East Asian Journal of Multidisciplinary Research (EAJMR)
Vol.2, No.4 2023: 1569-1590

Leadership Development in the Context of a Russian Beneficiation Plant: Quasi-Experiment

Marina Kravtšuk
Estonian Business School
Corresponding Author: Marina Kravtšuk kravtsukm@hotmail.com

A R T I C L E I N F O

Keywords: Leadership Development, MLQ, Quasi-Experiment, Russia

Received : 05, February
Revised : 10, March
Accepted: 15, April

A B S T R A C T

The purpose of the study was to answer the research question: how to develop leadership in the context of a Russian beneficiation plant? A quasi-experiment using a pre-and post-intervention design was conducted by an immersed researcher, providing verifiable data, involving 3 levels of management, using MLQ as a tool for measurement with the specification of effectiveness criteria.

Results of the study indicated that context-based leadership development allows for achieving statistically significant change in the leadership styles and effectiveness of the management, leadership styles of executives were mirrored by middle managers and supervisors. The contextualization and provided statistics allow for comparison with the other studies and enable improvement of the body of knowledge, providing guidance for future research and practice.

DOI prefix: https://doi.org/10.55927/eajmr.v2i4.3569
ISSN-E: 2828-1519
https://journal.formosapublisher.org/index.php/eajmr

INTRODUCTION

Leadership development is a context-based process aimed at improving the knowledge, skills, and abilities of leaders, building interpersonal commitments and relationships vital for the achievement of organizational goals (Day, 2014; Lord, 2019), so success is subject to the understanding of contextual needs and utilization of a solid theoretical foundation (Avolio, 2011; Day et al., 2021). Nevertheless, the majority of the research was conducted in the context of western cultures (Mhatre & Riggio, 2014), which highlights a need for more research in non-western cultures (Avolio, 2011; Moldoveanu & Narayandas, 2019). Also, the field is dominated by practitioners that prefer to utilize best practices and fads as opposed to theory-based approaches, which highlights a need for an explanation of how to develop leadership (Day & Thornton, 2018).

The Full Range Leadership Development approach (Bass & Avolio, 2018), based on the popular theory of transformational leadership (Antonakis & Day, 2018; Bass, 1985; Burns, 1978) and the Full Range of Leadership Model (FRLM) (Avolio & Bass, 1991), could serve as a theoretical foundation for building a leadership development program; however, scholars argue that the development approaches must meet the contextual needs of individual leaders and organizations, which traditional approaches fail to do, insisting on consideration of the contextual needs and working environment to expand on the body of knowledge (Avolio, 2011; Bolden, 2005; Li et al., 2021; Lord, 2019; Mhatre, K. & Riggio, 2014; Moldoveanu M. & Narayandas, 2019).

Leadership development approaches need to be aligned to the guiding principles (Gosling & Mintzberg, 2004), consideration of which during the review of the FRLD allowed to identify several research gaps. The approach is not specific in the description of the criteria for participants, therefore, there is a risk a selected person could not have the current accountability and authority of a leader, represent a needed level of management, function or problematic process, which means that the development efforts could not make much of a difference for an organization (Avolio et al., 2009; Lord, 2019; Nijstad, 2009; Day et al., 2021). The FRLD is utilizing Multifactor Leadership Questionnaire (MLQ) as a major measurement tool that is, commonly, answered by employees of an organization/ subordinates of a leader (Bass & Avolio, 2004; Bass & Riggio, 2006; Batista-Foguet et al., 2021), which could be subjective, since the evaluators might not be familiar with leadership constructs, could think of leadership in general, think of episodes versus context when doing the evaluation, this can distort the measurements and create a common method bias (Jacquart et at., 2018; Lord, 2019; Lowe et al., 1996). To increase the objectivity of the measurements, evaluators need to have a clear comprehension of the measured constructs, consider context, and not be intimidated by the authority of the leader, which is possible in some cultures (Antonakis et al., 2004; Grachev et al., 2007; Li et al., 2021; Lord, 2019; Mhatre & Riggio, 2014). Also, the criteria of effectiveness used by MLQ are not specified, so evaluation is based on perception (Bass & Avolio, 2018; Lord, 2019), measurements could be done by researchers immersed in the cultural, industrial, organizational, and managerial context, with specified criteria of

effectiveness (Avolio et al., 2009; Lord, 2019; Mhatre & Riggio, 2014; Northouse, 2019; Vogel et al., 2020) .

The purpose of the research was to close the identified gaps and provide an answer to the main research question: How to develop leadership in the context of a beneficiation plant in Russia? This article aims at answering the posed research question by conducting a quasi-experiment in a Russian beneficiation plant, involving managers of 3 different levels, using MLQ with specified effectiveness criteria as a tool for leadership styles measurement. The research was conducted by an immersed researcher. To the best knowledge of the author, there were no other similar studies conducted.

THEORETICAL REVIEW

Leadership is a process through which a person is influencing a group of people aimed at the achievement of a common goal (Northouse, 2019), it remains popular today. One of the most popular leadership theories nowadays is the "New Leadership" paradigm, which focuses on the impact of leadership on performance and represents the theory of transformational leadership (Antonakis & Day, 2018; Mhatre & Riggio, 2014).

