & Brown, 2008; Gruzdev et al., 2018).

A review of existing research on soft skills reveals that a number of studies to date have concentrated on generating a measure targeting at soft skills (e.g., Aasheim et al., 2012; Bak & Boulocher-Passet, 2013; Buchynska & Schlichter, 2019; Dunaway, 2013; Hefley & Bottion, 2021; Jordan & Bak, 2016; Lutz & Birou, 2013; Murphy & Poist, 1991; Turner & Lowry, 2002; Van Yperen Hagedoorn et al., 2021; Yadin & Rashkovits, 2009; Zaffar & Winter, 2008). However, few of these studies have been carried out with a focus on the IT sector (e.g., Aasheim et al., 2012; Buchynska & Schlichter, 2019; Dunaway, 2013; Turner & Lowry, 2002; Van Yperen Hagedoorn et al., 2021; Zaffar & Winter, 2008). In addition, all these studies were conducted before the Covid-19 pandemic period, so they lacked a remote working perspective.

Considering the gap in the relevant literature and the significance of soft skills to employability and success in the IT sector, the present study aims to develop a scale which intends to measure soft skills in the IT context. The study recognises the significance of remote working in the IT sector which has been emphasized in the relevant literature (Aasheim et al., 2012; Bak & Boulocher-Passet, 2013; Buchynska & Schlichter, 2019; Dunaway, 2013; Hefley & Bottion, 2021; Jordan & Bak, 2016; Lutz & Birou, 2013; Murphy & Poist, 1991; Turner & Lowry, 2002; Van Yperen Hagedoorn et al., 2021; Yadin & Rashkovits, 2009; Zaffar & Winter, 2008) and incorporates this aspect in scale/item development process. All of these existing scales focus on the general workforce or various industries and are not specifically tailored to reflect the unique needs of the IT sector.

This study aims to address this gap in literature by developing a new scale specifically designed to measure soft skills in the IT sector. Bridging this theoretical gap will enable more accurate sector-specific assessments and contribute to the development of targeted training strategies. The scale developed in this study will not only have practical implications for the industry but will also provide a significant theoretical contribution. Identifying the shortcomings of existing scales will help clarify which soft skills are critical in specific scenarios within the IT sector.

Unlike previous studies that focus on technical and operational aspects, our research emphasizes the critical role of soft skills in navigating the challenges and opportunities of remote work environments. By synthesizing existing subdomains of soft skills and proposing a unified framework, our study not only clarifies these attributes but also provides a practical tool for organizations to assess and enhance their employees' soft skills. Additionally, our research contributes to the literature by bridging the conceptual gap with a domain-specific definition of soft skills, developing a validated scale to systematically evaluate these competencies, offering actionable insights for fostering soft skills in remote work settings, and focusing on Generation Z to provide unique insights into the soft skills needs of this emerging workforce.

2 Literature Background

2.1 Soft skills and IT

Traditionally, hard and soft skills have been defined by their nature: hard skills have been linked to technical and administrative abilities, while soft skills have been associated with human, conceptual, leadership, and interpersonal abilities (Bak et al., 2019). However, defining what soft skills exactly refer to would be challenging considering the diversity in the definitions, construct representations, and measurements of soft skills proposed in different areas, including psychology, education, business, and IT. Moreover, when conceptualising and operationalising the construct of soft skills, some researchers consider these skills as personality traits linked to the character of individuals (Antón-Sancho et al., 2021). On the other hand, some researchers refer to these skills as non-cognitive, emotional, social, people, interpersonal skills, applied skills, 21st-century skills, transversal skills or behavioural attitudes (Albandea & Giret, 2018; Andreas, 2018; Bailly & Léné, 2012; Bak et al., 2019; Batista & Romani-Diaz, 2022; Caeiro-Rodríguez et al., 2021; Caggiano et al., 2020; Carvalho et al., 2022). Some researchers even pay attention to specific physical properties, such as good appearance, when they consider soft skills (Bailly & Léné, 2012). Therefore, the conceptualising of soft skills may vary across disciplines and frameworks employed in studies conducted.

