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THE PERCEPTION OF SUSTAINABILITY COMPETENCES IN LOGISTICS AND SUPPLY CHAINS

ПЕРЦЕПЦИЈА ОДРЖИВОСТИ КОМПЕТЕНЦИЈА У ЛОГИСТИЦИ И ЛАНЦИМА СНАБДЕВАЊА

Summery: *The European Union (EU) has adopted a huge number of guidelines and policies to promote sustainability in different sectors. The study focuses on the twin green and digital transformation, which is particularly highlighted in the context of the European Green Deal, a comprehensive strategy to tackle climate change and environmental degradation while embracing digital innovation for economic growth and societal progress. These guidelines and policies show the EU's commitment to promoting sustainability in different sectors and to achieving the objectives of climate change, environmental protection and sustainable development. One of the areas that plays an important role for the individuals as well as for the economy is logistics and supply chain management. The main research question of this study is to investigate the relationship between the basic sociodemographic characteristics and their perception of the importance of sustainability competences in logistics and supply chains in the future. The study was carried using survey questionnaire on employees in the field of logistics and supply chains in Slovenia. The results show the main statistically significant differences in these perceptions are primary based on differences in employees demographic characteristics, such as gender, age and level of education of the employees.*
Keywords: *Sustainable competences, Sustainability, Environmental impact, Corporate social responsibility*
JEL Classification: *Q56, M14, L91, D23*

Резиме: Европска унија (ЕУ) усвојила је низ смерница и политика за промовисање одрживости у различитим секторима. Студија се фокусира на двоструку зелену и дигиталну трансформацију, која је посебно наглашена у контексту Европског зеленог договора, свеобухватне стратегије за борбу против климатских промена и деградације животне средине уз истовремено прихватање дигиталних иновација за економски раст и напредак друштва. Ове смернице и политике показују посвећеност ЕУ промовисању одрживости у различитим секторима и постизању циљева климатских промена, заштите животне средине и одрживог развоја. Једна од области која игра важну улогу како за појединце, тако и за привреду је логистика и управљање ланцем снабдевања. Главно истраживачко питање ове студије је да се истражи однос између основних социодемографских карактеристика и њихове перцепције значаја компетенција одрживости у логистици и ланцима снабдевања у будућности. Студија је спроведена коришћењем анкетног упитника о запосленима у области логистике и ланаца снабдевања у Словенији. Резултати показују да су главне статистички значајне разлике у овим перцепцијама примарно засноване на разликама у демографским карактеристикама запослених, као што су пол, старост и степен образовања запослених.
Кључне ријечи: одрживе компетенције, одрживост, утицај на животну средину, корпоративна друштвена одговорност
ЈЕЛ класификација: *Q56, M14, L91, D23*

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INTRODUCTION

Europe has to become the world's first climate-neutral continent under the EU's climate law. As part of this, the European Union wants to prepare all sectors of the economy for the challenge, starting by reducing emissions by at least 55% by the end of this decade. The "Fit for 55" legislation puts the European Union on track to meet its climate targets by 2030. In doing so, Europe aims to shape the green transition for the benefit of citizens and industry (European Commission 2023).

The European Union has also developed The European sustainability competence framework. The development of a European sustainability competence framework is one of the policy actions set out in the European Green Deal as a catalyst to promote learning for environmental sustainability in the European Union. GreenComp defines a set of sustainability competences to be used in educational programmes to help learners develop knowledge, skills and attitudes that promote ways of thinking, planning and acting with empathy, responsibility and care for our planet and public health (Joint Research Centre 2022a).

In the context of the EU directives, it is important to mention the green and digital transition in the field of logistics and supply chain management, with the help of technology such as digital twins, virtual equivalents of the real world, which can, among other things, model traffic in order to optimise traffic flows, reduce congestion and, at the same time, reduce emissions. To make the most of the transition, it will require proactive and integrative management. It will require the cooperation of business, government and civil society (Joint Research Centre 2022b).

To cross these bridges between the sustainable and the digital, it is important having the right skills to do so. Competencies are a combination of elements such as knowledge, skills, abilities, capabilities and resources. In supply chain management (SCM), competence is a key factor for achieving superior performance and competitiveness. Research has shown that supply chain competencies lead to improved performance both operationally and financially (Derwik and Hellström 2017).

