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## **ABSORPTIVE CAPACITY OF SCHOOLS**

### **Abstract**

*This article presents the concept of absorptive capacity as the potential to identify, assimilate, recognize the value of external knowledge. The aim of this article is to present the results of expert interviews with principals of primary and secondary schools. The study was conducted in schools located in Silesia in 2011. It was noted that the absorptive capacity contributes to building a competitive advantage for schools.*

*Key words: absorptive capacity; dimension, factor, school*

### **1. Introduction**

Changes in the economy which were a result of the country's transition also contributed to the adoption of the September 1, 1999 educational reforms. The aim of these reforms was not only to create a new type of school, but to also implement new rules for financing public schools and establish a new system of supervising them. In addition, the Lisbon Strategy set the objective of member countries to improve the quality and effectiveness of education, facilitate universal access to education systems and open up education to the local environment.

According to the reforms in education, schools must not only fulfill the functions of teaching and educating, but also to ensure optimal conditions for the development of society, to shape young people's attitudes and skills that will enable the fulfillment of the tasks in the future of society. The school has become a local center of culture, lifelong learning and active citizenship. In line with the Lisbon Strategy, the school should build on innovation, value of foreign experience and business experience in the field of organization and management.

In other publications, it is assumed that each school is subject to market forces and thus is capable of self-discovery, understanding its problems, improving and learning from mistakes made as well as successes [Bednarska-Wnuk, 2010]. With knowledge and a learning imperative the organization

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becomes effective in the face of change [Rokita, 2003], acquires the ability to solve problems of survival under conditions of uncertainty [Krupski, Niemczyk, Stanczyk-Hugiet, 2009].

The implementation of public services, a drop in the birth rate, the response to social needs, a transparency in activity and performing of functions has led to schools needing to become competitive and possess skills that will contribute to the efficient use of resources, including: the ability to absorb externally generated knowledge [Stanczyk-Hugiet, 2007], as competition is lobbying for the skills and competencies [for: Czakon, 2007].

The purpose of this paper is to present the essence of absorptive capacity in regard to schools. The first part presents the essence of absorptive capacity. The second part presents the results of empirical studies on the absorptive capacity in schools.

## **2. Absorptive capacity**

Capacity is defined as the potential of action, „regardless of its praxeologic characteristics, and so the level of efficiency” [Czakon, 2007]. Ability occurs when an organization recognizes its capabilities and resources. An organization that has ability is one, with accumulated skills and resources, that can reach specific objectives in such a way that it distinguishes itself from the competition. It knows how to do something and is able to do it.

H. Cohen and D. A. Levinthal in *Absorptive capacity: A new perspective on learning and innovation* (1990) initiated an interest in research on the absorptive capacity of an organization. This work in the years 1980-2011 was cited in 31 publications. Since 1990 many scientific publications have been written on the subject. They examine the theory behind absorptive capacity, however there is no empirical research.

In recent years, some attempts have been made to redefine this concept towards competitive advantage [Grant, 1996], organizational learning [Dyer, Harbir], the response to the presence of knowledge in organizations [Lane, Koka, Pathak, 2006], the development of innovation in an organization [Jong, Freel, 2010] building a competitive advantage, innovation and knowledge management. The issue of absorptive capacity of an organization has also been addressed by Polish management theorists [Czakon, 2007].

The absorptive capacity of an organization was originally defined as the ability to identify, assimilate, recognize the value of external knowledge [Cohen, Levithal, 1990], and the ability to use knowledge found in the surrounding environment and utilized for commercial and economic purposes. It is also the ability to develop a set of organizational procedures

and processes that can help the organization acquire, learn, process and exploit knowledge in order to obtain dynamic organizational capacity and problem solving ability [Kim, 1998]. In defining knowledge, the transfer of knowledge and its importance, the process of learning in organizations, learning to interact, changes in the environment, the absorbance factor of an organization were all taken into account. It is one of the fundamental learning skills that enable you to identify knowledge and information outside the organization, their assimilation, internalization and usage for market purposes. It depends on basic knowledge (table 1).

