

**RESEARCH TITLE**

**The Effect of Leadership Skills Acquired from the Leadership Diploma on the Motivation of Government School Principals in Northern Directorates: Proposed Vision for Improvement**

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**Abstract**

This study aimed to examine the effect of leadership skills acquired from the Leadership Diploma on the motivation of government school principals in northern directorates. The population included in this study included 315 government school principals in Jenin, Qabatya, and Tubas Directorates. A quasi-experimental design was used; the study sample included 100 principals who had been trained through the Leadership Diploma. A questionnaire was used to collect data from the school principals. The results showed that principals who completed the Leadership Diploma had higher motivation, a sense of responsibility, and self-efficacy than the control group. Also, the study demonstrated that there was no effect of the training received during the leadership diploma on the motivation due to age, gender, specialization, and qualification. However, there was an effect of the principals' experience, in favor of 5 to 10 years. The study recommends starting the Leadership Diploma program to all government school principals from the first year.

**Key Words:** Leadership skills, Leadership Diploma, Motivation, School Principals.

## أثر المهارات القيادية المكتسبة من دبلوم القيادة على دافعية مديري المدارس الحكومية في المديرية الشمالية: رؤية مقترحة للتطوير

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### المستخلص

هدفت هذه الدراسة إلى فحص أثر المهارات القيادية المكتسبة من دبلوم القيادة على دافعية مديري المدارس الحكومية في المديرية الشمالية. شمل مجتمع الدراسة (315) مديرًا ومديرة من مديري المدارس الحكومية في مديريات جنين وقباطية وطوباس. استخدمت الدراسة المنهج شبه التجريبي، وتكوّنت عينة الدراسة من (100) مدير ومديرة ممن تلقوا التدريب من خلال دبلوم القيادة. ولجمع البيانات، استخدمت استبانة وُزعت على مديري المدارس. أظهرت النتائج أن المديرين الذين أنهوا دبلوم القيادة يتمتعون بمستويات أعلى من الدافعية، والشعور بالمسؤولية، والكفاءة الذاتية مقارنة بالمجموعة الضابطة. كما بيّنت الدراسة عدم وجود أثر للتدريب الذي تلقاه المديرون خلال دبلوم القيادة على الدافعية يُعزى إلى متغيرات العمر، والجنس، والتخصص، والمؤهل العلمي. في المقابل، وُجد أثر لخبرة المديرين في الدافعية لصالح من تتراوح خبرتهم بين (5-10) سنوات. وأوصت الدراسة ببدء تطبيق برنامج دبلوم القيادة لجميع مديري المدارس الحكومية منذ السنة الأولى لتوليهم مهام الإدارة.

**الكلمات المفتاحية:** المهارات القيادية، دبلوم القيادة، الدافعية، مديرو المدارس.

## Introduction

Schools are the one of most important institutions where students are developed cognitively, socially, and morally. Teachers play an important role in the educational process; they affect students' achievement. Good administration is necessary to the success of teachers and students. (Dinampo & Balones, 2023). Leadership is Known as the core element of educational administration; it directs schools towards achieving educational goals. Educational leaders should inspire and guide the staff towards their shared goals (Rachman et al., 2023). Also, they should influence individuals towards achieving these goals, motivating them, and enhancing an environment where responsibilities are shared among the whole team members (Jambo & Hongde, 2020). Leaders play an important role in influencing teachers' motivation, affect the whole school members (Hasibuan, 2022).

A successful leader seeks to be motivated to achieve. Some training programs, such as the Leadership training, help school principals with knowledge and skills that they need to succeed in their roles. Leadership training helps principals in dealing with schools' difficulties, using good practices, and applying good strategies. So, principals who go through the training programs should be well prepared to achieve high levels of achievement and be motivated (Elfaragy et al., 2022). In addition, leadership motivates principals to achieve their goals, and it enhances their commitment and sense of responsibility (Faisal, 2023).

## Theoretical Background

Motivation refers to the need of school principals to succeed in tasks, it is linked with personal aspirations and educational objectives, it can be powered by many factors, such as the desire for recognition and rewards (Hasibuan, 2022) . There is a good relationship between having leadership skills and motivation (Marselina et al., 2023). Sometimes motivation comes from inside the person. For example, they may feel motivated and think to develop their methods when they find satisfaction in helping teachers (Faisal, 2023). This is known as intrinsic motivation. (Rohim et al., 2023). Principals are responsible of resolving school problems effectively, so, they should be ready to take on their responsibilities and organize the educational environment(ÇETİN et al., 2023). Moreover, principals are responsible of disciplined environment, making suitable decisions to achieve the school's goals (Velody & Koskei, 2023).

