

A Serial Mediation Model for Sustainable Leadership Styles

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Abstract

Sustainability Leadership style is a relatively new leadership style founded by Hargreaves and Fink (2012). This study performed a thorough review of sustainable leadership styles and found that it affects teachers' job satisfaction from the perspectives of Intrinsic Motivation and Extrinsic Motivation. Teacher job satisfaction has a direct impact on teachers' work performance, and this influences students' academic achievement. This work developed a model of the relationships between sustainable leadership style, teacher job satisfaction, and teacher job performance based on the Serial Mediation Model.

Keywords: Sustainable Leadership Style; Teacher Job Satisfaction; Teacher Work Performance; Student Academic Achievement; Serial Mediation Model

Introduction

The principal's leadership style is important to ensure that the academic achievement of students can be improved, where the principal's leadership is one of the benchmarks for the overall success of a school (Najjat & Rabiatal-Adawiah, 2016). Based on past studies, leadership style has a considerable effect on the improvement and effectiveness of school achievement (Kieti, 2018). Without an appropriate leadership style, the effectiveness of school achievement cannot be realized, although the school has sufficient instructional and financial resources (Odude, 2013). Badenhorst and Radile (2018) demonstrate that weak leadership and management styles are the primary causal factors for poor academic performance in "Technical and Vocational Education and Training" (TVET) Colleges in the context of South Africa.

A good relationship between the principal and the teacher has a direct impact on the overall academic achievement of the students, and the leadership style ensures a good relationship with the school teacher (Kalagbor, 2016). This is because principals, teachers and the school management staff have the responsibility to plan the school's activities and direction to achieve excellence, wherein the principal's leadership style influences the planning. Poor planning leads to uncertain student achievement (Kalagbor, 2016; Maina, 2010).

Several salient types of leadership styles exist in the literature, namely, Attributional Leadership (Kelley, 1967), Charismatic Leadership (Conger & Kanungo, 1987), Executional Leadership (Bass & Stogdill, 1990), Transformational Leadership (Bass & Stogdill, 1990), Visionary Leadership (Robbins & Judge, 2001), Instructional Leadership (Leithwood, Jantzi, & Steinbach, 1999) and Sustainable Leadership (Hargreaves & Fink, 2012). Looking at all these leadership styles, sustainable leadership is the best leadership style, since it includes the most detailed leadership characteristics, including visionary, communicative, environmental,

developmental, and encouraging, and involves careful responsibility and management (Heng & Karuppanan, 2022b).

Literature Review

Hargreaves and Fink (2012) founded the Sustainable Leadership Style to evaluate leadership in the field of education. Sustainable leadership allows organizations to thrive, because it is a form of stable leadership, helping excellence and even sustainability (Jamal & Hamid, 2018; Saberi & Hamzah, 2020). Sustainable leadership is the principle of preserving educational excellence and at the same time maintaining a certain level of achievement (Hargreaves & Fink, 2012).

Hargreaves and Fink (2012) listed seven principles of sustainable leadership, namely, (a) continuous learning; (b) create backup leaders in schools; (c) the application of a culture of learning sharing among teachers; (d) encourage partnerships with organizations outside the school; (e) diversity; (f) maintenance; and (g) use human resources well to preserve and improve teacher work performance.

The implementation of sustainable leadership can take advantage of various elements in the environment, including (a) reform that emphasizes learning without changing the management system of a school; (b) reform that emphasizes long-term goals; (c) reform supported by readily-available resources; (d) reform that does not have a negative impact on the environment and the school system; and (e) reform that increases the involvement of school organizational resources, including principals and teachers, to enhance sustainability.

However, one of the problems faced by principals in practicing sustainable leadership is the possibility of dissatisfaction among school teachers caused by the workload they carry (Abdul Manaf 2009). This is because the performance and achievement of teachers may decrease due to the burden of additional tasks, especially administrative work and the hope of parents wanting their children to excel in their studies (Abdullah, 2010; Jamal & A.Hamid, 2018). If this situation occurs, then the sustainable leadership implemented by the principal to encourage improvement and preserve achievements may be difficult to achieve.

