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The Importance of Organizations in the Awareness Activity of Individual Ecological Behavior -Continuous Improvement, Through the Training Process of Adults

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Abstract

Lifelong learning is not a desideratum of modern society, it manifests itself throughout the development of human civilization, but learning/assuming an ecological behavior is and must become a current and future lifestyle. "We now accept that learning is a lifelong process, a process that keeps us in the front of change. The most pressing obligation we have is to educate people on how to learn." - Peter Drucker (b. 1909 - d. 2005). Commercial companies have a particularly important role in the environmental education of employees through the implementation of management policies to reduce the negative impact on the environment, as well as through personal and group training.

Ecological education means the transition from communication/awareness to application through appropriate ecological behavior. The steps to follow are: Speech \rightarrow Hearing \rightarrow Listening \rightarrow Understanding \rightarrow Agreeing \rightarrow Action \rightarrow Continuing said action.

The case study highlights the importance of implementing appropriate environmental policies to reduce the negative effects that specific work has on the quality of the environment. By implementing institutional training, the benefit is transferred from the company, respectively a microgroup, to the individual/adult as part of this group, and he, in turn, will extrapolate this behavior in the private/daily life to his peers, adults, young people or children.

Keywords: Companies/Commercial Societies, Ecological Education, Awareness, Ecological Behavior, Adults

Introduction

Companies/commercial societies as employers have an extremely important role in the ecological education of employees, by implementing a plan of measures to reduce the environmental impact and sustainable development. The first step made by companies/organizations in this regard is the implementation of the environmental agreement, by implementing the STAS ISO 14001 through a plan of measures corroborated between the environmental protection department, the financial department and the communication department, at an organizational level. Thus, if the first two departments will develop a plan of sustainable measures, the communication-training department will organize the training process of employees, so that the proposed measures are actually implemented.

Ecological education of earners/employees of a company/organization must be understood as a set of skills developed by a person to think and act environmentally friendly, at a subconscious level, in the sense of protecting the environment. Environmental education must have as its main feature the sustainable development of employees' environmental skills and abilities (Benciu and Pop, 2013).

Therefore, the information received, and especially the way in which they assume it and the way they will apply and disseminate this information are all extremely important in organizational and private life. Thus, the training for employees aims to develop an ecological behavior and correct-real actions in terms of environmental protection.

The education process is based on the ability to communicate information, so that the recipients of this information - employees succeed in the stages from receipt to processing and assuming the information received. Thus, it is possible to start involving employees by implementing the ISO 14001 environmental STAS from an individual to an organizational level, by understanding the notions in the field of ecology and environmental protection, such as:

- □ carbon footprint,
- □ correct use of raw materials,
- □ sustainable development of the organizational community,
- □ proper waste management, etc.

Ecological education: from communication and awareness of information to the application of ecological concepts in everyday life

What is conscious assumption/awareness and what is its importance? As mentioned above, the awareness process has several stages, which we will mention below, highlighting in each stage its importance in said process. Communication is an ongoing process that contains the following steps: Speech \rightarrow Hearing \rightarrow Listening \rightarrow Understanding \rightarrow Agreeing \rightarrow Action \rightarrow Continuing said action (Rientjes *et al.*, 2000).

Thus, if in the Training stage we have: speaking - hearing - listening, in the Awareness stage we will include understanding - agreeing information and methodology adopted at an organizational level, thus reaching the Assumption stage, by applying ecological measures both in an organizational life and in private. Thus, a complete cycle will be created, the adult generation/employees-parents, grandparents, towards the young generation/children-students, students of the flow of ecological information, thus making it possible to learn an ecological behavior in society (Rientjes, 2008).

