

APPLICATION OF INDUSTRIAL E-LEARNING IN THE PROCESS OF IMPLEMENTING THE STRATEGY OF GRUPA AZOTY S.A. – A CASE STUDY

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Purpose: The aim of the research described in this article is to specify the possibilities offered by e-learning, used in achieving the strategic goals of Grupa Azoty S.A. (within the scope appropriate for the research subject), as well as a process supporting strategy implementation.

Design/methodology/approach: Systematic literature review and content analysis (including internal documents). Interviews with selected managers of the studied company and specialists dealing with IT, general management, and staff development; self-observation; average rank method.

Findings: The specification of possibilities offered by e-learning in the process of strategy implementation has been determined, respondents' opinions have been collected, and ranks have been assigned to individual factors, indicated by respondents during the interviews.

Research limitations/implications: Research available in the literature refers exclusively to its training and educational functions (in the classic sense - acquiring knowledge). Industrial e-learning is a poorly recognizable construct and therefore arbitrarily interpreted, conceptually ungrounded, and subjectively defined. This is a significant limitation because, in the case of industrial e-learning, its repository function (knowledge available at your fingertips without the need to assimilate it) and monitoring, as in the described case, the implementation of strategic tasks are more important.

Practical implications: For the examined company, this means the necessity of building awareness of e-learning itself, its capabilities, and applications, not so much in training but as an essential repository of unique/unavailable online knowledge and as a supportive process throughout the entire stage of strategy implementation and execution.

Originality/value: The content of the article goes beyond the framework set in the literature, which deals with e-learning in a classical (educational and training) approach. There is a lack of research on e-learning treated as a process/tool (depending on the adopted semantic perspective) supporting the implementation of a company's strategy. There is also a lack of research on industrial e-learning. This article is an attempt to fill this gap.

Keywords: industrial e-learning, e-learning as a process, implementation/execution of the strategy, chemical industry.

Category of the paper: Research paper, Case study.

1. Introduction

Currently, e-learning as an educational tool, used in both academic and corporate environments, is significantly gaining popularity. Undoubtedly, this is related to the development of information technologies and their accessibility to an increasingly wider audience. The dynamic development of online tools also stems from the fact that they have proven themselves in crisis situations, particularly during the SARS-CoV-2 pandemic.

In the vast majority of cases, e-learning is understood classically, i.e., as a platform/repository/tool that enables the realization of educational tasks. Its effectiveness has been confirmed by the experience of isolation, where, without such tools and their basic educational functions, there would be a paralysis of the education system or higher education. Initially implemented as a tool supporting educational and training processes, facilitating access to educational offerings, and enhancing the form of delivery or attractiveness of content, e-learning has ultimately become an unexpected lifeline. It has prevented the paralysis of the education system. The forms and types of e-learning described in the literature mainly focus on its functionalities related to the dissemination and diffusion of knowledge. They are based on user opinions, beneficiaries, etc., to improve this tool as a useful, time-reducing training and educational platform. These are the main research trends illustrating the effectiveness of this tool as a praxeological category. Upon reviewing the literature, it can be concluded that there is a lack of research on e-learning as a process/tool (depending on the adopted semantic perspective) supporting the implementation of corporate strategy.

In the authors' opinion, e-learning has many possibilities, the functionality of which has not yet been identified, let alone studied. Assuming this premise and taking into account the fact of developing and approving a strategic plan for the period 2022-2030 in the economic entity under study, it seems reasonable to assess the usefulness of e-learning in implementing the newly adopted strategy.

The Grupa Azoty Capital Group's strategy is divided into two parts: corporate and segmental. By providing safe chemistry and implementing modern solutions that meet stakeholder expectations in harmony with the environment, the company indicates development directions up to 2030. The Group's strategy also includes looking forward to artificial intelligence (Kądziałowski, 2022). The actions contained in the strategy are subordinated to the basic pursuit of organizational excellence through continuous improvement of processes, systems, and the entire organization (Chojnacka, 2014). In this way, the company aims to increase value in the areas of environmental protection, energy transformation, and product development. It also aims at the development and professionalization of personnel, increasing motivation, especially focused on the goals arising from the "Green Deal" (Szeliga-Duchnowska, 2021). The realization of objectives focuses on the category of "Green Nitrogen", becoming the leitmotif that shapes the role and significance of the Group in implementing and

anticipating pro-ecological megatrends, as well as raising awareness of the fundamental values guiding the Group. These include preserving the natural environment, essential resources, concern for future generations, etc., constituting the axiological foundation of the Azoty Group's activities (Goranczewski, Kądziałowski, 2022). Therefore, taking into account mainly energy transformation, reducing harmful emissions to the environment, or introducing biodegradable products, the company identifies several key strategic areas, which are:

- Raw material diversification in the "green" direction.
- Implementation of the developed ESG strategy and its reporting to the market.
- Actions aimed at decarbonization and reducing environmentally harmful emissions.
- The "Green Hydrogen" project.
- The "Green Ammonia" project.

The purpose of the research described in this article is to specify the possibilities offered by employing e-learning in the implementation and realization of the strategic objectives of Grupa Azoty S.A. (within the scope relevant for the research subject) and as a process supporting the implementation of the strategy. Based on the objective specified above, the following research questions were formulated:

P.1 How can e-learning be incorporated into the realization of business objectives resulting from the overall "Green Nitrogen" strategy?

P.2 How can e-learning support the process of strategy implementation?

2. Research Method

To conduct research related to explaining the research problems formulated above, qualitative tools were used. The presented research problems have a utilitarian nature, applicable in the studied economic entity. They also have an explanatory character, explaining the specifics of industrial e-learning, different in its functionality from educational e-learning, but preserving the essence of e-learning as a source of knowledge in the organization (Łukaszczykiewicz, 2022). Such formulated research objectives and methods selected to explain them, in accordance with generally accepted principles, do not require the formulation of hypotheses (Kostera, 2003). The primary goal of the conducted research is to determine the possibilities of using e-learning as a process supporting the implementation of the Grupa Azoty S.A. strategy. Taking this into consideration, the authors applied the following research methods:

1. Systematic literature review and content analysis (including internal documents). Specification of keywords such as industrial e-learning, strategy, implementation, e-learning in the work environment, e-learning as a process was performed. Based on this, a query of articles containing the above keywords was conducted in scientific

databases such as: Academic Search Ultimate, including Business Source Ultimate, Education Resources Information Center, AGRICOLA, Open Dissertations, Green FILE, Newspaper Source, and Google Scholar. While educational e-learning is represented on a large scale in available literature, industrial e-learning or process-oriented (standardized) e-learning is represented in a small number of records. Hence, it may be considered a niche area. The same applies to e-learning as a process supporting strategy implementation. No such publications were found concerning the chemical sector. Next, the content of the available articles was reviewed, and the collected research material was organized (e.g., Łuczewski, Bednarz-Łuczewska, 2012; Easterby-Smith, Thorne, Jackson, 2015).

2. Interviews with selected managers of the studied company and specialists dealing with IT, general management, or personnel development. It was assumed that these people could have a general orientation in the issue of using e-learning in the work environment (Gudkova, 2012).
3. Self-observation (the authors are employees of the entity in which the research was conducted) (Ciesielska, Wolanik, Boström, Öhlander, 2012; Goranczewski, 2018).
4. To maintain the principle of triangulation, using interviews conducted with key individuals, the average rank method was introduced, treating respondents discussing the application of e-learning in the strategy implementation process as experts (Cabała, 2010). Each of them received a table with 9 factors, which they then ranked from 1-5, where 1 meant the smallest impact and 5 the greatest impact on strategy implementation.

The research was conducted in January and February 2023 at Zakłady Azotowe Kędzierzyn SA, a member of Grupa Azoty SA, engaged in the production of nitrogen fertilizers, chemicals, and OXO alcohols and plasticizers. The basis for the research was the general strategy guidelines of Grupa Azoty S.A. for 2021-2030, along with indications (operationalization) of these guidelines for the entity constituting the research area. Respondents were therefore tasked with defining the role of e-learning as a support process in strategy implementation at the level of the studied company and the tasks carried out in this area. The selection of the studied entity was purposive. The conducted research is related to a scientific conference co-organized by Grupa Azoty Zakłady Azotowe Kędzierzyn S.A. and the Jagiellonian University. Its participants, including PhD students working in the company and external guests, were tasked with evaluating the newly developed strategy from the perspective of their research interests. The selection of respondents with whom the research was conducted was similar. Considering the strategic document, the focus was on representatives of managerial staff, who have a key role/responsibility for effective strategy implementation. Due to the specificity of the research area, the set of respondents was supplemented with people dealing with IT in the organization.

