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## **Relationship between individual and organizational learning: Mediating role of team learning**

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### **Abstract**

The aim of this paper is to recognize the relationships between individual and organizational learning while considering team learning as a mediator of these relationships. The research object is a large Polish enterprise specializing in the production of cast-iron items. In order to test assumed research hypotheses, statistical analyses were conducted using the IBM SPSS Statistics Suite, version 20. The suite helped conduct correlation analyses concatenation, line regression analyses and mediation analyses using the PROCESS macro by Hayes and Preacher. The research results show a statistically significant relationship between individual learning and each of the five dimensions of organizational learning [clarity of purpose and mission; leadership commitment and empowerment; knowledge transfer; experimentation and rewards; and teamwork and group problem solving]. What is more, they prove that team learning is a mediator of a relationship between individual and organizational learning. Interestingly, only one full mediation has been observed while researching the mediative effect of team learning in relation to each out of the five dimensions of organizational learning. It occurred in relation to experimentation and rewards. In the remaining cases these were partial mediations.

**Keywords:** organizational learning, team learning, individual learning.

**JEL Classification:** D83, O34.

### **Introduction**

Organizational learning is still a widely researched area in the field of management. For many years the issue of organizational learning has been a major

point of interest for researchers who have been searching for sources of competitive advantage [Argyris & Schön 1978; Lipshitz, Friedman & Popper 2007; Tam & Gray 2016]. Despite a wide variety of both theoretical and experimental research papers. The aforementioned subject matter is still popular.

In the context of global economical crisis, development of new competencies and abilities takes on a distinctive meaning. This fact makes it necessary to make learning a central goal of organizations [King (ed.) 2009; Travica 2013]. Nowadays, they operate in changeable and complex environments [Vecchiato 2015; Jyoti, Utpal & Debasis 2015]. For that reason, constant learning is becoming their main driving force in acquiring adaptational skills and gaining flexibility [Haynie & Shepherd 2009; Hatch & Dyer 2004]. Organizational learning is a means to facilitate adaptability towards constant changes [Rijal 2010]. It helps organizations survive and compete successfully [Gutiérrez, Bustinza & Barrales 2012]. It is one of the most important sources of competitive advantage [Manuj, Omar & Yazdanparast 2013].

Some researchers agree that organizational learning links its three distinctive levels: individual, team and organizational one [Aragón, Jiménez & Valle 2014]. Each of those levels can be improved independently by means of various learning mechanisms [Senaratne & Malewana 2011]. In spite of this, there are specific kinds of relationships that connect these levels. Theoretical [Crossan, Lane & White 1999] as well as empirical [Murray & Moses 2005] attempts are made to define these relationships. Some serious attempts at combining individual, team and organizational learning are noticeable, [Senaratne & Malewana 2011; Chadwick & Raver 2015] despite qualitative and quantitative research relating to mutual relationships among those variables varies in terms of presentable results [e.g. Nonaka & Takeuchi 1995; Chan 2003; Yang et al. 2004; Senaratne & Malewana 2011; Taniyaovalaksna & Li 2013]. Thus, there is strong need to look further into the relationships among individual, team and organizational learning.

Research activity within the subject has contributed greatly to strategic management literature. In spite of that a research gap is noticeable in the sense that the mediating role was attributed to team learning. Considering relationships between individual and team learning with the use of mediative effects is the first and foremost research initiative in this field. It contributes to knowledge complementation within the range of overall learning of organizations.

Considering this, the analysis of relationships between individual and organizational learning levels will be carried out in the conditions of outcome variable occurrence of the assumed relationship, that is of learning at the team level. Thus, the aim of this research paper is the identification of the correlation be-

tween individual and organizational learning with team learning as a mediator of the aforementioned relationship. Researching this relationship will make it possible to understand the process of overall organizational learning better.

This paper has been divided into several sections. The first section focuses on the introduction followed by a individual, team and organizational learning literature review. The further part of the paper presents research methodology, results as well as a discussion and conclusions.

## **1. Literature overview**

### **1.1. Individual and organizational learning**

The thread of organizational learning has been present in scientific research since the 1960s and 1970s. Articles describing it started to be published at the beginning of the 1980s [Olejniczak 2012, p. 64]. The promulgation of this term should be connected with the publication of the book by Ch. Argyris and D.A. Schön [1978] entitled „Organizational learning: a theory of action perspective”. It was published in 1978 and is regarded as the basis of research on organizational learning.