To ensure the effectiveness of leadership (Avolio, 2011), suggested focusing on leadership development defined as a process, focused on improving the knowledge, skills, and abilities of individual leaders and helping them to establish interpersonal commitments and relationships, necessary for the effective achievement of the set goals in the context of an organization (Day, 2000, 2014). For that purpose, Bass and Avolio (2018) suggested using The Full Range Leadership Development (FRLD) approach that is based on the popular theory of transformational leadership (Antonakis & Day, 2018; Bass, 1985; Burns, 1978) and Full Range of Leadership Model (FRLM) (Avolio & Bass, 1991) , and is designed to help a leader to go through the following cycle within an organizational context (Bass & Avolio, 2004): awareness – context is identified and practical problems are specified, self-image is challenged; application – practical problems are reviewed, solutions and implementation plans are developed and agreed upon; adoption – agreed solutions are implemented as per plans, feedback on the progress, coaching and mentoring are provided and reflection on the received knowledge and experience is done; achievement – a deeper understanding of leadership impact, accountability, and responsibility for the development of the subordinates, perpetuation, and continuous improvement of effectiveness is achieved.

The FRLD is using the Multifactor Leadership Questionnaire (MLQ (5X - short form)) (Bass & Avolio, 2004), the most widely accepted tool for leadership styles measurement Bass & Avolio, 2018). A meta-analytic review of the MLQ-based studies (Lowe et al., 1996) indicated that low-level managers had higher scores than high-level managers on all transformational leadership styles and on management by exception - transactional leadership style, at the contingent reward - transactional leadership style the scores of both levels were approximately the same. According to recent research, CEO transformational leadership enhances firm performance(Jensen et al., 2020). A review of 10

studies (Poturak et al., 2020) examined the impact of transformational leadership on effectiveness in different cultures, including the USA, Israel, Germany, Swiss, Egypt, China, Bosnia, Herzegovina, and Iraq, indicated that in 50% of the cases the influence was positive, in 30% cases there was no difference, and in 20% cases the influence was negative. Another meta-analysis research examined country differences in the relationship between leadership and employee engagement (Li et al., 2021), where the majority of the studies were cross-sectional, representing data from 45 countries. Results of the analysis indicated that leadership effectiveness is influenced by and consistent with the culture. There was a positive relationship between some leadership styles and employee engagement, a negative relationship between abusive supervision and work engagement, several dimensions of culture moderate leadership-employee engagement. Using pre- and post-test measurements, a quasi-experiment was conducted, examining leadership behavior, group cohesion, and training outcomes, which provided positive and statistically significant results (Arthur & Hardy, 2014).

In a meta-analysis of leadership development impact (Avolio et al., 2009), it was noted that the majority of research was conducted through field surveys, limiting the possibility of verifying conclusions, suggesting to use more of experimental or quasi-experimental designs describing how leadership is influenced (Arthur & Hardy, 2014; Day & Thornton, 2018; Hackman, 2012; Li et al., 2021).

METHODOLOGY

Sample and selection criteria

The research was conducted in a Russian beneficiation company in 2019, chosen based on the solicited interest of the management. The company was engaged in the beneficiation of sand and operated in the local market. The management provided information on the beneficiation process and a list of managers of different levels that could impact it. The managers, selected for the study, held leadership roles for at least 12 months before the start of the research. Also, no interventions with the leadership styles were conducted during that period, which minimized the risk for internal validity, such as history and maturation (Chiang et al., 2015). A sample of 14 managers from different levels was selected: 3 executives (21.4%), 5 middle managers (35.7%), and 6 supervisors (42.9%). The selected managers represented all key functions of the organization: planning, mining, beneficiation, maintenance, and quality (Table 1).

Organizational level	Function	Position	Headcount	% of Sample
Executive	General, Operations, Asset	General manager, Operations manager, Asset manager	3	21.4%
Middle Manager	Planning, Mining, Beneficiation,	Planning manager, Mining manager, Beneficiation	5	35.7%

	Maintenance, Quality	manager, Maintenance manager, Quality manager		
Supervisor	Beneficiation, Maintenance	Beneficiation shift supervisor, Maintenance supervisor	6	42.9%
Total Sample Size			**14**	**100.0%**

Table 1. Sample of managers by organizational level. Source: Composed by the author

Methods of data collection and analysis

The MLQ (5X - short form) was used to assess the leadership styles and effectiveness. The MLQ consists of 45 questions: 36 questions on leadership styles, and 9 questions on extra effort, effectiveness, and satisfaction. A 5-point scale is used to collect answers to the questions(Bass & Riggio, 2006). MLQ (5X - short form) has two subforms: Leader Form - used by leaders to rate their behavior, and Rater Form - used by leader associates to rate the leader (Bass & Avolio, 2004). To get the data, the author conducted interviews with the sample managers using the Rater Form (MindGarden, 2021), focusing on only 40 questions as per the subject of the research: 36 questions on leadership styles and 4 questions on effectiveness. Interviewees were requested to provide instances of different reports and logs, standards and procedures, describe context and situations that would support their replies. Role accountabilities specified the effectiveness criteria used (Table 2).