Communication is a process of transmitting an accessible message so that the recipients of the message can fully integrate the information received. Communication is real and effective

when the receiver can decode the message, by assuming. From a psycho-pedagogical point of view, information is intelligible when it is understood by a preschool child (de Graaf and Klaas, 2010). Thus, it is desired that the information transmitted be as accessible as possible to the understanding of more and more non-specialists in the field of ecology. The transposition of the information must be interactive and attractive, so that the decoding of the message is easy. The communication of the message must also be of a non-discriminatory nature from a social, racial, intellectual, gender or other point of view. Communication and, therefore, dialogue are not processes through which we act on a person, but processes through which something is shared with other people. Therefore, the dialogue requires an adaptation at a mental level, regarding the relationship with those around, the purpose of the dialogue being understanding the interlocutor and not just the attempt to make him understand us. (Hesselink et al., 2010) It should be borne in mind that during a dialogue we have open messages at the verbal-social level, but also hidden messages at the non-verbal-psychological level. Gestures, facial expressions, body movements, tone of voice also agree to the transmission of non-verbal messages, these being decoded at a psychological level. Real communication is achieved when, in the dialogue, the two types of messages transmit the same information, the non-verbal, psychological message strengthening the open, verbal message (Naumescu, 2008)

From an economic point of view for the organization/company it is useful that the trainings are correctly organized, the methodology of ecological measures is simple and easy, so that the integration and assumption of notions/measures is real (Rubin and Silva, 2003). By assuming them in the organizational life, the adult employee will achieve a transgression of them in private life, thus managing not only the individual conscious assumption, but also a dissemination of an ecological behavior towards the young generation - children, students in middle schools and high schools (Benciu *et al.*, 2019).

Methodology

Starting from the premise of implementing environmental policies at an institutional level, the team of master students together with teachers from the Faculty of Ecology and Environmental Protection of the Ecological University of Bucharest and the Faculty of Geography from the University of Bucharest, established as a research topic the observation of individual improvement of the ecological behavior as an adult, in the multinational company Romstal Imex SRL.

The choice of this multinational company as a case study was primarily due to the organization's management policies, the objectives of the Human Resources' Department and the Environmental Department along with the Department of Internal Communication to constantly create, among employees, visions of sustainability by implementing green products (ECO). Secondly, seen as a continuation of the acquisition of ecological ideologies and practices in the pre-university and university learning stage, the study was conducted over a period of four years 2014 - 2018, during which time, statistical data, answers to related questions raising the quality of life through environmental protection actions have been collected, being analyzed by quantifiable methods new environmental quality parameters: carbon footprint, reducing energy and material consumption, reducing CO_2 emissions.

At the same time, the process of involving all the company's employees in actions with the role of environmental protection was also a goal. This meant participating in meetings based on dialogues between employees and employers, where the comparative results of the company were presented from year to year, thus forming internal communication tools.

Regarding the training and personal development of university graduates with environmental protection profile, Romstal Imex SRL company has developed a series of projects on recruiting young people in this field and facilitating an optimal framework for the implementation of theoretical knowledge during adulthood.

Results and Discussions

The case study will detail the actions taken by the joint team of master students and teachers from the Faculty of Ecology and Environmental Protection of the Ecological University of Bucharest and the Faculty of Geography of the University of Bucharest, within the multinational organization, Romstal Imex SRL.

The environmental policy of *reducing the carbon footprint* is a new challenge that most companies face. Unfortunately, nowadays, responsibilities in this area (recent for many) are not very clearly or quantitatively defined, so a new market can be created for consulting and auditing services, or even research, to direct and verify companies' efforts to reduce their carbon footprint through stated environmental policies.

Romstal Imex SRL has been operating in Romania since 1994 and specializes in selling construction plumbing equipment (Sustainability report company Romstal Imex SRL, 2018, Dep. Communication, www.romstal.ro). Along with the interest in meeting the requirements of its customers, there is the ongoing concern of reducing the environmental impact generated by the works specific to the object of activity, and the company's employees are in a continuous training process in the field of ecology and environmental protection. In order to limit the impact on the environment through saving, recycling, substitution, reduction and evaluation, the company has developed a plan of ecological measures regarding energy policy for the period 2014-2019 (Energy Management Project within the company Romstal, 2014, http://academia.romstal.ro/login.php).

Thus, in 2016, the company Romstal Imex SRL initiated the project "*I went green*", the goal being to train employees in the company's vision on sustainability, the importance of reducing the individual carbon footprint and changing their own consumption behaviors (Energy Management Project within the company Romstal, 2017) and in addition, promoting ecological and economical solutions to customers. In this regard, the following describe the activities that the company has proposed in order to reduce the level of greenhouse intensifying gas emissions and also reduce the carbon footprint:

•*The predominant use of ecological products (ECO)* in order to reduce the negative impact on the environment, but also their sale, leads to the reduction of the CO₂ footprint on the buildings/works of Romstal customers. By using timed or photocell batteries, the water waste can be significantly reduced, as well as the amount of hot water used, respectively the energy consumed for its preparation (Figure 1).