The term “learning within an organization” appeared in the literature in the 1950s. The author described the way the environment influenced both group understanding and perception of problems occurring within an organization as well as organizational structure [Simon 1953]. “Learning within an organization” meant individuals learning in their working environment, whereas ”organizational learning” should be perceived as an entire organization learning. The true transfer from “learning within an organization” towards “organizational learning” took place in the 1960s and 1970s. The contributing authors were Cyert and March as well as Argyris and Schön. The first two authors formulated a general theory of organizational learning being the part of decision processes of companies [Cyert & March 1963]. Slightly later, Argyris and Schön [1978] using the metaphor of an organization as an organism, proposed a mechanism of learning at the level of an entire organization [Schön 1973].

In spite of dynamic development the concept of organizational learning has not been categorized within one cohesive definition and one cohesive conceptual system. Organizational learning can be defined as a process during which organizations change and modify their mental models, rules, processes and knowledge – maintaining and improving their efficiency [Beheshtifar, Mohammad-Rafiei & Nekoie-Moghadam 2012, p. 563]. The process is implemented on the basis of

learning at individual level as well as in order to adapt an organization to changeable conditions [Castaneda & Rios 2007, p. 363].

Thus, the basis of the comprehensive organizational learning is the individual level [von Zedtwitz 2002, p. 257]. Every organization is in need of the knowledge and expertise of its members in order to achieve success [Aslam et al. 2011, p. 738]. It is known that an organization itself does not produce knowledge: it is its individual members who undertake actions leading to the acquisition of this resource. An organization can only create conditions that facilitate learning. Because of this, the most important factor is the constant learning of an organization's individual members [Castaneda & Rios 2007, p. 363]. By extending their knowledge, workers accelerate processes of learning which result in the overall development of the organization. Individuals who do not learn and do not acquire new skills and abilities get worse results and over time can become a burden for an organization. In reality there is less chance of achieving success if workers do not acquire new knowledge.

According to Argyris and Schön [1996], individual learning takes place when new knowledge is acquired as a result of the transformation of existing experiences. Kim [1993] claims that individual learning happens through experiences and observations. On their basis, various concepts and mental models are formulated. Marsick and Watkins [2002, p. 135] identify individual learning, which is placed among cognitive processes, with the selective retention of experiences. Learning at an individual level is initiated by autonomous knowledge acquisition. It refers to every stage of an individual's professional life and involves the usage of various mechanisms. However, individual learning will not bring benefits for an organization if it is not changed into learning at an organizational level. Thus, individual learning is equally as important for an organization as it is for the workers themselves. It is the basis of learning at an organizational level [Yang 2009; Campbell & Armstrong 2013].

Organizations are not solely sets of individuals, but there are no organizations without such sets. Likewise, learning at an organizational level is not solely the sum of individual learning of individual workers. Nevertheless organizations are able to learn only through the experiences and actions of their workers. In other words, organizations can learn regardless of a specific individual, but not regardless of all their members [Kim 1998, pp. 41, 47, 52]. Such a regularity was noticed as early as 1984 by Daft and Weick [1984 in: Kim 1993, pp. 42-43]. In later research it was confirmed often enough that learning at an individual level is the key to understanding learning at an organizational level which, in consequence, meant acknowledging this relationship as commonly predominant. For example Murray and Moses [2005, p. 1189] underlined that the better the skills

of the workers, the higher engagement and more developed anticipation and phenomena interpretation abilities are, the more significant their contribution to improvement of a learning process is at the level of an entire organization above all. McShane and von Glinow [2010, p. 87] proved that organizational learning is strongly dependant on individual learning. In connection to the above it was acknowledged that individual learning is positively related to organizational learning. It is the basic assumption of this research and a starting point for further considerations. Hence:

*H1: There is a positive relationship between individual and organizational learning.*

For the purpose of this research it is acknowledged, after Goh and Richards [1997], organizational learning will be described with the following variables: clarity of purpose and mission; leadership commitment and empowerment, knowledge transfer, experimentation and rewards, teamwork and group problem-solving. It is expected that individual learning will be positively related to each of the five dimensions of organizational learning.

## 1.2. Team learning as a mediative variable

Identification of relationships between individual and organizational learning does not exhaust the scope of research in the field of a comprehensive organizational learning. More complex conceptualization of relationships between these variables is reflected in a variable mediating the assumed relation. Mediation takes place if the influence of an independent variable on a dependent variable takes place via a third variable [Cohen et al. 2003, pp. 158-161]. It is called a mediative variable and pertains to cause and effect mechanisms [Baron & Kenny 1986]. From an individual learning point of view, a mediator is understood to be the cause whereas from an organization learning perspective it is an effect. Thus, introducing assumed relations into a model of a mediative variable will be an added value in relation to the considerations which have been discussed as far as comprehensive learning of an organization is concerned.

