Systemy Logistyczne Wojsk
Zeszyt 59 (2023)
ISSN 1508-5430, s. 151-168
DOI: 10.37055/slw/186387

Instytut Logistyki
Wydział Bezpieczeństwa, Logistyki i Zarządzania
Wojskowa Akademia Techniczna
w Warszawie

Military Logistics Systems
Volume 59 (2023)
ISSN 1508-5430, pp. 151-168
DOI: 10.37055/slw/186387

Institute of Logistics
Faculty of Security, Logistics and Management
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in Warsaw

The importance of green human capital in green logistic processes in Polish enterprises

Znaczenie zielonego kapitału ludzkiego w procesach Green Logistics w polskich przedsiębiorstwach

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Abstract. Due to the high market dynamics, economic and environmental, constantly growing and changing customer needs, each organization is looking for new solutions related to the technology of goods flow, process optimization, aimed at both improving the quality of products and improving their production processes towards reducing their impact on the natural environment. In this context, Green Human Resources (GHR) may become a key factor in the success of greenlogistics (GL), because the success of the company depends in particular on the actions of employees, their knowledge, skills and their use and awareness. Therefore, the goalof the research was to check how the method of managing green human capital influences changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes (including in terms of GL). As research shows, companies use GHR to promote behaviors among employees that increase the ecological efficiency of the entire company, but their share is still negligible. The study was conducted using an electronic survey questionnaire on a group of 200 enterprises. The conducted research showed the relationship between the importance of individual elements of human capital in enterprise strategies and changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes. The following components had the greatest impact on the studied effects: human capital: knowledge, personal and social skills, interpersonal relations and psychological characteristics of employees.
Keywords: Human capital, green logistic, intellectual capital, management, green human capital

Abstrakt. Ze względu na dużą dynamikę rynku, uwarunkowania polityczne, ekonomiczne i środowiskowe, ciągle rosnące i zmieniające się potrzeby klientów, każda organizacja poszukuje nowych rozwiązań mających poprawić ich funkcjonowanie zarówno w obszarze wewnętrznym - organizacyjnym oraz technicznym, jak i w obszarze zewnętrznym - czyli postrzegania jej przez klientów i partnerów. Na rynku ciągle pojawiają się nowe rozwiązania związane z technologią przepływu towarów, optymalizacją procesów, mające na celu zarówno poprawę jakości produktów jak i poprawę procesów ich wytarzania w kierunku ograniczenia ich wpływu na środowisko naturalne. W tym kontekście Green Human Resources (GHR) może stać się kluczowym czynnikiem sukcesu zielonej logistyki (GL), gdyż to w szczególności od działań pracowników, ich wiedzy, umiejętności i ich wykorzystania oraz świadomości zależy sukces przedsiębiorstwa. Dlatego za cel badań przyjęto sprawdzenie, jak zarządzanie zielonym kapitałem ludzkim wpływa na zmiany funkcjonowania przedsiębiorstw w wybranych obszarach związanych z przebiegiem i jakością procesów logistycznych (w tym w ujęciu GL). Jak pokazują badania, przedsiębiorstwa wykorzystują GHR, do promowania wśród pracowników zachowań zwiększających efektywność ekologiczną całej firmy, jednak ich udział nadal jest znikomy. Badanie przeprowadzono z wykorzystaniem kwestionariusza ankietowego w formie elektronicznej na grupie 200 przedsiębiorstw. Przeprowadzone badania wykazały zależności pomiędzy znaczeniem poszczególnych elementów kapitału ludzkiego w strategiach przedsiębiorstwa a zmianami funkcjonowania przedsiębiorstw w wybranych obszarach związanych z przebiegiem i jakością procesów logistycznych. Największy wpływ na badane efekty miały następujące elementy składowe: kapitału ludzkiego: wiedza, umiejętności osobiste i społeczne, relacje międzyludzkie oraz cechy psychologiczne pracowników.
Słowa kluczowe: kapitał ludzki, zielona logistyka, kapitał intelektualny, zarządzanie, zielony kapitał ludzki

