

Leadership Development in Executive Education Programs: Measuring Behavioral Change and Organizational Impact through Pre-and Post-Assessment Data

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Abstract

Over the last twenty years organizations have increased their budget for leadership development programs yet research studies have not provided sufficient proof about the success of these programs especially in developing countries. The research study assessed how an executive leadership development program in Uzbekistan caused changes in executive behavior and organization performance through a pretest-posttest evaluation method which included a three-month follow-up period. The statistical population included 250 middle managers from 77 public and private organizations who participated in the National Leadership Development Program of the Presidential Academy of Public Administration of Uzbekistan. 211 managers completed all three assessment stages which represents 84.4 percent of the total group. Data were collected through a Leadership Competencies Questionnaire which included 36 items divided into eight dimensions and through direct manager assessments and learning transfer questionnaires and objective team performance indicators and semi-structured interviews. The researchers used paired t-tests and repeated-measures analysis of variance and hierarchical regression analysis to analyze quantitative data while qualitative data were examined through content analysis. The results demonstrated that leadership competencies increased from 3.06 at pretest to 3.85 at posttest ($p < 0.001$, $d = 1.48$) and this increase maintained statistical significance although it slightly decreased to 3.75 at the three-month follow-up. The dimensions of coaching and employee development (1.38) and effective communication (1.28) produced their most significant effect sizes. The study used hierarchical regression analysis to determine that direct manager support ($\beta = 0.33$) and training relevance ($\beta = 0.31$) and learning application opportunity ($\beta = 0.29$) served as the strongest behavior change predictors while the complete model explained 56.7% of variance in behavioral modification. Team performance indicators showed significant improvement through three metrics which included team member satisfaction ($d = 0.52$) and goal achievement ($d = 0.48$) and reduced turnover ($d = 0.30$). The analysis showed that increased self-awareness

served as the starting point for internal transformation while bureaucratic constraints functioned as the main structural barrier which obstructed behavior modification. The study finds that leadership development programs which local needs assessment and a competency model designed for the Uzbek cultural environment produce sustainable behavioral changes which enhance team performance. Executive training needs to undergo a complete process redesign with continuous learning support and backing from senior leaders to achieve the best return on investment.

Keywords: Leadership development, executive training, behavior change, effectiveness assessment, Uzbekistan, learning transfer, organizational performance

Introduction

Organizations have increased their spending on leadership development programs to an exceptional degree during the last twenty years (Amagoh, 2009; Bass & Bass, 2009). Global estimates indicate that more than \$60 billion is spent annually on executive education and training worldwide, and this figure is still rising (Wallace et al., 2021). Organizations make this substantial investment because they believe that leadership quality represents the dominant factor which determines organizational success or failure in current complex business environments (van Wart, 2003; Avolio et al., 2009). Organizations need to establish leadership programs which develop executives who handle uncertainty while driving innovation and supporting employees who pursue their highest performance (Kjellström et al., 2020; Flaig et al., 2020). Executive education serves as one of the primary methods through which leadership development programs operate which management schools and educational institutions have consistently studied (Burke & Collins, 2005; Martineau & Hannum, 2004). The programs aim to develop managers through enhanced knowledge and skill acquisition while preparing them to lead their teams (Ebrahimi & Azmi, 2015; Black & Earnest, 2009). The basic question which has existed since the beginning of this study needs to be solved whether the programs produce actual changes in the managers' professional conduct (Russon & Reinelt, 2004; Patterson et al., 2017). The research investigates whether

the organizational changes lead to better results for the business (Phillips et al., 2012). The present research examines these questions as its central focus.

The existing empirical research results show that leadership development programs produce conflicting outcomes (Avolio et al., 2009; Wallace et al., 2021). Multiple studies have shown that program participants experience high satisfaction levels which lead to increased knowledge and understanding (Black & Earnest, 2009; Russon & Reinelt, 2004). Only a small number of studies have proven that training results in permanent behavioral transformations which produce observable organizational performance outcomes (Patterson et al., 2017; Phillips et al., 2012). The gap between what people think and what actually exists represents a major problem for human resource training and development workers who need to maintain their professional standing with executive management (Martineau & Hannum, 2004). The problem arises because organizations face challenges when they try to assess changes in employee conduct (Howard & Reinelt, 2006; Njah et al., 2021). Human behavior exists as a complex system that consists of many parts which depends on different factors from the personal and organizational to the environmental dimensions (Doornenbal et al., 2021; Lee et al., 2020). A training program creates behavioral changes when researchers establish evaluation methods which include accurate assessment tools and all potential factors that could interfere with results (Amagoh, 2009). Managers find themselves in a state of confusion about whether to keep funding this sector because organizations lack systematic assessments to guide their decisions (McAlearney, 2008; Flaig et al., 2020).