3. Literature review

Currently, in the scientific literature, we can observe a renewed increase in interest in the topic of e-learning. As mentioned earlier, this interest was triggered by the pandemic, which forced entrepreneurs to entrust employees with remote work. It is also a result of the growing interest of new generations of employees, including Generation Y, Generation Z, or "Millennials," entering the labor market, further freedom and universalization of performed activities, and the possibility of working in a sufficiently flexible way (Kotnis, 2005). Work that allows for the completion of tasks from any chosen location. The constant growth of interest in e-learning is also a consequence of digitization moving towards the model situation of Industry 4.0, currently being modified towards 5.0 to not forget about people in digitalization processes (Grabowska, 2018). The conducted literature review indicates that publications on e-learning can be divided into those which:

- refer to e-learning as a training tool used in academic environments, as well as those which
- are used in corporate environments.

Among the numerous articles examining e-learning in corporate environments, we can notice publications regarding factors determining the effective implementation of e-learning platforms, the reception of implemented tools by users, e-learning as an integral part of HR policy (Żołądziewski, 2011), and the effectiveness of e-learning (Bizon, 2011). In the available literature, there are no studies on the impact of e-learning on strategy implementation. According to M.E. Porter (1980), a company's strategy is one of the most important documents determining the company's development directions, affecting its success or failure. The information contained therein directly translates into the organization's future, and as a result, the achievement of set goals. However, strategy implementation in literature is described by P. Wołczek (2012) as the weakest link in strategic management, resulting, among others, from a lack of proper communication, misunderstanding of strategy, or lack of knowledge about the role of employees in implementing strategic actions. In the current turbulent times, additional factors not previously present, such as crises or catastrophes, which we are currently experiencing, are added. As a result, the directions of raw material supplies change, planning processes become inefficient, logistics chains are broken, overloaded, etc. All this requires immediate corrections in the strategies implemented by economic entities (e.g., Stoner, Freeman, Gilbert, 1997). The literature review shows that merely establishing a strategy is only half the success. Without implementing tasks resulting from such a document, daily duties of the entire organization, there can be no talk of achieving strategic success (e.g., Oblój, 2014; Gierszewska, Romanowska, 2009; Chojnacka, 2021). It is also the complementarity and joint "effort" of all systems and tools in the organization, including the tool that is e-learning. From the conducted literature review and the trace results of the research

presented there, which could be attributed to the research objective indicated in the introduction, it follows that e-learning increases the competitive advantage in higher education (Gregorczyk, 2010), or the development of managerial competencies (Ratalewska, Szymańska, 2013). which have a real impact on the implementation of the strategy (Halina, 2002). Researchers such as Bai, Y., Li, H., Liu, Y. (2021) point out that, in the perspective of the last 10 years, we can observe the dynamic development of research on e-learning in various contexts and reference criteria. E-learning itself is no longer treated exclusively as a tool (e.g., Łukaszczykiewicz, 2022; Borowiec, 2019). From the available literature, it appears that the main research trend is currently determining/identifying the processes of effective implementation, design, and evaluation of e-learning (e.g., Fee, 2013; Lin, Chen, Nien, 2014; Graves, 2001). However, this does not change the fact that despite pointing to the diversity of research, their number is scant, and the understanding of the essence of e-learning remains unchanged. It is education and training that set the research trends represented in the literature. Hence, for example, there is a lack of research that would determine how/if e-learning affects the strategy implementation process? What factors determine the effectiveness of implementation, which experts involved in strategy implementation and/or employees assigned to perform such tasks would assess/categorize/rank from the point of view of their importance and validity, as key? It can be assumed that such factors are not only universal. They may also have a specific character resulting from conditions such as:

- the type and form of the entity implementing the strategy,
- the sector/industry in which the strategy is to be implemented,
- the level of detail/cascading of actions related to the implementation of the strategy (very well described and ordered by the BSC method (Kaplan, Norton, 2009), in which so-called CAMs (goal, activity, indicator) are formulated),
- the selection of priorities and focusing on them to improve the effectiveness of the entire strategy and concentrate on important matters.