Introduction

The ways of conducting business by modern logistics or production companies are constantly modified, the pace of which depends on the nature of changes in the environment and the ability of companies to respond to market challenges. Traditional management, based on material resources, turns out to be insufficient in these realities, and it becomes necessary to develop and use intangible resources more and more intensively.(Purnamawatiet al., 2022, p. 149).Only skillful, synergistic (Nagano, 2020, pp. 98-111)the combination of these two types of resources may allow enterprises to build lasting market advantages (Yusoffet al., 2019, pp. 626-637)in line with the market requirements in the field of environmental protection, which are crucial for the survival of enterprises (Barney et al., 2010, pp. 1464-1479).Combining the resources owned by the company in an effective way, allowing for the use of their full potential, requires employees with an appropriate configuration of skills, knowledge, experience and personality traits. Both research and practice provide a number of evidence that human capital (HC) is a key resource whose individual and collective knowledge is essential for the survival of enterprises in today's rapidly changing environment(Masri, Jaaron, 2017, pp. 474-489). As the research results show, HC significantly improves the results in logistics processes(Liu et al., 2022, p. 17)being the primary resource for creating their value. It is widely recognized as a strategic resource necessary for - required on the modern market - quick modification of the methods of logistics operations used, ensuring the ability of enterprises to survive on a highly turbulent market(Subramanian, van de Vrande, 2019, pp. 517-535).Investments in the development of HC are investments in the future

economic value of the enterprise(da Silva et al., 2019, pp. 102-122). The analysis of the literature shows that the construction of human capital in logistics processes is complex. Different authors indicate the existence of different components. They are among the most frequently mentioned:

- knowledge(Yong, et al., 2019, pp. 364-374),
- personal skills and social skills, interpersonal relations (Beneveneet al., 2021),
- health(Torres et al., 2018, pp. 453-472),
- competencies(Martinidiset al., 2021, pp. 14036),
- experience(Shoaib et al., 2021),
- motivation level(Barrena-Martinez et al., 2019, pp. 71-81),
- engagement(Sheikh, 2022, pp. 1199-1220),
- oral and biological depreciation (Abeysekera, Guthrie, 2004, pp. 251-268),
- innovation, creativity(Song et al., 2021, p. 128520),
- psychological characteristics (Barrena-Martinez et al., 2019, pp. 71-81) .

It should be emphasized that the research and concepts presented in the literature indicate that an important strategic option for enterprises - in the context of innovation and sustainable development (SD) - is the development of dynamic opportunities, including those based on HR - the so-called green human capital (GHC) (Zaid et al., 2018, pp. 965-979).GHC enables enterprises to develop dynamic environmental capabilities to implement green and sustainable organizational practices(Agyabeng-Mensah, Tang, 2021, pp. 1377-1398). The existence of a GHC in the enterprise increases opportunities within the framework of sustainable development, such as improving Green Supply Chain Management (GSCM) practices(Jabbour et al., 2019),green production (GP) and green logistics (GL)(Marrucciet al., 2021, pp. 128859). Due to the fact that logistics processes significantly affect energy emissions and consumption(Vienažindienėet al., 2021, pp. 7500), more and more often, from the point of view of both building the market image of enterprises and adapting to more and more rigorous legal regulations, actions that successively reduce the negative impact of enterprises on the natural environment are gaining in importance. GL is based on developing environmental awareness and leads to a deeper analysis of the actions taken by enterprises and environmental consequences (Fortes, 2009). The primary objective of GL is to manage all operations in such a way that it is possible to achieve a balance between economic, environmental and social considerations (El-Berishyet al., 2013, pp. 527-531). GL is one of the elements of the overall strategy of enterprises related to their taking responsibility for the natural environment and social issues(Karaman et al., 2020, p. 120718). As a consequence, it leads to distinguishing these enterprises from the competition, creating opportunities to enter new markets and acquire new customers. GL covers such elements as reducing the negative impact of the distribution methods used on the environment and reducing energy consumption during logistics operations and waste processing (Zhang et al.,