Organizational level	**Position**	**Effectiveness criteria**
Executive	General manager	EBIT
	Operations manager	Cost of production
	Asset manager	Cost of maintenance
Middle Manager	Planning manager	Plan attainment
	Mining manager	Productivity
	Beneficiation manager	Productivity
	Maintenance manager	Availability
	Quality manager	Reclamations
Supervisor	Beneficiation shift supervisor	Output per shift
	Maintenance supervisor	Downtime

Table 2. Effectiveness criteria. Source: Composed by the author

A quantitative analysis was conducted on the MLQ data. Widely used in the leadership field Cronbach's alfa reliability test was done, ensuring consistency and reliability of the measurements(Hur-yagba, 2016; Singh, 2015). The difference between the pre-intervention and post-intervention leadership

styles and effectiveness was evaluated using a paired-samples t-test(McLead, 2019; Swift & Piff, 2014; Thyer, 2012).

Intervention program layout and procedure

A pre-intervention and post-intervention design was used to conduct the quasi-experiment (Chiang et al., 2015). Context-based leadership development intervention, serving as an independent variable, was used to alter the leadership style and effectiveness of different levels of management, serving as a dependent variable. The research was conducted over 16 calendar weeks, time sufficient for reliable data collection and assessment (Arthur & Hardy, 2014). A pre-intervention measurement was executed during 1-2 calendar weeks. The intervention program was executed during 3-14 calendar weeks, during which the following has been done: calendar weeks 3-6 - training workshops, calendar weeks 4-7 – context-driven problem-solving workshops, calendar weeks 5-14 – implementation of changes, calendar weeks 3-14 – coaching of leaders and monitoring of performance and action-taking. A post-intervention measurement was executed during 15-16 calendar weeks. (Figure 1).

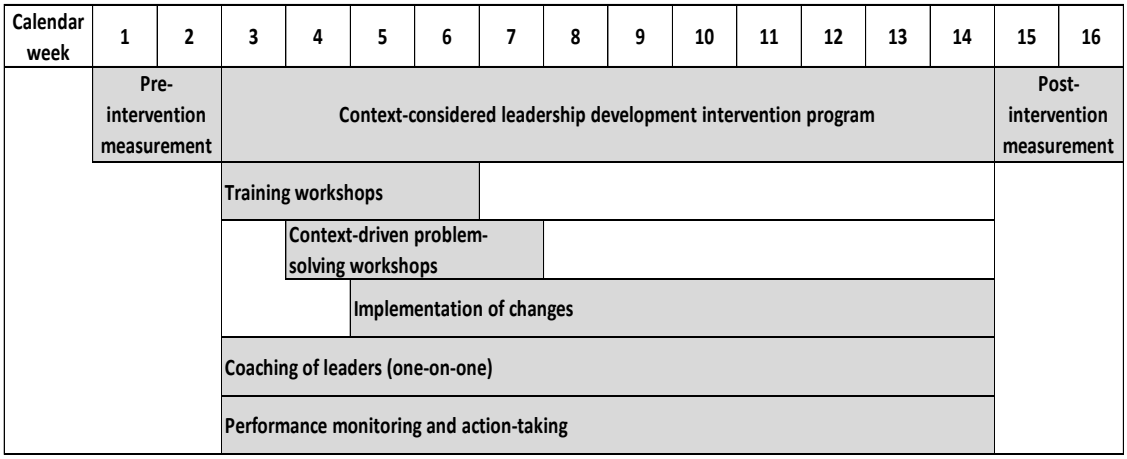

Figure 1. Context-based leadership development intervention program design. Source: Composed by the author

Pre-intervention (week 1-2)

Pre-intervention measurement was conducted with 14 managers during individual 2-hour MLQ interviews, totaling 28 hours. The effectiveness measurement was done based on the objective criteria (Table 2). The consistency and reliability of the measurements were checked by Cronbach's alfa reliability test using IBM SPSS Statistics version 28 software. The MLQ results were organized by level of management: overall sample, executives, middle managers, and supervisors.

Intervention program (week 3-14)

The intervention program took into consideration the results of the pre-intervention measurements. Selected managers were obliged to participate in the program. The program included 4 training workshops, 4 hours each, totaling 16 hours and covering the following topics:

1. Leadership and effectiveness(Bass & Bass, 2008; Bass & Riggio, 2006; Nijstad, 2009),
2. Full Range of Leadership Model(Bass & Avolio, 2018; Hur-yagba, 2016), the challenge of self-image,
3 and 4 Leadership tools(Jaques, 2010; Liker, 2019).

In addition, 4 context-driven problem-solving workshops were held, 4 hours each, totaling 16 hours and covering the following: internal alignment through goal setting, standardization, performance monitoring and reviews, performance analysis and improvements.

Individual coaching was conducted upon completion of the workshops with all managers. The minimal duration of the coaching session was 1 hour. In total, 112 hours of coaching were completed with managers. Performance was closely monitored on a day-to-week-month basis, discussed with the accountable managers, and needed actions were taken throughout the intervention program.

Post-intervention (week 15-16)

Post-intervention measurement was conducted with the same 14 managers during individual 2-hour MLQ interviews, totaling 28 hours. The effectiveness measurement was done based on the objective criteria (Table 2). The consistency and reliability of the measurements were checked again by Cronbach's alfa reliability test using IBM SPSS Statistics version 28 software. The MLQ results were organized by level of management: overall sample, executives, middle managers, and supervisors. The results of the post-intervention and pre-intervention measurements were compared by paired samples t-test using IBM SPSS Statistics version 28 software, and an answer to the posed research question was received.