The purpose of this research is to identify the perception of employees in Slovenian companies operating in the field of logistics and supply chain management regarding the importance of sustainability competences in the future. The main research question addressed in this study is: Are there statistically significant differences in the perception of the importance of sustainable competences in the future regarding to the socio-demographic characteristics of employees in logistics and supply chain management?

1. THEORETICAL FRAMEWORK

1.1 Sustainable competences

Sustainability means different things to different people at different times. Often, sustainability and sustainable development are used interchangeably, despite their conceptual differences. Sustainability can be described as a long-term goal, such as achieving a more sustainable world, while sustainable development, as the word suggests, refers to the many processes and pathways used to promote development or achieve progress in a sustainable way.

Sustainability means prioritising the needs of all life forms and the planet by ensuring that human activities do not exceed planetary boundaries.

Sustainability competence is about enabling learners to embody sustainable values and to consider complex systems in order to take or demand action that restores and maintains ecosystem health and enhances equity, and to create visions for a sustainable future (Joint Research Centre 2022a),

The key competences for sustainable development identified by UNESCO are: systems thinking, foresight, normative and strategic competence, collaboration, critical thinking, self-awareness and integrated problem-solving (Norren and Beehner 2021).

The United Nations has defined sustainability competences in three groups: core values, core competences and managerial competences. Core values include: integrity, professionalism, respect for diversity. Core competences include: communication, teamwork, planning and organising, accountability, creativity, customer orientation, commitment to continuous learning, technological

awareness. Managerial competences include: leadership, vision, empowering others, building trust, performance management, judgement/decision making (United Nations 2010).

The European Union defined sustainability competences are divided into four groups, which are: embodying sustainability values, embracing complexity in sustainability, envisioning a sustainable future in acting for sustainability. Embodying the values of sustainability includes the competences: valuing sustainability, supporting fairness and promoting nature. Embracing integrity in sustainability includes the competences: systems thinking, critical thinking and problem framing. Envisaging sustainable futures includes the competences: future literacy, adaptability and exploratory thinking. The acting for sustainability competences are: political agency, collective action and individual initiative (Joint Research Centre 2022a).

1.2 Sustainable competences in logistics and supply chain management

Supply chain management and logistics activities have a number of positive impacts on society in terms of mobility and accessibility, infrastructure, employment, etc. On the other hand, they have a negative impact on the environment, as they depend on fossil fuels and non-renewable natural resources, which have a negative impact on the health and safety of the population, causing air pollution, congestion, accidents, etc. (Abbasi and Nilsson, 2016).

Due to the high impact of supply chain management and logistics on environmental standards, the focus is on improving the performance of supply chain management and logistics in relation to environmental impact. Sustainable competitive advantage is based on a combination of efficient and effective logistics operations and well-functioning, customised and in-company developed information systems (Sandberg and Abrahamsson 2011).

In the field of logistics and supply chain management, the most frequently identified sustainability competences are: systems thinking competence; communication skills; cross-functional team working, stakeholder management – communication, supplier relationship management – communication, functional-oriented competences, source-to-contract, demand management – category strategy, demand management – tender analysis; supplier relationship management – application of tools, sustainability and compliance, basic individual knowledge on this field, basic sustainability knowledge; commitment to change; self-reflection (Schulze et al. 2018).

1.3 Socio-demographic characteristics and sustainable behaviour

There are many studies on sustainable behaviour that have examined socio-demographic characteristics to profile sustainable consumers by gender, age and education level.

More than 30 years ago, studies did not show statistical correlations between sustainable consumers and gender. However, new studies on gender show that women are more likely than men to be environmentally conscious (Park et al. 2011; Mohr and Schlich 2015; Panzone et al. 2016; Santos et al. 2022).

In terms of age, most studies show that young or middle-aged people are more socially responsible consumers, but the results are mixed. Some results have shown a significant and positive correlation between age and green sensitivity and behaviour, while others have shown a significant and negative correlation - green consumers are older than average (Park et al., 2011). Mohr and Schlich (2015) found that middle-aged consumers are more likely to adopt sustainable food purchasing patterns. A study by Panzone et al. (2016) shows that younger consumers are more concerned about the environment, but older consumers have higher scores for green consumer behaviour.

With regard to education, research shows that education is related to sustainable consumer attitudes and behaviour. There is a positive relationship between education and sustainable consumer behaviour (Park et al. 2011). Alborzi et al. (2017) studied sustainable behaviour in terms of washing clothes in households and found that households with lower levels of education show more unsustainable behaviour than the group of households with university education. Similarly, in a food study, consumers with higher levels of education were more likely to adopt sustainable consumption behaviours (Mohr and Schlich 2015). That university education predicts greater environmental concern, while postgraduate education is negatively associated with preferences for sustainability from a food perspective, is also shown in a study by Panzone et al. (2016).

