Modeling and Optimization of Service Investigation Services: Empirical Study Using Pop-Hrm Approach at Head of Private Smk School in Bogor District, Indonesia

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A R T I C L E I N F O	A B S T R A C T
	The Head of School as head of the school is a contributing factor to success in efforts to strengthen governance, accountability, and public image. This success is not independent of competence and ability in tasks, roles, and functions. Providing primary service to all school citizens, optimizing the empowerment and development of the school citizen, focusing on performance and growth, and impacting school progress and society, this leadership is called serving leadership. Based on preliminary research, it is known that the head of a private SMK school in the Bogor district has not optimally demonstrated serving leadership. This research aims to produce ways and strategies for strengthening leadership serves by analyzing the influence of positive and dominant influence variables on serving leadership. The research uses the POP-HRM approach (Modeling and Management Resource Enhancement Optimization) with SITOREM analysis to produce optimal solutions from existing solutions. Implications of the research are, that if serving leadership wants to be empowered then it requires the development of adversity intelligence, proactive personality, teamwork, and increased commitment to the organization, as well as work motivation. ***KEYWORDS: Serving Leadership, Adversity Intelligence, Proactive Personality, Teamwork, Organizational Commitment, Work Motivation, SITOREM Analysis***

1. Introduction

National development through the field of education is aimed at enlightening the life of the nation and developing Indonesian humanity as a whole. Government efforts to advance education in Indonesia continue to be carried out continuously. One of them is to reform the basic duties of the head of the school as a leader in the school. The head of the school is a strategic key to achieving educational goals effectively and efficiently because the quality of the school depends on the head, how the head performs his duties, and functions as a leader. The Regulations of the Minister of Education and Culture (Permendikbud) No. 6 of 2018 affirm that teachers appointed as heads of schools are no longer an additional duty but a basic duty to lead and manage each level of education.

Educational leadership is the ability and process of influencing, guiding, coordinating, and mobilizing others related to the development of education science and the implementation of educational services, so that the activities carried out can be more efficient and effective in achieving the goals of education. The head of the school who serves is the head of the school who helps his citizens in their efforts to advance the school. Serving leadership is the style of management in terms of leading and serving being in harmony, and existing in interaction with the environment.

The concept of serving leadership is providing primary service to the entire school citizen, optimizing the empowerment and development of school citizens, with the essence of the head of school serving others. In other words, the teacher who is appointed as head of the school is not just a leader who has

mastered managerial sciences, entrepreneurship, and supervision, but a head of school who has mastered management sciences and entrepreneurial and supervisory and who is ready to serve teachers, educators, students, parents, the community and the entire stakeholder related to education.

Serving leadership developed in the school will produce the head of the school who has the following skills: 1) technical skills are skills in monitoring and evaluating the learning process, as well as the progress of learning processes, 2) human skills are the skills in building cooperation with the entire school citizen so that a harmonious atmosphere between the school citizens and the community is created, 3) conceptual skills are the skill in solving various issues that arise in school with wisdom and wisdom. (Permendiknas Number 13 / 2007).

Based on data and facts obtained through a preliminary survey conducted on December 16-21, 2022, using a questionnaire that the leadership serves in 30 Private SMKs in Bogor District, in conditions of great need to be strengthened. The initial survey was a statement - a statement to 30 school leaders as respondents. The results showed that 47% of school leaders had not shown humility, 41% had not shown compassion, 48% had never shown accountability, 47% hadn't shown courage, 50% had not demonstrated integrity, and 58% had yet to show, listening behavior. The results of the above survey show that leadership in the service of the head of school still needs to be reinforced, and considering that the leadership serving the head is an important element related to the achievement of educational goals, this leadership is interesting to study.

This research aims to produce ways and strategies for strengthening leadership serves by analyzing the influence of positive and dominant influence variables on serving leadership. Based on the results of qualitative research the variables are adversity intelligence, proactive personality, commitment to the Organization, teamwork, and motivation to work. Furthermore, the methods and strategies for improving leadership in the services found are recommended to the relevant parties, namely the Head of the Education Service, the Educational Organizing Institution, the School Supervisor, the Head of School, and Private SMK Teachers in Bogor District. This research focuses on ways and strategies to strengthen the leadership of the services which are important elements related to the achievement of educational goals.

2. Literature Review

Serving Leadership (Y)

Dierendonck, (2011), explains that serving leadership is a leadership behavior that prioritizes service, that is, service arising from one's desire to do service to others, aimed at allowing the individual served to grow, be healthy, be autonomous, and have a serving soul. Leadership indicators serve as follows: 1) empowering and developing, 2) humanizing, 3) authenticity, 4) developing interpersonal acceptance, 5) providing direction, and (6) stewardship.

Parris, D.I. and Peachey, J.W. (2013), servant leadership is putting the leaders above the personal interests of the leaders. As far as leadership indicators serve are as follows: 1) listening, 2) empathy, 3) healing, 4) awareness, 5) persuasion, 6) conceptualization, 7) foresight, 8) stewardship 9) commitment to the growth of people, and 10) building community.

Stone, A.G. et al. (2004), defines serving leadership as a leader who serves and meets the needs of others optimally by developing an individual attitude around him in the hope of having a similar attitude to serve well. As far as serving leadership indicators are concerned are as follows: 1) vision, 2) honesty, 3) integrity, 4) trust, 5) service, and 6). Spears Style, l.c. (2010), serving leadership is a leader who prioritizes service, starting with the natural feeling of someone who wants to serve and to precede service. moreover, consciously, this choice brings aspiration and impetus to leading others. leadership indicators serve as follows: 1) listening, 2) empathy, 3) healing, 4) awareness, 5) persuasion, 6) conceptualization, 7) perseverance, 8) openness, 9) commitment to growth, and 10) community-building.

Sendjaya, S. et al, (2008) define servant leadership as a leader who puts the needs, aspirations, and interests of others above themselves. A servant leader commits to serve others. As for the indicators of leadership, serving are as follows: 1) maintaining relationships, 2) responsible, 3) morality, 4) spirituality, and 5) describing influence.

From the various theories above it can be synthesized that serving leadership is a leadership behavior that begins with a feeling and commitment to do service consciously, to direct the individual, to prioritize the interests of others, to aspire, to be harmonious, and to be of good character to build common well-being and goodness. indicators of serving leadership are as follows: 1) humility, 2) compassion, 3) accountability, 4) courage, 5) integrity, and 6) listening.

Adversity Intelligence (X1)

Shivaranjani (2014), explains that the adversity quotient is how well a person faces difficulties and his ability to cope with them. Indicators of adversity intelligence, namely: 1) control, 2) origin and ownership, 3) reach, and 4) endurance.

Pangma, R. et al., (2009), the Adversity Quotient relates to how well individuals can solve and combat the problems they face. Adversity intelligence indicators are as follows: 1) identification of problems, and how to respond or not to them, 2) finding and developing ego identity or self-control in a problem situation, 3) adapting and adapting to the environment, 4) individual strength to face problems (physical and mental), and 5) adaptation to stress situations.

Santos, M.C.J. (2012), describes the adversity quotient as the ability to withstand difficulties. adversity intelligence indicators are as follows: 1) control, 2) origin and ownership, 3) reach, and 4) endurance. wijaya (2007) argues that adversity intelligence is the degree of perseverance of an individual in dealing with all the challenges faced in his life. Adversity intelligence indicators are as follows: 1) Control, 2) Origin, 3) Ownership, 4) Reach, and 5) Endurance.