Context

In leadership development research, the methodology of quasi-experiment needs to be utilized more often (Arthur & Hardy, 2014; Avolio et al., 2009). The methodology can be applied in the real-life context, it allows for the evaluation of results, does not require the utilization of control groups and random assignment of the participants (Chiang et al., & Price, 2015; Rogers &. & Révész, 2019). On one hand, the context-considered leadership development program served as an independent variable that was influenced, on the other the leadership styles and effectiveness of the managers served as a dependent variable.

Cultural context

Russia is the largest country in the world (Liuhto, 2005) with a culture that has been developing for over one thousand (Dimnik, 2007; Elenkov, 1998). In 2007, cross-cultural research GLOBE conducted a study of Russian organizational leadership (Grachev et al., 2007), so 450 Russian middle managers from food processing, financial services, and telecommunication industries were included. The study suggested that collectivistic Russian

culture is changing to more individualistic, authority and privilege possessing people are highly respected. To ensure the successful survival of the business, in the periods of transformations and transition managers need to demonstrate assertiveness; however, nepotism and other asymmetries may alter the behavior of managers. In some cases, ethics might be ignored in the race for performance. Also, people in Russia have a high need for security and stability, managers need to provide direction and support to their subordinates to allow for strategic thinking and execution. Managers are good networkers and cooperators on all levels of engagement.

Industrial context

In 2019, the Russian mining and beneficiation industry has experienced a growth of 4% and 1,9% accordingly(Горная промышленность, 2019). In general, the industry requires investments, opportunities for cost reduction and productivity increase exist (Global Business Reports, 2012). Process management, modernization and standardization of safety, performance, quality management, worker and leadership development require improvement (Vostrikov et al., 2019).

Organizational context

The organization consisted of mining, beneficiation, maintenance, quality, and other administrative departments. The total headcount was 300 full-time employees. The company management wanted to increase the efficiency of the beneficiation process, which operated 24/7. For 12 months before the research commencement, there were no changes in the structure and technology used, so their influence on the leadership styles and effectiveness of the managers and risks for the internal validity of history and maturation (Chiang et al., 2015) were minimized.

Managerial context

The management of the company was convinced that they were doing a great job and it would be difficult to improve something. All the managers were qualified specialists. Despite a strong technical background, there was a lack of proper communication and alignment between the departments – each department was setting its own priorities ignoring potential impacts on the rest of the organization. Beneficiation process performance goals were not officially set, in most cases the goal was "to do better than yesterday". Standards on how to execute different operations, such as shift changeover, transition from one product to another, stopping and restarting the process after maintenance shutdown and so on did not exist. Everything depended on the level of experience of the operator. Official performance reviews took place once per month, which did not allow for timely variance identification. Variances in performance were not explained and recorded anywhere, which did not allow for thorough analysis and action-taking.

Role of the author

The author of the research was an associate of the managers, an outsider that worked together with the insiders to conduct the research (Bass & Avolio, 2004; Herr & Anderson, 2015). This approach was selected with consideration of the local culture, where people with authority, for example managers of different levels, are highly respected (Grachev et al., 2007), which could prevent from providing an honest and objective opinion on their leadership styles and effectiveness. The independence of the author has allowed for conducting the objective evaluation. The author managed the research project and was accountable for the achievement of the research purpose by collecting and analyzing data, developing and executing the intervention.

RESULTS AND DISCUSSION

The study allowed for the closing of research gaps in the field of leadership development. An immersed researcher has conducted a quasi-experiment in the real-life context of a Russian beneficiation plant, focusing on 3 levels of managers and objectively measuring the changes in their leadership style and effectiveness using MLQ with specified criteria of effectiveness.

Training and context-based problem-solving workshops, as well as coaching of the managers was conducted to ensure the development of the leadership of the organization. The following changes were implemented: goals and priorities of the production, maintenance, and quality departments were reviewed and aligned, operational plans of the departments were adjusted accordingly at all levels, appropriate standards were implemented to support management and operators, such as shift changeovers, supervisory tours, the transition from one product to another, stopping and restarting of the beneficiation plant after maintenance shutdown, Excel database for performance variance recording and analysis was developed and implemented, day-to-week, day-to-month functional, and cross-functional performance reviews at all levels were introduced.

Overall sample

The conducted overall sample evaluation of the leadership styles and effectiveness using MLQ has shown high reliability and internal consistency, ranging from 0.816 during pre-intervention to 0.836 during post-intervention evaluations. The results of the paired samples t-test for the overall sample indicated that the change was positive, and statistically significant at p=0.05 with low to medium effect sizes (Table 3).

Effects analysis indicated that medium effect size was achieved by an increase in the utilization of individual consideration, idealized influence (attributed), and active management by exception. The positive results of the study support the conclusions of a meta-analysis (Avolio et al., 2009), indicating that there was an internal alignment in terms of which leadership styles are used and preferred, building up collective trust and cooperation and supporting the findings of the GLOBE study in Russia (Grachev et al., 2007).

The effectiveness of the managers improved. Executives demonstrated a small improvement in effectiveness, while middle managers and supervisors showed a medium effect. This indicated that the intervention helped to realize the improvement potential that existed at the lower levels of management, thus increasing the readiness of the organization for future challenges.