**Table 1.** Definitions of absorptive capacity

Date	Author	Definitions	Perspective
1965	J. H. Adler	Absorptive capacity is the ability of an economy to utilize and absorb external information (or knowledge) and resources	Macroeconomic
1989	W. M. Cohen, D. A. Levinthal	Absorptive capacity is the ability to identify, assimilate, and exploit knowledge from the environment	Adjusted the concept to the organizational context
1990	W. M. Cohen, D. A. Levinthal	Absorptive capacity is the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to achieve commercial ends	Redefined absorptive capacity as representing a single-loop learning
1998	P. J. Lane, M. Lubatkin	Relative absorptive capacity is the ability of a firm to learn from another firm through a studentteacher pairing approach, called a learning dyad	Distinguished three dimensions of absorptive capacity: 1) the ability to recognize and value external knowledge; 2) the ability to assimilate new external knowledge; and 3) the ability to commercialize new external knowledge
1999	F. A. J. Van den Bosch	Absorptive capacity comprises evaluation, acquisition, utilization of new outside knowledge	Developed a more integrated framework of the co-evolution of a firm's pathdependent absorptive capacity and the knowledge environment
2002	S. A. Zahra, G. George	Absorptive capacity is a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge	Reconceptualized absorptive capacity as a dynamic capability of a firm, which consists of potential absorptive capacity (acquisition, assimilation) and realized absorptive capacity (transformation, exploitation)

Source: own work.: M. Easterby-Smith, M. A. Lyles, Handbook of organizational learning and knowledge management, Blackwell Publishing Ltd, Oxford 2003, pp. 278.

Lane and Lubatkin (1998) have developed the notion of relative absorptive capacity. They have reconceptualized the firm-level concept of absorptive capacity as a learning dyad-level structure, arguing that „the ability of a firm to learn from another firm is jointly determined by the relative characteristics of the two firms” [Lane and Lubatkin, 1998]. Van den Bosch et al., [1999] have developed a more integrated framework of the co-evolution of a firm’s path-dependent absorptive capacity and knowledge environment. They argue that Cohen and Levinthal’s implicate feedback loop is dependent on the environment in which a firm competes and on its success in coping with this environment. When the business environment changes, the firm will respond to this situation, and if its response does not work as expected, the firm will try to improve it. The ability to accept new units of outside knowledge depends on the level of knowledge held by the organization. However, this is not sufficient. Absorptive capacity is closely linked to management structures and systems of social relationships. Apart from basic knowledge, there is a need to develop organizational units referred to as a combination of possibilities, integration of stakeholders in the processes of organizational learning, which will enable the organization to use the basic and the ‘new’ knowledge [Kogut, Zander, 1992].

### **3. The Determinants of Absorptive Capacity**

Absorptive capacity is non-material and is not directly observable, so it is difficult to measure. It is not constant, so you can influence it. However, it may be identified by factors that affect her. A study carried out by Lane et al. [2002] concludes that the determinants of a firm’s absorptive capacity have only been scarcely examined. Of these few studies, Daghfous [2004] has provided an overview of the determinants of absorptive capacity which have mainly been derived from the work of Cohen and Levinthal [1990]. The determinants of absorptive capacity (table 2) can be broadly categorized into two groups: internal and external factors. Internal factors include the prior knowledge base, the level of education, the presence of gatekeepers, and investments in R&D. External factors contain the interaction with other firms.