From the various theories above it can be synthesized that adversity intelligence is a characteristic of an individual who has a response to various difficulties and obstacles in carrying out tasks. indicators of adversity intelligence are as follows: 1) control attitude, 2) origin, 3) ownership, 4) reach, and 5) resistance to difficulties.

Proactive Personality (X2)

Schermerhorn, J.R. Jr., et al., (2007), explain that proactive personality is a disposition that identifies whether an individual acts or does not influence their environment. Indicators of proactive personality are as follows: 1) identifying opportunities and pursuing them, 2) showing initiative, 3) taking action, and 4) persisting until meaningful change occurs.

Covey, S.R. (2004), being proactive means having initiative, being responsible, making choices based on principles and values, using the four unique human gifts (self-awareness, conscience, imagination, and free will), creating change, and driving creativity. Indicators of proactive personality are as follows: 1) being initiative, 2) being responsible, 3) making choices based on principles and values, 4) using four unique human gifts: self-awareness, conscience, imagination, and free will, 5) creating change, and 6) boosting creativity.

DuBrin, A.J. (2014), explained that a proactive personality refers to someone who has a relatively stable tendency to make environmental changes. Proactive personality indicators are as follows: 1) a desire for control, 2) taking charge at work, 3) above-average cognitive skills, 4) high self-efficiency, 5) setting challenging goals, 6) opportunity seeking and breaking things that merit breaking, 7) independent judgment combined with a willingness to speak out, 8) being an early riser, and 9) assessing the probable success of proactive behavior.

Crant, M.J. and Bateman, T.S. (2001), describe a proactive personality as someone who identifies opportunities,

shows initiative, takes action, and endures until meaningful change occurs. A person who identifies opportunities, shows initiative, takes action and perseveres until meaningful change occurs.

From the various theories above it can be synthesized that proactive personality is a characteristic of an individual who tends to take action to influence the environment. Proactive personality indicators are as follows: 1) identification of opportunities and follow-up, 2) initiative, 3) action, and 4) work hard until change occurs.

Teamwork (X3)

Robbins, S.P. and Judge, T.A., (2013), explain that Teamwork is a group whose members produce greater group performance than the aggregate of individual performance. Teamwork indicators are as follows: 1) performance is collective, 2) group members are synergistic, 3) priority is given to communities (not individuals), and 4) members complement each other's skills and skills.

Gibson, J.L, et al. (2012), Teamwork is a group of individuals whose behavior and performance interact between one member and the other. Indicators of teamwork are as follows: 1) members have common goals, 2) strong interpersonal relationships among members, 3) the group fosters cohesion, and 4) the members complement each other.

Kreitner, R. and Kinicki, A. (2010), describe teamwork as a group of individuals who feel satisfied working in a group and each is willing to contribute to the group. factors affecting group collaboration: 1) clearly defined group objectives, 2) active participation of members, 3) informal relationships between members, 4) joint decision-making (consensus), 5) open interpersonal communication, 6) clear group norms, and 6) complementary abilities.

Tenner, A.R., and DeToro, I.J., (2002), described teamwork as a group of people working together to a common goal, and that goal would be more easily achieved by teamwork than by doing it alone. Teamwork indicators are as follows: 1) evaluation and recognition, 2) social relations, 3) organizational support, 4) job characteristics, and 5) leadership.

From the various theories above it can be synthesized that teamwork is a group of individuals who work together by influencing each other and contributing effectively and responsibly in carrying out tasks to common goals. Teamwork indicators are as follows: 1) cooperation, 2) trust, 3) cohesiveness, 4) responsibilities, and 5) communication.

Organizational Commitment (X4)

Mitchell, T.R. and Larson, J.R. (2005), explain that the commitment of an organization is the attitude of a person to continue to play a role in the organization. Indicators of work commitment are as follows: 1) loyalty, 2) self-identification with the organization, and 3) acceptance of the goals of the organization.

Hellriegel, D and Slochun, J.W. Jr. (2011). An organization's commitment is the extent to which a person's involvement in the organization and its strength of identification with the organization. Indicators of commitment to work are as follows: 1) have confidence in the goals and values of the

organization, thus creating an emotional connection between the member of the organization and its organization; and 2) willingness and willingness to devote his energy and mind to the interests of the organization, because he needs it and will pursue his career development, in a strong relationship with the organization, so that the member strives to be part of it and has no intention of leaving it.

Ivancevich, J. et al (2008), Organizational commitment can be understood as the sense of identification, involvement, and loyalty expressed by employees to the organization. Indicators of commitment to the organization are as follows: 1) effective occupational commitment, 2) continuity commitment, and 3) normative commitment.

Luthan, F. (2006), describes organizational commitment as an attitude that reflects employee loyalty to the organization and a sustainable process in which employees express their concern for the organization and success and sustainable progress. indicators of work commitment are as follows: 1) affective commitment, 2) continuous commitment, and 3) normative commitment.

From the various theories above it can be synthesized that organizational commitment is a strong desire that exists in one person to his organization in the form of loyalty by playing an active role to the goals of the organization as well asining his integrity in the organization. Indicators of commitment to the Organization are as follows: 1) sense of ownership, 2) loyalty to the job, 3) unity within the organization and achieving the organization's goals 4) desired service 5) feedback obtained from the organization 6) suitability of capabilities, 7) increased income and satisfaction of needs.

Work Motivation (X5)

George, J.M. and Jones, R., (2012), Explain that work motivation is a psychological force that determines the direction of one's behavior in an organization, one's level of effort, and one's level of endurance. Work motivation elements: 1) direction of behavior, 2) level of effort, and 3) level of persistence.

Schermerhorn, J.R. (2013), motivation describes the inner strength of an individual that takes into account the level, direction, and endurance of the effort done at work. Simply put, highly motivated people work hard at work while unmotivated people don't. One of the most important managerial responsibilities is to create conditions where others are consistently inspired to work hard. Work motivation indicators are as follows: 1) achievement, 2) recognition 3) work itself 4) responsibility, 5) advancement 6) growth, 7) working conditions, 8) interpersonal relationships, 9) organizational policy and administration, and 10) compensation.

Greenberg, J. and Baron, R.A. (2008), define motivation as a process that drives, directs, and nurtures human behavior towards achieving a goal. Motivation will generate an incentive, an inner urge to do something as much as possible and direct it as it should in the achievement of a goal. Motivation factors are 1) Stimulation, which is something that can influence a person to perform an activity, 2) Maintenance, which is the activity of keeping and caring for something well, 3) the stimulating element, which is reviving something inside in doing an

activity/work, and 4) Direction, is giving a definite direction in achieving a desired goal.

Wexley, K.N. and Yukl, G.A. (2005), describe work motivation as something that gives rise to work drive. Motivation is a form of a person's desire to do something, the motivation comes from within, as well as from outside. The motivation factors include: 1) motivation of work depends on the factor of the job itself, 2) achievements achieved, 3) opportunities for progress, and 4) recognition of others.

From the various theories above it can be synthesized that work motivation is the urge, desire, and movement that grows within a person, both coming from within and outside him to do a job with a high spirit using all the abilities and skills he possesses aimed at maximum achievement. The indicators are: 1) achievement, 2) confession, 3) responsibility, 4) progress, 5) working conditions, and 6) organizational procedures.