School principals will be able to take on their responsibilities when they are self-motivated. They will guide teachers, contact with parents, enhance a positive work environment (Alene et al., 2025), and solves problems that affect the schools' performance (Rohim et al., 2023). Principals should think flexibly, along with self-confidence and their ability to work. They should identify the problem, collect information, analyze its causes, evaluate solutions, and then implement the results(Ekren et al., 2025). They should depend on creative thinking and decision-making abilities to achieve school stability(Velody & Koskei, 2023). Therefore, they will be better able to lead the team (Rohim et al., 2023). Also, they will affect students through solving problems, motivating (Alene et al., 2025).

Sometimes, principals are motivated to achieve goals in order to receive praise or rewards. For example, they may work hard to receive a recognition from the ministry of education (Hasibuan, 2022). Respect from the society acts as a form of external motivation that enhances a person's self-confidence (Hernandez et al., 2022). This increases trust, facilitates the implementation of educational programs. It also encourages community participation in the educational process, that affects principals' performance (Kumar et al., 2024). This acceptance can also be encouraged by building relationships of respect, and increasing community cooperation (Berhanu & Naidoo, 2024).

Motivated principals show a sense of responsibility that encourages mutual trust with their team members. In this way, they work to achieve their goals (Rohim et al., 2023). Also, principals take responsibility for the decisions inside the school; these decisions affect the team performance. Also, they are responsible of decisions that their outcomes affect the workers' performance, the achievement of their vision, and positive relationships among the team. (Zeinstra et al., 2023). In order to make decisions well. A school principal should have a good level of competence and awareness, because, hesitation in making decisions weakens school discipline (Alene et al., 2025) Moreover, when school principals have enough knowledge about their job, they can develop their schools (Boudouaia et al., 2024). Principals should improve themselves in order to be familiar with the modern administrative methods that help them in facing challenges (Prakash et al., 2024). A principal's ability to support teachers is important in motivation. The more responsible principals are and the more ability to direct their team well, the more development of team performance (Boudouaia et al., 2024). It is important for principals to make right decisions, keep a safe school environment despite difficult circumstances (Ramos-Pla et al., 2021). Principals' confidence in themselves helps them in developing their performance (Collie et al., 2024).

### **Definition of Terms**

**leadership skills:** Administrative abilities performed by school principals in many areas such as planning and developing relationships inside and outside the school (Leithwood et al., 2020), these abilities also help principals to lead, set goals, and control resources to achieve educational goals, coordinate activities, solve problems, and make decisions (Papilaya & Nanda, 2024).

**Leadership Diploma:** A training program for school principals, implemented under the supervision of the Ministry of Education, to equip principals with leadership skills. It includes 360 training hours that last for a whole year. Principals join face-to-face sessions every month and an online session three times per month to discuss what was learned during the face-to-face session. It contains ten units covering leadership skills such as strategic planning, follow up and supervision, communication, teaching and learning, and schools' environment. Each principal should prepare a project and procedural research that reflect the knowledge and skills they have acquired during the training period. (Ziada, 2021).

**Motivation:** According to Bandhu et al. (2024) motivation means the ability to direct behavior that drives actions towards a goal which requires sustained effort. But Morris et al. (2022) defined motivation as identifying unsatisfied needs and finding a goal to fulfill it. It can be intrinsic, or extrinsic.

**School Principals:** leaders who are responsible of everything at school, direct school operations, evaluate teachers' performance, allocate resources, and maintaining relationships with staff to improve school performance (Hoque & Raya, 2023).

### **Problem Statement**

Leadership requires many leadership skills that help the leader to guide individuals to achieve their goals (Yada & Jäppinen, 2022). Principals should have many skills to be an effective leader. The researcher works as a supervisor at School Performance Monitoring Department in Qabatiya Directorate, she evaluates principals' performance, she also trains them within the Leadership Diploma program. During repeated visits to schools, she noted that the training had improved their motivation to achieve. The researcher also discovered that the previous studies have focused on the role of leadership in improving teachers' motivation. However, there is no single study that concerns with the principals' motivation themselves. This gap in the literature aroused the researcher's curiosity and encouraged her to explore this topic in depth.