**Table 2.** External and internal determinants of absorptive capacity

Determinants	Autor
<b>Internal</b>	
Prior related knowledge	Cohen, Levinthal [1990]; Nonaka, Takeuchi [1995]; Waalkens [2006]
Level of education	Rothwell, Dodgson [1991]; Vinding [2000]
Gatekeepers	Vinding [2000]; Gradwell [2003]
Firm's size and age	Sorensen, Stuart [2000]; Liao et al. [2003]; Avermaete et al. [2003]; Lee, Sung [2005]
Investments in R&D	Cohen, Levinthal [1990]; Veuglers [1997]; Vinding [2000]
Organizational structure	Kogut, Zander [1992]; Van den Bosch et al. [1999]
<b>External</b>	
Interaction	Ghoshal, Bartlett [1988]; Levinson, Asahi [1995]; Steensma [1996]

Source: own work: A. Daghfous, *Absorptive Capacity and the Implementation of Knowledge-Intensive Best Practices*, SAM Advanced Management Journal 2004, nr 69, s. 21-27.

Cohen and Levinthal consider the level of prior related knowledge as the determinant of a firm's absorptive capacity [Cohen and Levinthal, 1990]. According to Kim [1998], a prior knowledge base is the sum of all individual units of knowledge within an organization. Prior related knowledge has a positive effect on a firm's absorptive capacity because it determines the level of a firm's ability to perform three principal activities: to acknowledge the value of the new knowledge, to assimilate it, and to apply it for commercial ends [Cohen and Levinthal, 1990].

According to Vinding [2000], the employees' level of education is another determinant of absorptive capacity. The more education and training individuals have received, the higher their ability to assimilate and use new knowledge. As a firm's absorptive capacity depends on that of its organizational members, the level of education and training of these individuals has a positive influence on the level of the absorptive capacity of this organization [Schmidt, 2005].

The presence of so called 'gatekeepers' plays an important role in determining absorptive capacity [Daghfous, 2004]. Vinding [2000] states that the gatekeeper, whose role it is to create a language that can be understood by all different departments and parties involved, can improve a firm's absorptive capacity through knowledge sharing.

Daghfous [2004] claims that size can affect a firm's absorptive capacity. Larger firms with sufficient R&D resources are likely to be more innovative than smaller firms, which in most cases have only limited R&D capacities. This situation suggests that a firm's innovativeness (the outcome of absorptive

capacity) and its size are positively correlated. In their study of high-tech firms, Lee and Sung [2005] indicate that size as measured by the number of employees, is significantly related to R&D activities, which are often used as an indicator to measure a firm's absorptive capacity [Cohen and Levinthal, 1990]. A study by Liao et al., [2003] however, suggests that compared to large organizations, smaller firms are better capable of responding to changes and introducing innovations, because these organizations have less bureaucracy and their business culture is less hierarchical.

In studying absorptive capacity Cohen and Levinthal [1989] mainly focus on the role of R&D expenditures. They also point to the dual role of R&D in the innovation process of firms: realizing absorptive capacity and generating new knowledge and innovations. Many authors use R&D to model absorptive capacity at the firm level. Daghfous [2004] argues that investments in R&D have repeatedly been found to play a critical role in the improvement of the skills of the employees. The relationship between R&D spending and absorptive capacity seems to be bi-directional [Daghfous, 2004]: absorptive capacity influences the direction and intensity of R&D [Vinding, 2000], while the R&D investments in turn affect the efficiency of absorptive capacity [Daghfous, 2004]. It has also been argued that the absorptive capacity of a firm is determined by its expertise in stimulating and organizing knowledge sharing (Van den Bosch et al., 1999).

Daghfous [2004] states that a firm's organizational structure and its cross-functional communication can improve its absorptive capacity [Van den Bosch et al., 1999; Lane and Lubatkin, 1998]. Furthermore, in order to improve absorptive capacity, the organizational structure should be flat, flexible, adaptable, dynamic, and participative [Daghfous, 2004]. In addition, Gradwell [2003] points to the strong positive influence of close networks and relationships within firms on the transfer of tacit knowledge.