In fact, the dimension of sustainable leadership style was found to be directly related to the Two Factor Theory (Heng & Karuppanan, 2022a). The Two Factor Theory is a salient job satisfaction theory that is related to the Discrepancy Theory (Locke, 1969) and the Equity Theory (Adams, 1963).

The Two Factor Theory is a comprehensive theory on job satisfaction because it includes the characteristics of intrinsic motivation and extrinsic motivation. However, the Discrepancy Theory is only characterized by intrinsic motivation, while the Equity Theory is only characterized by extrinsic motivation (Adams, 1963; Heng & Karuppanan, 2022a; Herzberg, 2017; Locke, 1969).

The relationships between the dimensions of the sustainable leadership style with the Two Factor Theory are summarized in Table 1, where the dimension of continuous learning is related to intrinsic motivation while other dimensions of sustainable leadership style include; (a) create backup leaders in schools; (b) promote a culture of learning sharing among teachers; (c) encourage partnerships with friends or organizations outside the school; (d) diversity; (e) maintenance and; (f) good use of human resources related to intrinsic and extrinsic motivation (Heng & Karuppanan, 2022a).

Table 1: *The relationship between the dimensions of Sustainable Leadership style with the Two Factor Theory*

No.	Dimensions of Sustainable Leadership	Types of Motivation in Two Factor Theory	
		Intrinsic Motivation	Intrinsic Motivation
1	Continuous learning	√	
2	Creating supportive leaders in schools	√	√
3	The implementation of learning sharing culture among teachers	√	√
4	Encourage partnerships with friends or organizations outside of the school	√	√
5	Diversity	√	√
6	Maintenance		√
7	Good use of human resources	√	√

Based on this in-depth literature review, prior studies on job satisfaction factors demonstrate that job satisfaction is influenced by the Motivation Factors (Intrinsic) and the Hygiene Factor (Extrinsic), which are factors under the Two Factor Theory, as shown in Table 2. Therefore, it can be concluded that the dimension of sustainable leadership style affects teachers' job satisfaction. Nine out of fifteen past studies argue that job satisfaction has a direct relationship with teacher work performance, namely, (a) Aziizah, Wirawan, and Thalib (2018); (b) Wahyuni, Christiananta, and Eliyana (2014); (c) Izzati and Mulyana (2019); (d) Azis (2020); (e) Wolo, Trisnawati, and Wiyadi (2017); (f) Pratiwi, Askafi, and Baehaki (2020); (g) Yudhistira (2019); (h) Nurahmah, Ekawati, and Jayanti (2019) and; (i) Jusoh, Ismail, and Abdullah (2020).

Table 2: *Summary of Factors that affect Job Satisfaction and its relationship with Job Performance based on the Two Factor Theory*

No.	Reference	Job Satisfaction Factors		Relationship between Job Satisfaction and Job Performance
		Motivational Factors (Intrinsic)	Hygiene Factors (Extrinsic)	
1	Aziizah et al. (2018)	- Opportunities to grow - Suitability to the task	- Principal's support and motivation - Colleagues - Good salary - Salary	√
2	Wahyuni et al. (2014)	- Job suitability - Opportunity to grow	- The supervisor's leadership style - Work benefits - Surveillance	√
3	Izzati dan Mulyana (2019)	- Progress - Recognition - Responsibility - Achievements	- Company's policy - Working conditions or environment - Social factors (relationships or social interactions)	√
4	Azis (2020)	- Psychological factors (employees' attitudes towards their jobs)	- Physical factors (Work environment and worker conditions) - Financial factors (Guarantee and employee welfare)	√