Figure 1. Benefits of using the photocell battery

Source: Sustainability report Romstal Imex SRL, 2018, p.12

• New projects, actions, equipment to reduce the energy footprint. Thermal insulation of buildings - the major benefit was the reduction of heat loss by enveloping the building by 20% - 50% (Figure 2 a, b).



Figure 2. Thermal / hydro insulation, Romstal Imex SRL headquarters, Vitan-Bârzești Road, Bucharest

Source: Energy Management within the Romstal company, 2014

• Optimization, modernization, replacement of heating / cooling systems by redesigning and modernizing the command / control panels and ensuring centralized and remote control, by installing BMS Building Management System modules in electrical panels (Figure 3 a, b).



Figure 3. a) Modernization of heating systems (old thermal power plant - b) New thermal power plant

Source: Energy Management within the Romstal Company, 2014

• Installation of BMS equipment in the company's headquarters' buildings, thus controlling and optimizing the activities related to climate control, lighting control, outlets or interruption of heating in an area where the door is open due to unloading the goods, the heating will be resumed after closing the door.

• Automatic reactive power compensation. One cause of overloading electricity transmission networks, which leads to additional fuel consumption and CO2 emissions, is the presence in the network of an important component of reactive, inductive and/or capacitive energy, generated at the level of internal distribution networks and of consumers. At Romstal, reactive energy compensation was approached at the highest technological level today, by using the latest equipment in the field, based on electronic compensation, with IGBTs (static frequency converters), modulating. The results were spectacular, with the reactive energy decreasing by more than 95%. Although much more expensive than the classic variants with capacitor batteries, these solutions pay off financially quite quickly (Sustainability Report, Romstal, 2018).

• Use of LED lighting sources. Switching entirely to LED lighting sources. LED systems have a much longer lifespan of at least 30,000 hours, well over the 2,000 hours of operation that an incandescent bulb can provide or the 10,000 hours that an economical compact fluorescent bulb can provide). The average light efficiency of conventional incandescent bulbs is 11 Im/W, of economical bulbs is 60 Im/W, while the light efficiency of LED lighting sources is higher than 80 Im/W (Figure 4 a, b).



Figure 4. a) Reduction of lighting consumption at the Romstal locations and b) Reduction of CO₂ emissions

Source: Sustainability report, Romstal, 2018

• Installation of water aerators (economizers) in order to reduce water consumption. At all work points, aerators were installed on the batteries, thus reducing by 50% the volume of water consumed compared to previous years, and for the commercial sector, all batteries were equipped with aerators, to ensure low water consumption (Figure 5).



Figure 5. Reduction of CO₂ **emissions (in kg) in the period 2014-2017 by using aerators** Source: Sustainability report, Romstal, 2018

• The installation of electric hand dryers significantly reduces paper consumption, but especially pollution, compared to the use of classic paper towels. 200 hot air hand dryers were installed, equivalent to saving 311 trees or 445 tons of paper. From an economic point of view, the supply services are no longer necessary, the purchase of paper towels is eliminated, thus reducing costs and from an ecological point of view, the waste of raw materials is canceled (Figure 6).



Figure 6. CO₂ emissions (kg) for hand dryers (left side) versus paper towel (right side) Source: Sustainability report, Romstal, 2018

• *Production of electricity in photovoltaic power plants*. The Romstal Company has developed an important project for the installation of photovoltaic panel (CEF) power plants. They were installed on the roofs of their own buildings, not affecting in any way the useful surfaces at ground level and not having any negative impact on the environment (Figure 7 a, b).



b)

Figure 7. Installation of solar and photovoltaic panels for domestic hot water preparation Source: Energy Management Project, Romstal, 2017

• *Placement of electric charging stations in Romstal headquarters*. Romstal supports the development of the infrastructure dedicated to electric cars, offering charging solutions in 28 locations across the country.

• Reducing consumption in the freight and passenger transport sector. Old cars with high fuel consumption and high levels of pollutants were replaced and new trucks with Euro 6 technology were purchased. Thus, engine capacities decreased from an average of 1724 cm³ to an average of 1465 cm³, and CO₂ emissions decreased from an average of 141.8 g/km to 97.9 g/km (Figure 8).