2021, p. 102509).As the research results indicate, GHC has a significant impact on financial results, but it does not have a significant impact on social results and green competitiveness. GL mediates the relationship between GHC and green competitiveness and social performance. Therefore, green human capital affects the effective implementation of green logistics practices, which results in building stronger green competitiveness and better social and financial results (Agyabeng-Mensah, Tang, 2021, pp. 1377-1398).In addition, it has been observed that combining GL and GHC leads to a positive impact on the SD of enterprises(Cheng et al., 2023). As the research results show, GHC significantly improves the results in logistics processes (Liu et al. 2018, pp. 794-817) being the primary resource for creating their value (Ployhartet et al., 2013, pp. 371-398). The existence of a GHC in an enterprise increases opportunities for sustainable development, such as streamlining green supply chain management practices (GSCM), green production (GP) and green logistics (GL) (Chiappetta Jabbouret al., 2019, pp. 793-801). GL is based on developing environmental awareness and leads to a deeper analysis of the actions taken by enterprises and environmental consequences (Fortes, 2009). A review of the literature allows us to conclude that the correlation between GHC and GL has not been thoroughly investigated and the areas have not yet been fully integrated (Lengnick-Hall et al., 2013, pp. 366-377). Therefore, research integrating these two is important from the point of view of establishing links between them (Zaid et al., 2018, pp. 965-979), as well as their impact on environmental, social and economic aspects in terms of sustainable development (Bag et al., 2021, pp. 125233).

Therefore, the main purpose of the work was to determine howgreen human capital management affects changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes (including in terms of GL). Data from 200 enterprises located in the southern part of Poland (mainly the Śląskie and Małopolskie voivodships) were obtained for the analysis. To achieve the goal, statistical data analysis was used, which made it possible to identify potential correlations between the importance of individual elements of human capital (HR) in the company's strategies and selected elements of logistics processes (including GL) and to identify potential correlations between the effects within selected elements of logistics processes (including GL).

Research methodology

The study was conducted using a survey questionnaire in electronic form on a group of 200 enterprises that agreed to participate in the study after initial contact. The research sheet consisted of 30 questions divided into three sections corresponding to the components of intellectual capital: human capital (HC), structural capital (SC) and relational capital (RC). The list of elements subjected to the study

was established on the basis of an in-depth literature review allowing to determine the basic factors crucial from the point of view of effective creation, development and use of individual IC components. The importance of individual elements in enterprise strategies was determined by representatives of the management staff using the Likert scale (1 - low importance, ..., 5 - a factor of key importance).

Only results related to HC are presented in this article. In this area, the importance of the following elements was examined:

- (HC1) knowledge,
- (HC2) personal and social skills, interpersonal relations,
- (HC3) health,
- (HC4) competences,
- (HC5) experience,
- (HC6) level of motivation,
- (HC7) commitment, values,
- (HC8) moral and biological depreciation,
- (HC9) innovation, creativity,
- (HC10) psychologicalfeatures.

The study covered the area of the southern part of Poland (mainly Śląskie and Małopolskie voivodships). Research facilities were selected in a purposeful way - enterprises had to have a knowledge management system included in the strategy, implemented and consolidated.

The basic quantitative characteristics of the tested sample are presented in Table 1.

In addition, representatives of the management staff in the survey determined to determine how green human capital management affects changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes (including in terms of GL):

P1. Increasing the speed of information processing.
P2. Improving the security of confidential information.
P3. Reducing the amount of materials in warehouses (inventory levels).
P4. Increasing the number of deliveries/services.
P5. Reducing the number of errors in logistics processes.

Table 1. Characteristics of the research sample

Divisioncriterion	Category	Number of enterprises	Percentage
Size	Small	50	25%
	Medium	90	45%
	Big	60	30%
Type	Service	80	40%
	Production	120	60%
Period of existence	Up to 5 years	47	31%
	5 – 10 years	62	23,5%
	Over 10 years	91	45,5%
Area of operation	International	40	42%
	National	84	20%
	Regional	76	38%

Source: Own study

The tested elements significantly affect the sustainable development of the company, supporting the integration of solutions related to GL. Reducing the number of errors in logistics processes and limiting the amount of materials in warehouses contributes to, for example, reducing energy consumption, reducing fuel consumption or eliminating waste. Increasing the number of deliveries may contribute to their greater optimization in terms of both cargo content and transport routes. Increasing the speed of processing and information security reduces the number of operations and the load on IT systems.