Despite the diversity in conceptualisations, one significant aspect of soft skills that is commonly recognised is that, unlike personality traits, they can evolve and can be learnt at schools, in the family or the workplace and are transversal-- meaning that they are cross-cutting and shared across different sectors of the labour market and academia (Andreas, 2018; Albandea & Giret, 2018; Antón- Sancho et al., 2021). Soft skills are considered important to a career that typically demands interacting with others and features a set of attributes such as communication skills, team building, problem-solving and time management skills (Andreas, 2018).

Soft skills in this study are contextualized for the IT sector, with emphasis on competencies such as virtual collaboration, self-management, and digital communication—skills increasingly vital in remote and hybrid work environments. Sources were identified through systematic searches in databases such as Scopus and Web of Science, using keywords including 'soft skills,' 'Generation Z,' and 'IT workforce.' Selection was based on relevance, recency, and peer-reviewed status.

2.2 Remote working

In recent years, the effects of remote working and digital transformation on business processes have become the focus of academic attention. This literature review has identified significant studies. Schuh et al. (2024) present a four-dimensional classification aimed at sustaining professional work environments shaped by post-pandemic digitalization. Hafermalz and Riemer (2016) examine how employees cope with social isolation during remote work. Chen and Hung (2022) analyze the costs perceived by different occupational groups in remote work environments. Johnson (2001) investigates the impact of remote work on individual characteristics. Zaza and Erskine (2024) examine the effects of mandatory technology-mediated remote work on employee performance during the pandemic. Mirbabaie et al. (2020) focus on the risks of digital overuse associated with remote work and explore "digital detox" approaches. Virtaneva et al. (2021) investigate the impact of remote work on knowledge workers during the COVID-19 pandemic. Debowski et al. (2022) examine remote design thinking processes. These studies address the various effects of remote work on organizations, individuals, and business processes, revealing that this topic constitutes a multidimensional and interdisciplinary research field. However, the role of soft skills in remote work environments has been largely overlooked. Communication, teamwork, problem-solving, and time management

skills have gained importance in the post-pandemic era as remote work reshapes employee interaction and collaboration dynamics. Despite their critical role in supporting productivity, adaptability, and well-being in remote work environments, these skills remain understudied, particularly in the IT industry context. Therefore, our study aims to fill this gap in the literature by conducting research to identify soft skills at the individual level, focusing on remote work.

2.3 Scales in remote working context

The increasing prevalence of remote work has necessitated the development of various measurement tools and conceptual models to assess critical competencies for employees working in virtual environments. While early research focused on productivity, organizational trust, and work-life balance (Grant et al., 2019; Charalampous et al., 2023), recent studies highlight the increasing importance of soft skills to enable effective collaboration, adaptability, and decision-making processes in remote work environments (Benligiray et al., 2024; Yildiz & Toprak-Yildiz, 2024). Soft skills, which include aspects such as communication, teamwork, emotional intelligence, and problem-solving, are considered essential for successful remote work integration, especially in knowledge-intensive fields such as Information Technology (IT). Despite this recognition, assessing soft skills in the context of remote work has been under-researched, with existing scales focusing either on general remote work competencies (Tramontano et al., 2021) or industry-specific technical skills and do not provide a comprehensive measurement framework for behavioral competencies. Additionally, there is a distinct lack of studies addressing soft skills required in remote work for Generation Z, given their experiences working remotely during the COVID-19 pandemic. This focus is critical because Generation Z represents a key demographic group expected to dominate the remote workforce in the near future. The COVID-19 pandemic has provided Generation Z with the opportunity to gain first-hand experience with remote work, especially during their university education, making them a key group for understanding the future of remote work dynamics. This gap in literature prevents a comprehensive understanding of how soft skills operate in remote work environments and how they can be effectively measured and developed.

In response to these gaps, the Soft Skills Remote Work Culture Acceptance Model (SSRWCA) proposed by Yildiz and Toprak-Yildiz (2024) provides a theoretical basis for the integration of soft skills into remote work adaptation assessments. Based on Causal Action Theory (RAT), this model highlights the role of decision-making skills, behavioral skills, management skills, and negotiation skills in shaping employees' abilities to effectively engage in remote work environments. By incorporating MacKenzie et al.'s (2011) best practices in scale development, this study aims to fill an important gap in the literature by developing a scale that will strengthen the methodological rigor of assessing soft skills in the IS field.