Probst and Büchel [1994] noticed that individual learning is limited to individual experiences, individual ways of thinking, problem solving ability, interests or motives. However, organizational learning is based on group decisions, sharing experiences and creating collective reality. It is focused on adapting to the needs of an organization and its members. [Probst & Büchel 1994, pp. 18-20]. The assumptions are still a topic of study among contemporary researchers [e.g. Chadwick & Raver 2015]. The question is why such regularity occurs: In other words, what kind of variable is a mediator for a given relation.

According to some authors, the bridge connecting individual and organizational learning can be team learning [Chan 2003; Murray & Moses 2005; Aslam et al. 2011; Murray & Millett 2011]. In their opinion it can enhance organizational learning if individual members are able to share their knowledge and take part in discussions concerning their views during group meetings. According to Probst and Büchel [1994, pp. 21-22], who are cited by the above-mentioned researchers on the matter, team learning could be a bridge between individual and organizational learning, if the following conditions are fulfilled. Communication is the first of them. It means that individual workers should effectively share their knowledge with the rest of their team members. Secondly, acquired knowledge should be transparent to all interested parties. It creates an opportunity of sharing opinion openly. The third condition is connected with integration, and refers to consolidation processes of the higher-level group, that is, at an organizational level. In this context integration is based on communication among teams in order for the organizational learning processes to be put into practice.

Team learning should be perceived as the engagement of team members in the monitoring of aims achieved from the perspective of fulfilling fixed aims, gaining new information, creating new possibilities [Edmondson 1996, p. 164]. It also means involving its individual members in the process of the skill development of an entire team and adjusting it to the needs resulting from set goals [Senge 1990, pp. 236-237].

Members of an organization acquire knowledge individually, the effects of which are the individual experiences, individual skills, notes or memory of an individual. At a team level learning takes place through information distribution and its interpretation. It results in reports, products, specific experiences of a team, technologies and told stories. At the third level, knowledge is stored within organizational memory. Databases, procedures, processes and key competencies are created at those times [von Zedtwitz 2002, p. 257]. Organizational memory comes down to gathering knowledge and its further transferring or spreading. Supported by new technologies it offers its workers access to organizational resources of knowledge. However, relying solely on the „soft” form of organizational memory (referring to the minds of the workers) is not safe: the risk is connected with the imperfection of human memory. Additionally, there is always the danger of a worker leaving an organization by a worker who remains in possession of valuable knowledge resources. In circumstances like these the “hard” organizational memory seems to be more reliable. It applies to the creation of knowledge gathering systems, and that knowledge is acquired during certain actions taken up by the workers, their results, by acquired experiences or changes in functioning of an organization. Thus, organizational memory created

at the organizational learning level supports learning processes, using somebody else's experiences [Argote 2015]. That is why one of the factors conditioning organizational learning is information diffusion within an organization, which is given attention by Aslam et al. [2011, p. 741-743] in their theoretical considerations. In this context it was assumed that team learning plays a key role in distribution, processing and interpretation of individual experiences towards organizational memory.

Chan [2003] took up a challenge to explain the directions and relation forces between individual, team and organizational learning. The research carried out in an Australian hospital showed a strong and statistically important relationship between team and organizational learning as well as slightly weaker, but still statistically significant relationship between individual and team learning. Remarkably, the hypothesis concerning the relationship between learning at an organizational and individual levels was rejected. It turned out that within the examined organization individual learning was not a significant predictor of organizational learning. In the presented case team learning was not attributed to the role of a relationship mediator between individual and organizational learning and such analyses were not carried out. According to the classical approach of Baron and Kenny [1986], concerning mediative relationship testing, the relationship between independent and dependant variables versus the relation of these two variables after the mediator is introduced into the model. In the case mentioned above, such a comparison could not have taken place because of the lack of relations between an individual and organizational learning. An alternative calculation can be taken into account proposed by Cohen and Cohen [1983], which serves as a peculiar kind of expansion of the former approach with additional mediation significance tests. It is based on relations ratio values between an independent variable (in this case it is individual learning) and a mediator (team learning) versus a mediator and a dependent variable (organizational learning). Chan's results are evidence of existing relationships between these variables, however, no mediatory significance tests have been carried out (e.g. Sobel test, Aroian test, Goodman test, the bootstrap method) which could uniformly support or reject the hypothesis that team learning is a relationship mediator between individual and organizational learning. The ensuing state of things encourages further research to test such a hypothesis. It is all the more important that in previous empirical considerations the question of teams functioning as individual and organizational learning integration mechanisms have not been paid much attention. The majority of this type of research has been proposed in purely theoretical works.

