
Green Competence in Business Practice and Education: A Spatial Analysis

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Abstract:

Purpose: The purpose of this paper is to point out the need to modify the educational process towards a "green" education aimed at solving environmental problems. The paper poses the following research hypothesis: Building competitive advantage of enterprises depends on bridging the education gap in the context of green transformation. In relation to the stated objective and the adopted hypothesis, the paper poses the following research question: "What concrete steps should policymakers take to ensure access to an educated 'green workforce'?". In an attempt to answer this question, the paper first addresses the essence of green competences and their importance in building competitiveness, and then focuses on presenting the incentives determining the development of green competence. Also, the article first addresses the essence of green competences then identifies the incentives contributing to the development of green competences. A key element of the article is to present the results of the study and a model for securing an educational gap to address the green competence gap.

Design/Methodology/Approach: A critical analysis of the literature and an observational method using argumentation to support generalised theses were used to achieve the aim. In addition, the method of induction and deduction, the method of comparison and generalisation were used. In the article, a questionnaire tool was used.

Findings: The reflections carried out allowed the identification of key actions to strengthen green competences. On the basis of the analysis carried out, it was shown that there are serious problems at school level in the context of 'green knowledge and skills'.

Practical Implications: The problems presented in this article regarding the educational gap in green competence demonstrate the necessity for protective solutions. It is important to prepare such solutions to bridge this educational gap. In addition, it is important to ensure proper "green education" of teachers so that the educational process of children and young people is not disrupted.

Originality/Value: The article presents the results of own desk research. The issue presented has not previously been addressed in discussions published internationally.

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1. Introduction

The current economy is developing dynamically, which brings with it threats to the environment, especially in the context of climate change. Some managers are reflecting on the need to take pro-environmental measures that could reduce the negative impact of all economic processes on the human environment (Budziewicz-Guźlecka, 2019). Pro-environmental initiatives are becoming more and more prominent.

Therefore, it can be assumed that their implementation will not be possible without appropriately shaped competences oriented towards environmental aspects (called green competences) in the subsequent stages of human resources management processes. The analysis of the environment carried out has shown that entities taking pro-environmental measures place their expectations of green employee competences in the first place already at the recruitment stage.

2. Literature Review

Green competence has also been defined in the literature as the necessary ecological knowledge, skills and other socio-economic behaviours of an individual to behave and act appropriately and responsibly with a view to the overall well-being of the immediate environment (Ziółkowska, 2024; Kozar 2017; Bianchi, 2020).

From the point of view of trying to properly define the notion of green competence, work on this topic, also conducted in other fields such as environmental education, environmental psychology and environmental economics, is relevant (Urbaniak, 2022; Subramanian, Abdulrahman, Wu, and Nath, 2016).

Moreover, due to the ambiguity of the concept, multiple terminologies have been used. These terms include concepts such as sustainable capabilities, green skills, green capabilities, pro-environmental competencies.

In the literature, there are also definitions that relate green competence to the competence needs of enterprises (Kozar, 2022; Ali, Malik, Yaqub, Jabbour, de Sousa Jabbour, and Latan, 2023; Papademetriou, Ragazou, Garefalakis, and Passas, 2023). In the context of business management, 'green competence of employees is the result of their knowledge and skills in the application of pro-environmental solutions in the company. As indicated earlier, the term green competence is a very broad term, encompassing many dimensions (Khan, Mehmood, and Kwan, 2024):

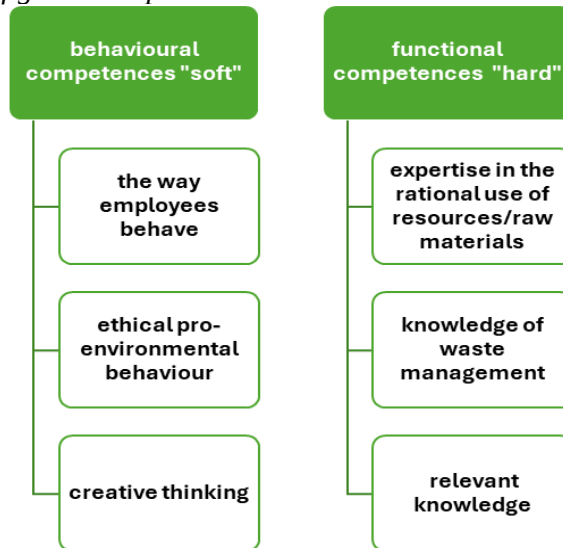
- green knowledge - this concerns general knowledge of the natural environment,
- green skills - these are skills of both a professional and general nature that are needed primarily in green professions, but also those affected by the green transition, i.e., the ability to perform tasks that take into account their environmental impact in such a way as to minimise the negative impact on the ecosystem,
- green awareness - this refers to an awareness of the impact of human activities on the environment (e.g. leaving a carbon footprint, etc.),
- green attitudes - understood as an individual's perception of the importance of environmental protection,
- green capabilities - important for self-development and increasing productivity in the green economy,
- green behaviour that supports environmental sustainability.