Paired Samples Statistics				**Paired Samples Test**					**Paired Samples ES**	
Leadership styles		**M**	**N**	**Dif.**		**t**	**df**	**Sig. 2-p**	**ES**	**St[a]**
				M	**SD**					
1	LF: POST	0.41	14	-0.18	0.2	-2.92	13	0.01	Cohen's d	0.23
	LF: PRE	0.59	14						Hedges' cor.	0.24
2	MBE - P:POST	0.77	14	-0.93	0.5	-6.89	13	0.00	Cohen's d	0.50
	MBE - P:PRE	1.70	14						Hedges' cor.	0.52
3	MBE - A: POST	1.98	14	0.43	0.3	4.64	13	0.00	Cohen's d	0.35
	MBE - A: PRE	1.55	14						Hedges' cor.	0.36
4	CR: POST	1.55	14	0.59	0.3	8.75	13	0.00	Cohen's d	0.25
	CR: PRE	0.96	14						Hedges' cor.	0.26
5	Int. St.:POST	1.43	14	0.45	0.3	4.88	13	0.00	Cohen's d	0.34
	Int. St.:PRE	0.98	14						Hedges' cor.	0.35
6	Ins. Mot.: POST	1.14	14	0.41	0.3	4.41	13	0.00	Cohen's d	0.35
	Ins. Mot.: PRE	0.73	14						Hedges' cor.	0.36
7	Ind. Con.: POST	1.71	14	0.52	0.4	5.39	13	0.00	Cohen's d	0.36
	Ind. Con.: PRE	1.20	14						Hedges' cor.	0.37
8	Id.in. (beh.):POST	1.43	14	0.43	0.2	6.45	13	0.00	Cohen's d	0.25
	Id.in. (beh.):PRE	1.00	14						Hedges' cor.	0.26
9	Id. in. (at.):POST	1.61	14	0.38	0.3	5.14	13	0.00	Cohen's d	0.27

	Id. in. (at.):PRE	1.23	14						Hedges' cor.	0.28
10	Effect.: POST	2.34	14	0.39	0.2	6.90	13	0.00	Cohen's d	0.21
	Effect.: PRE	1.95	14						Hedges' cor.	0.22
a. Standardizer. The denominator used in estimating the effect sizes. Cohen's d uses the sample standard deviation of the mean difference. Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.										

Table 3. Overall sample - paired samples statistics: Composed by the author

Executives level

The results of the paired samples t-test for the executive level indicated that the change was positive, mostly statistically insignificant at p=0.05 except for passive management by exception, contingent reward, intellectual stimulation and idealized influence (behaviour), with low to medium effect sizes (Table 4).

Effects analysis indicated that medium effect size was achieved by a decrease in the utilization of passive management by exceptions, small and medium effect sizes were achieved by an increase in the utilization of intellectual stimulation and idealized influence (behaviour) leadership styles. These results can be explained by culture, specifically, passiveness was reduced when it was recognized as a danger, and executives started to focus on building stronger internal alignment and stimulating initiative by demonstrating authority and serving as role models (Grachev et al., 2007).

Paired Samples Statistics				**Paired Samples Test**					**Paired Samples ES**	
Leadership styles		**M**	**N**	**Diff.**		**t**	**df**	**Sig. 2-p**	**ES**	**St[a]**
				M	**SD**					
1	LF: POST	0.25	3	-0.17	0.3	-1.00	2	0.42	Cohen's d	0.29
	LF: PRE	0.42	3						Hedges' cor.	0.36
2	MBE - P:POST	0.33	3	-1.67	0.3	-10.00	2	0.01	Cohen's d	0.29
	MBE - P:PRE	2.00	3						Hedges' cor.	0.36
3	MBE - A: POST	2.58	3	0.50	0.4	2.00	2	0.18	Cohen's d	0.43
	MBE - A: PRE	2.08	3						Hedges' cor.	0.54
4	CR: POST	2.25	3	0.75	0.3	5.20	2	0.04	Cohen's d	0.25

	CR: PRE	1.50	3						Hedges' cor.	0.31
5	Int. St.:POST	2.17	3	0.67	0.1	8.00	2	0.02	Cohen's d	0.14
	Int. St.:PRE	1.50	3						Hedges' cor.	0.18
6	Ins. Mot.: POST	1.75	3	0.33	0.1	4.00	2	0.06	Cohen's d	0.14
	Ins. Mot.: PRE	1.42	3						Hedges' cor.	0.18
7	Ind. Con.: POST	2.25	3	0.42	0.5	1.39	2	0.30	Cohen's d	0.52
	Ind. Con.: PRE	1.83	3						Hedges' cor.	0.65
8	Id.in. (beh.):POST	2.17	3	0.58	0.1	7.00	2	0.02	Cohen's d	0.14
	Id.in. (beh.):PRE	1.58	3						Hedges' cor.	0.18
9	Id. in. (at.):POST	2.33	3	0.25	0.4	1.00	2	0.42	Cohen's d	0.43
	Id. in. (at.):PRE	2.08	3						Hedges' cor.	0.54
10	Effect.: POST	2.75	3	0.33	0.3	2.00	2	0.18	Cohen's d	0.29
	Effect.: PRE	2.42	3						Hedges' cor.	0.36

a. Standardizer. The denominator used in estimating the effect sizes. Cohen's d uses the sample standard deviation of the mean difference. Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

Table 4. Executives - paired samples statistics: Composed by the author

Middle managers level

The results of the paired samples t-test for the middle managers level indicated that the change was positive, mostly statistically significant at p=0.05 except for laisses-faire leadership style, with small to medium effect sizes (Table 5).