Research Methods

This research uses the POP-HRM (Modeling and Management Resource Enhancement Optimization) approach developed by Setyaningsih, S. and Hardhienata (2019). In this method, research begins with conducting qualitative research to dig into factors that are supposed to have a positive and dominant influence on the resources to be strengthened.

Based on the factor or variable found, a constellation of the influence of the variable on the resources to be reinforced, resulting in the research hypothesis. Qualitative research is carried out at 16 (Sixteen) private SMKs in the Bogor district. Qualitational research will be conducted for 3 (three) months, from August 14 to October 28, 2022, gradually from the preparation of research proposals to the establishment of the findings of research hypotheses.

Modeling Theory and Optimization Operations Research

Optimization Operations Research is a common method used in the study and optimization of systems through system modeling. Hardhienata, S. (2017), defines operational research as the application of scientific methods to find optimal solutions and decision-making of a problem taking into account existing resources and limitations. The analysis and solution of the problems mentioned above are usually done using modeling and optimization.

A statistical mathematical model is an equation formed from a framework of thought to describe the relationship or influence of a dependent variable with an independent variable. In most research that uses statistical models in the field of management, especially in the area of education management, the discussion is stopped on the finding that there is a relationship or positive influence between the variables studied. This results in research conclusions that are merely statistical conclusions and result in only normative recommendations.

SITOREM Analysis

SITOREM is an acronym for "Scientific Identification Theory to Conduct Operation Research in Education Management", which can generally be understood as a scientific method used to identify variables to carry out "Operation Research" in the field of Education Management (Hardhienata, 2017). In the context of research - correlational research and path analysis, SITOREM is used as a method to perform: (a) Identification of influence forces between free variables and bound variables, (b) Analysis of the value of research results for each indicator of the research variable, (c) Analyse of the weight of each of the indicators of each study variable based on the criterion "Cost, Benefit, Urgency and Importance". Based on the identification of the influence strengths between the research Variables, and also based on the weight of the individual indicators from the free variable with the largest contribution, then the priority sequence of indicators to be improved and to being or developed can be organized.

POP-HRM Approach

This research uses the POP- HRM (Modeling and Management Resource Enhancement Optimization) approach developed by Setagatansih, S. and Hardhienata, S., in 2019. In this method, research is initiated by conducting qualitative research to dig factors that are supposed to have a positive and dominant influence on resources to be reinforced. Based on factors or variables found, a constellation of the influence of variables on resources that will be strengthened is compiled to produce a research hypothesis. Steps in POP-SDM consist of seven stages, namely: 1) Research Theme, 2) Pre-Modelling, 3) Modeling, 4) Pre-Model Test, 5) Modeling Test, 6) Model Optimization, and 7) Optimal Recommendation.
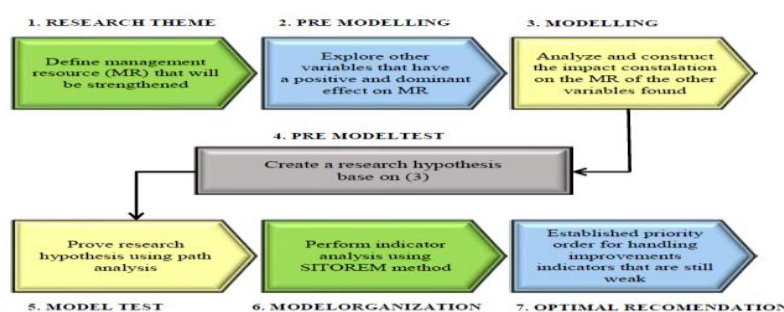
Source: Setyaningsih, S. and Hardhienata, S (2019)
Figure 1. Stage of POP-HRM Approach

Quantitative research was carried out on the head of a private SMK school in the Bogor district with a head population of 352 people, with a sample of 188 heads of schools counted using the Cochran formula. The data collection in this study uses a research instrument in the form of a questionnaire that is distributed to the head of the school as the research respondent.

Details of the research instrument are derived from the research indicators that will dig into his condition. Before being distributed to respondents, the research instruments were tested first to determine their validity and feasibility. The validity test is performed using the Pearson Product Moment technique, while the reliability test uses calculations using the Alpha-Cronbach formula.
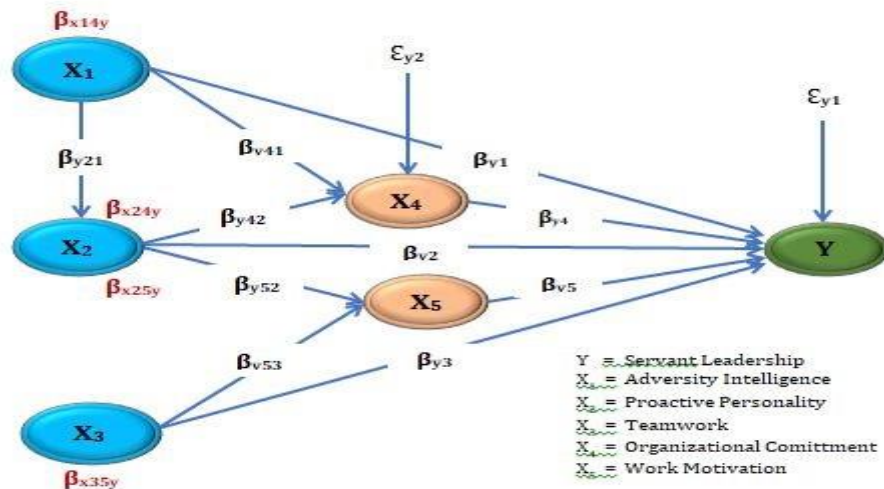

Figure 2. Framework of Thought/Constellation of Variable Research

A framework of thought can be understood as a representation of the researchers' thinking that explains the object (variable/focus) of the problem, and why researchers have the assumption as stated in the research hypothesis. Based on the constellation research confirmed by the Expert then can be arranged, the framework of thought constellations.

After the data is collected, the homogeneity test, the normality test, the linearity test of the regression model, correlation analysis, analysis of direct and indirect influences, as well as the statistical hypothesis test is then carried out analysis SITOREM. Based on the thinking framework/constellation of the variable research above, the mathematical model of statistics can be compiled as follows:

Substructural equation 1 : $\hat{y} = \beta y_1 x_1 + \beta y_2 x_2 + \beta y_3 x_3 + \beta y_4 x_4 + \beta y_5 x_5 + \varepsilon_y$
Substructural equation 2 : $X_4 = \beta_{41} x_4 + \beta_{42} x_4 + \varepsilon_4$
Substructural equation 3 : $X_5 = \beta_{52} x_5 + \beta_{53} x_5 + \varepsilon_5$
Substructural equation 4 : $X_2 = \beta_{21} x_1 + \varepsilon_2$
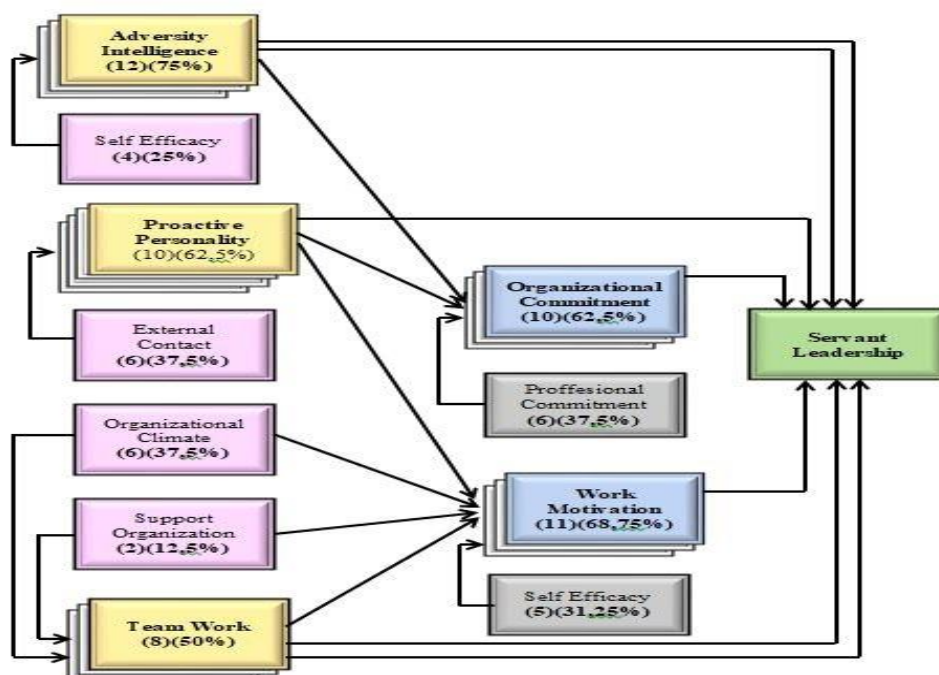
Result and Discussion

Figure 3. Variables obtained from qualitative research

1. Descriptive statistics

Based on the results of the analysis statistical descriptions for research variables can be revealed about the symptoms of data centralization as listed in the following table:

Table 1. Summary Description Statistical Variable Research

No	Description	Adversity Intelligence X_1	Proactive Personality X_2	Teamwork X_3	Organizational Commitment X_4	Work Motivation X_5	Servant Leadership Y
1.	Mean	122.91	126.75	122.80	121.05	126.28	118.65
2.	Standard Error	1.19771	1.75046	1.77186	1.21728	1.25326	0.97599
3.	Median	126.5	134	130	124	130	123
4.	Mode	130	150	149	121	136	129
5.	Stand Deviation	16.4221	24.001	24.2945	16.6906	17.1838	13.3821
6.	Sample Variance	269.687	576.049	590.223	278.575	295.284	179.081
7.	Kurtosis	1.64832	1.64903	0.5498	0.58266	0.85695	0.19120
8.	Skewness	-1.3927	-1.4904	-0.7772	-0.9844	-1.0468	-1.0205
9.	Range	81	101	101	70	77	59
10.	Minimum Score	64	52	59	74	75	77
11.	Maximum Score	145	153	160	144	152	136

2. Classical Assumption Test
a. Validity & Reliability Test

As for the validity and reliability test results of the research instruments, the following tables are presented:

Table 2. Validity and Reliability Test Results of the Research Instruments

No	Variable	Quantity of Question Details	Valid statement	Reliability value	Conclusion
1	Servant Leadership	40	34	0,946	Valid and reliable
2	Adversity Intelligence	40	35	0,944	Valid and reliable
3	Proactive Personality	40	37	0,943	Valid and reliable
4	Teamwork	40	37	0,939	Valid and reliable
5	Organizational Commitment	40	35	0,922	Valid and reliable
6	Work Motivation	40	36	0,952	Valid and reliable

b. Normality Test

Based on the overall calculation results of the error normality test in this study, it can be seen in the summary in the following table:

Table 3. Estimated Standard Error Normality Test

No	Estimate Error	n	L_{Count}	L_{abel} $\alpha = 0,05$	$\alpha = 0,01$	Conclusion
1	$Y - \hat{Y}_1$	188	0.011	0.065	0.075	Normal
2	$Y - \hat{Y}_2$	188	0.011	0.065	0.075	Normal
3	$Y - \hat{Y}_3$	188	0.010	0.065	0.075	Normal
4	$Y - \hat{Y}_4$	188	0.012	0.065	0.075	Normal
5	$Y - \hat{Y}_5$	188	0.008	0.065	0.075	Normal
6	$X_4 - X_1$	188	0.009	0.065	0.075	Normal
7	$X_4 - X_2$	188	0.012	0.065	0.075	Normal
8	$X_5 - X_2$	188	0.010	0.065	0.075	Normal
9	$X_5 - X_3$	188	0.008	0.065	0.075	Normal
10	$X_2 - X_1$	188	0.012	0.065	0.075	Normal
Normal distribution requirements: $L_{count} < L_{table}$						

c. Homogeneity Test

Based on the overall calculation results of the error normality test in this study, it can be seen in the summary in the following table:

Table 4. Summary of Data Variance Homogeneity Test

No	Grouping	X^2_{count}	X^2_{table} $\alpha = 0,05$	Conclusion
1.	Y based on X_1	3710.50	6132.59	Homogeneous
2.	Y based on X_2	4469.28	7288.01	Homogeneous
3.	Y based on X_3	4912.17	8451.28	Homogeneous
4.	Y based on X_4	3787.16	6313.26	Homogeneous
5.	Y based on X_5	3714.91	6192.48	Homogeneous
6.	X_4 based on X_1	3823.33	6132.59	Homogeneous
7.	X_4 based on X_2	4592.84	7288.01	Homogeneous
8.	X_5 based on X_2	4613.17	7288.01	Homogeneous
9.	X_5 based on X_3	5145.55	8451.28	Homogeneous
10.	X_2 based on X_1	3977.44	6132.59	Homogeneous
Population requirements Homogeneous $\chi^2_{count} < \chi^2_{table}$				

d. Regression Model Test

The overall calculation results of the regression model in this research can be seen in the summary in the following table:

Table 5. Regression Model

No	Relationship Model Between Variables	Regression Model	Significance Test Results
1.	$Y \rightarrow X_1$	$\hat{Y} = 1{,}162 + 0{,}664\,X_1$	Significance
2.	$Y \rightarrow X_2$	$\hat{Y} = 1{,}833 + 0{,}487\,X_2$	Significance
3.	$Y \rightarrow X_3$	$\hat{Y} = 2{,}121 + 0{,}416\,X_3$	Significance
4.	$Y \rightarrow X_4$	$\hat{Y} = 1{,}433 + 0{,}598\,X_4$	Significance
5.	$Y \rightarrow X_5$	$\hat{Y} = 1{,}358 + 0{,}611\,X_5$	Significance
6.	$X_4 \rightarrow X_1$	$X_4 = 0{,}920 + 0{,}721\,X_1$	Significance
7.	$X_4 \rightarrow X_2$	$X_4 = 1{,}562 + 0{,}554\,X_2$	Significance
8.	$X_5 \rightarrow X_2$	$X_5 = 1{,}631 + 0{,}548\,X_2$	Significance
9.	$X_5 \rightarrow X_3$	$X_5 = 2{,}008 + 0{,}452\,X_3$	Significance
10.	$X_2 \rightarrow X_1$	$X_2 = 0{,}731 + 1{,}180\,X_1$	Significance
11.	$Y \rightarrow X_1 \rightarrow X_4$	$\hat{Y} = 3{,}412 + 0{,}365\,X_1 + 0{,}328\,X_4$	Significance
12.	$Y \rightarrow X_2 \rightarrow X_4$	$\hat{Y} = 5{,}145 + 0{,}342\,X_2 + 0{,}197\,X_4$	Significance
13.	$Y \rightarrow X_3 \rightarrow X_5$	$\hat{Y} = 4{,}677 + 0{,}304\,X_2 + 0{,}264\,X_5$	Significance
14.	$Y \rightarrow X_3 \rightarrow X_5$	$\hat{Y} = 4{,}308 + 0{,}195\,X_3 + 0{,}409\,X_5$	Significance

e. Regression Model Significance Test

The overall calculation results of the linearity test of the regression model in this study can be seen in the summary in the following table:

Table 6. Summary of Regression Model Significance Test Results

No	Relationship Model Between Variables	F_{Count}	F_{table} $\alpha=0.05$	F_{table} $\alpha=0.01$	Significance Test Results
1.	$Y \rightarrow X_1$	17,562	3,952	6,939	Very Significant
2.	$Y \rightarrow X_2$	27,153	3,952	6,939	Very Significant
3.	$Y \rightarrow X_3$	40,134	3,952	6,939	Very Significant
4.	$Y \rightarrow X_4$	24,399	3,952	6,939	Very Significant
5.	$Y \rightarrow X_5$	26,564	3,952	6,939	Very Significant
6.	$X_4 \rightarrow X_1$	5,931	3,952	6,939	Significance
7.	$X_4 \rightarrow X_2$	12,070	3,952	6,939	Very Significant
8.	$X_5 \rightarrow X_2$	17,157	3,952	6,939	Very Significant
9.	$X_5 \rightarrow X_3$	23,067	3,952	6,939	Very Significant
10.	$X_2 \rightarrow X_1$	16,906	3,952	6,939	Very Significant
11.	$Y \rightarrow X_1 \rightarrow X_4$	14,551	3,952	6,939	Very Significant
12.	$Y \rightarrow X_2 \rightarrow X_4$	18,218	3,952	6,939	Very Significant
13.	$Y \rightarrow X_3 \rightarrow X_5$	20,402	3,952	6,939	Very Significant
14.	$Y \rightarrow X_3 \rightarrow X_5$	15,885	3,952	6,939	Very Significant
Significant Conditions: F-count > F-table					

f. Linearity Test

The overall calculation results of the linearity test of the regression model in this study can be seen in the summary in the following table:

Table 7. Summary of Regression Model Linearity Test Results

No	Relationship Model Between Variables	F_{Count}	F_{table} $\alpha=0.05$	F_{table} $\alpha=0.01$	Linearity Pattern Test Results
1.	$Y \rightarrow X_1$	0,248	1,450	1,688	Linear
2.	$Y \rightarrow X_2$	0,288	1,429	1,655	Linear
3.	$Y \rightarrow X_3$	0,294	1,412	1,629	Linear
4.	$Y \rightarrow X_4$	0,307	1,442	1,675	Linear
5.	$Y \rightarrow X_5$	0,322	1,439	1,671	Linear
6.	$X_4 \rightarrow X_1$	0,089	1,450	1,688	Linear
7.	$X_4 \rightarrow X_2$	0,138	1,429	1,655	Linear
8.	$X_5 \rightarrow X_2$	0,191	1,429	1,655	Linear
9.	$X_5 \rightarrow X_3$	0,250	1,429	1,655	Linear
10.	$X_2 \rightarrow X_1$	0,189	1,429	1,655	Linear
11.	$Y \rightarrow X_1 \rightarrow X_4$	0,000	0,005	0,001	Linear
12.	$Y \rightarrow X_2 \rightarrow X_4$	0,000	0,005	0,001	Linear
13.	$Y \rightarrow X_3 \rightarrow X_5$	0,000	0,005	0,001	Linear
14.	$Y \rightarrow X_3 \rightarrow X_5$	0,000	0,005	0,001	Linear
Linear Terms: F-count < F-table					

3. Path Analysis

The influence of the path as a whole by combining the results of the analysis on each substructure can be described as follows:
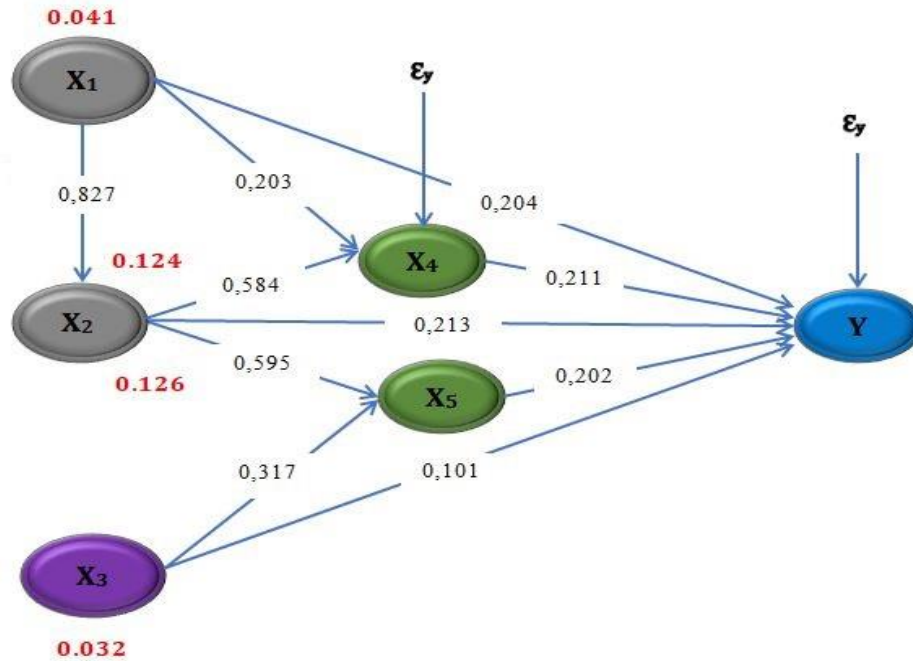

Figure 4. Path Analysis Results

The influence between the independent variable and the dependent variable when viewed from path analysis, then this relationship is a functional relationship where Servant Leadership (Y) is formed as a result of the functioning of the Adversity Intelligence (X1), Proactive Personality (X2), Teamwork (X3) Work Commitment functions. (X4) and Work Motivation (X5). Discussion of research results can be described as follows:

1. Direct influence between the Adversity Intelligence Variable (X1) on the Servant Leadership Variable (Y)

From the calculation results, the path coefficient value ($\beta y1$) = 0.204, with t-count = 3.629, while t-table at the real level α = 0.05, t-table = 1.972, then t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the Adversity Intelligence variable (X1) on Servant Leadership (Y), meaning that the stronger the Adversity Intelligence (X1) in the individual principal will increase the principal's Servant Leadership (Y).

2. Direct influence between the Proactive Personality Variable (X2) on the Servant Leadership Variable (Y)

From the calculation results, the path coefficient value ($\beta y2$) =0.213, with t-count =2.879, while t-table at the real level α = 0.05, t-table =1.972, then t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the Proactive Personality variable (X2) on Servant Leadership (Y), meaning that the stronger the Proactive Personality (X2) in individual school principals will increase the principal's Servant Leadership (Y).