In all these areas, the role and influence of e-learning as a utilitarian tool supporting implementation processes should be sought. Thus, we are dealing with semantic dualism:

- e-learning as a process (in a subjective approach) supporting the implementation of the strategy, both in its general dimension and in specific objectives,
- e-learning, in an attributive approach, as a tool supporting the implementation processes detailed in the organization's strategy document and the resulting operationalizing documents.

The above collection of research possibilities in the field of e-learning could undoubtedly be even longer. The literature does not mention this, which means that researchers do not undertake such research topics, remaining in the sphere of straightforward training or classical education. For example, Mastalerz (2010) mentions that in times of crisis, companies reducing costs related to education and employee development should treat e-learning as a tool enabling

cheaper education substitute. On the other hand, Kępińska-Jakubiec, Majewski (2009) indicate that the application of an appropriate training base, allowing for the effective use of e-learning, supports both the strategy and the company's goals.

4. Results of the conducted own research

Solving the problems presented in the introduction required determining the research questions to be directed to the respondents during the interviews. Anticipating difficulties with interpreting the category of industrial e-learning, in order to facilitate the respondents understanding of the essence of this conceptual category, the set of asked questions related predominantly to the possibility of using e-learning within the organizational areas the respondents are currently assigned to. Tables 1 and 2 present the results of the conducted interviews in relation to problems P1 and P2. To maintain the principle of confidentiality/ensuring the sense of security of respondents, it was decided that job titles or organizational areas will not be provided, and gender and age will be coded in the following way:

- A - Top management (board, directors of units and departments).
- B - Middle management (office and department managers).
- C - Independent employees (coordinators, specialists).
- Age range of work experience (D - 1-10; E - 11-20; F - 21-35).

Table 1.
Findings in relation to P1 (N = 15)

Question number	Content of the question	Sample/most common answers with respondent code
1.1	What knowledge/information is necessary to achieve the business objectives resulting from the Green Nitrogen Strategy?	<p>"... knowledge and resources accumulated in the Capital Group over the past years..." A/E</p> <p>"... a description of the main strategic objectives and initiatives to achieve those objectives..." C/E</p> <p>"... the status of creating new products, reporting energy consumption levels, the status of implementation of a given investment, monitoring the market situation (competition, prices of services, raw materials...) ..." B/E</p> <p>"... general knowledge of development directions and trends, both national and European..." B/E</p> <p>"... employees' knowledge of the strategy, their awareness and understanding of the purposefulness of the implemented changes..." A/F</p> <p>"... financial, industry and green technology trends..." A/F</p>

Cont. table 1.

1.2	Where should you look for sources of knowledge, access to this information?	<p>"... inside the organization, currently knowledge very often remains underused – inventoried..." A/E</p> <p>"... in Grupa Azoty's strategy for 2021-2030..." B/E</p> <p>"... in industry-related publications, conference materials and portfolios of other companies in the industry..." C/D</p> <p>"... in market analyses provided by corporate offices..." A/F</p> <p>"... Currently, this knowledge is dispersed and not developed within the organization..." B/E</p> <p>"... on the company's intranet..." C/E</p>
1.3	What should the form of conveying this information look like: flowcharts, infographics, VR, text?	<p>"... the form should be tailored to the users, intuitive, fast, supported by artificial intelligence..." A/E</p> <p>"... a combination of different forms, concise texts, animations and infographics..." C/E</p> <p>"... infographics, short form of transmitted content, VR..." B/E</p> <p>"... tailored to the content, not based only on one form, concise but not monotonous..." B/E</p> <p>"... containing infographics and flowcharts as well as sample simulations and scenes..." A/F</p> <p>"... tailored to the type of information transmitted... synthetic and kept to a minimum." A/F</p> <p>"... flowcharts or texts in the form of abstracts with reference to source materials..." C/A</p> <p>"... any form depending on specific areas of the company..." B/E</p>
1.4	How can e-learning fit into the succession strategy of key employees and/or managers necessary and important to achieve strategic goals?	<p>"... Industrial e-learning is absolutely part of the strategy of succession of key employees and/or managerial staff. Maintaining aggregated knowledge about business goals, based on collected and systematized data, enables effective management of the change process, reducing risks and increasing efficiency. ." A/E</p> <p>"... the e-learning platform may be a base for training and didactic materials created with the participation of persons performing strategic functions in the Company. This would allow to supplement the necessary theoretical knowledge with information on specific experience gained in a given position + building a database of files made available by people in key positions (transfer of developed know-how)..." C/E</p>
1.5	How does e-learning affect employees' ability to accept changes related to the implementation of the strategy?	<p>"... Building awareness and adapting to employee changes takes a long time and without access to knowledge raises many barriers..." B/E</p> <p>"... Well-prepared e-learning builds awareness in Just in Time..." A/F</p>