Figure 8. CO₂ emissions (kg) from the Romstal freight transport activity Source: Sustainability report, Romstal, 2018

These last three measures represent long-term financial investments with a recovery rate of up to 8 years, but the main motivation for allocating funds was primarily ecological and secondary, financial.

• Selective waste collection and recycling - the objective for 2017 was to increase the percentage of fulfilling legal recycling requirements individually from 26%, as it was achieved in 2016, to 65% of the total amount recycled. The goal for 2018 is to replace all disposable cardboard boxes with reusable boxes, made of recyclable plastic. In order to obtain these results, the awareness campaign of the employees regarding the selective waste collection both at work and at home was very important (Figure 9 a, b).



Figure 9 a), b). The situation of fulfilling the legislative obligations regarding the selective waste collection by Romstal Imex

Source: Sustainability report, Romstal, 2018

• *Developing a "Well-Being" strategy* for employees and integrating sustainability into the company's training and leadership program. Employee awareness through training in the environmental field, health and safety at work and their involvement in specific projects such as:

- Green Thinking and Green Living" programs employees' gardens the possibility to cultivate a small garden with colleagues, at work; planting trees in the outdoor spaces of the company, voluntary planting activities;
- □ thematic workshops: "Urban Gardening", "First Aid", "Raw Vegan";
- actions dedicated to employees' children: "Green 1st of June for children", "Green Planet Mission", "Childhood Games" at the Botanical Garden "Dimitrie Brândză" of the University of Bucharest with the support of the Children's Forest project, "Perfect Salad" etc.;
- communication sessions, presentations and round tables. A relevant example is the thematic session "*Climate evolution in Romania*" aimed at raising adult awareness about the importance of a healthy lifestyle. Employee participation in internal and external sports competitions (table tennis, football, marathon), etc.;
- film screening, reports and documentaries on ecology, promoting knowledge of local nature, sustainable traditions, promoting the consumption of local products (Figure 10 a, b).



Figure 10 a), b). Space for employees' garden - vegetables grown Source: Sustainability report, Romstal, 2018

• Forming an interdepartmental communication team - *EcoTeam*, with specialists from the HR *Human Resources* and Marketing departments, the aim being the unitary communication focused on ecological principles to support the business strategy and change of activities in the direction of environmental protection.

The principle of involvement started from attracting employees who believe in the benefits of ecology (they have as personal values these concerns), wanting to learn and apply more, show enthusiasm and energy to promote towards other colleagues, customers or collaborators, succeeding an active involvement of all the employees of the company. Thus, the employees along with the employer started many environmental initiatives in the office - *Green Office* such as:

- Selective collection, recycling a campaign meant to raise awareness on the impact of different types of waste, offering the opportunity to bring to the office waste from their own homes for recycling. Reducing the amount of plastic used by giving up plastic cups.
- Providing bicycles for commuting to work, to all Romstal Imex SRL employees who wish to do so (Figure 11);
- canteen at the headquarters with green menu, fresh bar, fruit and vegetable shop, offering products that reduce water and energy consumption;
- the possibility of personal involvement in supporting children with special needs or in helping the elderly;
- communication campaigns through newsletters, displays in offices and shops, screening films and documentaries on environmental topics, workshops and presentations.

The benefits of implementing ecological transportation in 2016

10% of Romstal employees used bicycles when commuting to work and returning home

87% of bicycles were made available for the employees that wished to make a difference regarding air quality protection

55 000 km represents the total distance travelled in the year 2016 by the Romstal employees

9.6 tons of CO₂ represents the carbon dioxide reduction amount as a result of using bicycles as means of transportation

Figure 11. Bicycle rack for employees

Source: Sustainability report, Romstal, 2018



The results of these ecological actions-measures are reported over a period of 4 years, 2013-2017, as follows. It should be mentioned that in this evaluated period, 2013-2017, the company expanded nationwide, reaching 60 branches and over 1,200 employees.

□ Electricity consumption decreased by over 50%, compared to 2013, while the total area of built premises increased by at least 12% (Figure 12).