The assessment was carried out again using the Likert scale (1 - minor/insignificant changes, ..., 5 - major/significant changes of a strategic nature). The article - taking into account the thematic scope presented in it - contains 5 elements from this group:

The research was carried out in accordance with the following research plan:

1. Analysis of scientific literature in order to determine the current state of knowledge, synthesis of knowledge and - on this basis - defining the existing knowledge gap.
2. Development and testing of a research tool in the form of a survey questionnaire. The test study was conducted on a group of 30 companies and allowed for the clarification of the content of the questionnaire so that it was fully understandable and ensured the possibility of correct interpretation by the respondents.
3. Conducting surveys in the period from May to December 2022. The questionnaires were made available to the respondents in electronic form using Microsoft tools and cloud.
4. Data analysis using statistical methods. The obtained survey results were analyzed using the Cronbach's alpha test in order to determine the credibility

of the research tool used. The analysis carried out allowed to confirm the credibility of the survey - the value of the test was at the level of 0.85.

5. Interpretation of research results and development of final conclusions referring to existing scientific research.

As part of the analysis of the results, additional division criteria were used based on:

- type of activity (manufacturing, service),
- company size (small, medium, large),
- period of operation (up to 5 years, 5 - 10 years, over 10 years),
- area of operation (international, national, regional).

The analysis of the results was carried out according to the following plan:

1. Analysis of data related to the importance of components of human capital in the strategy of enterprises. Mean values were examined, taking into account various criteria for dividing the studied population.
2. Analysis of changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes - being the result of human capital management.
3. Correlation analysis aimed at identifying potential relationships between the importance of individual components of human capital in enterprise strategies and changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes.
4. Correlation analysis between the examined changes in selected areas of the functioning of enterprises related to the course and quality of logistics processes. The study was conducted taking into account the adopted criteria for the division of the study population.

Analysis of the results

The first part of the research concerned the importance of individual elements of human capital in enterprise strategies (the results, in the form of average values, are presented in Table 2).

Table 2. A summary of average values for the examined elements, divided into categories of enterprises

Category	HC1	HC2	HC3	HC4	HC5	HC6	HC7	HC8	HC9	HC10
Total	3.24	3.22	3.06	2.96	3.10	3.19	2.96	2.99	2.99	3.07
Production	3.26	3.20	3.06	3.02	3.28	3.15	2.87	3.08	2.98	3.07
Service	3.21	3.24	3.05	2.86	2.84	3.24	3.10	2.85	2.99	3.08
Samll	3.10	3.10	3.16	3.14	3.00	2.94	2.82	2.94	2.82	3.14
Medium	3.27	3.19	2.89	2.81	3.06	3.24	3.07	3.03	3.02	3.00
Big	3.32	3.35	3.22	3.02	3.25	3.30	2.92	2.95	3.07	3.12
Up to 5 years	3.23	3.36	2.96	3.15	3.21	3.00	3.36	3.02	3.06	3.36
5 - 10 years	3.32	3.47	3.18	2.85	3.13	3.35	3.08	3.08	3.18	2.95
Over 10 years	3.19	2.97	3.02	2.92	3.02	3.16	2.67	2.90	2.81	3.00
International	2.93	3.13	2.83	3.08	3.13	3.23	2.78	2.88	2.98	3.08
National	3.43	3.11	3.21	2.89	3.10	3.27	3.08	3.13	2.92	3.20
Regional	3.20	3.38	3.00	2.96	3.09	3.07	2.92	2.88	3.07	2.92