Effects analysis indicated that large size was achieved by a decrease in the utilization of passive management by exception, large and medium effect sizes were achieved by an increase in the utilization of individual consideration and active management by exception. These results find support in the Russian culture (Grachev et al., 2007) specifically, middle managers started to mirror the styles of executives, focus on individual subordinates, their strengths and weaknesses to get the needed results, helping them to develop and improve, thus building a stronger collective. This helped to increase the level of trust for each other but required a verification from the management side, which was

ensured by an increase in compliance checks, which was expected and taken well by the subordinates, further strengthening the collective bonds.

Paired Samples Statistics				Paired Samples Test					Paired Samples ES	
Leadership styles		M	N	Diff.		t	df	Sig. 2-p	ES	St[a]
				M	SD					
1	LF: POST	0.60	5	-0.20	0.3	-1.63	4	0.18	Cohen's d	0.27
	LF: PRE	0.80	5						Hedges' cor.	0.30
2	MBE - P:POST	0.90	5	-0.75	0.4	-4.74	4	0.01	Cohen's d	0.35
	MBE - P: PRE	1.65	5						Hedges' cor.	0.39
3	MBE - A: POST	2.45	5	0.65	0.3	5.10	4	0.01	Cohen's d	0.29
	MBE - A: PRE	1.80	5						Hedges' cor.	0.32
4	CR: POST	1.60	5	0.70	0.3	5.72	4	0.00	Cohen's d	0.27
	CR: PRE	0.90	5						Hedges' cor.	0.30

5	Int. St.:POST	1.40	5	0.55	0.4	2.75	4	0.05	Cohen's d	0.45
	Int. St.:PRE	0.85	5						Hedges' cor.	0.50
6	Ins. Mot.: POST	1.30	5	0.80	0.2	8.55	4	0.00	Cohen's d	0.21
	Ins. Mot.: PRE	0.50	5						Hedges' cor.	0.23
7	Ind. Con.: POST	1.75	5	0.75	0.4	4.74	4	0.01	Cohen's d	0.35
	Ind. Con.: PRE	1.00	5						Hedges' cor.	0.39
8	Id.in. (beh.):POST	1.40	5	0.55	0.2	5.88	4	0.00	Cohen's d	0.21
	Id.in. (beh.):PRE	0.85	5						Hedges' cor.	0.23
9	Id. in. (at.):POST	1.45	5	0.35	0.1	5.72	4	0.00	Cohen's d	0.14
	Id. in. (at.):PRE	1.10	5						Hedges' cor.	0.15
10	Effect.: POST	2.30	5	0.35	0.1	5.72	4	0.00	Cohen's d	0.14

	Effect.: PRE	1.95	5						Hedges' cor.	0.15

a. Standardizer. The denominator used in estimating the effect sizes. Cohen's d uses the sample standard deviation of the mean difference. Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

Table 5. Middle managers - paired samples statistics: Composed by the author

Supervisory level

The results of the paired samples t-test for the supervisory level indicated that the change was positive, mostly statistically significant at p=0.05, except for laisses-faire, active management by exception, and inspirational motivation, with low effect sizes (Table 6).

Effects analysis indicated that the medium effect size was achieved by a decrease in the utilization of passive management by exception, also medium effect sizes were achieved by an increase in the utilization of individual consideration and idealized influence (attributed) leadership styles. These results also support earlier research findings (Grachev et al., 2007) and demonstrate that supervisors mirror the styles of the middle managers, which can be explained by the respect that existed within the organization toward superior management.

Paired Samples Statistics				**Paired Samples Test**					**Paired Samples ES**	
Leadership styles		**M**	**N**	**Diff.**		**t**	**df**	**Sig. 2-p**	**ES**	**St[a]**
				M	**SD**					
1	LF: POST	0.33	6	-0.17	0.2	-2.00	5	0.10	Cohen's d	0.20
	LF: PRE	0.50	6						Hedges' cor.	0.22
2	MBE - P: POST	0.88	6	-0.71	0.3	-5.22	5	0.00	Cohen's d	0.33
	MBE - P: PRE	1.58	6						Hedges' cor.	0.36
3	MBE - A: POST	1.29	6	0.21	0.2	2.08	5	0.09	Cohen's d	0.25
	MBE - A: PRE	1.08	6						Hedges' cor.	0.27
4	CR: POST	1.17	6	0.42	0.1	7.91	5	0.00	Cohen's d	0.13
	CR: PRE	0.75	6						Hedges' cor.	0.14

5	Int. St.:POST	1.08	6	0.25	0.2	2.74	5	0.04	Cohen's d	0.22
	Int. St.:PRE	0.83	6						Hedges' cor.	0.24
6	Ins. Mot.: POST	0.71	6	0.13	0.1	2.24	5	0.08	Cohen's d	0.14
	Ins. Mot.: PRE	0.58	6						Hedges' cor.	0.15
7	Ind. Con.: POST	1.42	6	0.38	0.2	4.39	5	0.01	Cohen's d	0.21
	Ind. Con.: PRE	1.04	6						Hedges' cor.	0.23
8	Id.in. (beh.):POST	1.08	6	0.25	0.2	2.74	5	0.04	Cohen's d	0.22
	Id.in. (beh.):PRE	0.83	6						Hedges' cor.	0.24
9	Id. in. (at.):POST	1.38	6	0.46	0.3	3.84	5	0.01	Cohen's d	0.29
	Id. in. (at.):PRE	0.92	6						Hedges' cor.	0.32
10	Effect.: POST	2.17	6	0.46	0.2	4.57	5	0.01	Cohen's d	0.25
	Effect.: PRE	1.71	6						Hedges' cor.	0.27

a. Standardizer. The denominator used in estimating the effect sizes. Cohen's d uses the sample standard deviation of the mean difference. Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