Employees' green competences are the resultant of their knowledge and skills in applying pro-environmental solutions in the company. Due to the complexity of the concept of competence itself, a clear distinction should be made between behavioural competences and functional competences, as illustrated in Figure 1.

The former describe "soft" skills and refer to the way employees have to behave in order to do their job properly (without contributing to environmental risks). Green behavioural competencies that may be desirable from employers include creative thinking and ethical behaviour of an environmental nature, or the ability to manage people under conditions of environmental risk.

Functional competences, on the other hand, define 'hard' skills and refer to what employees need to know in order to do their jobs well. Among these, special attention should be paid to expertise in the economical use of raw materials or waste segregation (Williams, 2014) and the ability to drive energy-efficiently. Shaping a company's desired green competences can take place through:

- training,
- assessing employee attitudes and behaviour,
- involving employees in company initiatives of a green nature.

Figure 1. Types of green competence

Source: Own elaboration.

The development of green competences in a company should be permanent. This observation is due to the fact that such specific competences are devalued relatively quickly due to the dynamic development of technology or knowledge in the field of pro-environmental solutions itself.

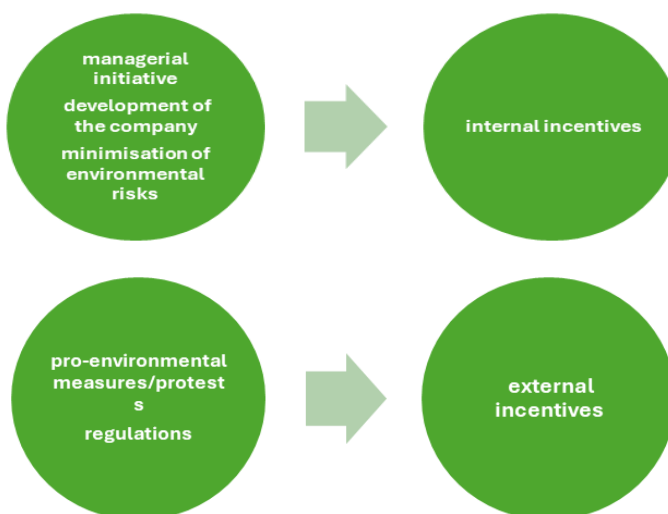
3. Enterprise and the Green Transition

As researchers on the subject have shown, the source of competitive advantage in the marketplace can be found in the building and maintenance by enterprises of appropriate interactions with the natural environment (Kubasik, 2006). Creating positive relations in this area depends on the knowledge and skills of the staff of a given enterprise.

Hence, it becomes necessary to appropriately shape the already mentioned green competences among employees. The source of the attempt to shape green competences among employees in companies may be both internal and external conditions, as presented in Figure 2.

In the first case, competencies are created on the initiative of the company's managers. They are a derivative of the identified opportunities for further development of the company or a means of mitigating the occurrence of environmental risk, i.e. a crisis situation, which may imply a number of adverse consequences, including those of a financial nature (Sharfman and Fernando, 2008).

Figure 2. Incentives contributing to the creation of green competences among employees



Source: Own elaboration.

As far as the external incentives contributing to the creation of green competences among employees are concerned, it is necessary to mention the pro-environmental actions undertaken by local communities (e.g., environmental protests) or the need for companies to comply with current legislation. In companies, it is diagnosed that in some workplaces, the possession of appropriate green competences is necessary for the proper performance of professional activities.