Source: Own elaboration based on conducted interviews.

In relation to the first research problem, respondents indicate a whole spectrum of knowledge relevant from the point of view of strategy implementation, starting from historical knowledge, affecting, for example, the ability to reproduce assets, to the prospective scope in terms of trends and directions of development of industries and the sector in which the research subject operates. Respondents point to the importance of both the external sources of knowledge (market analyses, industry studies, prepared by specialized entities) and internal ones, such as corporate materials, developed by internal services. Everyone wants the form of conveying available information to be as simple as possible, i.e., concise, engaging, and not monotonous. From conversations with respondents, it appears that e-learning is primarily associated with training.

In the next table, selected statements of the respondents related to the second research problem are presented.

Table 2.

Research results in relation to P2 (N = 15)

Question number	Content of the question	Sample / most common answers with respondent code
2.1	Does e-learning increase employee involvement in the implementation process, and if so, why?	<p>"... Yes, because it has a chance to engage more employees." C/E</p> <p>"... Definitely... the use of such tools makes employees feel directly responsible..." A/E</p> <p>"... Yes, the employee is more motivated to receive basic information and does not waste time looking for information..." B/E</p> <p>"... Yes, making employees aware of goals and their role in achieving those goals makes them feel part of the organization..." A/F</p> <p>"... so can contribute to the increase of employees' awareness..." A/F</p> <p>"... yes, because it allows you to monitor the progress of work on an ongoing basis..." B/E</p>
2.2	How does e-learning affect the effectiveness of providing information about the strategy to employees?	<p>"... allows for quick transmission of complete information..." B/E</p> <p>"... allows multiple playbacks, is available at any time..." A/F</p> <p>"... through the speed and contextuality of information..." A/F</p> <p>"... the ability to access information at any time" C/D</p> <p>"... access to knowledge "Here and Now"..." B/E</p>
2.3	How e-learning affects the ability of employees to embrace changes related to the implementation of the strategy	<p>"... allows to remove barriers and improve internal communication..." B/E</p> <p>"... makes it easy to access and review the proposed changes anytime, anywhere..." C/D</p> <p>"... allows for faster decision-making, reduces reaction time..." B/E</p> <p>"... allows for prior assimilation/acceptance of upcoming changes..." B/E</p> <p>"... supports the management of the cycle of change, eliminating the negative approach resulting from fears, leaving the comfort zone and thought patterns..." A/E</p> <p>"... building awareness and adapting to employee changes takes a long time and without access to knowledge raises many barriers..." B/E</p>
2.4	How e-learning can increase employee motivation to achieve business goals	<p>"... through the exchange of experience, monitoring the implementation of projects..." A /E</p> <p>"... By making employees aware of goals and their role in achieving these goals, it makes them feel part of the organization... have a real impact on the implementation of the strategy..." A /F</p> <p>"... involving employees in individual processes, assigning specific tasks..., showing the benefits..." C/E</p>

Source: Own elaboration based on conducted interviews.

The majority of respondents indicate that e-learning will have a positive impact on engagement in the implementation of tasks resulting from the strategy, on time-saving, on increased awareness, and consequently on motivation and commitment. Respondents emphasize the speed of access to information as an essential attribute of effective task execution, treating these two categories equivalently. Change management is crucial in strategy implementation; therefore, the people with whom the research was conducted see a positive

influence of e-learning. Mainly by shortening the change cycle due to information availability, greater awareness, the opportunity to familiarize oneself with planned changes beforehand, and the ability to adapt to them.