## Research Questions

### Main Question

What is the effect of the leadership skills acquired from the Leadership Diploma on the motivation towards achievement of government school principals in the northern directorates?

### Sub-questions

RQ1: Do the average levels of motivation in the experimental group and the control group differ at ( $\alpha \leq 0.05$ )?

RQ2: Do the average levels of motivation differ due to gender, age, academic qualification, specialization, and practical experience?

### Significance of the Study

From theoretical perspective, the study addresses a necessary topic, which is measuring the effect of the Diploma on school principals' motivation, and it is the first study, to the researcher's knowledge, that studies the effect of a training program on principals.

From a practical perspective, the study provides information for The Ministry of Education on how is the leadership Diploma necessary for school principals.

### Study Hypotheses

H1: There are no statistically significant differences at the level of ( $\alpha \leq 0.05$ ) between the average levels of motivation in the experimental group and the control group.

H2: There are no statistically significant differences at the level of ( $\alpha \leq 0.05$ ) between the average levels of motivation due to the variables of gender, age, academic qualification, specialization, and practical experience.

### Research Design

The study follows the quasi-experimental approach because it is appropriate for the study objectives, using a nonequivalent control group design. In the Non-equivalent control-group design both groups are given first a pretest and then a posttest [after the treatment is given to the experimental group]. The pretest score and the posttest score are compared to determine if there are important differences. An advantage of this Design is that it involves intact groups (i.e., keeps the participants in natural settings), thus allowing a higher degree of external validity

	Pre-test	Treatment	Posttest
Experimental group	O <sub>1</sub>	X	O <sub>2</sub>
Control group	O <sub>3</sub>		O <sub>4</sub>

### Population of the Study

The study population consists of all public-school principals in Qabatyia, Jenin, and Tubas Directorates whom number was 315 according to the Ministry of Education in the year 2024-2025. Sample of the Study

The experimental group consisted of all principals enrolled in the training program during the year from Jenin, Qabatiya, and Tubas directorates, totaling (100) participants, and the control group consisted of (100) principals who did not enroll in the diploma program in the same year. They were selected purposively because the participants in the diploma training program had already been determined by the Ministry of Education.

## Study Tools

The researcher used the following tool:

### Motivation questionnaire

This questionnaire was designed to measure principals' level of their motivation to work. It consists of twenty-one items related to four domains to identify the factors that motivate principals to achieve better. It was based on two previous scientific studies: the first, by Erdem& Cicekdemir (2016), and the second, by Ling et al. (2015). The scale contains four domains; intrinsic motivation, extrinsic motivation, sense of responsibility, and self-efficacy. A five-point Likert scale was used for this tool, with responses ranging from (1 = strongly disagree) to (5 = strongly agree).

### Validity of the questionnaire

#### Content Validity

The questionnaire was reviewed by a group of expert evaluators specializing in leadership, teaching, and learning to ensure the validity, modify, delete, or add items. The percentage of evaluators who agreed on the questionnaire items reached 80%, according to research standards for content validity. This indicates that the questionnaire has acceptable content validity. So, the questionnaire in its final draft consists of 21 items, covering four domains.

#### Construct Validity and Internal Validity

The tool validity was proven through computing correlation coefficients between each domain and the total score. The results showed that all domains expressed strong statistical significance at the significance level of 0.01, showing a high degree of consistency between the domains.

The correlation between the first domain and the total score was ( $r = 0.914^{**}$ ), a high value statistically significant at the 0.01 level, showing the high validity of this domain. The results in the second domain showed that the correlation coefficient was ( $r = 0.922^{**}$ ), reflecting the reliability and accuracy of the items related to this domain and their consistency with the general structure of the scale. The third domain achieved a correlation coefficient of ( $r = 0.907^{**}$ ), that is also statistically high. The fourth domain recorded ( $r = 0.889^{**}$ ), which indicates a high correlation between this domain and the overall scale as shown in table (1).

Table (1)

*correlation coefficients between all domains of motivation scale and total score.*

domain	correlation	domain	correlation
intrinsic motivation	.914 <sup>**</sup>	sense of responsibility	.907 <sup>**</sup>
extrinsic motivation	.922 <sup>**</sup>	self-efficacy	.889 <sup>**</sup>

### Reliability of the Scale

To assess the reliability of the questionnaire, Cronbach's alpha coefficient was employed, the results show a value of (0.92) which is above 0.90 that considered excellent and enhances the reliability of the scale as shown in table (5)(Zakariya, 2022).