The use of pretest-posttest designs as a training evaluation method which researchers frequently use carries both benefits and drawbacks (Howard & Dailey, 1979; Rohs & Langone, 1993, 1997). The program assesses leadership competencies through initial measurements and subsequent testing which takes place after the course conclusion to determine progress and discover areas needing development (Alias et al., 2015; Zula et al., 2010). The training effectiveness assessment requires additional methods which include 360-degree evaluations and organizational impact measurements that extend beyond

initial results to achieve complete assessment (Alimo-Metcalf, 1998; Bracken et al., 2016; Lockyer & Sargeant, 2022). The Republic of Uzbekistan has implemented extensive reforms in its administrative and economic system in recent years (Amagoh, 2009). The reforms which aim to shift from government control to market-based systems have created an increasing requirement for qualified managers who understand contemporary management practices (van Wart, 2003). Public and private organizations respond to this demand by allocating substantial resources to create leadership development programs which target their mid-level and senior staff members (Flaig et al., 2020; McAlearney, 2008). The assessment process that determines how well these programs work remains at an initial phase because there has been minimal research conducted in this particular area (Njah et al., 2021).

The existing research gap within Uzbekistan creates an excellent opportunity for investigation (Amagoh, 2009). The main research question investigates whether the expensive leadership development programs successfully improve executive skills for those who complete them (Patterson et al., 2017; Phillips et al., 2012). The assessment of leadership skills through the program shows which particular competencies have experienced the greatest growth (Alias et al., 2015; Ebrahimi & Azmi, 2015). The assessment needs to determine whether participants successfully applied their acquired knowledge at work to establish beneficial effects within their organizations (Burke & Collins, 2005; Black & Earnest, 2009). Human resource managers and education specialists and policymakers in public administration improvement need to answer these questions because their work depends on this information (Howard & Reinelt, 2006). The current research study will investigate its research questions through examination of the major leadership development program which has operated in Uzbekistan during the last three years. The program which developed and executed its design targeted leadership development for 250 middle management personnel who worked in both public and private sector organizations. The study designed its research methodology to collect data from three distinct sources which included self-report evaluations conducted by participants at two time points before and after their

training and their direct managers' evaluations of their behavior modifications and actual workplace performance metrics which included employee satisfaction data and team productivity measurements (Sureda et al., 2021; Chandler et al., 2010; Das, 2023).

The significance and essential nature of this research study can be demonstrated through multiple perspectives (Wallace et al., 2021). The study develops new scholarly knowledge about management training evaluation methods which apply to developing nations and non-Western cultural contexts (Amagoh, 2009; van Wart, 2003). The research presents a dual approach that researchers and practitioners can use to assess both behavioral changes and their effects on organizations (Martineau & Hannum, 2004; Patterson et al., 2017). The research results provide a foundation which decision-makers in Uzbekistan and Central Asian countries can use to make better choices about leadership development investments while reducing waste of essential financial and human assets (Flaig et al., 2020; Njah et al., 2021).

Literature Review

Conceptualizing Leadership Development in Executive Education

Modern management literature defines leadership development as an educational process which extends beyond technical skill training and managerial knowledge development (Amagoh, 2009; Bass & Bass, 2009). The concept describes a process which continuously evolves to help managers develop their organization leadership skills needed to handle complex and unpredictable situations (Kjellström et al., 2020; Wallace et al., 2021). Executive education programs serve as a primary method to achieve this objective because they develop practical skills and self-awareness and leadership abilities through hands-on training which differs from traditional academic programs that teach theoretical knowledge (Burke & Collins, 2005; Martineau & Hannum, 2004). The design of these programs uses empirical methods which include case studies and simulations and practical projects and multi-source feedback to create a training system that helps managers learn to handle actual workplace challenges (Alimo-Metcalf, 1998; Bracken et al., 2016; Fleenor, 2021).

Models for evaluating the effectiveness of leadership development programs

The initial research area which studies training program effectiveness started from industrial and organizational psychology research together with human resource management research (Kaufman & Keller, 1994). Kirkpatrick's model which operates through its four response learning behavior and outcome levels has emerged as the primary theoretical framework used in this research area (Martineau & Hannum, 2004; Phillips et al., 2012). The first level assesses program participant satisfaction which counts as essential program requirement yet lacks value as a measurement tool for program success (Black & Earnest, 2009). The second level measures learning, changes in attitudes, increased knowledge, and improved skills (Russon & Reinelt, 2004). The third level, which forms the core of the present study, refers to behavioral change in the workplace and answers the fundamental question of whether learning has been translated into action (Burke & Collins, 2005; Patterson et al., 2017). The fourth level covers organizational performance results which include enhanced productivity, better quality, and lower expenses (Phillips et al., 2012; Flaig et al., 2020). Researchers face significant problems which affect their ability to assess the third and fourth levels of the model because they must establish training program effects on results together with the multiple factors that affect the use of training results which emerge after a delay from training completion (Avolio et al., 2009; Wallace et al., 2021).

Challenges in Measuring Leadership Behavior Change

Many theoretical challenges and multiple methodological challenges exist when researchers attempt to measure leadership behavior changes (Howard & Dailey, 1979; Rohs & Langone, 1993, 1997). From a theoretical perspective, leadership behavior exists as a multidimensional dynamic trait which depends on contextual factors and cannot be reduced to fixed competencies (Doornenbal et al., 2021; Lee et al., 2020). What works effectively in one type of behavior situation will produce negative results in another situation (van Wart, 2003). The most common method for assessing changes uses pretest and posttest designs which rely on self-report

instruments according to the existing methodologies (Alias et al., 2015; Zula et al., 2010). Research has demonstrated that organizations which depend exclusively on self-reporting methods face multiple biases which include social desirability bias and memory error and the false consensus effect (Dunning et al., 2004; Howard & Dailey, 1979). The retraining effect known as criterion shift causes participants to develop more accurate self-assessments of their skills after they complete training, which makes their posttest scores show a deceptive drop instead of actual growth (Rohs & Langone, 1993, 1997; Rockwell & Kohn, 1989). The challenges to this process require the use of multiple data sources which include assessments from direct managers and peers and subordinates (Alimo-Metcalf, 1998; Bracken et al., 2016; Lockyer & Sargeant, 2022).