4. Green Jobs

Jobs related to the green economy are referred to in the literature as 'green' jobs. These are jobs that, through their high level of environmental competence, have the effect of minimising the negative environmental impact of the economic activities of companies. However, there is no standard definition of a green job, and such a gap can be a serious problem in terms of securing current and future labour market needs. To date, there have been four approaches to identifying green jobs. The first is to select occupations involved in green industrial processes - such as active waste management, processing, recycling and so on.

The disadvantage of this approach is that it relies on information that is often company-specific and therefore not suitable for a consistent classification of green jobs. The second method of recording green employment is based on the link between products and services that are known to contribute to environmental and conservation goals and the workforce involved in their production or supply.

The identification of these products and services follows the descriptions in federal procurement programmes and includes typical products such as hybrid or electric cars, insulation products or energy monitoring systems.

While referring to tangible and easily recognisable items is undoubtedly an advantage, this approach relies on ad hoc definitions that can produce many false negatives, namely by omitting green activities that are not directly related to the production of a specific product or service, such as energy conservation in a company.

Still another approach to identifying green employment is based on selecting industries that have a high percentage of companies actively engaged in environmental and conservation goals, such as, for example, the production of energy-efficient appliances, filters or wind turbines. As with the first approach discussed above, this approach has the advantage of capturing employment at the industry level and is therefore amenable to comparative analysis.

At the same time, industry classification systems are not detailed enough to distinguish green products and services from similar, non-environmental products and services. In practice, this means that the green jobs figure can easily contain 'false positives'. The three approaches analysed so far define green jobs only indirectly, using an aggregate level to define what is green (industry) or by explicitly linking the greenness of a process or product to the nature of the work.

5. Methodology

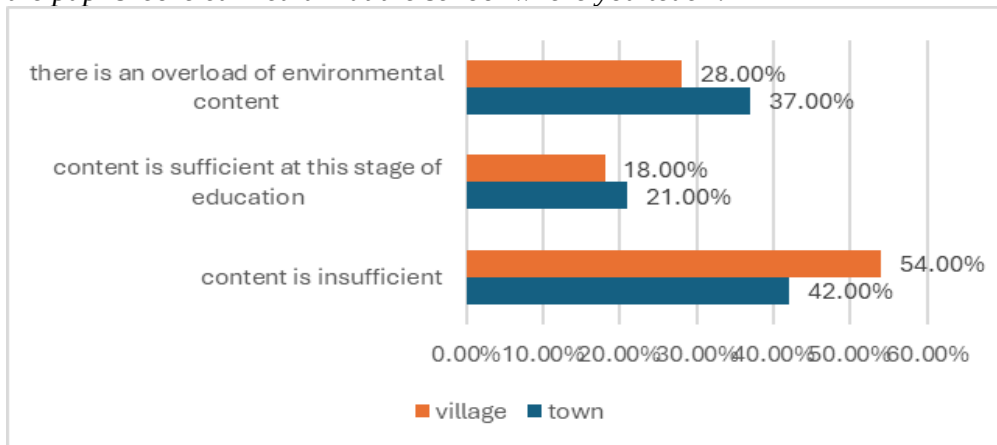
The survey was conducted to obtain the data and information needed to verify the research hypothesis set out above. The study was carried out according to the following scenario: 1) Definition of the scope of the study and the target group; 2) Selection and preparation of the survey instrument; 3) Conduct of the survey; 4) Summary and analysis of the results; 5) Formulation of conclusions.

The survey was conducted in Q1 2024 on a group of 108 secondary school teachers representing the West Pomeranian, Pomeranian and Lubuskie Voivodeships (42 from urban areas and 66 from rural areas). The questionnaire consisted of a total of 12 questions. These included single-choice and multiple-choice questions, as well as open-ended questions.

However, due to the limited capacity of the article, selected results of the study are presented. The authors paid particular attention to issues concerning the shaping of pro-ecological awareness and knowledge among teachers-educators and the assessment of pro-ecological content, which is part of the core curriculum in the educational process in Poland.

More than 50 per cent of teachers in rural areas and 42 per cent of teachers in urban areas considered the current environmental content of the core curriculum to be insufficient, as shown in Figure 3.