Table 6. Supervisors - paired samples statistics: Composed by the author

CONCLUSIONS AND RECOMMENDATIONS

The purpose of the study was to answer the research question: how to develop leadership in the context of a Russian beneficiation plant? Which was answered by conducting a quasi-experiment using a pre-and post-intervention design, providing verifiable data, involving 3 levels of management: executives, middle managers, and supervisors, using MLQ as a tool for leadership styles and effectiveness measurement with the specification of effectiveness criteria. An immersed researcher conducted the study.

The study indicated that context-based leadership development allows to achieve statistically significant change in the leadership styles and effectiveness of the managers. Effectiveness was evaluated using objective criteria with effect sizes ranging from low to medium. The results specified that in the studied context the leadership styles of executives were mirrored by middle managers and supervisors.

To the best knowledge of the author, no similar studies have been conducted before with the reported level of contextualization in non-western

culture, industry, multiple levels of management, utilization of MLQ with the specified effectiveness criteria and provided statistics, which allows for comparison of the results with the other studies. The results enable improvement of the body of knowledge and provide guidance for future research and practice.

FURTHER STUDY

The research was subject to the Russian cultural, industrial, organizational, as well as managerial real-life contexts, thus difficult to replicate, but provided better insight allowing to further strengthen the leadership development theory. To increase the external validity the study needs to be repeated at other organizations in similar context.

Objective effectiveness criteria and data were used to evaluate the leadership styles and effectiveness of the leaders by an immersed researcher, which is lowering the risk of the common method bias (Lowe et al., 1996) and aligned to the local culture, where subordinates would not be so willing to honestly evaluate direct managers that have authority and power over them (Grachev et al., 2007). Nevertheless, objective measures of effectiveness related to the accountabilities of the managers could be more focused on transactional as opposed to transformational outcomes (Lowe et al., 1996). Future research could focus on specifying additional objective effectiveness criteria that could capture transformational outcomes as well as transactional ones. Also, measurements could be done by the immersed researcher, managers, and their subordinates.

REFERENCES

Antonakis, J. , Schriesheim, C. , Donovan, J. , Gopalakrishna-Pillai, K. , Pellegrini, E. , &, & Rossomme J. (2004). Methods for studying leadership. In R. Antonakis, J., Cianciolo, A., Sternberg (Ed.), *The Nature of Leadership* (pp. 48–70). SAGE Publications, Inc.

Antonakis, J., & Day, D. (2018). Leadership: Past, Present, and Future. In D. Antonakis, J., Day (Ed.), *The Nature of Leadership* (Third Ed., pp. 3–26). SAGE Publications, Inc.

Arthur, C., & Hardy, L. (2014). Transformational leadership: A Quasi-Experimental Study. *Leadership and Organization Development Journal*, *35*(1), 38–53.

Avolio, B. (2011). *Full Range Leadership Development* (Second Ed). SAGE Publications, Inc.

Avolio, B. & Bass, B. (1991). *The Full Range Leadership Development Programs: Basic and Advanced Manuals*. Bass, Avolio Associates.

Avolio, B., Reichard, R., Hannah, S., Walumbwa, F., & Chan, A. (2009). A Meta-Analytic Review of Leadership Impact Research: Experimental and Quasi-experimental Studies. *The Leadership Quarterly*, *20*(5), 764–784.

Bass, B. (1985). *Leadership and performance beyond expectations*. Free Press.

Bass, B., & Avolio, B. (2004). *Multifactor leadership questionnaire. Manual and Sample set* (Third ed). Mind Garden, Inc. www.mindgarden.com

Bass, B., & Avolio, B. (2018). *MLQ Trainer's Guide Training Full Range of Leadership* (2nd Ed). Mind Gardern, Inc. www.mindgarden.com

Bass, B., & Bass, R. (2008). *The Bass Handbook of Leadership. Theory, research, and management applications* (Fourth Ed). Free Press.

Bass, B., & Riggio, R. (2006). *Transformational leadership* (Second Ed). Lawrence Erlbaum Associates, Inc.

Bolden, R. (2005). *What is leadership development? Purpose & Practice. Research Report 2*.

Burns, J. M. (1978). *Leadership*. Harper & Row.

Chiang, I., Jhangiani, R., & Price, P. (2015). *Research Methods in Psychology* (2nd Canadi). BCCAMPUS.

Day, D. (2000). Leadership development: A review in context. *The Leadership Quarterly*, *11*(4), 581–613.

Day, D. (2014). The Future of Leadership: Challenges and Prospects. In D. Day (Ed.), *The Oxford Handbook of Leadership and Organizations* (pp. 859–867). Oxford University Press.

Day, D., & Thornton, A. (2018). Leadership Development. In D. Antonakis, J., Day (Ed.), *The Nature of Leadership* (pp. 354–380). SAGE Publications, Inc.