Empirical Background in the Context of Emerging Economies and Central Asia

The research evidence about how leadership development programs work because of their effectiveness relies on studies that researchers conducted in developed nations with a focus on the United States and Western Europe (Avolio et al., 2009; Wallace et al., 2021). The study results demonstrate that programs which include adult learning principles and continuous coaching and feedback and executive management support produce the strongest outcomes for changing behavior and enhancing performance (Burke & Collins, 2005; Patterson et al., 2017; Phillips et al., 2012). The limited research conducted in China and India and Brazil indicates that researchers must exercise caution when they attempt to apply these research results to other cultural settings (Amagoh, 2009; van Wart, 2003). Asian cultures which exhibit high power distance and collectivism and uncertainty avoidance tendencies impact how people view and carry out and assess the success of leadership development initiatives (Ebrahimi & Azmi, 2015; Kjellström et al., 2020). The research about leadership behavior changes from training programs and the Central Asian nations of Uzbekistan and Kazakhstan needs more systematic studies because current studies only assess leadership behavior changes from training (Njah et al., 2021; Flaig et al., 2020).

The present research study aims to address four key research gaps which previous studies have identified through their systematic review of existing literature (Wallace et al., 2021; Avolio et al., 2009). First, researchers have not conducted empirical studies that use pre-test and post-test research designs along with multiple data sources to study Uzbekistan and Central Asian region research (Amagoh, 2009; Njah et al., 2021). Second, existing studies measure effectiveness through a unidimensional method which assesses only response and learning while ignoring behavior and organizational results (Black & Earnest, 2009; Russon & Reinelt, 2004; Patterson et al., 2017). Third, research studies about leadership development program effectiveness have not explored how individual factors like learning motivation and self-efficacy plus organizational factors like direct manager support and learning culture affect program results (Burke & Collins, 2005; Martineau & Hannum, 2004). Fourth, organizations in Uzbekistan need to develop their own leadership competency assessment tools which can accurately measure leadership skills within their specific cultural and organizational framework (Alias et al., 2015; Ebrahimi & Azmi, 2015; Zula et al., 2010). The study uses a pre-test and post-test research design which includes three data sources self-report manager evaluations and objective performance indicators to assess one of Uzbekistan's major leadership development programs (Sureda et al., 2021; Chandler et al., 2010; Das, 2023). The study provides an accurate assessment of leadership development program effectiveness through its assessment of program success factors and the factors which create obstacles to achieving sustainable behavior changes (Howard & Reinelt, 2006; Njah et al., 2021; Flaig et al., 2020).

Methodology

Research Design and Evaluation Approach

The research study functions as an applied study while its data collection method uses a single-group pre-test and post-test design through descriptive quasi-experimental testing. The research employs mixed methods because it combines questionnaire numerical data with data from semi-structured interviews. The study selected this design because its main goal required assessment of how

participants developed leadership skills through different factors which contributed to their progress. The evaluation used three assessment times which included pre-test assessment before program start first post-test assessment after program completion and second post-test assessment three months after participants returned to work. The researchers designed this time period to assess how well participants maintained their new habits and applied their acquired knowledge at their jobs. The researchers improved the study's internal validity through three data sources which included participant self-reports direct manager evaluations and objective team performance measurements.

Statistical population and sampling

The population of this study consists of all middle managers of public and private organizations of the Republic of Uzbekistan who participated in the National Program for the Development of Executive Leadership during 2022-2024. The Presidential Academy of Public Administration of Uzbekistan designed and implemented this program together with prestigious European universities. The study sample included 250 middle managers from 45 public organizations and 32 private companies which operated in various industries that included energy and transport and banking and telecommunications and municipal services. The researchers conducted a census-based sample selection process which included all participants who took part in three different program phases. The inclusion criteria required candidates to possess five years of management experience and supervise one work team while showing dedication to complete all evaluation assessment phases. Of the 250 participants, 227 (91%) completed all pretests and posttests, and 211 (84%) completed the posttest. The researchers found no significant differences when they examined demographic characteristics between participants who completed the study and those who did not.