Table (5)

*Results of Chronbach's alpha for motivation scale*

No. of Items	Cronbach's Alpha
21	0.929

## Results

PERAM-ANCOVA tests were used to analyze the data, which are a nonparametric alternative to ANCOVA analysis when the basic assumptions of ANCOVA were not met. These assumptions are: The normal distribution test. The p-value for the Shapiro test was 0.0001, which is less than the statistical significance level of 0.05. The second assumption is homogeneity of variances between study groups. The p-value for Leven test was 0.001, which is less than the statistical significance level of 0.05. The alternative was to use PERAM-ANCOVA, available in the R package "permuco". The lmPerm package was used to obtain the mean marginal estimated (MME) using the emmeans package, and then to calculate the pairwise comparisons.

Results related to the first hypothesis which states:

There are no statistically significant differences ( $\alpha \leq 0.05$ ) between the averages of motivation levels in the experimental group and the control group.

The results indicate an impact of the group (experimental, control) on motivation levels at a significance level of ( $\alpha = 0.05$ ). The resampled P(F) value for the group at the intrinsic motivation level was 0.0002, which indicates an effect of the group (experimental, control) on the post-application level of intrinsic motivation. Similarly, for the levels of extrinsic motivation, sense of responsibility and self-efficacy, the resampled P(F) value was 0.0002, which is less than the significance level of ( $\alpha = 0.05$ ). Regarding overall motivation, the results showed that the (experimental, control) group had an impact on overall motivation. The resampled P(F) value was 0.0002, which is less than the significance level of ( $\alpha \leq 0.05$ ) (Appendix A).

Pairwise comparisons across all motivation levels shows that the comparison was statistically significant across all motivation levels. The p-value for all comparisons reached 0.001, which is statistically significant at a statistical significance level of ( $\alpha \leq 0.05$ ) in favor of the experimental group (Appendix B).

The results showed that principals who finished the training were more motivated than others who didn't. They work harder which is reflected in their school staff, feel responsible and motivated to work. This is consistent with studies by (Faisal, 2023; Rohim et al., 2023 ; Ekren et al., 2025)

The results also showed that school principals who finished the Diploma are more extrinsically motivated, because they prefer to work well in order to receive praise from their superiors at the Ministry of Education. Furthermore, the confidence of the community in principals' performance makes them support the school, which increases the principal's sense of extrinsic motivation. This is consistent with the studies of (Hernandez et al., 2022; Hasibuan, 2022).

Results related to the second hypothesis:

There are no statistically significant differences at a significance level of ( $\alpha \leq 0.05$ ) between the average levels of motivation due to the variables of gender, age, qualification, specialization, and experience.

The results indicate that both gender and specialization variables are not statistically significant at a significance level of ( $\alpha = 0.05$ ). The resampled F values were 0.8264 and 0.7146, respectively, which are greater than the statistical significance level. However, the qualification, experience, and age were statistically significant. The F values were 0.0230, 0.0014, and 0.0034, which are less than the statistical significance level.

Regarding the post-test of the extrinsic motivation level, both gender and specialization were not statistically significant. The F values were 0.6110 and 0.5816, which are greater than the statistical significance level. Meanwhile, qualification, experience, and age variables were statistically significant at a significance level of ( $\alpha = 0.05$ ). The resampled F values were 0.0260, 0.0024, and 0.0102, which is less than the statistical significance level. Therefore, these variables had an effect on the post-test of the extrinsic motivation level.

Regarding the sense of responsibility, the variables of gender, specialization, qualification, and age were not statistically significant at a significance level of ( $\alpha = 0.05$ ). The resampled F values were 0.9134, 0.1290, 0.0680, and 0.051. Meanwhile, experience was statistically significant. The resampled F value was 0.0014.

Concerning self-efficacy, it was found that gender, specialization, qualification, and age were not statistically significant at a significance level of ( $\alpha \leq 0.05$ ). The resampled F values were 0.6078, 0.1730, 0.7976, and 0.0814 which are greater than the statistical significance level. Meanwhile, experience variable was statistically significant at a significance level of ( $\alpha = 0.05$ ). The resampled F value was 0.0010, which is less than the statistical significance level. (Appendix C).