In their theoretical considerations Murray and Moses [2005] strived toward a better understanding of role of team learning concerning comprehensive learning organization. They came up with the assumption that an individual broadens their knowledge during so called individual learning cycle, with the use of which develops their interpretational and intuitive skills. However, high levels of individual learning, the evidence of which are the acquired interpretational and intuitive skills, facilitates team learning. They focused on teams presenting those skills as „mechanisms” that improve and develop the integrational skills of their members. They assumed as well that individual and organizational learning depended on the effectiveness of the team. Attention is drawn to the fact that this model does not apply to all teams functioning within an organisation , but rather solely to dynamic team learning, that is, the teams in which a basic member choice criterion is an individual's ability to learn. They occur in organizations that learn, whereas in traditional organizations people are picked on the basis of their knowledge and expertise. Individuals being members of dynamic learning teams gather together in order to achieve certain organizational goals in autonomical, self-regulatory or semi-autonomical ways. Their aim is to achieve or exceed team goals as well as organizational requirements. Thus, the question is whether team learning can serve as a bridge between individual and organizational learning in traditional organizations as well (in which not the ability to learn but acquired knowledge and expertise are decisive factors concerning team membership). Based on the aforementioned:

*H2: Team learning is a mediator of relationship between individual and organizational learning.*

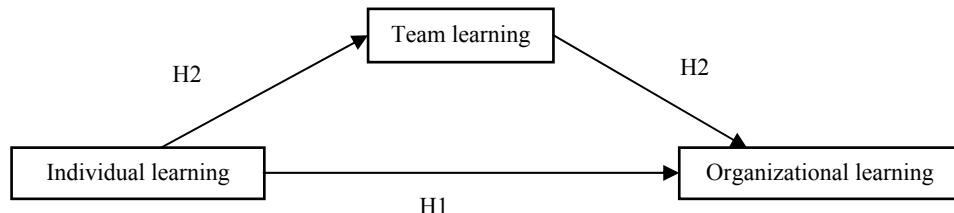
Organizational learning is described through five previously mentioned dimensions (the clarity of purpose and mission, leadership commitment and empowerment, knowledge transfer, experimentation and rewards, and teamwork and group problem solving). In relation to this team learning is expected to be a variable mediating the relationship among individual learning and each of the five dimensions of organizational learning.

## **2. Theoretical model**

The existing literature discussed above does not include arguments strong enough to state that one can improve organizational learning with the use of mediative effect through individual learning. The scarcity of empirical research results suggests that additional researching is needed to create and support ex-

planations. That is why the main research aim is to understand and explain the relationship between individual and organizational learning when a variable mediating the assumed relations occurs, that is, team learning (Figure 1).

**Figure 1.** A model describing the main aim of the paper



### 3. Method and data

For the purpose of this study, three categories of variables have been identified. The first of them serves as a variable dependent upon the other one. A dependent variable (explained) is the one that will be being explained. It is dependent on the other variable and undergoes changes within a circumscribed phenomenon or process. In contrast, the variable which determines the value of a dependent variable or affects the latter is named independent variable (explaining). It is the reason for certain changes of the values of a dependent variable or is considered related to a dependent variable [Frankfort-Nachmias, Nachmias & DeWaard 2001]. In the project the dependent variable is organizational learning, defined by the following dimensions: clarity of purpose and mission, leadership commitment and empowerment, transfer of knowledge, experimentation and rewards, and teamwork and group problem solving. An independent variable is individual learning. The relationship between these variables is examined in the context of mediative effect. Thus, the concept model has been enriched with a variable mediating between individual and organizational learning which is team learning.

In order to achieve the main goal, the research object was carefully selected. The research object is a large Polish enterprise with the head office in Świętokrzyskie Region, specializing in the production of cast-iron items. It was established in 1948 as a result of the merger of three grey iron-cast metalworks. It was commercialised in 1998. Its products are sold both nationwide and abroad. It is mainly focused on industrial and large-scale production. In the last few years it implemented a number of process and product innovations, for which it was awarded many times. The examined enterprise has been the biggest

production facility in the municipal area in which it is located, and is one of the biggest grey cast-iron foundry in Poland. It employs 270 employees, constantly taking care of their development.