3 Methodology

3.1 The sample

The sample utilized in the current study featured 139 Management Information Systems department undergraduates attending a university in a metropolitan city in Türkiye. The age of the participants ranged between 18-23. Participation in the study was voluntary.

The item development process involved literature synthesis and expert input. Exploratory and confirmatory factor analyses were conducted to ensure structural validity, with detailed factor loadings and fit indices reported.

3.2 Data collection and analysis

Data were collected using an online platform to which the participants had access. The participants received a link to the online platform, which took them to the scale administered in digital format. It took around 40 minutes for participants to answer all items on the scale. The data were initially analysed using exploratory factor analysis (EFA) to investigate the appropriateness and structure of the data, as well as scale and item properties. In the second phase, the data were analysed using confirmatory factor analysis (CFA). Confirmatory factor analysis enables researchers propose and test theoretical measurement models which account for the links between the underlying latent variables and the empirical measures (Knoke, 2005).

3.3 Construction of the Scale

The construction of the scale featured several stages. The first stage was the operationalisation of the construct at hand, soft skills. As previously noted, the construct of soft skills has been conceptualised and measured in various ways in the relevant literature. Therefore, a systematic review of existing research in IS, IT and business was undertaken to operationalise the construct. Implications and findings provided by relevant research formed the basis of construct definition, which also guided all item writing efforts. Initially, an item pool which included around 250 items was created. The items were subject to a qualitative analysis by three experts. The final form of the scale included four subscales: decision-making skills subscale, behavioural skills subscale, management skills subscale, and negotiation skills subscale. The subscales which constitute the soft skills scale were based on these four constructs (i.e., decision making skills, behavioural skills, management skills, and negotiation skills) underlying the main construct of soft skills.

While several soft skills scales exist, this study addresses the unique behavioral and communication patterns of Generation Z, particularly within the IT sector, which are not adequately captured by existing instruments.

4 Results

4.1 Initial quantitative analyses and exploratory factor analysis

Before conducting the main confirmatory factor analysis, an exploratory factor analysis (EFA) was initially undertaken to ensure the appropriateness and structure of the data, scale and item properties. Analyses were performed separately for each subscale of interest in the same manner by using SPSS (IBM SPSS Statistics 25). These were the analyses performed: Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test, Bartlett's test of Sphericity, and Cronbach alpha for internal consistency. The results of the KMO and Barlett's test of Sphericity indicated the appropriateness of the data for further EFA. The internal reliability scores for the decision-making skills subscale (25 items), behavioural skills subscale (18 items), management skills subscale (23 items), and negotiation skills subscale (4 items) were .92, .90, .93, and .65, respectively. The internal reliability values were found to be

very strong for the decision-making skills subscale, behavioural skills subscale, management skills subscale and acceptable for the negotiation skills subscale.

4.2 Confirmatory factor analysis

CFA is a statistical method that helps researchers investigate the underlying factor structure of a particular set of observed variables. CFA makes it possible to evaluate if there are significant relationships between observed variables and the unobservable latent variables (i.e., constructs) that underlie them (Hair et al., 2018). CFA analyses were conducted using Smart PLS software using the maximum likelihood (ML) estimation method. Information about the underlying structure of the subscales, R^2 values, overall item properties and model fit has been presented in Table 1.

Table 1: Sample table

	Decision-making skills subscale	Behavioural skills subscale	Management skills subscale	Negotiation skills subscale
1 Underlying structure	Problem solving skills, organisational skills, planning skills, flexibility, cognitive skills, initiative skills	Communication skills, time management skills, motivation and enthusiasm, stress management skills	People managementskills, teamwork skills, leadership skills, collaborationskills, managing complexity and change	Negotiation skills
2 R^2	Problem solving skills (.65), organisational skills (.65), planning skills (.61), flexibility (.65), cognitive skills (.66), initiative skills (.62)	Communication skills (.65), time management skills (.49), motivation and enthusiasm (.47), stress management skills (.53)	People managementskills (.64), teamwork skills (.78), leadership skills (.80), collaboration skills (.79), managing complexity and change (.76)	Negotiation skills(.85)
3 Item properties	All item loadings ranging between .60-.84	All item loadingsranging between .64-.83	All item loadings ranging between .60-.80	All item loadings ranging between .63-.78
4 Model fit	SRMR 0.09	SRMR 0.08	SRMR 0.08	SRMR 0.10