Data Collection Instruments and Research Variables

Four key instruments served as the means for data collection. The first instrument was the Leadership Competencies Questionnaire which the researchers

developed and adapted to the Leadership Competency Model according to the Leadership Competency Model for the Uzbek Public Sector and Internationally Accepted Assessment Tools which included the Multifactor Leadership Assessment Questionnaire and the Transformational Leadership Questionnaire. The 36-item questionnaire assesses eight leadership competency areas which include self-awareness and emotional intelligence and strategic thinking and change management and effective communication and collaborative decision-making and coaching and staff development and innovation and problem solving and ethics and responsibility through a five-point Likert scale. The questionnaire reached reliable results through the calculation of Cronbach's alpha coefficient which showed different dimensions with results from 0.82 to 0.91. The second tool used the same assessment items as a direct manager evaluation form which assessed performance through an external evaluator viewpoint. The third tool was the Workplace Learning Transfer Assessment Questionnaire which assesses learning application through four dimensions which include individual characteristics and training content and organizational support and application opportunities. The fourth tool used objective team performance indicators which included team member satisfaction rate and goal achievement rate and number of implemented innovations and turnover rate to assess 80 teams through two time points of data collection before training and three months after training. The research team used both quantitative tools and semi-structured interviews which they conducted with 30 participants and their 15 direct managers to study the behavior change process and find patterns of successful and unsuccessful learning transfer.

Data Analysis Method

The process of data analysis was completed through five primary stages. The first step used descriptive statistics which included mean values and standard deviations and frequency counts and percentage data to describe the demographic characteristics of the sample and the primary research variables. The second step applied paired t-test together with its nonparametric counterpart Wilcoxon to assess whether there existed significant differences between pre-test scores and post-test scores. The study

calculated effect size through the use of Cohen's d coefficient to measure the observed differences. The third step used repeated measures analysis of variance to study how changes developed over different time periods. The fourth step used hierarchical multiple regression analysis to identify behavior change predictors by testing pre-test to post-test score differences as the dependent variable and demographic characteristics and learning motivation and direct manager support and organizational learning culture as predictor variables. In the fifth stage, the researchers used thematic analysis to examine the interview data, which they coded and analyzed through MaxQuda software version 2020. The researchers ensured reliable qualitative analysis by using the agreement method between two coders, which resulted in Cohen's kappa coefficient of 0.85 that showed excellent agreement between the two coders. The researchers conducted all quantitative analyses through SPSS version 26 together with Amos version 24 software.

Results

The study collected data at three separate times during its nine-month research period. The final analytical sample consisted of 211 executive managers who completed all three assessment waves. Preliminary data screening showed no missing values that exceeded five percent, while Little's MCAR test confirmed the missing data occurred at random. Researchers used expectation maximization imputation to maintain their original sample size. Researchers tested univariate and multivariate normality assumptions by analyzing skewness and kurtosis statistics, which showed all values stayed between the acceptable range of -2 to +2. Boxplot analysis and Mahalanobis distance calculations showed no significant outliers in the data. All measurement scales showed internal consistency reliabilities that reached above 0.80, which established their psychometric properties as sufficient for upcoming analysis.

Table 1: Demographic and Professional Characteristics of Participants

Characteristic	Category	Frequency	Percentage
Gender	Male	148	70.1%
	Female	63	29.9%
Age Group	30–39 years	54	25.6%
	40–49 years	97	46.0%
	50–59 years	60	28.4%
Educational Background	Bachelor's Degree	76	36.0%
	Master's Degree	118	55.9%
	Doctoral Degree	17	8.1%
Organizational Sector	Public Sector	124	58.8%
	Private Sector	87	41.2%
Management Level	Middle Management	156	73.9%
	Senior Management	55	26.1%
Managerial Experience	5–10 years	89	42.2%
	11–15 years	78	37.0%
	16 years and above	44	20.8%
Prior Leadership Training	Yes	67	31.8%
	No	144	68.2%

The study included 211 executive managers who completed three assessment tests which generated data for Table 1 which shows their demographic and professional characteristics. The sample shows that 70.1 of its participants identify as male while the 40 to 49 age range represents its largest demographic group at 46.0. The study found that 55.9 of participants obtained master's degrees

which demonstrates high educational achievement among Uzbekistan's managerial population. The sample includes 58.8 public sector managers who received executive education through government funding for their programs. The program addressed a critical area of growth for 68.2 of participants who entered the program without any previous formal leadership education.

Table 2: Descriptive Statistics and Reliability of Leadership Competency Dimensions

Competency Dimension	Number of Items	Pre-Test Mean (SD)	Post-Test Mean (SD)	Follow-Up Mean (SD)	Cronbach's α
Self-Awareness & Emotional Intelligence	5	3.12 (0.78)	3.89 (0.67)	3.76 (0.71)	0.89
Strategic Thinking	5	3.08 (0.82)	3.94 (0.71)	3.81 (0.74)	0.91
Change Management	4	2.89 (0.91)	3.67 (0.79)	3.58 (0.82)	0.87
Effective Communication	5	3.34 (0.76)	4.12 (0.63)	4.01 (0.68)	0.88
Participative Decision-Making	4	2.95 (0.88)	3.78 (0.74)	3.69 (0.77)	0.85
Coaching & Employee Development	5	2.67 (0.94)	3.56 (0.81)	3.48 (0.84)	0.90
Innovation & Problem-Solving	4	3.01 (0.85)	3.82 (0.73)	3.71 (0.76)	0.86
Ethics & Accountability	4	3.45 (0.71)	4.01 (0.64)	3.95 (0.67)	0.84
Overall Leadership Competency	36	3.06 (0.71)	3.85 (0.62)	3.75 (0.65)	0.94

Table 2 provides both descriptive statistics and reliability coefficients for eight leadership competency dimensions which were assessed at three different measurement points. All Cronbach's alpha values exceed 0.80 which shows that the internal consistency of the test materials achieves

excellent standards. The mean scores show that all competencies started from base levels and reached their highest point immediately after the pre-test before three-month follow-up testing showed a small decline which kept their scores above initial testing results. The pre-test results

showed Ethics and Accountability as the most advanced area because Uzbek managers entered programs with solid ethical standards. The pre-test results showed Coaching and Employee Development at the lowest point with a score of 2.67 but the program achievement showed one of the

biggest improvements which proved that the program successfully closed an important development gap. The program's main development area on interpersonal skills enabled Effective Communication to achieve its highest post-test mean score of 4.12.