Initially, the question of the impact of environment on the organization was ignored by research [Lenart, 2011]. Thus, researchers believed that the organization does not have to interact with the outside. With time, the organization was defined as a system strongly determined by their surroundings. However, an organization is defined by the element of a given system, so it interacts with other elements. Researchers indicate that interactions with the outside is known as the 'outer cognitive economy' [Nooteboom, 1992], relationships with other members of the network of knowledge [Caloghirou, Kastelly, Tsakanikas, 2004] are one of the main factors that influence and stimulate the development of new products, organizational processes, the absorptive capacity of the organization, and in particular the ability to recognize the value of new knowledge and its reception.

#### **4. Absorptive capacity – empirical findings**

The aim of this study was to answer the impending question: what factors influence the absorptive capacity of schools. The object of the study were public and private schools. According to art. 2 of the Act on the Education System of 7 September 1991 (Journal of Laws of 2004 No 256, pos. In 2572, as amended.) the education system includes schools: primary, lower secondary and upper secondary. According to the definition adopted by the Central Statistical Office, a school is an educational unit established on the basis of the memorandum or entry in the records - by the government, local authority, legal or natural person under the provisions of the education system Act.

Selection of the education sector as a research facility is not accidental. Polish schools operate under the provisions of the Act and the Education System of 7 September 1991 on the education system (Unit text of Acts. Laws of 1996 No. 67, item. 329 as amended.) And the regulations issued thereunder. There are certain tasks and objectives of schools: Allowing students to gain knowledge and skills necessary to obtain a graduation certificate enables them to make informed choices for further education or choose a direction for their future profession as well as shape the educational environment conducive to realizing the objectives and principles set out in the Act, according to the terms schools and age groups. The choice of education as a field of research was supported by the fact that it has been honored by the World Bank as one of the pillars of economic development and potential indicators of the knowledge economy. Thus, investing in education contributes to output growth, interest of foreign investors, technology development, economic growth, human capital training in preparation for working life, and thereby contributes to economic wealth, social welfare and political stability. Schools in the environment are seen as serving organizations, internally bureaucratic, inefficient and very varied externally, and providing public services [Ansoff, 1985].

OECD studies show that knowledge in education is heterogeneous in nature - which means decreasing the ability of this sector to generate knowledge. The education sector is spending too little money on R & D. It has a very low awareness of the idea of knowledge management and rather pursues the idea rather minimally. Cooperation of specialists from various fields was also assessed to be at a low level. Interaction between novices and experts mostly runs to a small degree and very little cooperation is undertaken within the network. Cooperation with extensive exterior networks has not been developing and very little has evolved in terms of collaboration between public and private sectors. The relationship between the schools is judged to be weak and there is little use of modern telecommunications technology in the transmission of knowledge.



As well the mediation process and implementation of new knowledge lags at a slow pace. In addition, the OECD points to the low efficiency and performance of education systems [Education at Glance 2010].

For the study, the author concluded that knowledge of external and internal factors affecting the absorptive capacity contributes to; the ability to take decisions concerning the diagnosis, assessment, assimilation and acquisition of new knowledge, as well as the ability to gain difficult to imitate by competitors knowledge that is essential for creating a competitive advantage, the ability to respond to signals emerging from the environment and the needs of stakeholders and satisfying their needs at the highest level. In order to verify factors of absorptive capacity - in late August and September 2011, an empirical pilot study in schools in the province of Silesia was conducted. The research was exploratory in nature and is the basis for model verification research and access to further research on the issues of absorptive capacity in schools. The objectives of research and the need for the assembly of value of empirical material revealed a range of qualitative methods (expert interviews). The decision to choose the methods and techniques was dictated by the objective of the study and the need for expert review of the literature mentioned factors, the absorptive capacity.

The author wanted to explore the theme of which was not subjected to detailed examination. The research project carried out requires the use of a diverse research lab. For this purpose, in-depth interviews will be done. Using qualitative methods can provide us with a "deeper" understanding of social organization from a perspective of their actors [Silverman, 2009]. The selection of subjects for the interviews was done at random. This meant that each subject was given a number and the numbers were then read out in a fixed sequence as they were selected randomly from a table. The range of choicee included schools from the province of Silesia, while the list was constructed based on data contained in a public educational information system.