In the view of previous studies related to socio-demographic data and our survey, the following hypotheses in this study are set:

H1: There are statistically significant differences in the perception of the importance of sustainable competences in logistics and supply chain management in the future, depending on the gender of the respondents.
H2: The perception of the importance of sustainable competences in logistics and supply chain management in the future varies according to the age group of the respondents.
H3: The perception of the importance of sustainable competences in logistics and supply chain management in the future varies according to the level of education of the respondents.
H4: There are statistically significant differences in the perception of the importance of sustainable competences in logistics and supply chain management in the future, depending on whether or not respondents have a formal education in logistics and supply chain management.
H5: The perception of the importance of sustainable competences in logistics and supply chain management in the future does not differ according to the size of the company where the respondents are employed.
H6: The perception of the importance of sustainable competences in logistics and supply chain management in the future varies according to the sector in which the respondents' company operates.

2. METHODS

In the research, the perception of the employees working in companies operating in logistics and supply chains in Slovenia on the importance of sustainability competences in logistics and supply chains in the future was investigated.

A survey questionnaire was developed. The first part included socio-demographic data such as: gender, age, level of education, logistics and supply chain education, size of the company, sector the company is part of. The second part of the questionnaire consisted of 22 listed sustainability competences from the field of logistics and supply chains, which respondents rated on a Likert scale from 1 (not at all important) to 5 (very important) how important they think the listed competences will be in the future. The sustainability competences listed in the questionnaire were obtained from scientific articles related to sustainability competences in logistics and supply chain management, as well as from the European Union and the United Nations Sustainability Competences Guidelines (Giangrande, 2019; Norren and Beehner, 2021; Vuorikari et al., 2022). The survey questionnaire was sent to employees of companies working in logistics and supply chain management and it was carried out between January and August 2023. A total of 617 respondents completed the survey.

The results of the questionnaire were analysed using the SPSS software platform for advanced statistical analysis. The statistical test of reliability was 0.90, indicating a very high level of consistency between the items on the scale (Table 1). Kolmogorov-Smirnov test of normality show statically significance. However, due to enough size of the sample, in the following parametric t-test for independent samples and ANOVA for independent samples were used to validate the hypotheses.

Table 1 Statistical reliability test - Cronbach's alpha

Cronbach's Alpha	N of Items
0,9	22

Source: Own source

3. RESULTS AND DISCUSSION

In the following lines, results of the survey are presented. Table 2 shows socio-demographic data related to gender, age, educational level, education related to logistics and supply chains, size of the company and the sector to which the organisation works (Table 2).

Of the 617 respondents, the majority were male (53%), followed by female (46%) and 1% identified as other. The average age of respondents was 43.5 years. The youngest respondent was 18 years old and the oldest 65 years old. By age group, the highest number of respondents were aged between 41 and 50 (41%) and the lowest number were aged between 18 and 30 (8%). In terms of highest level of education completed, the highest proportion of respondents had completed vocational secondary education (26%). It can be seen that 70% of them have completed at least secondary education or more. Most respondents have qualifications in logistics, transport and business, economics (57%). The smallest share of respondents (8%) has a qualification in a completely different field. Two thirds of respondents (69%) work in small or medium-sized enterprises. This was also the aim of the research, to cover an equal share of small, medium-sized and large enterprises.

Most of the respondents' companies are in the freight forwarding, transport, logistics services sector (37%). These companies were also the target group of the research. This is followed by respondents from the retail trade, wholesale sector, where there is also a lot of logistics and supply chain management present.