Source: Own study

The highest average values in total terms were obtained for the following criteria: HC1, HC2 and HC6. The data presented in Table 2 make it possible to conclude that enterprises, depending on the criterion of their division, use different priorities as part of their operating strategies. In manufacturing enterprises, greater emphasis was placed on aspects related to the level of competence, experience and moral and biological depreciation of employees (criteria HC4, HC5, HC8), while in service enterprises on motivation and commitment (HC6, HC7). Taking into account the size of the enterprise, it can be stated that large enterprises in most of the examined criteria (6 out of 10) received the highest average ratings. The differences between this group of enterprises and the other two were the greatest in areas related to social skills, social relations and experience (HC2, HC5). In 7 out of 10 examined criteria, the lowest average values of answers were found for small enterprises (although in the areas related to competences - HC4 and psychological characteristics - HC10, the highest average values were found in this group of enterprises). Taking into account the time of existence of enterprises, it is noteworthy that in none of the analyzed criteria in the group of enterprises over 10 years of existence, the highest average was not found. In areas related to personal and social skills, employee involvement, moral and biological depreciation, and innovation, the average values for this group of enterprises were clearly lower than in the other groups (HC2, HC7, HC8, HC9). Taking into account the area of operation of enterprises, the greatest differences in average values were found for knowledge and health (surprisingly the lowest values

for international enterprises) and employee engagement and values (the highest scores in the group of enterprises with a national scope).

In the second part of the research, the respondents' answers to the questions regarding to determine how green human capital management affects changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes (including in terms of GL). The results of the tests - in a graphical form - are presented in Figure 1. The concentration of results in the range of 2 - 4 points can be clearly observed. At the same time, especially in questions 1 and 5, the number of answers at level 5 was higher than for the remaining questions and the number of answers at level 1 was lower.

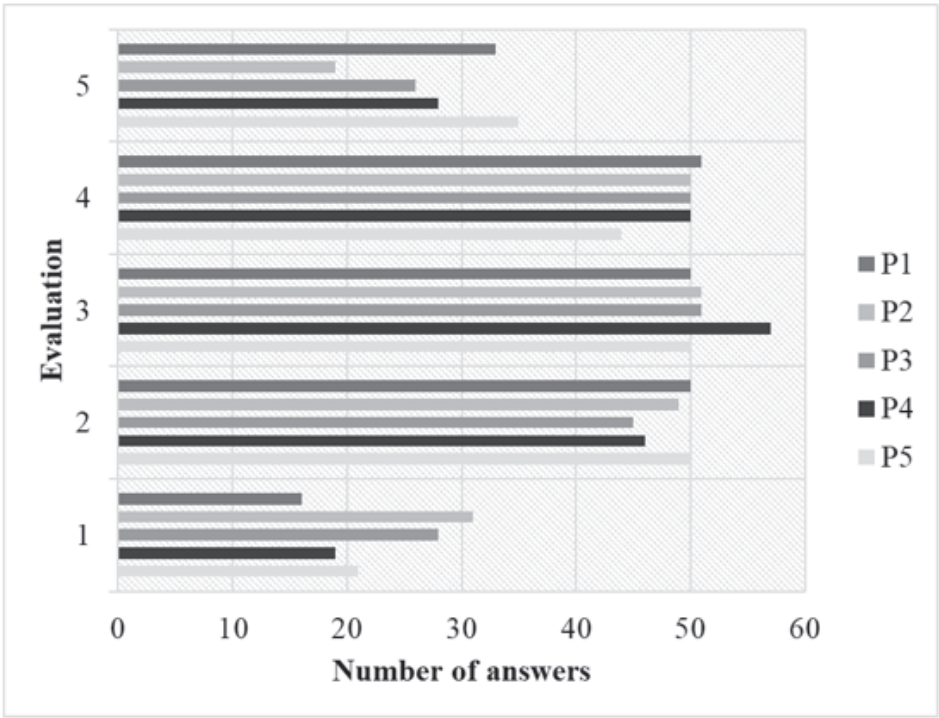

Fig. 1. Distribution of answers for individual questions
Source: Own study

Figure 2 presents data on changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes - depending on the adopted division criteria.

In the area related to the increase in the speed of information processing, it can be observed that small enterprises declared a lower impact of human capital than medium-sized and large enterprises (value lower by approx. 0.5). At the same time, clearly better results in this area were observed by enterprises with a period of existence up to 5 years (value higher by approx. 0.2), as well as those whose operations were conducted on an international scale (value higher by nearly 0.3).