Overall, the R^2 values, which represent the proportion of variance in the observed variable explained by the latent factor, were found to be indicating a strong relationship between the factors and the items in most of the cases. The item loadings, which indicate effectively each item measures the targeted latent factor, indicated good representation since all item loadings varied between .60 and .84. Finally, the Standardized Root Mean Square Residual (SRMR) values, which represent the discrepancy between the observed correlations based on the sample data and the predicted correlations based on the model, were computed to assess the model-to-data fit. Values ranging from 0.10-0.08 indicated an acceptable model-to-data fit for four subscales generated.

4 Discussions and Conclusions

The present study aimed to develop a soft skills scale that would measure intended skills and attributes in the context of IT. The scale consisted of four subscales targeting critical soft skills and attributes specified in the relevant literature. These subscales were decision-making skills subscale (Bak & Boulocher-Passet, 2013; Jordan & Bak, 2016; Lutz & Birou, 2013; Murphy & Poist, 1991), behavioural skills subscale (Derwik & Hellstrom, 2017; Dubey & Gunasekaran, 2015; Jordan & Bak, 2016; Zuo et al., 2018), management skills subscale (Jordan & Bak, 2016; Kovács et al., 2012, Lutz & Birou, 2013), and negotiation skills (Jordan & Bak, 2016; Kovács et al., 2012). The results of the EFA and CFA analyses indicated that the subskills functioned effectively, as evident in the item loadings ranging between .60 and .84 and acceptable R2 values representing the proportion of variance in the observed variables explained by the underlying factors in our model. The final version of the scale featured 70 items. The item number per subscale and subdimension is as follows. Decision-making skills subscale featured problem-solving skills (4 items), organisational skills (4 items), planning skills (4 items), flexibility (4 items), cognitive skills (4 items), initiative skills (5 items). The behavioural skills subscale featured communication skills (5 items), time management skills (4 items), motivation and enthusiasm (4 items), and stress management skills (5 items). Management skills subscale featured people management skills (5 items), teamwork skills (5 items), leadership skills (5 items), collaboration skills (4 items), and managing complexity and change (4 items). Finally, the negotiation skills subscale featured negotiation skills (4 items).

Each subdimension of the scale effectively reflects the dynamics of the IT industry. Given the increasing prevalence of hybrid work models and the growing importance of virtual collaboration, this scale provides a valuable roadmap for developing soft skills in post-pandemic workforce conditions. In hybrid work environments, the ability of employees to collaborate, communicate effectively within teams, and demonstrate leadership is becoming increasingly important. This study develops a sector-specific scale for measuring remote work and virtual collaboration skills, thereby contributing to the IS literature (Tramontano et al., 2021).

Negotiation skills, in particular, are among the most critical skills for IT professionals. Including subdimensions like conflict resolution in the negotiation skills subscale is highly meaningful, considering the importance of these skills. This approach ensures that IT professionals are equipped not only with technical skills but also with the ability to manage complex interpersonal relationships and resolve conflicts within teams. The strong emphasis on negotiation skills on this scale provides an important resource for evaluating leadership, collaboration, and changing management skills within the sector.

In conclusion, this study fills an important gap in IS literature and introduces a new measurement tool for evaluating sector-specific soft skills. While the literature often focuses on digital competencies and technostress (Molino et al., 2020; Yıldız & Toprak-Yıldız, 2024), this study provides an in-depth examination of decision-making, behavioral skills, management, and negotiation skills, making a significant contribution to the development of professionals in the IT sector.

The findings are discussed in relation to prior literature, highlighting both convergences and divergences. The study's main limitation is the homogeneous student sample, which restricts generalizability. Future research should validate the scale with broader and professional populations.

Acknowledgements

This study was supported by the Research Fund of the Izmir Democracy University. Project Number: HIZDEP-İİBF/2203.