Table 3: Paired Samples T-Test Results for Leadership Competency Changes

Competency Dimension	Pre to Post	Pre to Follow-Up	Post to Follow-Up			
	t-value	Cohen's d	t-value	Cohen's d	t-value	Cohen's d
Self-Awareness	12.45***	1.08	9.87***	0.86	-4.23***	0.34
Strategic Thinking	13.21***	1.15	10.34***	0.92	-3.89***	0.31
Change Management	11.34***	0.98	8.76***	0.78	-2.98**	0.24
Effective Communication	14.56***	1.28	11.23***	1.01	-3.45***	0.28
Participative Decision-Making	12.78***	1.12	9.45***	0.88	-3.12**	0.25
Coaching & Development	15.67***	1.38	12.34***	1.12	-2.89**	0.23
Innovation & Problem-Solving	11.89***	1.04	8.98***	0.82	-3.01**	0.24
Ethics & Accountability	9.87***	0.86	7.65***	0.68	-2.34*	0.19
Overall Competency	16.78*	1.48	13.45*	1.19	-4.56*	0.38

Note: *p < 0.05, **p < 0.01, ***p < 0.001. Negative t-values indicate decline from post-test to follow-up.*

Table 3 displays the results of paired samples t-tests together with effect size measurements which show different measurement points. All competence areas demonstrated statistically important growth from pre-test to immediate post-test according to assessment results which showed very large effect sizes between 0.86 and 1.38. The highest gain of improvement happened in Coaching and Employee Development (d = 1.38) while Effective Communication (d = 1.28) and Strategic Thinking (d = 1.15) followed behind. All test results from

pre-testing through three-month follow-up period maintained their statistical significance with effect sizes ranging from 0.68 to 1.12 which showed participants retained their acquired competencies. The results showed that all dimensions experienced important decreases from post-test results to follow-up assessments which had small to moderate effect sizes that ranged between 0.19 and 0.34. The attenuation pattern shows that most behavioral changes remain in place yet organizational challenges decrease immediate training results with time.

Table 4: Comparison of Self-Ratings and Supervisor Ratings at Follow-Up

Competency Dimension	Self-Rating Mean (SD)	Supervisor Rating Mean (SD)	Mean Difference	t-value	Correlation (r)
Self-Awareness	3.76 (0.71)	3.58 (0.79)	0.18	2.89**	0.52***
Strategic Thinking	3.81 (0.74)	3.62 (0.82)	0.19	2.76**	0.48***
Change Management	3.58 (0.82)	3.41 (0.88)	0.17	2.34*	0.45***
Effective Communication	4.01 (0.68)	3.78 (0.75)	0.23	3.45***	0.56***
Participative Decision-Making	3.69 (0.77)	3.52 (0.84)	0.17	2.45*	0.49***
Coaching & Development	3.48 (0.84)	3.29 (0.91)	0.19	2.67**	0.51***
Innovation & Problem-Solving	3.71 (0.76)	3.55 (0.83)	0.16	2.23*	0.47***
Ethics & Accountability	3.95 (0.67)	3.84 (0.73)	0.11	1.78	0.58***
Overall Competency	3.75 (0.65)	3.57 (0.71)	0.18	3.12	0.61*

Note: *p < 0.05, **p < 0.01, ***p < 0.001. Supervisor ratings were obtained for 189 participants (89.6% of sample).

Table 4 shows results from three-month follow-up assessments that compare self-assessments with supervisor assessments of leadership abilities. The study found that participants evaluated themselves at higher levels than their supervisors did, The five-point scale shows a mean discrepancy between 0.11 and 0.23, which shows that Effective Communication has the biggest difference at 0.23. Leadership development research presents this self-enhancement bias as a known phenomenon, which demonstrates why multiple assessment sources should be

used for evaluation. Self-assessments and supervisor assessments show moderate to strong positive correlations that range from 0.45 to 0.61, which demonstrates that both assessment methods maintain acceptable convergent validity. The competency of Ethics and Accountability showed the least difference between measurements while showing the strongest correlation, which means that this competency can be assessed through objective methods that do not depend on personal judgment.