3. Direct influence between the Teamwork Variable (X3) on the Servant Leadership Variable (Y)

From the calculation results, the path coefficient value ($\beta y3$) = 0.101, with t-count = 4.237, while t-table at the real level α = 0.05, t-table = 1.972, then t-count > t-table means that Ho is

rejected and H1 is accepted. Thus, there is a direct positive influence of the Teamwork variable (X3) on Servant Leadership (Y), meaning that stronger Teamwork (X3) in individual school principals will increase the principal's Servant Leadership (Y).

4. Direct influence between the Organizational Commitment Variable (X4) on the Servant Leadership Variable (Y)

From the calculation results, the path coefficient value ($\beta y4$) = 0.211, with t-count = 3.848, while t-table at the real level α = 0.05, t-table = 1.972, then t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the variable commitment to the organization (X4) on Servant Leadership (Y), meaning that the stronger the commitment to the organization (X4) in the individual principal will increase the principal's Servant Leadership (Y).

5. Direct influence between Work Motivation Variables (X5) on Servant Leadership Variables (Y)

From the calculation results, the path coefficient value ($\beta y5$) = 0.202, with t-count = 3.987, while t-table at the real level α = 0.05, t-table = 1.972, then t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the Work Motivation variable (X5) on Servant Leadership (Y), meaning that stronger Work Motivation (X5) in individual school principals will increase the principal's Servant Leadership (Y).

6. Direct influence between Adversity Intelligence Variable (X1) on Organizational Commitment (X4)

From the calculation results, the path coefficient value ($\beta y41$) = 0.203, with t-count =2.389, while t-table at the real level α = 0.05, t-table =1.972, so t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the Adversity Intelligence variable (X1) on commitment to the organization (X4), meaning that the stronger the

the Adversity Intelligence (X1) in the individual principal will increase the principal's organizational commitment (X4).

7. Direct influence between the Proactive Personality Variable (X2) on the Organizational Commitment Variable (X4)

From the calculation results, the path coefficient value (βy42) = 0.584, with t-count= 6.869, while t-table at the real level α = 0.05, t-table =1.972, then t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the Proactive Personality variable (X2) on commitment to the organization (X4), meaning that the stronger the Proactive Personality (X2) in the individual principal will increase the principal's organizational commitment (X4).

8. Direct influence between the Proactive Personality Variable (X2) on the Work Motivation Variable (X5)

From the calculation results, the path coefficient value (βy52) = 0.595, with t-count =9.133, while t-table at the real level α = 0.05, t-table =1.972, then t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the Proactive Personality variable (X2) on Work Motivation (X5), meaning that the stronger the Proactive Personality (X2) in the individual principal will increase the principal's Work Motivation (X5).

9. Direct influence between Teamwork Variables (X3) on Work Motivation Variables (X5)

From the calculation results, the path coefficient value (βy53) = 0.317, with t-count =3.323, while t-table at the real level α = 0.05, t-table = 1.972, then t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the Teamwork variable (X3) on Work Motivation (X5), meaning that stronger Teamwork (X3) in individual school principals will increase the principal's Work Motivation (X5).

10. Direct influence between Adversity Intelligence Variable (X1) on Proactive Personality Variable (X2)

From the calculation results, the path coefficient value (βy21) = 0.827, with t-count = 20.046, while t-table at the real level α = 0.05, t-table = 1.972, then t-count > t-table means that Ho is rejected and H1 is accepted. Thus, there is a direct positive influence of the Adversity Intelligence variable (X1) on the Proactive Personality (X2), meaning that the stronger the Adversity Intelligence (X1) in the individual principal will increase the principal's Proactive Personality (X2).

11. Indirect influence between the Adversity Intelligence Variable (X1) on the Service Leadership Variable (Y) through Organizational Commitment (X4)

From the results of calculating the indirect effect, the path coefficient value (βx14y) = 0.041, so Ho is rejected and H1 is accepted. Thus, there is an indirect positive influence between the Adversity Intelligence variable (X1) on Servant Leadership (Y) through organizational commitment (X4), meaning that the stronger the Adversity Intelligence (X1) in the individual principal will strengthen the principal's servant leadership (Y) through increasing organizational commitment (X4).

12. Indirect Influence between the Proactive Personality Variable (X1) on the Serving Leadership Variable (Y) through Organizational Commitment (X4)

From the results of calculating the indirect effect, the path coefficient value (βx24y) = 0.124, so Ho is rejected and H1 is accepted. Thus, there is an indirect positive influence of the proactive personality variable (X2) on servant leadership (Y) through organizational commitment (X4), meaning that the stronger the proactive personality (X2) in the individual principal will strengthen the principal's servant leadership (Y) through increased commitment. organization (X4).

13. Indirect influence between the Proactive Personality Variable (X2) on the Serving Leadership Variable (Y) through Work Motivation (X5)

From the results of calculating the indirect effect, the path coefficient value (βy25y) =0.126 is obtained, so Ho is rejected and H1 is accepted. Thus, there is an indirect positive influence between the variable proactive personality (X2) on servant leadership (Y) through work motivation (X5), meaning that the stronger the proactive personality (X2) in the individual principal will strengthen the principal's servant leadership (Y) through increased Work Motivation (X5).

14. Indirect influence between Teamwork Variables (X3) on Service Leadership Variables (Y) through Work Motivation (X5)

From the results of calculating the indirect effect, the path coefficient value (βy25y) = 0.032, so Ho is rejected and H1 is accepted. Thus, there is a positive indirect influence of the Teamwork variable (X3) on Servant Leadership (Y) through Work Motivation (X5), meaning that the stronger the Teamwork (X3) in the individual principal will strengthen the principal's servant leadership (Y) through increased Work Motivation. (X5).

Table 8. Research Hypothesis

No	Hypothesis	Path Coefficient	Statistical Test	Decision	Conclusion
1.	Adversity Intelligence (X1) on Servant Leadership (Y)	0,204	$H_0 : \beta_{Y1} \leq 0$ $H_1 : \beta_{Y1} > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
2.	Proactive Personality (X2) to Servant Leadership (Y)	0,213	$H_0 : \beta_{Y2} \leq 0$ $H_1 : \beta_{Y2} > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
3.	Teamwork (X3) to Servant Leadership (Y)	0,101	$H_0 : \beta_{Y3} \leq 0$ $H_1 : \beta_{Y3} > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
4.	Organizational Commitment (X4) to Servant Leadership (Y)	0,211	$H_0 : \beta_{Y4} \leq 0$ $H_1 : \beta_{Y4} > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
5.	Work Motivation (X5) on Servant Leadership (Y)	0,202	$H_0 : \beta_{Y5} \leq 0$ $H_1 : \beta_{Y5} > 0$	H0 is rejected H1 is accepted	Influential Direct Positive