References

Aasheim, C., Shropshire, J., Li, L., & Kadlec, C. (2012). Knowledge and skill requirements for entry-level IT workers: A longitudinal study. *Journal of Information Systems Education, 23*(2), 193–204. https://aisel.aisnet.org/jise/vol23/iss2/8/

Ahmed, F., Capretz, L. F., & Campbell, P. (2012). Evaluating the demand for soft skills in software development. *IT Professional, 14*(1), 44-49.

Albandea, I., & Giret, J. F. (2018). The effect of soft skills on French post-secondary graduates' earnings. *International Journal of Manpower, 39*(6), 782-799.

Alshare, K. A., Lane, P. L., & Miller, D. (2011). Business communication skills in information systems (IS) curricula: Perspectives of IS educators and students. *Journal of Education for Business, 86*(3), 186-194.

Andreas, S. (2018). Effects of the decline in social capital on college graduates' soft skills. *Industry and Higher Education, 32*(1), 47-56.

Antón-Sancho, Á., Vergara, D., & Fernández-Arias, P. (2021). Self-assessment of soft skills of university teachers from countries with a low level of digital competence. *Electronics, 10*(20), 2532.

Bailey, J., & Mitchell, R. B. (2006). Industry perceptions of the competencies needed by computer programmers: technical, business, and soft skills. *Journal of Computer Information Systems, 47*(2), 28-33.

Bailly, F., & Léné, A. (2012). The personification of the service labour process and the rise of soft skills: A French case study. *Employee Relations, 35*(1), 79-97.

Bak, O., & Boulocher-Passet, V. (2013). Connecting industry and supply chain management education: Exploring challenges faced in a SCM consultancy module. *Supply Chain Management: An International Journal, 18*(4), 468–479.

Bak, O., Jordan, C., & Midgley, J. (2019). The adoption of soft skills in supply chain and understanding their current role in supply chain management skills agenda: A UK perspective. Benchmarking: *An International Journal, 26*(3), 1063-1079.

Batista, M. P., & Romani-Dias, M. (2022). AACSB international accreditation as a catalyst for soft skills in business schools. *Journal of Education for Business, 97*(4), 213-219.

Basol, O., & Çömlekçi, M. (2022). Validity and reliability study of remote work attitude scale. *Journal Of Mehmet Akif Ersoy University Economics and Administrative Sciences Faculty*, *9*(1), 243–261. https://doi.org/10.30798/makuiibf.862439

Benligiray, S., Güngör, A., & Akbas, I. (2024). Measuring remote working skills: Scale development and validation study. *PLOS One*, *19*(4). https://doi.org/10.1371/journal.pone.0299074

Buchynska, T., & Schlichter, B. R. (2019). *Soft Skills in Co-Sourcing of Information System Development Services*. MCIS 2019, 14. https://aisel.aisnet.org/mcis2019/14/

Cacciolatti, L., Lee, S. H., & Molinero, C. M. (2017). Clashing institutional interests in skills between government and industry: An analysis of demand for technical and soft skills of graduates in the UK. *Technological Forecasting and Social Change, 119*, 139-153.

Caeiro-Rodríguez, M., Manso-Vázquez, M., Mikic-Fonte, F. A., Llamas-Nistal, M., Fernández-Iglesias, M. J., Tsalapatas, H., ... & Sørensen, L. T. (2021). Teaching soft skills in engineering education: An European perspective. *IEEE Access, 9,* 29222-29242.

Caggiano, V., Schleutker, K., Petrone, L., & Gonzalez-Bernal, J. (2020). Towards identifying the soft skills needed in curricula: Finnish and Italian students' self-evaluations indicate differences between groups. *Sustainability, 12*(10), 4031.

Carvalho, C., & Almeida, A. C. (2022). The adequacy of accounting education in the development of transversal skills needed to meet market demands. *Sustainability, 14*(10), 5755.

Castro, M., Barcaui, A., Bahli, B., & Figueiredo, R. (2022). Do the Project Manager's Soft Skills Matter? Impacts of the Project Manager's Emotional Intelligence, Trustworthiness, and Job Satisfaction on Project Success. *Administrative Sciences, 12*(4), 141.