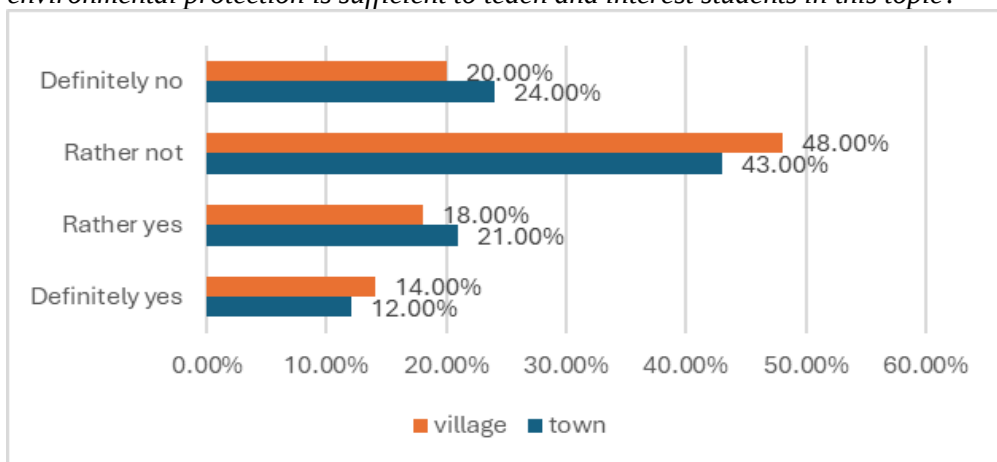
Figure 3. *How would you rate the extent of environmental content included in the pupils' core curriculum at the school where you teach?*



Source: Own research.

Only 1/5 are of the opinion that the content is sufficient. The teachers surveyed indicated that there is an overload of pro-environmental content (27% of teachers from rural areas and 37% of teachers from urban areas). But this is a result of the general perspective that young people in secondary school are heavily overloaded with different types of content. A further question concerned the teachers' self-assessment of their level of knowledge, as shown in Figure 4.

Figure 4. *Do you think that your level of knowledge in the field of ecology, environmental protection is sufficient to teach and interest students in this topic?*

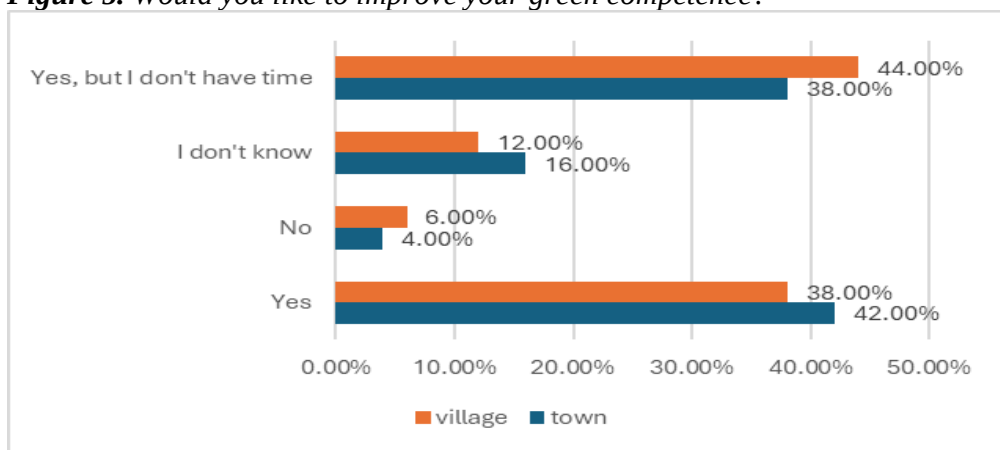


Source: Own research.

67% of teachers from urban areas and 67% of teachers from rural areas consider their knowledge of green issues in the broader sense to be insufficient. This is very worrying, because in the context of green competence development, educators are a key pillar.

Only 1/3 of the respondents considered their level of knowledge to be sufficient to teach and interest students in ecological issues. This is a small percentage that affects the quality of environmental education and above all environmental awareness. It appears that almost the majority of teachers (80% and 82%) would like to improve their competences (Figure 5).

Figure 5. Would you like to improve your green competence?



Source: Own research.