The research was carried out between August and September 2015. In order to measure the relationship among individual, team and organizational learning the questionnaire was used on the basis of one used by Chan [2003]. He measured individual learning using the research instrument designed by Sujan, Weitz and Kumar [1994]. The authors adjusted the questionnaire to their purposes, with the questionnaire designed by Ames and Archer [1988]; the questionnaire was originally used to measure student learning. Team learning was measured by Chan using Learning Survey Team, the research instrument designed by Edmondson [1996], whereas in order to measure organizational learning he used Organizational Learning Survey by Goh and Richards [1997]. The research used the seven-point Likert scale starting from (1) meaning “definitely NOT” down to (7) “definitely YES”. In the survey all the company’s employees were included. After rejecting the questionnaires that were falsely filled in, the data were gathered from 143 respondents (demographic characteristics of the sample are shown in Table 1).

**Table 1.** Sample demographics

		Frequency	%
Gender	Female	36	25.2
	Male	107	74.8
Age	Less than 30	30	21.0
	30-39	31	21.7
	40-49	59	41.2
	50-59	17	11.9
	60 or more	6	4.2
Education	University studies	27	18.9
	Secondary education	65	45.4
	Vocational education	35	24.5
	Primary education	16	11.2
Job function	White collar worker (managerial)	16	11.2
	White collar worker (non-managerial)	45	31.5
	Manual worker	82	57.3
Employment length (in years)	Less than 1	11	7.7
	2-3	23	16.1
	4-5	45	31.5
	6 or more	64	44.7

Note:

N = 143.

In order to test assumed research hypotheses, statistical analyses were conducted using the IBM SPSS Statistics Suite, version 20. The suite helped conduct the analysis of the basic kinds of descriptive statistics including Kolmogorov-Smirnov test which measures the normalcy of distribution of the variables

being measured, correlation analyses concatenation, line regression analyses and mediation analyses using the PROCESS macro by Hayes and Preacher [2014].

## 4. Results

### 4.1. The basic kinds of descriptive statistics and normalcy of dispersion

At the beginning, the basic kinds of descriptive statistics were calculated including Kolmogorov-Smirnov test (K-S). It was used to measure the normalcy of dispersion of all variables to be measured on the quantitative scale; the variable were significant from the viewpoint of the research aim achievement. On the basis of the K-S test it was stated that each measured variable (apart from teamwork and group problem-solving) has a distribution compatible with Gauss curve. In addition, the value of skewness confirmed that distribution of each of the variables are relatively symmetrical in relation to the average (Table 2).

**Table 2.** Descriptive statistics and Kolmogorov-Smirnov test

	M	Me	SD	Sk.	Kurt.	Min.	Max.	K-S	p
Individual learning	3.51	3.50	0.78	0.01	-0.32	1.88	5.57	0.57	0.904
Team learning	3.58	3.60	0.70	0.16	0.04	2.00	5.70	0.82	0.506
Organizational learning (overall result*)	3.65	3.62	0.71	0.25	0.12	1.81	5.57	0.88	0.417
Clarity of purpose and mission	3.62	3.50	0.89	0.13	-0.21	1.50	6.25	0.74	0.649
Leadership commitment and empowerment	3.68	3.60	0.84	0.25	0.33	1.60	6.20	1.16	0.138
Experimentation and rewards	3.68	3.60	0.86	0.19	0.35	1.40	6.00	1.14	0.152
Knowledge transfer	3.66	3.50	0.95	0.13	-0.14	1.50	6.25	1.03	0.235
Teamwork and group problem solving	3.58	3.33	0.90	0.05	-0.46	1.33	5.67	1.51	0.021

\* „Overall result” means the organizational learning outcome presented collectively with the simultaneous occurrence of all the five dimensions.

Note:

M – mean; Me – median; SD – standard deviation; Sk. – skewness Kurt. – kurtosis; Min. and Max. – lowest and highest distribution value; K-S – Kolmogorov-Smirnov test result; p – significance.

Thus, only in the case of teamwork and teamwork and group problem solving did the K-S test result reach a statistical significance below the threshold of 0.05. Despite, the value of skewness is close to zero, which means that the distribution of this variable is very similar to normal distribution.

#### 4.2. Team learning as the relationship mediator between individual and organizational learning

Before mediative analysis was started, it was tested on: whether an independent variable is significantly statistically related to a dependent variable; whether it is also related to a mediator; whether it is related to a dependent variable. The values of Pearson's  $r$  coefficients presented in table 3 are evidence that each relation is statistically significant at least when  $p < 0.001$ , moderately or very strong and positive. The positive characteristics of these linear relations is evidence that along with the increase of one variable, the increase of another variable results can be observed.