5	Abd Wahab dan Abdullah (2019)	- Not discussing factors thoroughly	- Not discussing factors thoroughly	
6	Aziz dan Hussin (2017)	- Responsibility - The job itself - Progress - Recognition	- Supervisor - Colleagues - Work environment - Salary - Safety - Salary	
7	Wolo et al. (2017)	- Progress and promotion opportunities - The work itself	- Supervisor - Colleagues - Workplace environment - Salary	√
8	Pratiwi et al. (2020)	- The role of the job - Opportunity for promotion	- Top supervisor - Colleagues - Work load	√
9	Aisyah, Manarus, dan Sidik (2016)	- The work itself - Opportunity for promotion	- Salary - Colleagues	
10	Darmawan (2016)	- The work itself - Opportunity for promotion	- Reasonable salary - Supervisory style	
11	Ghufron (2017)	- The job itself - Personal growth and development	- Connection - Changes and improvements to organizational systems - Salary - Supervisor	
12	Yudhistira (2019)	- Promotion opportunities - Appreciation	- Work allowance - Operational procedures - Colleagues - Communication	√
13	Nurahmah et al. (2019)	- Performance - Appreciation - Promotion or promotion opportunities - The job itself - Responsibility	- Company policy - Supervisor - Interpersonal relationships - Working conditions or environment	√
14	Jusoh et al. (2020)	- Not discussing factors thoroughly	- Not discussing factors thoroughly - Colleague level	√
15	Omar dan Hamzah (2020)	- awards	- Salary - Policies and regulations	

Discussion

This literature review presented the dimensions of sustainable leadership style in relation to the Two Factor Theory, from the perspective of Intrinsic Motivation and Extrinsic Motivation. Previous studies show that these factors that affect teacher job satisfaction, including the Motivation Factor (Intrinsic) and the Hygiene Factor (Extrinsic). They conclude

that job performance is affected by teachers' job satisfaction. Kalagbor (2016) suggests that a good relationship between school principals and teachers has an impact on student academic achievement. This argument is also supported by Badenhorst and Radile (2018), who show that a weak leadership and management style leads to poor academic achievement.

Figure 1 shows the Serial Mediation Model on the relationship between the principal's sustainable leadership style, teacher job satisfaction, teacher job performance and student academic achievement performance.

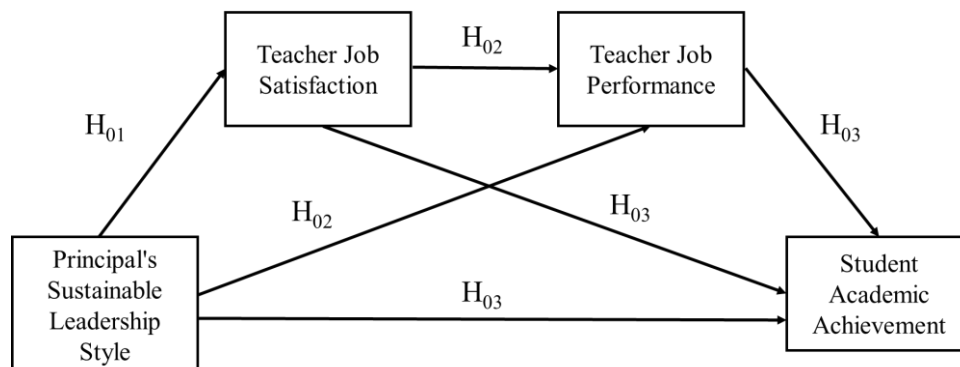


Figure 1: Serial Mediation Model for the relationship between the Principal's Sustainable Leadership Style, Teacher Job Satisfaction, Teacher Job Performance and Student Academic Achievement.

The Serial Mediation Model presents the direct and the indirect effects between the independent variables, the mediating variables and the dependent variables.

Direct Effects

The direct effect for the Serial Mediation Model examines whether the input variable is a significant predictor of the output variable (Hayes, 2018; MacKinnon, 2012).

There are two ways to analyze the Serial Mediation Model. Hayes (2018) suggests the application of SPSS PROCESS to analyze this model thoroughly. The second way is to employ linear regression. Figure 1 shows the Serial Intermediate Model divided into three types of linear regression frameworks (IBM Corp, 2012), as shown in Figures 2, 3 and 4. This is further explained hereafter.

a. Is the sustainable leadership style practiced by principals a significant predictor of teacher job satisfaction?