This means that teachers are very much aware of the need to upgrade their competences. On the other hand, about 40% of them indicated that they are willing, but that their workload and therefore lack of time does not allow them to realise courses/training to improve their competences.

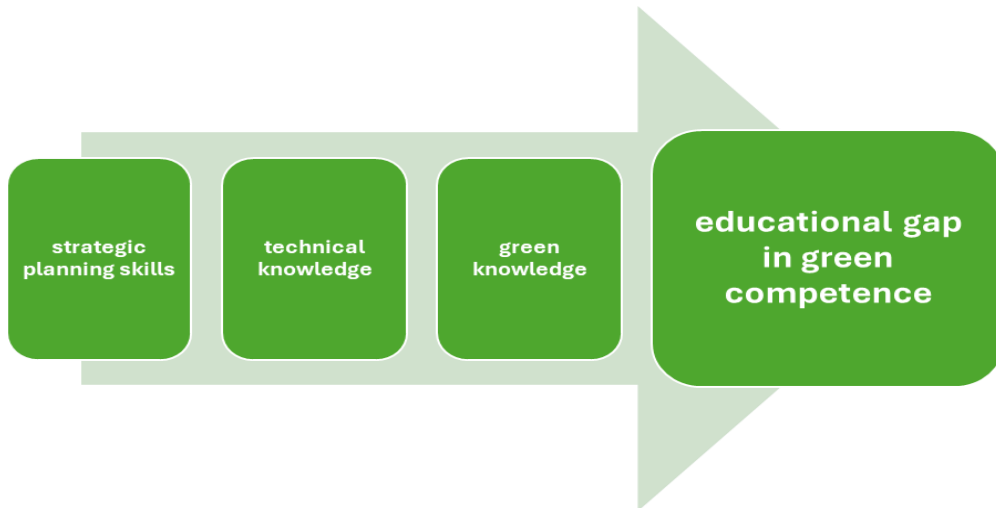
This is very worrying, as there is a danger that the educational gap in green competence and environmental awareness will not narrow in the next decade. There is even a fear that it will grow.

6. Discussion

The majority of employers where new green transition jobs have evolved have indicated that it is difficult to recruit staff with the competencies required for these positions. A key reason for this is that there are few people with these specialist competencies in the market. This is the result of an educational gap. These competences are not formed in the school education system -1/3 of the companies indicated this problem. It should be emphasised that acquiring green competences is a complex process, as green transformation competences are

very multifaceted, as they require a combination of strategic planning skills and technical knowledge. To address the education gap, multi-track support is needed, (Figure 6).

Figure 6. A model for securing the educational gap in green competence



Source: Own elaboration.

The role of the state in developing green competence is invaluable. Government, through its actions, should be actively involved in promoting and supporting environmental sustainability. How such engagement should be designed and implemented, on the other hand, is the subject of extensive deliberation.

It should be emphasised that the state has a range of options in the context of strictly economic as well as administrative instruments. One can point to, for example, carbon pricing, R&D subsidies and regulation, as well as many other implementation pathways. In practice, several instruments are embedded in a policy mix that seeks to balance multiple, sometimes contrasting issues, while remaining flexible and adaptive (OECD, 2007).

Not surprisingly, assessing the effectiveness of government interventions for green growth is the subject of fierce debate (Drab-Kurowska, 2018). It is important to emphasise that the empirical evidence on the impact of environmental policies and regulations on employment is inconclusive.

Some studies openly criticise environmental policy, claiming that it is cost ineffective or promotes job losses. This contradicts positive predictions about the expansion of markets for environmental goods and services, which tend to be labour-intensive. More detailed evidence comes from studies of direct interventions, such as regulations setting emission criteria.

Some researchers assess the impact of environmental regulation on employment in relation to industry specifics, company characteristics or type of pollution, others show no significant impact. while others find that environmental regulation creates jobs.

7. Conclusions

The practical implementation of a sustainable supply chain concept means that a company has to undertake a lot of preparation, implementation and monitoring of the planned projects (Budziewicz-Guźlecka and Drab-Kurowska, 2017). This involves the need for specialised knowledge. Education for sustainability allows one to understand the complexity of the processes and mechanisms behind sustainable development.

Acquiring the competences that are key not only to understanding the area but also to implementing specific solutions is an important part of the change in approach to supply chain management.

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