**Table 3.** Correlation matrix

		Individual learning	Team learning	Organizational learning (overall result)	Clarity of purpose and mission	Leadership commitment and empowerment	Experimentation and rewards	Knowledge transfer
Team learning	Pearson's $r$	0.715						
	Statistical significance	<0.001						
Organizational learning (overall result)	Pearson's $r$	0.641	0.700					
	Statistical significance		<0.001	<0.001				
Clarity of purpose and mission	Pearson's $r$	0.600	0.660	0.723				
	Statistical significance	<0.001	<0.001	<0.001				
Leadership commitment and empowerment	Pearson's $r$	0.509	0.567	0.866	0.589			
	Statistical significance	<0.001	<0.001	<0.001	<0.001			
Experimentation and rewards	Pearson's $r$	0.478	0.551	0.843	0.450	0.687		
	Statistical significance	<0.001	<0.001	<0.001	<0.001	<0.001		
Knowledge transfer	Pearson's $r$	0.523	0.547	0.796	0.456	0.551	0.604	
	Statistical significance	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Teamwork and group problem solving	Pearson's $r$	0.421	0.425	0.704	0.359	0.539	0.499	0.526
	Statistical significance	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

\* –  $p < 0.05$ .

\*\* –  $p < 0.01$ .

\*\*\* –  $p < 0.001$ .

Mediation analysis was carried out as the next step. In accordance with previous assumptions, the independent variable was individual learning, whereas the

dependent variable was the overall result of organizational learning, but the mediator was team learning. Analysis carried out revealed the occurrence of partial mediation. Although still statistically important, the significance of the relationship between individual and organizational learning weakens substantially after the mediator in the form of team learning has been introduced to the model. Thus, it can be recognized that the mediative effect of team learning takes place and the variable is a statistically significant mediator of the relationship between individual and organizational learning in accordance with the assumption of Baron and Kenny [1986]. The mediation can be as well considered important in accordance with Cohen and Cohen's approach [1983], because the independent variable is statistically significantly related to the mediator, and it is, in turn, related to the dependent variable (while taking control of the independent variable). In turn, the outcome of the Aroian test shows that the point estimator of a mediative effect which is the product of not standardized B coefficient concerning the relationship between a mediator and an independent variable as well as of the same coefficient concerning the relationship between a mediator and a dependent variable is significantly statistically different from zero. Moreover, the *bootstrap* method proposed by Hayes and Preacher [2014] does not contain '0' in confidence interval. What is more, the lower limit of interval is relatively far from '0', which may be evidence that the observed mediatory effect merits further research (Table 4, Figure 2).

**Table 4.** Results of bootstrapping tests for mediating effect

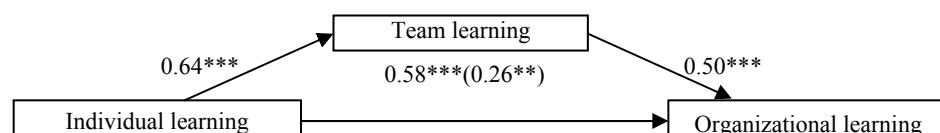
	Point estimator	SE	Z	95% CI with alteration for skewness	
				LL	UL
Mediative effect of team learning	0.319	0.06	5.31***	0.207	0.455

\* –  $p < 0.05$ .

\*\* –  $p < 0.01$ .

\*\*\* –  $p < 0.001$ .

**Figure 2.** Mediatory effect of team learning in a relationship between individual and organizational learning<sup>a</sup>



\* –  $p < 0.05$ .

\*\* –  $p < 0.01$ .

\*\*\* –  $p < 0.001$ .

<sup>a</sup> At each path unstandardized regression analysis co-efficients are shown (B). The hyphenated value is a co-efficient for an intermediate relationship between individual and organizational learning (with simultaneous control of team level).

Because organizational learning is described with five dimensions, five subsequent mediation analyses have been carried out. Each of the five learning factors at this level was consecutively a dependent variable. Concerning the fact that mediative effects turned out to be statistically significant at least at the level of  $p < 0.001$ , the exemplifying of the relationships along with the coefficients on five different figures was recognised unreasonable. Table 5 shows the point estimator of a mediative effect results in a collective way (the product of not standardized B coefficient for the path of independent variable – mediator as well as B coefficient for the path of mediator – dependent variable) along with the Z statistics coming from Aroian test and the lower and upper limit 95% confidence interval set down using the *bootstrap* method with alteration for skewness. It is worth mentioning that although the point estimator was not the biggest and the limits of confidence interval were not placed farthest away from “0”, the only total mediation can be observed within the limit dependent variable in the form of experimentation and rewards. Only in this case was the relationship between individual learning and experimenting plus rewards (which at the beginning was statistically significant at the level of  $p < 0.001$ ) ceased to be significant after the mediator had been introduced and achieved the value of  $p = 0.092$ .