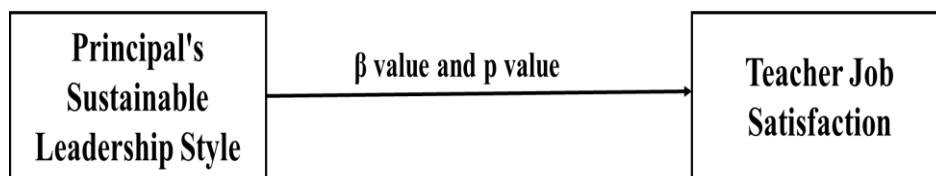


Figure 2: Hypothetical Regression Model (H₀₁)

The simple linear regression framework depicted in Figure 2 has only one independent variable (IV) and one dependent variable (DV). The null hypothesis (H₀) and the alternative hypothesis (H₁) are as follows:

H₀₁: The principal's sustainable leadership style is not a predictor of teacher job satisfaction

H₁: The principal's sustainable leadership style is a predictor of teacher job satisfaction

If the P value is less than the alpha value of .05, then the null hypothesis (H₀) is rejected. This shows that the principal's sustainable leadership style is a significant predictor of teacher job satisfaction. The β value was used to identify whether the principal's sustainable leadership style has a positive or negative effect on teacher job satisfaction. The R square value shows the percentage change in the variance of the independent variable (IV), which is teacher's job satisfaction with respect to teacher's job performance. The higher the R square value, the higher the effect of the independent variable (IV) on the dependent variable (DV) as a whole.

b. Is the principal's sustainable leadership style and teacher job satisfaction a significant predictor of teacher job performance?

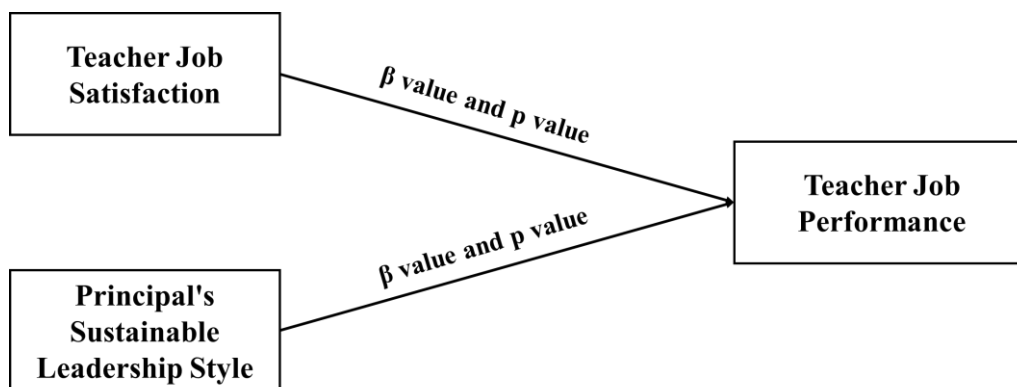


Figure 3: *Hypothetical Regression Model (H₀₁)*

Figure 3 shows the second direct effect of the Serial Mediation Model, which is the effect of the principal's sustainable leadership style and teacher job satisfaction on teacher job performance. Based on this regression model, multiple linear regression analysis was employed because there are two independent variables (IV) and one dependent variable (DV). The null hypothesis (H₀) and alternative hypothesis (H₁) are as follows.

H₀₂: The principal's sustainable leadership style and teacher job satisfaction are not predictors of teacher work performance.

H₁: The principal's sustainable leadership style and teacher job satisfaction are predictors of teacher work performance.

If the p value is less than the alpha value of .05, then the null hypothesis is rejected, and this shows that the principal's sustainable leadership style and teacher job satisfaction are significant predictors of teacher job performance. The β value was used to identify whether the principal's sustainable leadership style and teacher job satisfaction have a positive or negative effect on teacher work performance. Next, the R square value shows the percentage change in the variance of the dependent variable (IV), i.e., the principal's sustainable leadership style and teacher job satisfaction towards teacher job performance. The higher the R square, the higher the contribution of the effect of the dependent variable (IV) on the dependent variable (DV) as a whole.

c. Is the principal's sustainable leadership style, teacher job satisfaction and teacher job performance a significant predictor of student academic achievement?