No	Hypothesis	Path Coefficient	Statistical Test	Decision	Conclusion
6.	Adversity Intelligence (X1) on Organizational Commitment (X4)	0,203	$H_0 : \beta x_4 x_I \leq 0$ $H_1 : \beta x_4 x_I > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
7.	Proactive Personality (X2) to Organizational Commitment (X4)	0,584	$H_0 : \beta x_4 x_2 \leq 0$ $H_1 : \beta x_4 x_2 > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
8.	Proactive Personality (X2) on Work Motivation (X5)	0,595	$H_0 : \beta x_5 x_2 \leq 0$ $H_1 : \beta x_5 x_2 > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
9.	Teamwork (X3) to Work Motivation (X5)	0,317	$H_0 : \beta x_5 x_3 \leq 0$ $H_1 : \beta x_5 x_3 > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
10.	Adversarial Intelligence (X1) on Proactive Personality (X2)	0,827	$H_0 : \beta x_2 x_1 \leq 0$ $H_1 : \beta x_2 x_1 > 0$	H0 is rejected H1 is accepted	Influential Direct Positive
11.	Adversity Intelligence (X1) towards Servant Leadership (Y) through Organizational Commitment (X4)	0,011	$H_0 : \beta_{YI} \leq 0$ $H_1 : \beta_{YI} > 0$	H0 is rejected H1 is accepted	Influential Indirect Positive
12.	Proactive Personality (X2) towards Servant Leadership (Y) through Organizational Commitment (X4)	0,124	$H_0 : \beta_{YI} \leq 0$ $H_1 : \beta_{YI} > 0$	H0 is rejected H1 is accepted	Influential Indirect Positive
13.	Proactive Personality (X2) towards Servant Leadership (Y) through Work Motivation (X5)	0,126	$H_0 : \beta_{YI} \leq 0$ $H_1 : \beta_{YI} > 0$	H0 is rejected H1 is accepted	Influential Indirect Positive
14.	Teamwork (X3) to Servant Leadership (Y) through Work Motivation (X5)	0,032	$H_0 : \beta_{YI} \leq 0$ $H_1 : \beta_{YI} > 0$	H0 is rejected H1 is accepted	Influential Indirect Positive

4. Statistical Mathematical Models

Based on the constellation of influences between variables, a statistical mathematical model is produced as follows:

a) Substructural equation 1

$$\hat{y} = \beta y_1 x_1 + \beta y_2 x_2 + \beta y_3 x_3 + \beta y_4 x_4 + \beta y_5 x_5 + \varepsilon_y$$
$$\hat{y} = 0,204 x_1 + 0,213 x_2 + 0,101 x_3 + 0,211 x_4 + 0,202 x_5 + \varepsilon_y$$

b) Substructural equation 2

$$X_4 = \beta_{41} x_4 + \beta_{42} x_4 + \varepsilon_4$$
$$X_4 = 0,203 x_1 + 0,584 x_2 + \varepsilon_4$$

c) Substructural equation 3

$$X_5 = \beta_{52} x_5 + \beta_{53} x_5 + \varepsilon_5$$
$$X_5 = 0,595 x_2 + 0,317 x_3 + \varepsilon_5$$

d) Substructural equation 4

$$X_2 = \beta_{21} x_1 + \varepsilon_2$$
$$X_2 = 0,827 x_1 + \varepsilon_2$$

5. Optimal Solution for Strengthening Servant Leadership

Based on the results of statistical hypothesis testing, determining indicator priorities, and calculating indicator values as described above, a recapitulation of research results can be made which is the optimal solution for strengthening the Serving Leadership of School Principals as follows:
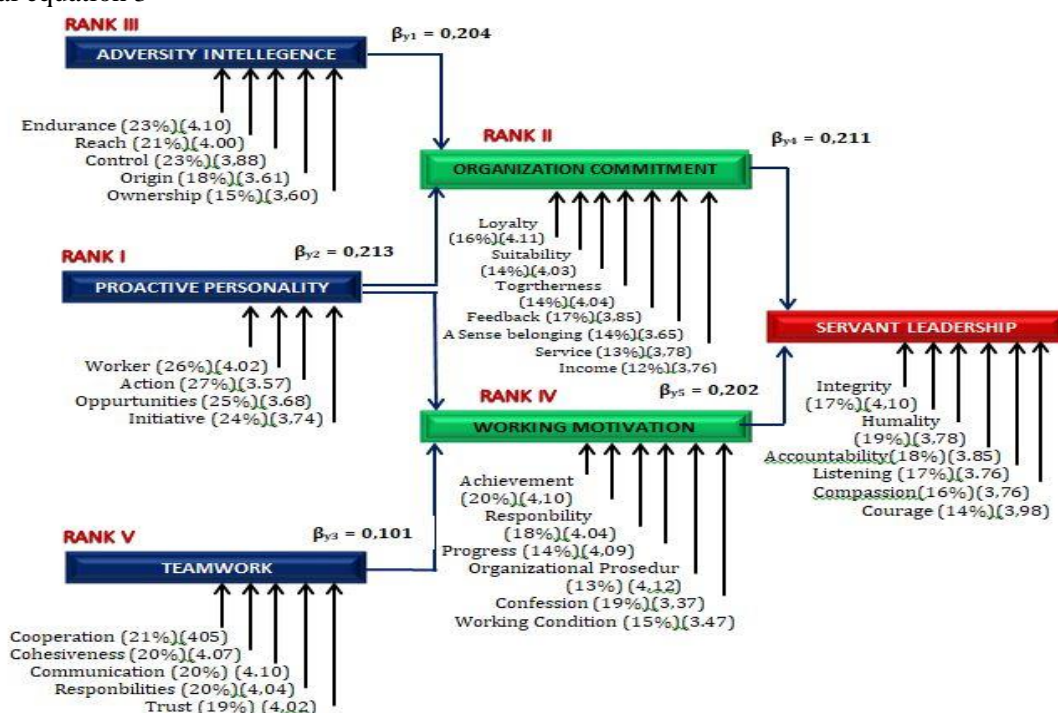

Figure 5. Constellation of Research Variables and Indicators

Table 9. SITOREM Analysis

SERVANT LEADERSHIP			
Indicator in Initial State		Indicator after Weighting by Expert	Indicator Value
1	Humility	1st Integrity (16.77%)	4.10
2	Compassion	2nd Humility (18.48%)	3.78
3	Accountability	3rd Accountability (17.93%)	3.85
4	Courage	4th Listening (16.77%)	3.76
5	Integrity	5th Compassion (15.59%)	3.76
6	Listening	6th Courage (14.45%)	3.98

ADVERSITY INTELLIGENCE ($\beta y1 = 0{,}204$) (rangk.III)			
Indicator in Initial State		Indicator after Weighting by Expert	Indicator Value
1	Control	1st Endurance (22.54%)	4.10
2	Origin	2nd Reach (20.96%)	4.00
3	Ownership	3rd Control (23.17%)	3.88
4	Reach	4th Origin (18.12%)	3.61
5	Endurance	5th Ownership (15.21%)	3.60

PROACTIVE PERSONALITY ($\beta y2 = 0{,}213$) (rank.I)			
Indicator in Initial State		Indicator after Weighting by Expert	Indicator Value
1	Opportunities	1st Worker (25.07%)	4.02
2	Initiative	2nd Action (26.67%)	3.57
3	Action	3rd Opportunities (24.88%)	3.68
4	Worker	4th Initiative (23.38%)	3.74

TEAMWORK ($\beta y3 = 0{,}101$) (rank.V)			
Indicator in Initial State		Indicator after Weighting by Expert	Indicator Value
1	Cooperation	1st Cooperation (21.45%)	4.05
2	Trust	2nd Cohesiveness (20.24%)	4.07
3	Cohesiveness	3rd Communication (19.78%)	4.1
4	Responsibilities	4th Responsibilities (19.64%)	4.04
5	Communication	5th Trust (18.88%)	4.02