**Table 5.** Results of bootstrapping tests for mediating effect

	Point estimator	SE	Z	95% CI with alteration for skewness	
				LL	UL
Mediative effect of team learning – individual learning and clarity of purpose and mission	0.386	0.08	4.85***	0.257	0.553
Mediative effect of team learning – individual learning and leadership commitment and empowerment	0.318	0.08	3.96***	0.168	0.500
Mediative effect of team learning – individual learning and experimentation and rewards	0.338	0.08	4.01***	0.184	0.538
Mediative effect of team learning – individual learning and knowledge transfer	0.308	0.09	3.40***	0.135	0.514
Mediative effect of team learning – individual learning and teamwork and group problem solving	0.208	0.09	2.28***	0.050	0.380

\* –  $p < 0.05$ .

\*\* –  $p < 0.01$ .

\*\*\* –  $p < 0.001$ .

## **Conclusions and discussion**

### **Contribution to theory and practice**

The aim of this analysis was to test the relationship between individual and organizational learning in the conditions where a meditative variable of an assumed relations was existent, that is team learning. Considering the relationships among the indicated variables with the use of mediation effect was the first research initiative in this sense. The research results turned out to be very interesting. Understanding the pattern of results can have significant implications for research and practice.

Individual learning is significantly and positively related to organizational learning. It means that individual knowledge intensification is followed by knowledge broadening at the organizational level. The acquired results confirmed the results of previous research conducted by Murray and Moses [2005], McShane and Glinov [2010] and Aslam et al. [2011]. However, Chan [2003], whose research instrument was used in this research, demonstrated the lack of relationships among individual learning and each of every five dimensions describing organizational learning. In the case analysed, an organization could not learn from individual workers. However, this research results prove the existence of such relationships. Interestingly, these relationships are very strong in case of clarity of purpose and mission, leadership commitment and knowledge transfer; they are moderately strong in relationship to the two remaining dimensions (experimentation and rewards; teamwork and group problem solving).

It means that new knowledge acquisition by individual employees is accompanied by the intensification of the following reactions of their superiors: firstly, the degree of involvement of the superiors increases considerably. They become more open to changes and are not afraid of new ideas. They aim at joint accomplishment of set goals. They engage employees in making vital decisions. They can accept criticism and give useful advice. Secondly, the superiors start to see the essence of the relationship between understanding of the aims of the company and the degree of their accomplishment. The superiors aim at gaining support and acceptance of the goals. They want their inferiors to fully understand the way the aims should be achieved. They pay particular attention to the values, which should be cherished by all employees. Thirdly, the degree of interest of the superiors in knowledge transfer increases considerably. They care for the employees to be able to discuss successful projects. They analyse the company's failures and make new and effective ways for the work performance to be accessible to all employees.

In the tested company individual learning shortens the time of organizational learning in other aspects as well. It is about experimenting and rewards as well as teamwork. In these two cases the influence of individual learning is slightly weaker, but still exists. The increase on the sense of experimenting and rewards means that: 1) it happens that the superiors persuade the inferiors to experiment in the workplace, to implement changes and new ideas; 2) sometimes the organization rewards innovative ideas. Whereas in case of teamwork and group problem solving, the situation is as follows. Occasionally informal teams are created in order to solve problems that emerge. Sometimes, superiors encourage employees to the joint problem solving before they are reported to the manager.

Another theoretical implication of the research is broadening knowledge concerning the relationship among individual, team and organizational learning. As stated above the research results are widely inconsistent. The analyses results presented in this research paper prove that team learning is a relationship mediator between individual and organizational learning. The high level of team learning (that is, active interpretation, processing and distribution of individual experiences towards organizational memory) significantly lowers the indirect relationship between individual learning and an overall result of organizational learning. In other words, an organization learns through teams. It means that the more the workers learn at an individual level, the more knowledge can be put under interpretation and processing in teams out of which it is then distributed towards an organizational level.

Organizational learning facilitates responding to changes that occur. It helps survive and compete efficiently in a dynamic environment. However, an organization does not produce knowledge itself. It needs an active individual. It is the individual members of an organization that learn, and in consequence generate this kind of resource category. Individual knowledge is interpreted and processed at the team level, and then is transferred towards an organizational level. Thus, an organization is only able to create conditions, which facilitate learning.