Charalampous, M., Grant, C., & Tramontano, C. (2023). Getting the measure of remote e-working: A revision and further validation of the E-work life scale. *Employee Relations*. https://doi.org/10.1108/ER-11-2021-0483

Chen, X., & Hung, W.-H. (2022, October 17). Understanding work behaviors in remote work environments during the COVID-19 pandemic: Transaction cost theory perspective. *ICEB 2022 Proceedings (Bangkok, Thailand)*. https://aisel.aisnet.org/iceb2022/53

Cuesta, M. B., & Budría, S. (2017). Unemployment persistence: How important are non cognitive skills? *Journal of Behavioral and Experimental Economics, 69*, 29-37.

Debowski, N., Tavanapour, N., & Bittner, E. A. (2022). Conversational agents in creative work–a systematic literature review and research agenda for remote design thinking. *Proceedings of the Pacific Asia Conference on Information Systems*.

Deming, D. J. (2017). The growing importance of social skills in the labor market. *The Quarterly Journal of Economics, 132*(4), 1593-1640.

Derwik, P., & Hellström, D. (2017). Competence in supply chain management: a systematic review. *Supply Chain Management: An International Journal, 22*(2), 200-218.

Dogara, G., Saud, M. S. B., & Kamin, Y. B. (2020). Work-based learning conceptual framework for effective incorporation of soft skills among students of vocational and technical institutions. *IEEE Access, 8*, 211642-211652.

Dubey, R., & Gunasekaran, A. (2015). Shortage of sustainable supply chain talent: an industrial training framework. *Industrial and Commercial Training, 47*(2), 86-94.

Dunaway, M. M. (2013). IS learning: The impact of gender and team emotional intelligence. *Journal of Information Systems Education, 24*(3), 189–202. https://aisel.aisnet.org/jise/vol24/iss3/4/

Farner, S. M., & Brown, E. E. (2008). College students and the work world. *Journal of Employment Counseling, 45*(3), 108-114.

Grant, C., Wallace, L., Spurgeon, P., Tramontano, C., & Charalampous, M. (2019). Construction and initial validation of the E-Work Life Scale to measure remote e-working. *Employee Relations*, *41*(1), 16–33. https://doi.org/10.1108/ER-09-2017-0229

Green, F. (2004). Why has work effort become more intense? *Industrial Relations: A Journal of Economy and Society, 43*(4), 709-741.

Gruzdev, M. V., Kuznetsova, I. V., Tarkhanova, I. Y., & Kazakova, E. I. (2018). University graduates' soft skills: The employers' opinion. *European Journal of Contemporary Education, 7*(4), 690- 698.

Hafermalz, E., & Riemer, K. (2016, June 15). The Work of Belonging Through Technology in Remote Work: A Case Study in Tele-Nursing. *Research Papers*. https://aisel.aisnet.org/ecis2016_rp/106

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate Data Analysis* (8 ed.). Cengage Learning.

Hefley, W. E., & Bottion, M. (2021). Skills of junior project management professionals and project success achieved by them. *International Journal of Information Systems and Project Management, 9*(1), 56–75. https://aisel.aisnet.org/ijispm/vol9/iss1/4/

Ito, H., & Kawazoe, N. (2015). Active learning for creating innovators: Employability skills beyond industrial needs. *International Journal of Higher Education, 4*(2), 81-91.

Johnson, R. (2001, December 31). Toward a Deeper Understanding of Alternative Work Arrangements: The Impact of Core Self-Evaluations on Remote Work. *AMCIS 2001 Proceedings*. https://aisel.aisnet.org/amcis2001/364

Jordan, C., & Bak, O. (2016). The growing scale and scope of the supply chain: A reflection on supply chain graduate skills. *Supply Chain Management: An International Journal, 21*(5), 610–626. https://www.emerald.com/insight/content/doi/10.1108/SCM-02-2016-0059/full/html

Joseph, D., Ang, S., Chang, R. H., & Slaughter, S. A. (2010). Practical intelligence in IT: Assessing soft skills of IT professionals. *Communications of the ACM, 53*(2), 149-154.

Knoke, D. (2005). Structural equation models. In K. Kempf-Leonard (Ed.), *Encyclopedia of social measurement* (pp. 689–695). New York: Elsevier

Kovács, G., Tatham, P., & Larson, P. D. (2012). What skills are needed to be a humanitarian logistician?. *Journal of Business Logistics, 33*(3), 245-258.