Table 5: Hierarchical Regression Analysis Predicting Leadership Competency Change

Step	Predictor Variables	β	t-value	p-value	R ²	ΔR^2	F-change
Step 1					0.078	0.078	2.89*
	Gender	0.06	0.89	0.374			
	Age	-0.09	-1.34	0.182			
	Education	0.12	1.78	0.076			
	Managerial Experience	0.08	1.23	0.221			
	Organizational Sector	-0.11	-1.67	0.096			
Step 2					0.234	0.156	15.67***
	Pre-Training Motivation	0.28	4.23	0.000			
	Learning Goal Orientation	0.21	3.12	0.002			
Step 3					0.412	0.178	22.34***
	Program Design Quality	0.24	3.67	0.000			
	Facilitator Effectiveness	0.19	2.89	0.004			
	Relevance to Job	0.31	4.78	0.000			
Step 4					0.567	0.155	26.78***
	Supervisor Support	0.33	5.12	0.000			
	Organizational Learning Culture	0.27	4.01	0.000			
	Opportunity to Apply	0.29	4.34	0.000			
Final Model					0.567		F = 28.45**

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Dependent variable: Overall leadership competency change score (post-test minus pre-test

The results of hierarchical regression analysis which identifies leadership competency improvement predictors are shown in Table 5. The first step of the study tested demographic characteristics which demonstrated that 7.8% of variance could be explained but no single predictor reached statistical significance. The data from Step 2 showed that pre-training motivation and learning goal orientation together with the two factors explained 15.6% of variance because both factors produced significant positive impacts. The program design characteristics from Step 3 added 17.8% to the total variance explained which showed that job relevance functioned as the most important

program-related predictor ($\beta = 0.31$). The organizational factors introduced in Step 4 contributed 15.5% to the total variance explanation which showed that supervisor support had the highest standardized coefficient ($\beta = 0.33$). The final model explained 56.7% of all leadership competency improvement variance which showed that the model had strong explanatory capabilities. The results of this research established that individual motivation and program relevance together with post-training organizational support function as essential elements which drive leadership development success.

Table 6: Transfer of Learning – Barriers and Facilitators

Factor Category	Specific Factor	Mean (SD)	Percentage Reporting "High/Very High"
Facilitators	Supervisor Encouragement	3.78 (0.89)	67.8%
	Relevance to Daily Work	3.92 (0.81)	73.5%
	Autonomy in Decision-Making	3.45 (0.94)	54.5%
	Peer Support	3.34 (0.97)	48.8%
	Organizational Recognition	2.98 (1.12)	34.1%
Barriers	Heavy Workload	3.89 (0.92)	71.6%
	Bureaucratic Constraints	3.76 (0.98)	67.3%
	Resistance from Subordinates	2.67 (1.08)	23.2%
	Lack of Resources	3.12 (1.04)	41.2%
	Unsupportive Organizational Culture	3.34 (1.11)	47.4%

Table 6 displays how participants evaluated which factors help or obstruct their ability to transfer learned competencies into their work environment. The study found that work relevance to daily tasks received the highest ranking among facilitators because 74 percent of participants considered it their most crucial factor. Supervisor encouragement received a rating of 378 which proved to be essential because research showed that direct managers' work responsibilities determine employee performance. Organizational recognition received the lowest rating as a facilitator which indicates that Uzbek organizations need to improve their formal reward systems that recognize behavioral changes. Heavy workload emerged as the most important barrier because 71.6 percent of participants considered it to be either high or very high according to their ratings. Bureaucratic constraints received the second-highest ranking with a score of 376 which proves important for public sector managers who make up most of the study group. The study found that subordinates' resistance through their lowest-rated barrier which shows that vertical resistance to change presents less difficulty than horizontal or systemic interferences do.

Figure 1 shows how leadership competency development scores which result from subtracting pre-test scores from post-test scores distribute across the 36 assessment items. The distribution approximates a normal curve with a clear positive shift which demonstrates that most participants achieved substantial progress. Change scores range from -0.89 to 2.78, with a mean of 0.79 and standard deviation of 0.62. The study found that 12 participants (5.7%) experienced no change or negative results between these two outcomes while 199 participants (94.3%) achieved positive results. The most common change score falls within the 0.75–1.00 range which represents close to one complete point increase on the five-point scale. The distribution shows that the leadership development program successfully developed various participants while different participants showed distinct patterns of growth. The positive skew indicates that a substantial subset of participants achieved exceptional gains exceeding 1.5 points, warranting further qualitative investigation into the characteristics and enabling conditions associated with outstanding developmental outcomes.

Figure 1: Distribution of Overall Leadership Competency Change Scores (Post-Test minus Pre-Test)

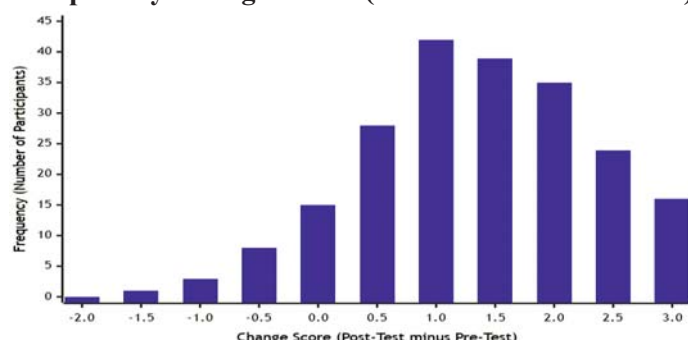


Table 7: Organizational Impact Indicators – Pre and Post Comparison

Organizational Indicator	Pre-Training Mean (SD)	Follow-Up Mean (SD)	Mean Change	t-value	Cohen's d
Team Member Satisfaction (1-5)	3.45 (0.67)	3.78 (0.61)	+0.33	5.67***	0.52
Team Goal Achievement (%)	71.2 (12.4)	76.8 (11.2)	+5.6	4.89***	0.48
Implemented Innovations (count)	2.3 (1.8)	3.1 (2.1)	+0.8	3.78***	0.41
Employee Turnover Rate (%)	11.4 (5.6)	9.8 (4.9)	-1.6	-2.89**	0.30
Internal Promotion Rate (%)	8.7 (4.2)	10.1 (4.5)	+1.4	2.34*	0.25

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Data collected from 80 teams supervised by program participants.