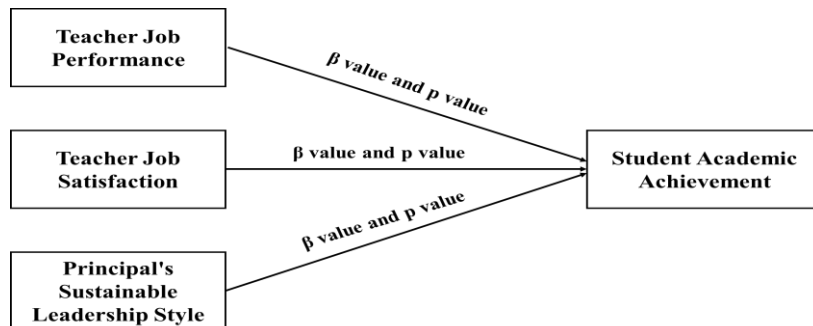


Figure 4: Hypothesis Regression Model (H03)

Figure 4 shows the third direct effect from the Serial Mediation Model, which is the effect of the principal's sustainable leadership style, teacher job satisfaction and teacher job performance on student academic achievement. This direct effect can be analyzed using multiple linear regression analysis, since there are three independent variables (IV) and one dependent variable (DV). The null hypothesis (H0) and the alternative hypothesis (H1) are as follows.

H03: The principal's sustainable leadership style, teacher job satisfaction and teacher job performance are not predictors of student academic achievement.

H1: Principal's sustainable leadership style, teacher job satisfaction and teacher job performance are predictors of student academic achievement.

If the p value is less than the alpha value of .05, then the null hypothesis (Ho) is rejected, and this shows that the principal's sustainable leadership style is a significant predictor of teacher job satisfaction. The β value was used to identify whether the principal's sustainable leadership style, teacher job satisfaction, teacher job performance have a positive or negative effect on student academic achievement. Next, the R square value shows the percentage change in the variance of the independent variable (IV), which is the principal's sustainable leadership style, teacher job satisfaction and teacher job performance on student academic achievement. The higher the R square, the higher the contribution of the effect of the independent variable (IV) on the dependent variable (DV) as a whole.

Indirect Effects

Indirect effects are used to identify which path or combination of variables have the most significant effect on the dependent variable, which is student academic achievement.

According to Hayes (2018), the sixth Serial Mediation Model has three types of pathways for indirect effects, which are discussed hereafter.

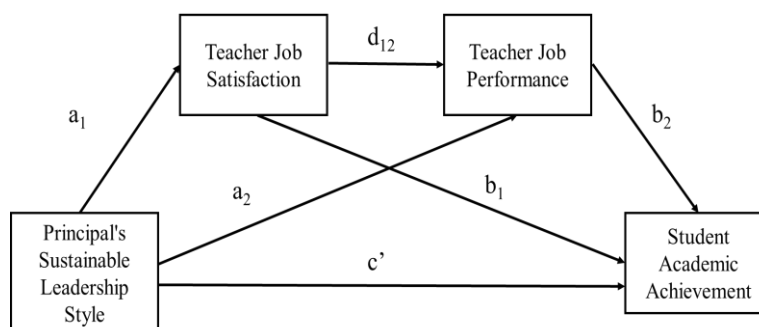


Figure 5: The Influence of the Principal's Sustainable Leadership Style on Student Academic Achievement through Teacher Job Satisfaction and Teacher Job Performance

a. The first path (H04) – Teacher job satisfaction mediates the principal's sustainable leadership style with student academic achievement.

Referring to Figure 5, the first path is the influence of the principal's sustainable leadership style on teacher job satisfaction through path a_1 , while the influence of teacher job satisfaction on student academic achievement is through path b_1 . The a_1b_1 path is a mediating effect between sustainable leadership style on student academic achievement through teacher job satisfaction, known as an indirect effect. The null hypothesis (H0) and alternative hypothesis (H1) are as follows.