CO2 emission resulting from electricity consumption (kg/m ²)						
2013		20				
2014	15	- 23%				
2015	13	- 33%				
2016	11	- 45%				
2017	9	- 51%				

Figure 12. CO₂ emissions resulting from electricity consumption during 2013-2017 Source: Sustainability Report, Romstal, 2018

□ The decrease in natural gas consumption for heating buildings peaked in 2014 when a series of measures were introduced, more organizational than investment ones. There was a decrease in the carbon footprint by 32%, so from a consumption of 19 tons - 2013 to 12.6 tons - 2017 (Figure 13).

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CO ₂ emissions from gas consumption (kg/m ²)					
2013		19			
2014	13	- 29%			
2015	12,8	- 30%			
2016	12,5	- 33%			
2017	12,6	- 32%			

Figure 13. CO₂ emissions from gas consumption during 2013-2017 Source: Sustainability Report, Romstal, 2018

Although the Romstal Company is not a large consumer of drinking and industrial water, it was still possible to achieve a decrease in consumption compared to 2013, which means a reduction of the carbon footprint of 24%. The peak year was 2017, when aerators were already installed in all locations, which significantly help reduce water consumption (Figure 14).



Figure 14. CO₂ emissions resulting from water consumption in the period 2013-2017 Source: Sustainability Report, Romstal, 2018

□ Not neglected was the reduction of fuel consumption for employee travel, and the main argument for the significant decrease was the change in the norm of vehicle emissions, almost entirely, with Euro 6 (Figure 15). CO₂ emissions from the burning of transport fuels are not spectacular, but a 38% reduction in fuel consumption has been achieved.

CO ₂ emissions resulted from fuel consumption for employee commute				
2013		1.020 t		
2014	881 t	- 14%		
2015	824 t	- 19 %		
2016	754 t	- 26 %		
2017	625 t	- 38%		

Figure 15. CO₂ emissions resulted from fuel consumption for employee commute during 2013-2017

Source: Sustainability Report, Romstal, 2018

□ Although the number of employees increased in the period 2013-2017, the volume of CO₂ emissions compared to the number of employees decreased continuously, as a result of the total carbon footprint decrease (Figure 16).

CO2 emissions relative to the number of employees				
2013			6,73 t	
2014		6,27 t	- 7%	
2015	5,62 t		- 17%	
2016	5,52 t		- 18%	
2017	4,88 t		- 27 %	

Figure 16. CO₂ emissions relative to the number of employees in the period 2013-2017 Source: Sustainability Report, Romstal, 2019

In 2013 the company started from the carbon footprint of 64.5 Kg/m², in 2017 it managed (by reducing the consumption of water, gas, electricity, selective collection, waste recycling, etc.) to reduce the carbon footprint, reaching 48 Kg/m². From 2013, the year in which the monitoring of the company's CO_2 emissions started, until 2017, the carbon footprint decreased by up to 25% for the entire company.

In addition to reducing the emissions generated by the factors presented in this paper, an important way to reduce the carbon footprint will be to adopt renewable energy. Although the costs are very high, the solutions of such technologies are more efficient, because the amount of energy generated/euro invested is higher.

Conclusions

The conclusions regarding the ecological actions/measures derived from the case study of the carbon footprint decrease and the degree of awareness among the employees of a company are the following:

- Involving the top management of the organization in the implementation of the company's environmental policies;
- □ Achieving a 25% carbon footprint reduction at the organizational level;
- The sustainable development of the company in the context of reducing the environmental impact, as well as the professional socio-ecological development of the employees through trainings on ecological topics, through trainings for ecological counseling of the company's specialists;
- Development of the ecological consultancy department in the field of constructions;
- Developing ecological skills and also solutions applicable in private life and their dissemination at the micro-society level (home, school, family, friends, etc.).

Special Thanks

The case study carried out within the company Romstal Imex SRL demonstrated in the most practical way that the rules of ecology and environmental protection are perfectly applicable in the daily life of all adults. Adding value is the training from the school years: primary,

high school and university, which allows to deepen the understanding of the importance of environmental protection and the increasing application of the values of ecology. This way we would like to warmly thank the Romstal Imex SRL management, the Department of Human Resources management, the Environmental Department, the Internal Communication Department, etc., which provided whenever requested, the data necessary to prepare the study during the three years of research.

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