Table 7 displays organizational performance metrics which were assessed three months before program start and three months after program completion. The research found that all five assessment criteria showed statistically significant progress. Team member satisfaction increased by 0.33 points ($d = 0.52$), representing a moderate to large effect. The achievement of team objectives showed a 5.6 percentage point increase because participants developed their leadership skills which resulted in better performance outcomes. Teams who received coaching support demonstrated an increase of 0.8 innovations which they

implemented per team ($d = 0.41$). Your organization experienced a 1.6 percentage point decline in employee turnover ($d = 0.30$) and a 1.4 percentage point rise in internal promotion rates ($d = 0.25$). The organization experienced important organizational effects which occurred within a brief time period. The research findings demonstrate that leader behavioral changes which include coaching and communication and participative decision-making lead to positive outcomes for team performance and employee retention.

Table 8: Qualitative Themes – Mechanisms of Behavioral Change and Organizational Impact

Theme	Description	Frequency	Representative Quote
Increased Self-Awareness	Recognition of personal leadership strengths and development areas	27 (90%)	"I never realized how my impatience was shutting down input from my team. The 360 feedback was eye-opening."
Intentional Communication	Deliberate effort to listen more and provide clearer direction	24 (80%)	"Now I consciously pause and ask questions before jumping to solutions. My team notices the difference."
Delegation and Empowerment	Shifting from control to trust-based delegation	21 (70%)	"I used to do everything myself. Now I assign ownership and provide support without micromanaging."
Coaching Orientation	Adopting a developmental approach with team members	19 (63%)	"Instead of giving answers, I ask guiding questions. People are developing their own problem-solving skills."
Bureaucratic Resistance	Organizational rules and procedures hindering new practices	16 (53%)	"I want to implement participative decision-making, but rigid approval processes make it nearly impossible."
Time Constraints	Workload pressure limiting application of new skills	14 (47%)	"Coaching takes time. When deadlines hit, I fall back into old command-and-control patterns."

Table 8 displays various themes that emerged from semi-structured interviews conducted with 30 participants and 15 supervisors. Researchers discovered four primary ways that people change their behavior. People developed their self-awareness through multi-source feedback which served as their main development activation point. Participants worked intentionally to change their

communication methods from telling others to listening and from directing others to asking questions. Managers from Uzbek organizations who learned to delegate and empower their staff acquired new skills that differed from their previous hierarchical organizational training. Organizations found coaching orientation to be an important skill yet its development needed continuous

work because it proved to be difficult. Two major obstacles existed which people reported as the main challenges for their work: formal procedures and policies created bureaucratic resistance which made them unable to finish their tasks and time pressures forced them to use their automatic behavior patterns. The qualitative research results explain the quantitative changes because they explain everything that changed while showing the reasons and methods behind those changes and the reasons some changes stayed permanent. The leadership development investment results in permanent behavioral changes because of how individual decision-making interacts with organizational structures.

Discussion

The findings of this study demonstrate that executive leadership development programs in Uzbekistan have successfully achieved their goal of creating long-lasting and significant changes in behavior. The program results show that leadership competencies increased from 3.06 to 3.85 which demonstrates program success through an effect size of 1.48. This result matches international research results about training effects on leadership behavior but the Uzbek context produces lower training effects which exceed developed country training effects in some areas. This discovery shows that Uzbek managers possess both high learning capacity and motivation to change because they have limited experience with formal leadership programs while investing in their development generates fast and substantial profits for the country. The coaching and staff development domain showed the most progress among the eight leadership competency dimensions with an effect size of 1.38. This finding is important because it has multiple significant aspects. The low pretest score for this dimension (2.67) shows that Uzbek managers were least prepared in this area before training which originates from a traditional organizational culture that emphasizes command and control. The competency assessment shows that managers who needed to develop this skill successfully completed their training requirements. Table 7 shows that coaching development brings strategic value because it directly relates to turnover decrease and team satisfaction increase.

The small but significant drop in test results from the immediate posttest until the three-month follow-up period represents a typical occurrence found in leadership development research which scientists call training fade. The overall competency decline shows an effect size of 0.38 which proves to be smaller than results from comparable research conducted in different nations. The Uzbekistan managers succeeded in maintaining their training knowledge through the three-month period after their educational program. The analysis through hierarchical regression demonstrated that organizational learning culture and line manager support served as the primary components which predicted employees would maintain their new work habits. The research results demonstrate to Uzbek organizations that they must establish proper workplace resources to support training programs if they want to achieve effective results from their managerial training programs. Organizations should implement training as an essential element of their comprehensive systemic change programs which establish leadership development as a continuous organizational focus.