The variables of qualification, experience, and age had an impact on the post-application of the level of intrinsic motivation. The p-values of this difference were 0.0207, -0.8246, 0.0013, which in favor of the categories (diploma - bachelor's), (5-10 years), (25-35 years). Regarding the extrinsic motivation, the variables of qualification and experience had an effect on the post-application of the level. The values were 0.0271, 0.0020, 0.0031. The difference was in favor of the categories (diploma - bachelor's) and (5-10 years). The level of sense of responsibility, the variable of experience had an impact on the post-test of the level. The p-value was 0.0010, which is statistically significant at a statistical significance level of ( $\alpha \leq 0.05$ ). The difference was in favor of the category (5-10 years). Regarding self-efficacy, the variable of experience had an impact on the post-test of the level. The p-value is 0.0009, which is statistically significant at a statistical significance level of  $\alpha=0.05$ . The difference was in favor of the (5-10 years) category. (Appendix D).

The researcher explains this by stating that the Leadership Diploma program is designed to ensure that all school principals are equipped with the same skills, regardless of their gender or specialization and all principals benefit from the program. This result is similar to the findings of a study by (Bibi et al. (2022) which indicated that gender and age variables do not explain differences in leadership practices, while the variable of years of experience play a clear role in principals' performance. concerning age, academic qualifications, and years of experience, the results showed that they had a clear effect on the principals' intrinsic and extrinsic motivation.

## Recommendations

The researcher suggests many recommendations to increase principals' achievement motivation. These recommendations are:

- Distributing the training program to all school principals in all directorates, because of its positive effect on principals' motivation.
- Include a training course in leadership with artificial intelligence applications that helps improving principals' motivation.
- Conduct future studies to address the effect of the Leadership Diploma program on student academic achievement.
- Conduct studies on the role of technology and digital transformation in developing leadership skills among school principals.

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## Appendices

### Appendix A

*PERAM-ANCOVA analysis results for the effect of the (control and experimental) group on the post-test of motivation levels.*

Intrinsic motivation					
	SS	df	F	parametric P(>F)	resampled P(>F)
Group	92.069	1	93.057	0.0000	0.0002
Pretest	1.408	1	1.423	0.2343	0.2350
Residuals	194.910	19 7			
Extrinsic motivation					
Group	94.026	1	95.40	0.0000	0.0002
Pretest	1.833	1	1.86	0.1742	0.1656
Residuals	194.162	19 7			
Sence of responsibility					
group	90.0387	1	106.37 0	0.000	0.0002
pretest	0.2827	1	0.334	0.564	0.5604
Residuals	166.754 1	19 7			
self-efficacy					
Group	121.783	1	145.57 1	0.00000	0.0002
Pretest	4.332	1	5.178	0.02395	0.0242
Residuals	164.808	19 7			
Total (Motivation)					
Group	94.650	1	130.8	0.0000	0.0002
motivation Pretest	1.809	1	2.5	0.1155	0.1138
Residuals	142.542	19 7			

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

## Appendix B

Intrinsic motivation					
Group	emmean	SE	df	lower.CL	upper.CL
Control	1.94	0.131	197	1.69	2.20
Experimental	4.08	0.131	197	3.82	4.34
binary comparison					
Contrast	estimate	SE	df	t.ratio	p.value
Control-experimental	-2.14	0.222	197	-9.647	<.0001
Extrinsic motivation					
Control	1.91	0.124	197	1.67	2.16
Experimental	3.91	0.124	197	3.67	4.16
binary comparison					
Control experimental	-2	0.205	197	-9.767	<.0001
Sence of responsibility					

*Pairwise comparisons and MME (means marginal estimated) for the (experimental and control) groups with respect to the post-application of motivation levels.*

Control	1.92	0.12	197	1.69	2.16
Experimental	3.99	0.12	197	3.76	4.23
binary comparison					
control – experimental	-2.07	0.201	197	-10.314	<.0001
Intrinsic motivation					
Control	1.74	0.117	197	1.51	1.98
Experimental	4.11	0.117	197	3.88	4.34
binary comparison					
Control- experimental	-2.36	0.196	197	-12.065	<.0001
Total ( motivation)					
Control	1.87	0.112	197	1.65	2.09
Experimental	4.04	0.112	197	3.81	4.26
binary comparison					
control - experimental	-2.17	0.189	197	-11.437	<.0001