In the area related to improving the security of confidential data, it can be observed that better results were declared by manufacturing enterprises (average higher than in service enterprises by more than 0.2), operating for up to 5 years (especially in relation to enterprises operating for more than 10 years - the value is greater by more than 0.3) and operating on a regional scale (advantage over enterprises with an international range of nearly 0.2). The weakest effects were declared by small enterprises (value lower by approx. 0.2 than medium and large enterprises).

The largest impact of human capital management on reducing the amount of inventories was declared by large enterprises (value higher than small enterprises by 0.5), operating on a national scale (average higher by approx. 0.2 than in other groups) and operating for up to 5 years. On the other hand, very small differences were found between manufacturing and service enterprises.

Service enterprises declared a much greater impact of human capital management on increasing the number of deliveries/services (average greater than production enterprises by 0.23). The weakest results were declared by small enterprises (average 3.00), operating for more than 10 years (average 3.02) and those operating in the regional scope (average 3.01).

The largest reduction in the number of errors in logistic processes was declared by service enterprises (average greater by 0.11 than manufacturing enterprises), large enterprises (especially in relation to small enterprises - average greater by nearly 0.4), operating for up to 5 years (average greater than enterprises operating over 10 years by more than 0.6 and more by more than 0.4 than for enterprises operating for 5-10 years) and operating on a national scale (average higher by approx. 0.2 than for othergroups of enterprises)

In the third part of the study, the obtained results were subjected to a correlation analysis aimed at identifying potential relationships between the importance of individual elements of human capital in enterprise strategies and changes in the functioning of enterprises in selected areas related to the course and quality of logistics processes. The study was conducted using Pearson's contingency coefficient with a level of detail of α=0.05. Based on the obtained results (Table 5), it can be concluded that the largest number of correlations was identified for the elements HC1, HC2 and HC10. Especially with regard to knowledge (HC1), high values of the correlation coefficient were observed in the context of each of the analyzed areas

of change. At the same time, no correlation was found between the inclusion in the strategy of enterprises of elements related to the moral and biological depreciation of employees and any of the examined areas of the functioning of enterprises related to the course and quality of logistics processes. The presented results allow to conclude that individual elements of human capital have a different impact on the performance of enterprises.