Taking into account the material collected during the interviews, it was decided that it is worth getting acquainted with the respondents' opinions on the importance of factors determining the effectiveness of e-learning in the process of strategy implementation. After collecting and processing the factual material, respondents were asked to assign importance to individual factors, and then the method of average ranks was applied.

Table 3.
Experts' perception of the importance of individual factors

Factors	Ranks averaged	Rank
K1-Building employee awareness - help in understanding the company's strategy	2,23	1
K2-Defining the role of employees in achieving strategic goals	2,37	2
K3-Possibility of continuous monitoring of the progress of strategic activities	4,43	4
K4-Real impact of employees on the implementation of strategic goals	3,77	3
K5-Easy access to the necessary strategic assumptions	5,47	6
K6-Access to strategy-related training and courses	5,63	7
K7-Possibility to broaden knowledge of strategy at a distance	8,57	9
K8-Motivating and encouraging employees to exchange knowledge on strategy	7,87	8
K9-Access to expertise (not widely available on the Internet) necessary to carry out tasks in real time. Easily digestible message that does not require industry education	4,73	5

Source: Own elaboration based on conducted interviews.

In order to examine the consistency of the experts' opinions obtained, the Kendall's coefficient was calculated.

$$W = \frac{s}{s_{max} - mT} = \frac{\sum_{j=1}^n \left(R_j - \frac{m(n+1)}{2} \right)^2}{\frac{1}{12} m^2 (n^2 - n) - mT} = 0.687 \quad (1)$$

The value of the coefficient equal to 0.687 indicates moderate agreement between experts' opinions. Therefore, it can be considered that the opinions of experts were not random. Experts indicated that the most important factor is building employee awareness and helping them understand the company's strategy. This means that from the experts' point of view, understanding the strategy and building awareness is the most important factor supporting its implementation. The least important factor, on the other hand, is the possibility of expanding knowledge remotely, which paradoxically constitutes the essence of the main research trends in the literature on the subject.

5. Conclusions

The final ranking order is shown in Table 3, based on which, taking into account the respondents' perspective, the following conclusions can be drawn. Building employee awareness and thus helping them understand the company's strategy is the foremost attribute of e-learning. In terms of strategy implementation, this is of key importance, which is associated with the distribution of information that contains the message - the idea - the values carried by the strategy. This is the foundation for identifying with its guidelines. Next, the respondents point to other groups of factors:

- access to knowledge not easily accessible online (in real-time), necessary for task execution; shortening the time needed to search for information, including easily digestible messages that do not require industry-specific education, facilitating the ability to monitor progress,
- familiarity with roles in the implementation of individual tasks.

As mentioned in the previous subsection, paradoxically, the possibility of expanding knowledge and access to courses was placed at the bottom of the list despite its relation to building awareness seen as the basic attribute of e-learning's role in the strategy implementation process. This confirms the fact that respondents (consciously or not) seek e-learning more for its repository function, enabling free access to easily digestible specialist knowledge, or for its function of monitoring progress in work related to strategy implementation, than for becoming a source of training materials. On the other hand, the research results show that respondents who deal with this tool treat it by default as an instrument supporting the education process, mainly in supportive areas such as occupational health and safety, or, for example, a collection of instructions for using IT applications, etc. Thus, they see its functionalities primarily in the area of "pure" training. Industrial e-learning is a poorly recognizable and therefore arbitrarily interpreted construct, conceptually ungrounded, and subjectively defined. Since this applies to both the authors of publications, who, with their work, create the possibilities and functionalities of e-learning (see the publication trends in the "literature review" subsection), it cannot be different in the environment of practitioners who derive their knowledge from the researchers' environment. Hence, both in the literature and among respondents, the classical understanding dominates. Also understood as a process (e.g., according to the ISO nomenclature), e-learning is unrecognizable to respondents. Taking into account the utilitarian nature of the research problems (significant for the entity constituting the research area) but also their cognitive dimension, it can be considered that the research objective has been achieved. The specification of possibilities that e-learning brings in the strategy implementation process was determined, respondents' opinions were collected, and rankings were assigned to individual factors indicated by respondents during the interviews. As a general conclusion from the conducted research,

it is necessary to build awareness about e-learning itself, its possibilities, and applications, not so much in terms of training but as an essential repository of unique/unavailable online knowledge and as a supportive process throughout the entire stage of strategy implementation and realization.

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