Day, D. V., Riggio, R. E., Tan, S. J., & Conger, J. A. (2021). Advancing the science of 21st-century leadership development: Theory, research, and practice. In *Leadership Quarterly* (Vol. 32, Issue 5). Elsevier Inc. https://doi.org/10.1016/j.leaqua.2021.101557

Dimnik M. (2007). The Patrimonies of the Rostislavichi in the kievan lands: An anomaly. *Mediaeval Studies*, *69*(187–222).

Elenkov D. (1998). Can American Management Concepts Work in Russia? A Cross-Cultural Comparative Study. *California Management Review*, *40*(4), 133–156.

Global Business Reports. (2012). Горная промышленность в России. *Engineering and Mining Journal*, *February*. https://www.gbreports.com/wp-content/uploads/2014/12/Russia_Mining2012_Russian-Language.pdf/

Gosling, J., & Mintzberg, H. (2004). The education of practicing managers. *Sloan Management Review*, *45*(4), 19–22.

Grachev M., Rogovsky N., & Rakitski. (2007). Leadership and Culture in Russia: The Case of Transitional Economy. In B. F. and H. R. Chhokar J. (Ed.), *Culture and Leadership Across the World, The GLOBE Book of In-Depth Studies of 25 Societies* (pp. 803–831). LAWRENCE ERLBAUM ASSOCIATES, PUBLISHERS.

Hackman, J. (2012). From causes to conditions in group research. *Journal of Organizational Behavior*, *33*, 428–444.

Herr, K., & Anderson, G. (2015). *The Action Research Dissertation* (2nd ed). SAGE Publications Inc.

Hur-yagba, A. (2016). *Effects of Transformational and Transactional Leadership Styles*. Lambert Academic Publishing.

Jacquart, P., Cole, M., Gabriel, A., Koopman, J., & Rosen, C. (2018). Studying leadership: Research Design and Methods. In D. Antonakis, J., Day (Ed.), *Nature of Leadership* (Third Ed, pp. 411–437). SAGE Publications, Inc.

Jaques, E. (2010). *Requisite Organization*. Cason Hall & Co. Publishers.

Jensen M., Potočnik K., & Chaudhry S. (2020). A mixed-methods study of CEO transformational leadership and firm performance. *European Management Journal*. doi: https://doi.org/10.1016/j.emj.2020.05.004.

Li, P., Sun, J. M., Taris, T. W., Xing, L., & Peeters, M. C. W. (2021). Country differences in the relationship between leadership and employee engagement: A meta-analysis. *Leadership Quarterly*, *32*(1). https://doi.org/10.1016/j.leaqua.2020.101458

Liker, J. (2019). *The Toyota Way. 14 Management Principles from the World's Greatest Manufacturer* (Indian Ed). McGraw Hill Education (India).

Liuhto, K. (2005). Russia — on the way to an information society? In A. Kuklinski & K. Pawlowski (Eds.), *Europe – The Global Challenges* (pp. 277–284). WSB-NLU.

Lord, R. (2019). Leadership in the future, and the future of leadership research. In R. H. & P. N. B. Schyns (Ed.), *Handbook of methods in Leadership Research* (pp. 403–429). Edward Elgar Publishing.

Lowe K., K. G. & S. N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the MLQ Literature. *The Leadership Quarterly*, *7*(3), 385–415.

McLead, S. (2019). *What does effect size tell you*. https://www.simplypsychology.org/effect-size.html/

Mhatre, K., & Riggio, R. (2014). Charismatic and Transformational Leadership: Past, Present and Future. In D. Day (Ed.), *The Oxford Handbook of Leadership and Organizations* (pp. 221–240). Oxford University Press.

Mind Garden. (2021). *Permission to reproduce 50 copies within three years of September 14, 2021* (Patent No. Multifactor Leadership Questionnaire). Mind Garden. www.mindgarden.com

Moldoveanu M., & Narayandas D. (2019). The Future of Leadership Development. *Harvard Business Review*, *march-april*.

Nijstad, B. (2009). *Group Performance*. Psychology Press.

Northouse, P. (2019). *Leadership. Theory & Practice* (8th ed). SAGE Publications Inc.

Poturak M., Mekić E., Hadžiahmetović N., & B. T. (2020). Effectiveness of Transformational Leadership among Different Cultures. *International Journal of Social Sciences & Educational Studies*, *7*(3).

Rogers, J., & Révész, A. (2019). Experimental and quasi-experimental designs. In H. McKinley, J., Rose (Ed.), *Routledge Handbook of Research Methods in Applied* (1st ed, pp. 133–143). Routledge.

Singh, K. (2015). Leadership Style and Employee Productivity: A Case Study of Indian Banking Organizations. *Journal of Knowledge Globalization*, *8*(2), 39–67.

Vogel, B., Reichard, B., Batistič, S., & Černe, M. (2020). A bibliometric review of the Leadership Development Field: How We Got Here, Where We Are, and Where We are Headed. *The Leadership Quarterly*, *101381*.

Vostrikov, A., Prokofeva E., G. S. & G. I. (2019). Analytical Modeling for the Modern Mining Industry. *Eurasian Mining*, *2*, 30–35.

Горная промышленность. (2019). *Горнодобывающий рынок России Как выглядит добывающая отрасль в 2019 году?* Https://Mining-Media.Ru/Ru/Article/Ekonomic/15345-Gornodobyvayushchij-Rynok-Rossii.