Table 2 Socio-demografic data

Gender	Frequency	Valid Percent (%)
Female	281	45,5
Male	329	53,3
Other	7	1,1
Total	*617*	*100,0*
Age by group	Frequency	Valid Percent (%)
From 18 to 30 years	47	7,7
From 31 to 40 years	175	28,8
From 41 to 50 years	251	41,4
From 51 to 65 years	134	22,1
Total	*607*	*100,0*
Highest completed education	Frequency	Valid Percent (%)
Primary school	4	0,7
Vocational secondary education	162	26,3
Higher education	131	21,2
Technical degree or 1st Bologna degree	116	18,9
Master degree or 2st Bologna degree	102	16,6
Master of Science	88	14,3
PhD	12	2,0
Total	*615*	*100,0*
Educated (regardless of level) in which of the listed fields	Frequency	Valid Percent (%)
Yes; logistics, transport	165	26,7
Yes; business, economics	186	30,2
Yes; other social sciences	64	10,4
Yes; engineering (e.g. mechanical engineering, computer science)	152	24,6
I have no formal education in the above fields	41	6,6
Other	9	1,5
Total	*617*	*100,0*
Number	Frequency	Valid Percent (%)
Micro - 10 employees or less	33	5,4
Small - between 11 and 50 employees	207	33,8
Medium - between 51 and 250 employees	218	35,6
Large - over 250 employees	154	25,2
Total	*612*	*100,0*
The sector in which the organisation works	Frequency	Valid Percent (%)
Education/research	20	3,3
Non-governmental, non-profit organisation	5	0,8
Service activity	71	11,6
Craft activity (e.g. hairdresser, metal worker, electrician, etc.)	28	4,6
Public sector (e.g. municipal administration, ministries, administrative units, etc.)	17	2,8
Freight forwarding, transport, logistics services	225	36,7
Manufacturing	79	12,9
Retail trade, wholesale	168	27,4
Total	*613*	*100,0*

Source: Own source

The first hypothesis was tested using t-test for independent samples (Table 3), comparing female and male gender variables and statistically significant differences between perceptions of sustainable competences in the future.

Table 3 Perception of sustainable competences according to female and male gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t-value	p
Sustainable competences	Female	239	4,3395	0,37501	0,02426	0.224	0.823
	Male	299	4,3322	0,37647	0,02177		

Source: Own source

The first hypothesis was: There are statistically significant differences in the perception of the importance of sustainable competences in logistics and supply chain management in the future, depending on the gender of the respondents. The results show that there are no statistically significant differences between female and male genders in their perception of the importance of sustainable competences in logistics and supply chains in the future.

The second hypothesis was tested by ANOVA test. It was investigated whether there are statistically significant differences in the perception of future sustainable competences in logistics and supply chain management according to age (Table 4).

Table 4 Perception of sustainability competences by age group

Sustainable competences						
	N	Mean	Std. Deviation	Std. Error	F	Sig.
From 18 to 30 years	43	4,2431	0,33999	0,05185	2,594	0,052
From 31 to 40 years	154	4,2919	0,39232	0,03161		
From 41 to 50 years	220	4,3692	0,36322	0,02449		
From 51 to 65 years	119	4,3739	0,37611	0,03448		
Total	*536*	*4,3379*	*0,37459*	*0,01618*		

Source: Own source

The second hypothesis was: The perception of the importance of sustainable competences in logistics and supply chain management in the future varies according to the age group of the respondents.

The results show that there are also no statistically significant differences between the different age groups in their perception of the importance of sustainability competences in logistics and supply chain management in the future.

The third hypothesis relates to statistically significant differences in the perception of future sustainable competences in the field of logistics and supply chain management according to the level of education of the respondents (Table 5).

Table 5 Perception of sustainability competences by education

Sustainable competences						
	N	Mean	Std. Deviation	Std. Error	F	Sig.
Primary school	3	4,6212	0,33505	0,19344	1,898	0,079
Vocational secondary education	139	4,2652	0,38773	0,03289		
Higher education	115	4,3877	0,29169	0,02720		
Technical degree or 1st Bologna degree	107	4,3161	0,43814	0,04236		
Master degree or 2st Bologna degree	86	4,3298	0,42292	0,04560		
Master of Science	81	4,3906	0,26754	0,02973		
Doctor of Science	10	4,4091	0,53182	0,16817		
Total	541	4,3350	0,37536	0,01614		

Source: Own source

The third hypothesis was: The perception of the importance of sustainable competences in logistics and supply chain management in the future varies according to the level of education of the respondents.

The results show that there were no statistically significant differences in the perception of sustainability competences in logistics and supply chain management according to the level of education completed by the respondents.

The fourth hypothesis relates to statistically significant differences in the perception of future sustainability competences in logistics and supply chain management depending on whether or not the respondents have a education in logistics or related fields (Table 6).