Due to the size of the population, the purpose and scope of the research project, it is necessary to separate it into separate parts. The research will be conducted in the province of Silesia. The number of students and schools are some of the factors that affect the validity of research in this region. The main indicator of demonstrating the current status of education in the region is the number of students in the type of educational establishment. Primary schools consist of 8.98%, middle schools 10%, and secondary schools 11.64% of all schools of this type in Poland. Figures concerning number of students passing external examinations are as follows (2011 data): professional examinations in technical schools: 61.64% (national average 62.9%), vocational school exams: 72.66% (national average 80.80%), secondary school exams: 91.35% (national average 62.90%), Matura (Matricular) exam: 76% (75% national average).



The importance and relevance for research in the province of Silesia is part of the adopted „Strategy for the Development of the Silesian Province ŚLĄSK 2020", which aims for a high level of education and skills for its citizens by taking action to improve the quality of education. In the context of this strategy its worth noting emphasizing that they intend to adapt school facilities to the dynamic changes occurring in the environment and socio-economic situation. These elements and the important role Silesia plays on the educational map of Poland underlines the importance of carrying out research in this region. The experts in interviews conducted were the directors of primary, middle and secondary schools. A total of ten interviews were done with school principals, who represented these organizations: primary school, middle school, secondary school.

The changes in the education system have also affected the change in the role of the school. Many authors point to a change in the concept, which involves treating the school as an administrator for the school-manager [Fazlagić, 2009; Law, Glover, 2003; Elsner, 2005]. This approach is also presented in the Regulation of the Minister of National Education of 27 October 2009 on the requirements, which should correspond to the person holding the position of Director and other executive positions in various types of public schools and the types of public institutions (Journal of Laws No. 184, item . 1436). Under the regulation, the school principal may be a person who is a teacher and does not have any professional training. However, he must possess a degree in management, ie college, university or graduate degree in management or qualification course in management education. On the other hand, the required five years of teaching as a teacher can be considered interchangeable with five years of service, including at least two years of work experience in a management position (§ 5.1., Pts. 3).

On behalf of the Ministry of Education Education Development Centre (public-service teacher training facility run by the Ministry of Education) conducted in the period from February 2011 to July 2011, a study under the project „Improving education management strategies at the regional and local level". One of the recommendations of the study is the building of a new education system for school heads such that the principal takes on the role of public manager: „Noteworthy is the lack of prior experience by persons taking on the position of principal. Construction of a new system of training and development based on experience, for example, management studies, would better prepare the person making key decisions for the school" [The report The Situation and the professional status of schools and educational institutions, 2011, p 25].

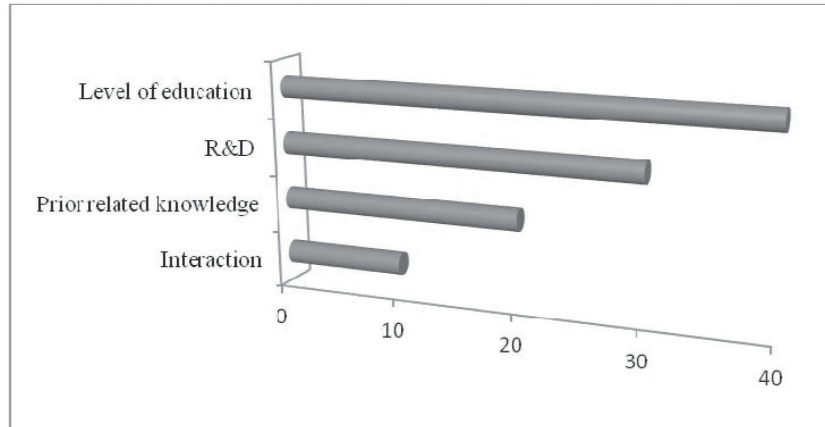
Literature indicates that it depends on the public manager's efficient and effective management of the organization at a high level [Sheepskin,