ORGANIZATION COMMITMENT (X4) ($\beta y4 = 0{,}211$) (rank.II)			
Indicator in Initial State		Indicator after Weighting by Expert	Indicator Value
1	a sense of belonging	1st Loyalty (16.36%)	4.11
2	Loyalty	2nd Suitability (13.78%)	4.03
3	Togetherness	3rd Togetherness (13.73%)	4.04
4	Service	4th Feedback (16.95%)	3.85
5	Feedback	5th a Sense of belonging (14.31%)	3.65
6	Suitability	6th Service (12.70%)	3.78
7	Income	7th Income (12.16%)	3.76

WORK MOTIVATION ($\beta y5 = 0{,}202$) (rank. IV)			
Indicator in Initial State		Indicator after Weighting by Expert	Indicator Value
1	Achievement	1st Achievement (20.01%)	4.10
2	Confession	2nd Responsivity (18.27%)	4.04
3	Responsivity	3rd Progress (13.89%)	4.09
4	Progress	4th Organizational Procedure (13.41%)	4.12
5	Working Condition	5th Confession (19.27%)	3.37
6	Organizational Procedures	6th Working Condition (15.15%)	3.47

SITOREM ANALYSIS RESULT			
Priority order of indicator to be Strengthened		Indicators remain to be maintained	
1st	Action	1.	Worker
2nd	Opportunities	2.	Loyalty
3rd	Initiative	3.	Suitability
4th	Feedback	4.	Togetherness
5th	a Sense of belonging	5.	Endurance
6th	Service	6.	Reach
7th	Income	7.	Achievement
8th	Control	8.	Responsibility
9th	Origin	9.	Progress
10th	Ownership	10.	Organizational Procedures
11th	Confession	11.	Cooperation
12th	Working Condition	12.	Cohesiveness
13th	Humility	13.	Communication
14th	Accountability	14.	Responsibilities
15th	Listening	15.	Trust
16th	Compassion	16.	Integrity
17th	Courage		

Conclusions, Implications, and Recommendations

Based on the results of the analysis, discussion of research results, and hypotheses that have been tested, it can be concluded as follows:

1. Strengthening servant leadership can be done by developing adversity intelligence, proactive personality, and teamwork as exogenous variables by increasing commitment to the organization and work motivation as intervening variables.

2. Using path analysis, the direct effects produced are as follows: 1) there is a direct influence of adversity intelligence on servant leadership with a path coefficient ($\beta y1$) of 0.304 so that the development of adversity intelligence can strengthen servant leadership. 2) there is a direct influence of proactive personality on servant leadership with a path coefficient ($\beta y2$) of 0.311 so proactive personality development can strengthen servant leadership. 3) there is a direct influence of teamwork on servant leadership with a path coefficient ($\beta y3$) of 0.201 so that teamwork development can strengthen servant leadership. 4) there is a direct influence of work motivation on servant leadership with a path coefficient ($\beta y4$) of 0.502 so increasing work motivation can strengthen servant leadership. 5) there is a direct influence of organizational commitment on servant leadership with a path coefficient ($\beta y5$) of 0.213 so increasing work commitment can strengthen servant leadership. 6) there is a direct influence of adversity intelligence on organizational commitment with a path coefficient ($\beta y41$) of 0.203 so that the development of adversity intelligence can strengthen work commitment. 7) there is a direct influence of proactive personality on organizational commitment with a path coefficient ($\beta y42$) of 0.584, so the development of proactive personality can strengthen work commitment 8) There is a direct influence of proactive personality on work motivation with a path coefficient ($\beta y52$) of 0.595 so that proactive personality development can strengthen work motivation 9) there is a direct influence of teamwork on work motivation with a path coefficient ($\beta y53$) of 0.317, so increasing teamwork can strengthen work motivation 10) there is a direct influence of proactive personality on adversity intelligence with a path coefficient ($\beta y21$) of 0.827 so that increasing proactive personality can strengthen adversity intelligence.

3. Using path analysis, the resulting indirect influence is as follows: 1) there is an indirect influence of adversity intelligence on servant leadership through commitment to the organization with a path coefficient ($\beta x41y$) of 0.061 so that the development of adversity intelligence can strengthen servant leadership through increased commitment to the organization. 2) there is an indirect influence of proactive personality on servant leadership through a commitment to the organization with a path coefficient ($\beta x42y$) of 0.182 so that proactive personality development can strengthen servant leadership through increasing commitment to the organization. 3) there is an indirect influence of proactive personality on servant leadership through work motivation with a path coefficient ($\beta x52y$) of 0.185 so that proactive personality development can strengthen servant leadership through increasing work motivation. 4) there is an indirect influence of teamwork on servant leadership through work motivation with a path coefficient ($\beta x53y$) of 0.064 so that teamwork development can strengthen servant leadership through increasing work motivation.

The implication of the conclusion above is, that if servant leadership is to be improved, it requires the development of adversity intelligence, proactive personality, teamwork, and increased commitment to the organization, as well as work motivation.

From the results of the SITOREM analysis, the optimal solution is obtained as follows:

1. Priority order for handling indicators to strengthen servant leadership, adversity intelligence, proactive personality, teamwork, commitment to the organization, and work motivation. Are as follows: 1st action, 2nd identification of opportunities and follow-up (opportunities), 3rd initiative, 4th feedback obtained from the organization (feedback), 5th sense of belonging, 6th service provided want (service), 7th increase in income and fulfillment of needs (income), 8th attitude to control difficulties (control), 9th attitude towards the origins of difficulties (origin), 10th attitude to face difficulties (ownership), 11th desire to get recognition (confession), 12th desire to get working conditions, 13th humility behavior, 14th accountability behavior, 15th listening behavior, 16th compassionate behavior, and 17th courage.

2. Indicators that are in good condition and need to be maintained or developed are as follows: 1) hard work until change occurs (worker), 2) loyalty to work (loyalty), 3) suitability, 4) togetherness in the organization and realizing organizational goals (togetherness), 5) resistance to difficulties (endurance), 6) attitude to anticipate the impact of difficulties (reach), 7) desire to achieve achievement, 8) desire to be responsible (responsibility), 9) desire to achieve progress, 10) desire to obtain organizational procedures, 11) cooperation 12) cohesiveness, 13) communication, 14) responsibilities, 15) trust, and 16) integrity behavior.

Suggestions or recommendations that can be given to related parties are as follows:

1. Principals need to improve service leadership by developing adversity intelligence, proactive personality, and teamwork, as well as increasing commitment to the organization and work motivation by improving: action, identification of opportunities and follow-up, initiative, feedback obtained from the organization, sense of belonging, desired services, increased income and fulfillment of needs, attitude to control difficulties, attitude towards the origins of difficulties, attitude to face difficulties, desire to gain recognition, desire to

obtain working conditions, humility behavior, accountability behavior, listening behavior, compassionate behavior and courage

2. School supervisors, school organizing institutions, and the education department need to train school principals in strengthening service leadership by providing

appropriate direction to strengthen the development of adversity intelligence, proactive personality, and teamwork, as well as increasing commitment to the organization and work motivation following the results of this research.

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