H04: Teacher job satisfaction is not effective as a mediator between the principal's sustainable leadership style and student academic achievement.

H1: Teacher job satisfaction is effective as a mediator between the principal's sustainable leadership style and student academic achievement.

The indirect effect a_1b_1 was calculated using Equation 1 (IBM Corp, 2012).

$$\text{Indirect effect } a_1b_1 = \beta_{a_1} \times \beta_{b_1} \quad (1)$$

where β_{a_1} is the direct effect of the principal's sustainable leadership style on teacher job satisfaction, while β_{b_1} is the direct effect of teacher job satisfaction on student academic achievement.

b. The second path (H05) – Teacher work performance mediates the principal's sustainable leadership style with student academic achievement.

Referring to Figure 5, the second path is the influence of the principal's sustainable leadership style on teacher work performance through path a_2 , while the influence of teacher work performance on student academic achievement is through path b_2 . The a_2b_2 path is a mediating effect between sustainable leadership styles on student academic achievement through teacher work performance, known as an indirect effect. The null hypothesis (H0) and the alternative hypothesis (H1) are as follows:

H05: Teacher work performance is not effective as a mediator between the principal's sustainable leadership style and student academic achievement.

H1: Teacher work performance is effective as mediation between the principal's sustainable leadership style and student academic achievement.

The indirect effect a_2b_2 was calculated using Equation 2 (IBM Corp, 2012).

$$\text{Indirect effect } a_2b_2 = \beta_{a_2} \times \beta_{b_2} \quad (2)$$

Where β_{a_2} is the direct effect of the principal's sustainable leadership style on teacher work performance, while β_{b_2} is the direct effect of teacher work performance on student academic achievement.

c. The third path (H06) – Teacher job satisfaction and teacher job performance mediate the principal's sustainable leadership style with student academic achievement.

Referring to Figure 5, the third path is the influence of the principal's sustainable leadership style on teacher job satisfaction through path a_1 , while the influence of teacher job satisfaction on teacher work performance is through path d_{12} . The influence of teacher work

performance on the academic achievement of students is through path b_2 . The $a_1d_{12}b_2$ path is a mediating effect between sustainable leadership style on student academic achievement through teacher job satisfaction and teacher job performance, known as an indirect effect. The null hypothesis (H_0) and the alternative hypothesis (H_1) are as follows:

H₀: Teacher job satisfaction and teacher job performance are not effective as mediators between the principal's sustainable leadership style and student academic achievement.

H₁: Teacher job satisfaction and teacher job performance are effective as mediators between the principal's sustainable leadership style and student academic achievement.

The indirect effect of $a_1d_{12}b_2$ was calculated using Equation 3 (IBM Corp, 2012).

$$\text{Indirect effect } a_1d_{12}b_2 = \beta_{a_1} \times \beta_{d_{12}} \times \beta_{b_2} \quad (3)$$

where β_{a_1} is the direct effect of the principal's sustainable leadership style on teacher job satisfaction, while $\beta_{d_{12}}$ is the direct effect of teacher job satisfaction on teacher job performance. β_{b_2} is the direct effect of teacher work performance on student academic achievement.

The hypotheses of indirect effects were analyzed simultaneously using the ratio method compared to the total amount of indirect effects (Hayes, 2018). Among the three indirect effect hypotheses, only one alternative hypothesis (H_1) was accepted (Hayes, 2018). The way to determine which alternative hypothesis (H_1) will be accepted is discussed hereafter.