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

## Appendix C

*PERAM-ANCOVA analysis results for the effect of the variables (gender, academic qualification, specialization, age, and practical experience) on the post-test of motivation levels.*

Intrinsic motivation					
	SS	df	F	parametric P(>F)	resampled P(>F)
Gender	0.07231	1	0.04965	8.239e-01	0.8264
Pretest	96.08121	1	65.97259	4.918e-14	0.0002
Residuals	286.90700	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Qualification	7.717	1	5.444	2.065e-02	0.0230
Pretest	72.305	1	51.006	1.738e-11	0.0002
Residuals	279.263	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Specialization	0.1884	1	0.1294	7.194e-01	0.7146
Pretest	84.3540	1	57.9438	1.094e-12	0.0002
Residuals	286.7909	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Years of experience	20.21	2	7.423	7.808e-04	0.0014
Pretest	67.44	1	49.551	3.175e-11	0.0002
Residuals	266.77	196			
	SS	df	F	parametric P(>F)	resampled P(>F)
Age	17.25	2	6.267	2.301e-03	0.0034
Pretest	82.81	1	60.177	4.647e-13	0.0002
Residuals	269.73	196			

extrinsic motivation					
	SS	df	F	parametric P(>F)	resampled P(>F)
Gender	0.3913	1	0.2678	6.054e-01	0.6110
Pretest	68.9064	1	47.1672	8.322e-11	0.0002
Residuals	287.7968	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Qualification	7.078	1	4.96	2.707e-02	0.0260
Pretest	51.540	1	36.12	8.839e-09	0.0002
Residuals	281.110	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Specialization	0.4563	1	0.3124	5.768e-01	0.5816
Pretest	66.9909	1	45.8663	1.424e-10	0.0002
Residuals	287.7317	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Years of experience	18.77	2	6.827	1.360e-03	0.0024
Pretest	48.95	1	35.609	1.111e-08	0.0002
Residuals	269.42	196			
	SS	df	F	parametric P(>F)	resampled P(>F)
Age	12.24	2	4.346	1.423e-02	0.0102
Pretest	64.10	1	45.529	1.655e-10	0.0002
Residuals	275.95	196			
Sence of responsibility					
	SS	df	F	parametric P(>F)	resampled P(>F)

Gender	0.01487	1	0.01141	9.151e-01	0.9134
Pretest	106.61274	1	81.79327	2.220e-16	0.0002
Residuals	256.77797	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Qualification	4.223	1	3.294	7.105e-02	0.0680
Pretest	87.439	1	68.201	2.109e-14	0.0002
Residuals	252.570	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Specialization	2.946	1	2.286	0.1321	0.1290
Pretest	108.271	1	84.025	0.0000	0.0002
Residuals	253.847	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Years of experience	18.13	2	7.442	7.667e-04	0.0014
Pretest	78.14	1	64.171	9.970e-14	0.0002
Residuals	238.67	196			
	SS	df	F	parametric P(>F)	resampled P(>F)
Age	7.774	2	3.06	4.915e-02	0.051
Pretest	96.668	1	76.09	1.110e-15	0.0002
Residuals	249.018	196			
self-efficacy					
	SS	df	F	parametric P(>F)	resampled P(>F)
Gender	0.3847	1	0.2648	6.074e-01	0.6078
Pretest	88.3592	1	60.8190	3.559e-13	0.0002
Residuals	286.2061	197			

	SS	df	F	parametric P(>F)	resampled P(>F)
Qualification	2.786	1	1.934	1.659e-01	0.1730
Pretest	72.645	1	50.426	2.198e-11	0.0002
Residuals	283.805	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Specialization	0.09443	1	0.06493	7.991e-01	0.7976
Pretest	82.99339	1	57.06772	1.544e-12	0.0002
Residuals	286.49642	197			
	SS	df	F	parametric P(>F)	resampled P(>F)
Years of experience	20.12	2	7.398	7.988e-04	0.0010
Pretest	62.50	1	45.969	1.379e-10	2,00E-04
Residuals	266.47	196			
	SS	df	F	parametric P(>F)	resampled P(>F)
Age	7.064	2	2.477	8.665e-02	0.0814
Pretest	79.707	1	55.889	2.497e-12	0.0002
Residuals	279.527	196			