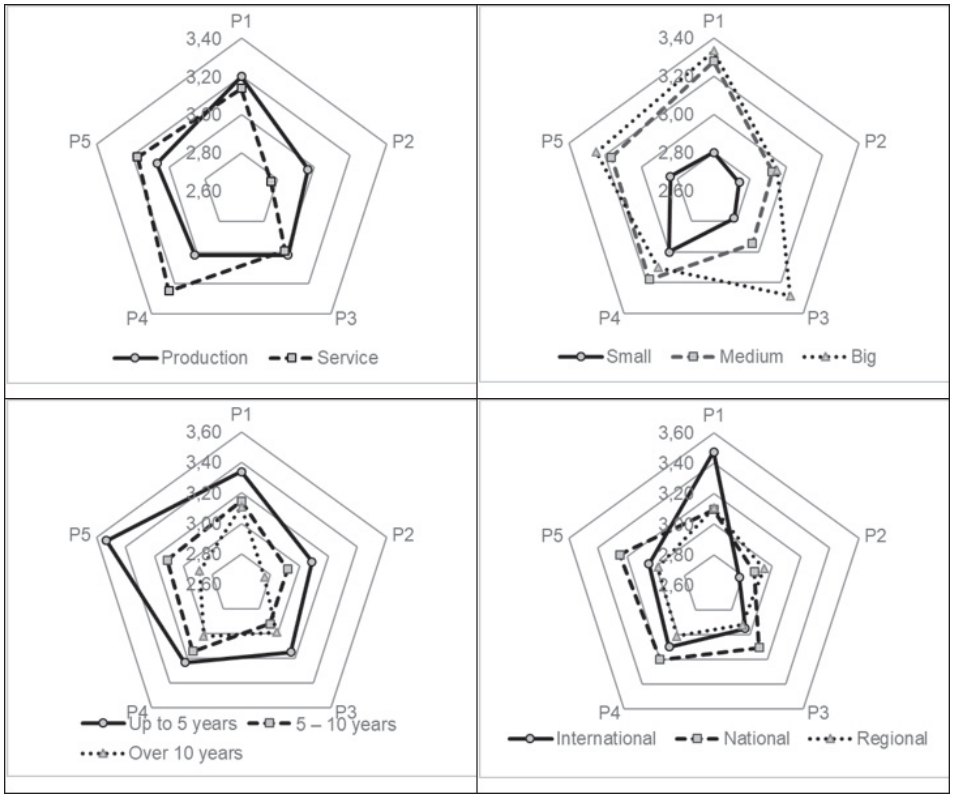

Fig. 2. Distribution of average values obtained for questions P1 - P5, taking into account the criteria for dividing enterprises

Source: Own study

Table 5. List of correlation values for the tested elements

Problem	HC1	HC2	HC3	HC4	HC5	HC6	HC7	HC8	HC9	HC10
P1	0.43	0.43	–	–	0.42	–	–	–	–	0.39
P2	0.48	0.44	0.39	–	0.43	–	–	–	–	0.38
P3	0.42	0.44	0.41	0.404	–	–	0.39	–	0.39	0.42
P4	0.47	0.43	0.45	–	0.39	–	–	–	–	0.39
P5	0.49	0.39	–	–	0.42	0.42	0.41	–	–	0.40

Source: Own study

The last part of the analysis was aimed at identifying potential correlations between individual changes in the functioning of enterprises in areas related to the course and quality of logistics processes. The result of this activity was the characterization of certain patterns and schemes allowing for a fuller understanding of the mechanism of the impact of human capital management on the functioning of the enterprise.

The presented results (Table 6) allow to conclude that 6 correlations were identified at the level of all enterprises.

Table 6. List of highest correlation values for the formulated questions

	P1	P2	P3	P4	P5
P1				**0,47***	**0,49**
				Service: 0.58	Production: 0.57
				Madium: 0.60	Madium: 0.56
				Up to 5 years: 0.70	Up to 5 years: 0.68
				5-10 years: 0.65	5-10 years: 0.44
				International: 0.74	International: 0.70
P2			0.50	0.48	
			Production: 0.49	Production: 0.48	Production: 0.48
			Service: 0.67	Service: 0.56	
			Small: 0.80	Small: 0.77	
					Medium: 0.56
			Big :0.67		
			Up to 5 years: 0.68		
			5-10 years: 0.73		
				Over 10 years: 0.59	
				National: 0.59	
			Regional: 0.69		

	P1	P2	P3	P4	P5
P3					**0.41**
					Medium: 0.54
					Over 10 years: 0.54
					National: 0.58
P4					**0.39**
					Medium: 0.56
P5					

In the table bold elementsare values obtained for the entire population, the remaining values refer to the relevant groups of enterprises in accordance with the name

Source: Own study

This indicates that in the surveyed group of enterprises, the effects of changes in the functioning of enterprises established as a result of human capital management were linked. The increase in the speed of information processing occurred simultaneously with the increase in the number of deliveries/services (the value of the correlation coefficient 0.47) and the decrease in the number of errors in logistic processes (0.49). The relationship was also found between the improvement in the security of confidential information and the reduction in the level of inventories (0.50) and the increase in the number of services/deliveries (0.48). In addition, the relationship between the reduction in the number of errors in logistics processes and the reduction in the level of inventories (0.41) and the increase in the number of deliveries/services (0.39) were identified.

Conducting an in-depth analysis based on the adopted criteria for dividing the studied population allowed for the identification of additional - often strong correlations - existing in individual groups. The highest number of correlations was found in the group of manufacturing enterprises (four: P1 with P5 and P2 with P3, P4 and P5). Three correlations were found in the groups of service enterprises, medium enterprises, existing up to 5 years and existing 5-10 years. The strongest correlations were identified in the group of small enterprises (P2 with P3 - the value of the correlation coefficient 0.80 and P2 with P4 - the value of the correlation coefficient 0.77). One correlation was identified for large and regional enterprises.