Lutz, H., & Birou, L. (2013). Logistics education: A look at the current state of the art and science. *Supply Chain Management: An International Journal, 18*(4), 455–467. https://www.emerald.com/insight/content/doi/10.1108/SCM-08-2012-0269/full/html

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly*, 293–334.

Mirbabaie, M., Marx, J., Braun, L.-M., & Stieglitz, S. (2020, January 1). Digital Detox – Mitigating Digital Overuse in Times of Remote Work and Social Isolation. *ACIS 2020 Proceedings*. https://aisel.aisnet.org/acis2020/87

Molino, M., Ingusci, E., Signore, F., Manuti, A., Giancaspro, M., Russo, V., Zito, M., & Cortese, C. (2020). Wellbeing Costs of Technology Use during Covid-19 Remote Working: An Investigation Using the Italian Translation of the Technostress Creators Scale. *Sustainability*, *12*(15). https://doi.org/10.3390/su12155911

Murphy, P. R., & Poist, R. F. (1991). Skill requirements of senior-level logisticians: practitioner perspectives. *International Journal of Physical Distribution & Logistics Management, 21*(3), 3- 14.

Sarkar, P., Posen, A., & Etemad, A. (2023). *AVCAffe: A Large Scale Audio-Visual Dataset of Cognitive Load and Affect for Remote Work* (B. Williams, Y. Chen, & J. Neville, Eds.; WOS:001243759700009; pp. 76–85).

Schuh, G., Herkenrath, C., Boos, W., Hoeborn, G., & Boenig, J. (2024, January 3). How to establish a lasting remote work concept in organizations: A classification for the operational design of remote work. *Hawaii International Conference on System Sciences 2024 (HICSS-57)*. https://aisel.aisnet.org/hicss-57/cl/distributed_collaboration/4

Tramontano, C., Grant, C., & Clarke, C. (2021). Development and validation of the e-Work Self-Efficacy Scale to assess digital competencies in remote working. *Computers in Human Behavior Reports*, *4*. https://doi.org/10.1016/j.chbr.2021.100129

Turner, R., & Lowry, G. (2002). *Towards a profession of information systems and technology: The relative importance of "Hard" and "Soft" skills for IT practitioners*. In: 2002 Information Resources Management Association International Conference, 19 May 2002-22 May 2002, Seattle, Washington, USA.

Van Yperen Hagedoorn, J. M., Smit, R., Versteeg, P., & Ravesteyn, P. (2021). *Soft skills of the chief information security officer*. BLED 2021 Proceedings, 31.

Virtaneva, M., Feshchenko, P., Hossain, A., Kariluoto, A., Himmanen, J., Kaitila, P., Kultanen, J., Kemell, K.-K., & Abrahamsson, P. (2021, June 17). COVID-19 Remote Work: Body Stress, Self-Efficacy, Teamwork, and Perceived Productivity of Knowledge Workers. *12th Scandinavian Conference on Information Systems*. https://aisel.aisnet.org/scis2021/8

Yadin, A., & Rashkovits, R. (2009). *New Perspective On Developing Technical And Soft Skills For IS Graduates–The Case Of System Analysis And Design Workshop*. MCIS 2009 Proceedings, 5. https://aisel.aisnet.org/mcis2009/5/

Yildiz, O., & Toprak-Yildiz, T. E. (2024, October 3). Acceptance of Remote Working Culture: Developing A Conceptual Model. *MCIS 2024 Proceedings*. https://aisel.aisnet.org/mcis2024/24

Zaffar, M. A., & Winter, S. J. (2008). *Minding the IS soft skills gap: Evidence of discourse convergence and organizational field structure*. ICIS 2008 Proceedings, 69. https://aisel.aisnet.org/icis2008/69/

Zaza, S., & Erskine, M. (2024). Thriving with Remote Work During a Crisis: Effects of a Mandatory Technology-mediated Work Environment on Job Outcomes. *AIS Transactions on Human-Computer Interaction*, *16*(1), 110–138. https://doi.org/10.17705/1thci.00202

Zuo, J., Zhao, X., Nguyen, Q. B. M., Ma, T., & Gao, S. (2018). Soft skills of construction project management professionals and project success factors: A structural equation model. Engineering, Construction and Architectural Management, 25(3), 425-442.