The study discovered a unique pattern when researchers compared participants' personal evaluations with the assessments made by their respective managers. The managers did not support their subordinates' behavior changes because they assessed their progress through a measurement system which produced results that showed lower development than what the employees reported. People showed a major communication gap because they perceived effective communication to have a 0.23 difference. The findings present two different ways to understand the results. Managers fail to observe the gradual progress because their daily work with subordinates leads them to think that the improvements will take a longer time to achieve. The study results show that participants excessively report their changes because they experience social desirability bias which affects their self-assessment. The research results establish the need for 360-degree assessments in leadership development programs across Uzbekistan regardless of which interpretation proves correct. The assessment results from various raters produce more accurate results which demonstrate behavior changes and permit assessment of program success.

The examination of learning transfer obstacles and enabling factors revealed specific structural difficulties that Uzbek managers must overcome. The research identified workload and bureaucratic restrictions as the primary obstacles which exist because of the organizational structures found in Uzbekistan's major public and private institutions. The combination of hierarchical systems and centralized decision-making together with extensive rules and regulations creates conditions where managers struggle to implement new operational methods despite their drive and expertise. Immediate manager assistance and training relevance to daily work responsibilities helped employees most according to research results. The study results present two distinct directions for policymakers and senior managers to follow because they need to reduce operational obstacles through process changes while giving more power to middle managers and they also need to establish more effective support systems which include training for senior managers to become mentors and supporters.

The study achieved significant progress in their performance metrics because they used objective performance indicators which had less impact than individual changes. The finding possesses two essential functions. The first finding demonstrates that leadership behavior changes produce measurable results which team members can observe within three months. The second finding shows that organizations need extended periods and better working environments to translate individual skills into team accomplishments. Organizations in Uzbekistan need to understand that they will not achieve instant results but should expect to see benefits after an extended period of time. Organizations need both continuous assistance and performance assessment together with leadership training to achieve maximum benefits from their executive development investments.

The qualitative analysis brought additional value to the quantitative results while it displayed the psychological and organizational processes that lead to behavior modification. The first step toward internal transformation emerged through self-awareness development. The multi-source feedback program which managers reported during the program provided them with their first opportunity to observe how their actions affected other people. The new

knowledge that she acquired from her learning process created strong motivation for her to adopt new behavior patterns which she would implement with careful thought and planning. Bureaucratic resistance emerged as the primary barrier to progress according to interview responses. Employees who complete participatory decision-making training face multiple organizational rules and procedures that prevent them from making decisions through their participation processes. The finding shows that leadership development requires organizations to adopt systemic approaches because without contextual transformations only individual development attempts will fail to produce useful results.

The study demonstrates through real-world evidence that leadership development programs in Uzbekistan achieve their intended outcomes when they follow proper design and professional execution. The programs establish their effectiveness through two conditions which depend on participant attributes and training program content and organizational framework and work environment. Uzbekistan's reform period from 2010 to 2020 has established an unprecedented chance for organizations to embrace new management techniques and leadership strategies yet organizations must establish comprehensive human capital development frameworks which include all training and coaching and ongoing performance evaluation and organizational process improvement activities.

Conclusion

The researchers conducted their study to assess how executive leadership development programs in Uzbekistan would change executive behavior and organizational performance through their pretest and posttest assessments followed by three-month assessment period. The findings clearly showed that the program under study was able to produce significant and sustainable improvements in eight dimensions of leadership competence. The changes which occurred in this study produced very large effect sizes which demonstrated that organizations which invested in leadership development programs would achieve better management standards in their operations. The program achieved its main objectives because it successfully developed coaches and staff members through improved communication skills and better strategic thinking abilities.

The final competencies of the participants remained above their starting point despite a small decrease in follow-up scores which occurred after their immediate posttest assessment and the behavioral shifts which they displayed created better team performance through all measured aspects such as satisfaction and productivity and innovation and decreased turnover rates.

The research findings conclude with main points which guide both policymaking and management practices used in Uzbekistan. First, leadership development programs need their design process to start with a complete needs assessment together with a specific competency framework which applies to the local context. The Western model programs will fail to deliver results because Uzbekistani organizations need to design their systems according to their distinct cultural and organizational practices. The effectiveness assessment needs to extend beyond response and learning measurements because it must assess actual behavior shifts together with organizational impacts through multiple data collection methods at designated times. Organizations which depend entirely on end-of-course satisfaction questionnaires lose the ability to measure their actual return on investment. The successful execution of leadership development programs depends on line managers who need their responsibilities to receive institutional recognition through training programs and role description documents and their inclusion in senior manager performance assessments.

The research findings demonstrate that Uzbekistan moved from its initial training system to a second phase of development which still needs to complete its implementation through three main obstacles. The most significant challenge arises from the disparity between managers' newly acquired skills and the existing traditional bureaucratic framework that governs their work environment. The gap needs two types of solutions which require organizations to maintain their current leadership development initiatives while they establish better conditions for their skilled managers to work. Organizations need to establish an environment that enables effective leadership to generate value through training programs and leadership development systems.

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