Conclusions

In the scientific literature, there is a very large number of studies that contain the term GL in the title, abstract or keywords specified by the authors. For example, in the Science Direct search engine, after entering the term GL, 26,087 results appear. However, when we correlate the term GL with GHL, the number of studies drops

drastically to 31 results - indicating that the correlation of these two elements has not been thoroughly investigated and the areas have not yet been fully integrated(Lengnick-Hall et al., 2013, pp. 366-377). Therefore, studies integrating these two concepts - which are generally unrelated - should be considered important from the point of view of establishing links between them.(Boudreau, Bicknell-Holmes, 2003, pp. 148-162),(Sarkis, Cordeiro, 2012, pp. 386-395), (Zaid et al., 2018, pp. 965-979), as well as their impact on environmental, social and economic aspects in terms of sustainable development (Srivastava, 2007, pp. 53-80), (Bag et al., 2021, p. 125233). Research results show that in-house Green Supply Chain Management (GSCM) practices in particular have a positive impact on green HRM practices (Yu et al., 2020, pp. 224-435), while external green supply chain management practices only mediate the link between sustainability practices, suggesting a lack of awareness among producers of the effectiveness of such GSCM practices to improve the economic and social dimensions of sustainability.

In connection with the above, the obtained research results regarding the impact of human capital management on changes in selected areas of the company's operation related to the course and quality of logistics processes may constitute a significant contribution to research on the sustainable development of the company, supporting the integration of solutions related to GL.

The continuous development of the industry and increased competition means that the need to develop not only products, but also services and technologies has become a common phenomenon nowadays. However, with such rapid progress in the development and implementation of modern technologies, or the use of more functional IT systems, optimal human capital management is still one of the basic problems that managers struggle with today. Therefore, the search for forms, methods and techniques in the area of human capital supporting logistics processes and their integration in organizational management is a challenge for contemporary theoreticians, managers and designers of GL processes.

On the path to perfection, the best solution may now be to implement an operating concept that will cover the entire enterprise. This is where the GHR concept can be helpful. While in large enterprises it is considered one of the basic elements of striving for improvement and competitiveness of the services provided or manufactured products, in small and medium-sized enterprises it is used in a small percentage. Due to the fact that there are nearly 2.2 million micro companies on the Polish market and less than 50 thousand small enterprises, which together constitute approximately 99.2% of all active companies, the implementation of human capital elements in logistics processes may contribute to improving their functioning and adapting to new business management concepts consistent with sustainable development. The study of the relationship between the importance of individual elements of human capital in enterprise strategies and changes in the functioning of enterprises in selected areas related to the course and quality of

logistics processes showed that the following components of human capital had the greatest impact on the examined effects: knowledge, personal and social skills, interpersonal relations and psychological characteristics of employees.

The conducted research allowed to conclude that in the surveyed group of enterprises there were differences in the approach to individual components of human capital, depending on the specificity of the business, the size of the enterprise, the area of their operation or the time of operation. In manufacturing enterprises, greater emphasis was placed on aspects related to the level of competence, experience and moral and biological depreciation of employees, while in service enterprises, motivation and commitment were declared as more important elements. Taking into account the size of the enterprise, the highest average values were found in the group of bigenterprises, and the differences between this group and medium-sized and small enterprises were visible primarily in the areas related to social skills, social relations and experience. Taking into account the area of operation of enterprises, the biggest surprise was the fact that the lowest average values for knowledge, health, employee engagement and value were found for international enterprises.

Due to the methodology used and the research scope, the conducted research had certain limitations. They were primarily related to the geographical area selected for research, which - due to its local specificity - could influence the results obtained. Moreover, the study used a limited number of questions relating only to part of the logistics function - as a result, the obtained picture of this area is incomplete. The development of this research should aim to expand the geographical area and deepen the analysis by using more complex statistical tools and referring to a greater number of GL aspects.

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