This research measured organizational learning by evaluating clarity of purpose and mission, leadership commitment and empowerment, transfer of knowledge, experimentation and rewards, teamwork and group problem solving. Because of that the overall result of mediative effect comprised of five mediation analyses. They revealed many interesting relationships. The strongest mediatory effect of team learning was shown by the individual learning and clarity of purpose and mission. It means that managers responsible for formulating purposes and missions acquire knowledge from individual workers via teams. Thus, one should assume that larger investment in knowledge from the side of the individual worker, and what follows, the development of their knowledge (inter-

preted and processed within teams), can contribute to clearer purposes and mission formulation as well as to increase the probability that they will be understood and widely accepted.

Slightly weaker but still relatively strong team learning mediative effects were observed among: a) individual learning versus experimentation and rewards, b) individual learning versus leadership commitment and empowerment, and c) individual learning versus knowledge transfer. Because of that one can assume that intensive learning at an individual level (verified within teams) can result in: a) organization encouraging its workers to searching for new ideas, implementing changes, experimenting and rewarding innovative ideas; b) management staff believing in learning as the key to success, its readiness towards coming changes and not being afraid of new ideas, readiness to giving feedback and engaging its workers in decision making process; c) an organization creating the possibilities to discuss successful enterprises and failures among other workers, aiming at eliminating barriers in knowledge sharing, appreciating respecting the advantages of learning of good practices from other organizations.

It is worth considering that the presence of a still statistically significant, although very weak team learning mediative effect was noticed between individual learning and organizational practice, which encourages in teamwork and group problem solving. It is also worth noting that in the case of team learning the respondents were asked about their learning practices during their teamwork and their engagement in acquiring information from individuals outside teams. In case of team work and group problem-solving (organizational level) it was tested whether an organization creates conditions and encourages in team working. Despite a coincidence in terminology there exists a distinctive substantive disparity between a mediative variable and one of the dimensions of a dependent variable. What is more, this kind of analysis result makes it necessary to do further research. It is difficult to assume whether a mediative effect takes place as a matter of fact, or there is not one at all.

A very interesting discovery is the only overall mediation observed in case of experimenting and rewards. After a mediator in the form of team learning was introduced into the model, the relationship between individual learning versus experimenting and rewards ceased to be statistically significant. Thus, this kind of relationship seems to be best suited to the company under research (in relation to the model in which the independent variable were as follows: clarity of purpose and mission, leadership commitment and empowerment, transfer of knowledge, teamwork and group problem solving).

On the basis of obtained results it is claimed that an organization is able to learn from its individual workers. It is evident because of a statistically significant, very strong relationship between an independent and dependent variable.

However, an organization learns from individual persons through teams. The evidence is the strength of the relationship between individual and organizational learning, which decreases greatly after a mediator in the form of team learning is introduced. As far as teams are concerned, they learn from individual workers. They interpret and process individual experiences and the knowledge acquired in such a way is transferred to the organizational level. The practical implication for those managers, who want to implement organizational learning, is encouraging the workers in broadening their knowledge as well as strengthening their ability to learn in teams.

Other practical implication of this research is providing the company's executive management staff with an idea of knowledge perception by using three levels: individual, team and organizational.

### **Limitations and future research**

The research results and formulated conclusions should be interpreted, after the following constraints are taken into consideration. The first constraint is related to the sample, which was limited to the examined company. Because of the model complexity and hypotheses verification, examination of other companies specializing in cast-iron item production in Poland as well as in other countries may become a necessity. In the future researchers may try to understand the process of organizational learning in the context of different cultures.

The next limitation is connected with the organizational structure. Within the organizational structure the following departments have been distinguished (with team of employees functioning). They are: the Environment, Health and Safety Department, the Production Department, the Chief Technologist Department, The Operations Department, the Warehouse Department, the Design Department, the Modelling Department, the Commercial Department (comprising of the Sales Department, the Service Foundry Department, the Marketing Department), the Organization and Personnel Department, the Export Department, the Quality Control Department, the Supply Department and the Accountancy Department. The sample was not differentiated because of those departments. It would be interesting to examine individual, team and organizational learning separately in every single department of a company.

An added value of these considerations is perceiving team learning as a variable mediating the relationship between individual and organizational learning, where dependent variable was described by the use of five different dimensions. It turned out that the tested variable is a partial mediation. Thus, one can assume that team learning is not the only mediating variable of the assumed reliance. Thus, searching other mediators, which could be used to find out why an assumed relation takes place is a ground for further research.

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