Table 6 Perception of sustainability competences by logistics qualification

Sustainable competences							
	N	Mean	Std. Deviation	Std. Error	F	Sig.	Post-hoc
Yes; logistics, transport (1)	145	4,3984	0,30558	0,02538	3,235	0,007	1 > 5
Yes; business, economics (2)	162	4,3499	0,40851	0,03210			
Yes; other social sciences (3)	53	4,2770	0,40570	0,05573			
Yes; engineering (e.g. mechanical engineering, computer science) (4)	137	4,3152	0,38393	0,03280			
I have no formal education in the above fields (5)	37	4,1523	0,34538	0,05678			
Other (6)	9	4,4596	0,28788	0,09596			
Total	543	4,3353	0,37471	0,01608			

Source: Own source

The fourth hypothesis was: There are statistically significant differences in the perception of the importance of sustainable competences in logistics and supply chain management in the future, depending on whether or not respondents have a formal education in logistics and supply chain management.

The results show that there are statistically significant differences between employees with a logistics and transport qualification and those without a formal logistics and supply chain qualification. Employees without a logistics and transport qualification have a lower perception of the future relevance of sustainable competences in logistics and supply chain management.

Hypothesis five tested for statistically significant differences in perceptions of future sustainability competences in logistics and supply chain management according to the size of the respondents' company (Table 7).

Table 7 Perception of sustainability competences by company size

Sustainable competences							
	N	Mean	Std. Deviation	Std. Error	F	Sig.	Post-hoc
Micro - 10 employees or less (1)	29	4,1019	0,32202	0,05980	5,704	0,001	1 < 3
Small - between 11 and 50 employees (2)	183	4,3351	0,33637	0,02487			
Medium - between 51 and 250 employees (3)	187	4,3952	0,36704	0,02684			
Large - over 250 employees (4)	140	4,3107	0,41936	0,03544			
Total	539	4,3371	0,37420	0,01612			

Source: Own source

The fifth hypothesis was: The perception of the importance of sustainable competences in logistics and supply chain management in the future does not differ according to the size of the company where the respondents are employed.

The results show that there are statistically significant differences between respondents employed in micro-sized companies compared to respondents employed in medium-sized companies. On average, respondents employed in micro companies rated the importance of sustainable competences in the field of logistics and supply chain management in the future lower (4.1) than respondents employed in medium-sized companies (4.4).

For the sixth hypothesis, we verified statistically significant differences in the perception of sustainability competences in logistics and supply chain management according to the sector in which the company operates (Table 8).

Table 8 Perception of sustainability competences by organizational sector

Sustainable competences						
	N	Mean	Std. Deviation	Std. Error	F	Sig.
Education/research	15	4,2848	0,57968	0,14967	0,878	0,523
Non-governmental, non-profit organisation	5	4,2727	0,20072	0,08977		
Service activity	61	4,3942	0,36728	0,04703		
Craft activity (e.g. hairdresser, metal worker, electrician, etc.)	24	4,2746	0,32846	0,06705		
Public sector (e.g. municipal administration, ministries, administrative units, etc.)	13	4,3986	0,46988	0,13032		
Freight forwarding, transport, logistics services	200	4,3634	0,32256	0,02281		
Manufacturing	73	4,3325	0,36895	0,04318		
Retail trade, wholesale	149	4,2904	0,42301	0,03465		

Source: Own source

The sixth hypothesis was: The perception of the importance of sustainable competences in logistics and supply chain management in the future varies according to the sector in which the respondents' company operates.

There were no statistically significant differences in the perception of future sustainability competences in the field of logistics and supply chain management according to the sector in which the company operates.

5. CONCLUSIONS

The results of the survey show that the perception of respondents in the field of logistics and supply chain management regarding sustainability competences is at a high level. On average, the rating of sustainability competences in terms of importance in five years' perspective is 4.3.

From our socio-demographic characteristics, we found that there are statistically significant differences in the perception of future sustainability competences in logistics and supply chain management depending on whether or not employees have a degree in logistics or supply chain management. It can therefore be concluded that education on relevant issues is key to the development of a better future.

There are also statistically significant differences in perceptions of future sustainability competences according to company size. Employees in micro enterprises rate the importance of future sustainability competences in logistics and supply chain management lower than those in medium-sized enterprises. It can be concluded that smaller companies are not as focused on sustainability because they do not have the resources to pay attention to it (time, money, human resources, knowledge, etc.).

This study analysed perceptions of sustainability competence according to socio-demographic characteristics. In future research, it would be useful to investigate other characteristics such as the lifestyle and attitudes of individuals and their perceptions of sustainability competences in the field of logistics and supply chain management.

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