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

## Appendix D

*Pairwise comparisons and MME (Mean Marginal Estimate) for statistically significant variables in the motivation domains.*

Intrinsic motivation					
Qualification	emmean	SE	df	lower.CL	upper.CL
Postgraduate	2.71	0.155	197	2.40	3.02
Diploma - Bachelor's	3.15	0.103	197	2.95	3.36
Contrast	estimate	SE	df	t.ratio	p.value
Postgraduate- Diploma - Bachelor's	-0.444	0.19	197	-2.333	0.0207
Years of experience	emmean	SE	df	lower.CL	upper.CL
1-5 years	2.87	0.124	196	2.62	3.11
5- 10 years	3.69	0.195	196	3.31	4.08
more than 10	2.84	0.139	196	2.56	3.11
Contrast	estimate	SE	df	t.ratio	p.value
(1-5 years)- (5-10 years)	-0.8246	0.236	196	-3.501	0.0017
(5- 1 من year)- more than 10	0.0313	0.187	196	0.167	1.0000
(5- 10 years)- more than 10	0.8558	0.239	196	3.580	0.0013
Age	emmean	SE	df	lower.CL	upper.CL
35-25 year	3.26	0.116	196	3.04	3.49
36-45 year	2.89	0.147	196	2.60	3.18
more than 46	2.45	0.208	196	2.04	2.86
Contrast	estimate	SE	df	t.ratio	p.value
(35-25 year)- (36-45 year)	0.378	0.188	196	2.016	0.1354
(35-25 year)- more than 46	0.811	0.239	196	3.391	0.0025
(36-45 year)- more than 46	0.432	0.254	196	1.701	0.2715
Extrinsic motivation					
Qualification	emmean	SE	df	lower.CL	upper.CL

Postgraduate	2.62	0.155	197	2.31	2.93
Diploma - Bachelor's	3.04	0.104	197	2.84	3.25
Contrast	estimate	SE	df	t.ratio	p.value
Postgraduate- Diploma - Bachelor's	-0.424	0.19	197	-2.227	0.0271
Years of experience	emmean	SE	df	lower.CL	upper.CL
1-5 years	2.75	0.123	196	2.51	3.00
5- 10 years	3.56	0.195	196	3.18	3.95
more than 10	2.76	0.140	196	2.49	3.04
Contrast	estimate	SE	df	t.ratio	p.value
(1-5 years)- (5-10 years)	-0.80865	0.234	196	-3.458	0.0020
(1-5 years)- more than 10	-0.00815	0.187	196	-0.044	1.0000
(5- 10 years)- more than 10	0.80051	0.240	196	3.330	0.0031
Age	emmean	SE	df	lower.CL	upper.CL
35-25 year	3.13	0.117	196	2.90	3.36
36-45 year	2.76	0.148	196	2.47	3.05
more than 46	2.49	0.210	196	2.08	2.90
Contrast	estimate	SE	df	t.ratio	p.value
(35-25 year)- (36-45 year)	0.374	0.189	196	1.979	0.1476
(35-25 year)- more than 46	0.645	0.240	196	2.682	0.0238
(36-45 year)- more than 46	0.270	0.257	196	1.053	0.8813
Sense of responsibility					
Years of experience	emmean	SE	df	lower.CL	upper.CL
1-5 year	2.79	0.116	196	2.56	3.02
5- 10 years	3.60	0.184	196	3.24	3.96
more than 10	2.83	0.132	196	2.57	3.09
Contrast	estimate	SE	df	t.ratio	p.value

(1-5 years)- (5-10 years)	-0.8078	0.221	196	-3.653	0.0010
(1-5 years)- more than 10	-0.0335	0.176	196	-0.190	1.0000
(5- 10 years)- more than 10	0.7744	0.226	196	3.422	0.0023
Self-efficacy					
Years of experience	emmean	SE	df	lower.CL	upper.CL
1-5 years	2.73	0.123	196	2.49	2.98
5- 10 years	3.60	0.194	196	3.22	3.98
more than 10	2.81	0.139	196	2.54	3.09
Contrast	estimate	SE	df	t.ratio	p.value
(1-5 years)- (5-10 years)	-0.8638	0.234	196	-3.696	0.0009
(1-5 years)- more than 10	-0.0769	0.187	196	-0.411	1.0000
(5- 10 years)- more than 10	0.7870	0.238	196	3.310	0.0033

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1