2005]. Thus, a change in the role of school management refers to contemporary challenges and means the need to adapt and increase the quality of education at schools. There are changes in the role of school heads as there is a need to implement management functions. Literature indicates that it is the management team that contributes to the absorptive capacity of the organization by making decisions on investment in R & D and linking external sources of knowledge [Cockburn, Henderson 1998], and also in providing information [Lenox and King, 2004 ]. Management also affects the process connected with knowledge [Van den Bosch et al., 2003]. Directors / managers can enhance the organization the importance of learning and are helpful in absorbing new technologies and practices [Cohen, Levinthal, 1990].

Individual interviews were conducted according to a previously prepared scenario containing a total of five open-ended questions. The way of formulating the questions in each case was matched to the type of the enterprise concerned, and moderated in the course of that conversation with the respondent. Each interview lasted 45-90 minutes, and its behavior was recorded using a digital voice recorder. All collected material was subjected to empirical scrutiny. A transcript was prepared, and obtained qualitative data analyzed using NVIVO 9th Respondents answered questions concerning: associations related to the absorptive capacity of knowledge, learning styles, schools, communication with third parties, factors affecting the absorptive capacity and were asked to identify barriers to the acquisition of knowledge.

School administrators asked for associations connected with the concept of absorptive capacity on the identified most often: finding new solutions (60%), exchange of experience (20%), absorptive (10%), adapt to new realities (4%), the integration of new knowledge to the school (2%), triggering creativity in students and employees (1%), development of school (1%), schools adapt to new demands of the environment (1%), easy flow of information (1%).

Another question concerned the definition of absorptive capacity. For more than half of school principals, the absorptive capacity of knowledge is the potential and willingness to acquire and apply new knowledge in practice, the adoption of knowledge from various sources, the sharing of knowledge. However, it should be noted that in the group a third of the study population defined absorptive capacity as the creation of conditions for acquiring knowledge. Very few respondents (2%) indicated an openness to new knowledge. In the next stage school principals were asked to identify ways of learning in school. Figure 1 presents the most frequently mentioned factors absorptive capacity.



**Figure 1.** Internal and external determinants of absorptive capacity [Source: own work].

School principals pointed to: skills and qualifications (40%), education projects (30%), the knowledge possessed by a school (20%), cooperation with the environment (10%). Only one school principal also pointed to the size of the school as an important factor in capacity. In his opinion, a large facility can not cope with the acquisition of knowledge.

It is worth noting that the lack of funds was, in addition to legal and organizational changes and resistance to acquiring external knowledge, cited as one of the major barriers to the absorptive of knowledge. In addition, school facility managers pointed to the lack of procedures for acquiring knowledge (30%), poor infrastructure (20%). One of the respondents stated that the acquisition of external knowledge is not useful in an educational establishment. Limited financial resources to a large extent limit the development of knowledge. The difficulty in obtaining financial resources, complicated procedures for submitting grant applications cause reluctance school principals to enter into the procedure of raising funds. In addition, the duration of waiting for results, and high turnover of teaching staff contribute to this reluctance.

## 5. Conclusions

Absorptive capacity contributes to the learning organization, its innovation, maintaining a competitive advantage in the market, follow the latest trends, absorptive of new technologies, as well as the speed of adaptation to change, generate economic value, and facilitates strategic decision-making. This is important if you need to locate the school in terms of competition and the declining birth rate.

Although the survey was a pilot, and his aim was to verify the factors affecting the absorptive capacity - it helped to understand the determinants of absorptive capacity. It is therefore necessary to conduct further research to explain and identifiable external and internal factors of absorptive capacity, and further provide school managers with the knowledge of external and internal factors and the development of absorptive capacity for decision-makers, authorities conducting and supervising school guidance on absorptive capacity.

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