First, calculate the total indirect effect (JKKSTL) using Equation 4 (IBM Corp, 2012).

$$JKKSTL = (\beta_{a_1} \times \beta_{b_1}) + (\beta_{a_2} \times \beta_{b_2}) + (\beta_{a_1} \times \beta_{d_{12}} \times \beta_{b_2}) \quad (4)$$

Second, calculate the proportion for each indirect effect (PKTL), as shown by Equations 5, 6 and 7 (IBM Corp, 2012).

$$PKTL_{a_1b_1} = \frac{(\beta_{a_1} \times \beta_{b_1})}{JKKSTL} \quad (5)$$

Based on Equation 5, $PKTL_{a_1b_1}$ is the proportion of indirect effects a_1b_1 and JKKSTL is the total amount of indirect effects.

$$PKTL_{a_2b_2} = \frac{(\beta_{a_2} \times \beta_{b_2})}{JKKSTL} \quad (6)$$

Based on Equation 6, $PKTL_{a_2b_2}$ is the proportion of indirect effects a_2b_2 and JKKSTL is the total amount of indirect effects.

$$PKTL_{a_1d_{12}b_2} = \frac{(\beta_{a_1} \times \beta_{d_{12}} \times \beta_{b_2})}{JKKSTL} \quad (7)$$

Based on Equation 7, $PKTL_{a_1d_{12}b_2}$ is the proportion of indirect effects $a_1d_{12}b_2$ and JKKSTL is the total amount of indirect effects.

Among the ratios obtained from Equations 5, 6 and 7, only one alternative hypothesis (H_1) for the highest ratio was accepted. This indicates that there is a mediation effect between the principal's sustainable leadership style and student academic achievement. The second and third ratios were high, and the null hypothesis (H_0) was accepted. This shows that there is no mediation effect between the principal's sustainable leadership style and student academic achievement.

Overall Effect

Overall effect analysis aims to compare direct effect and the overall indirect effect to identify whether the mediating variable (MV) influences the independent variable (IV) on the dependent variable (DV). Referring to Figure 5, c' is the direct effect between sustainable leadership style (X) on student academic achievement (Y). The overall effect (c) was calculated using Equation 8 (IBM Corp, 2012).

$$\text{Overall effects } (c) = \text{Direct effects } (c') + JKKSTL \quad (8)$$

Based on Equation 8, JKKSTL is the total effect indirectly calculated using Equation 4. The null hypothesis (H_0) and alternative hypothesis (H_1) for the overall effect are as follows.

H_0 : The indirect effect is not a significant effect between sustainable leadership style and student academic achievement.

H_1 : The indirect effect is a significant effect between sustainable leadership style and student academic achievement.

To identify whether the indirect effect is a significant effect between the sustainable leadership style on the academic achievement of students, the proportion method was used, which is shown in Equations 9 and 10 (IBM Corp, 2012):

$$PKSTL = \frac{JKKSTL}{\text{Overall effects } (c)} \quad (9)$$

$$NKSL = \frac{\text{Direct effects } (c')}{\text{Overall effects } (c)} \quad (10)$$

To identify whether the alternative hypothesis (H_1) was accepted for the overall effect ("the indirect effect is a significant effect between sustainable leadership style and student academic achievement"), the proportion for direct effects and indirect effects compared to the overall effect was calculated. The calculation of this proportion is shown in Equations 9 and 10. Equation 9 was used to calculate the indirect effect proportion (PKSTL) by using the highest indirect effect pathway (LKTLM) divided by the total effect (c). Equation 10 shows the calculation to obtain the direct effect proportion, which is by using the direct effect (c') divided by the overall effect.

If the direct effect proportion exceeds the indirect effect proportion, then the null hypothesis (H_0) is accepted, and this shows that the indirect effect is not a significant effect between the principal's sustainable leadership style and academic achievement. If the direct effect proportion does not exceed the indirect effect proportion, then the null hypothesis (H_0) is rejected. This shows that the indirect effect is a significant effect between sustainable leadership style and student academic achievement.

Conclusion

This literature review paper investigated the relationship between the Principal's Sustainable Leadership Style, Teacher Job Satisfaction, Teacher Job Performance and Student Academic Achievement. The method of analysis based on the Serial Mediation Model was also discussed. In addition, this work tested the hypotheses to analyze the direct effect, indirect effect and overall effect for the relationship between the Principal's Sustainable Leadership Style, Teacher Job Satisfaction, Teacher Job Performance and Student Academic Achievement. The Serial Mediation Model presented in this work is an important model for the study of the principal's sustainable leadership style and its effects on both teachers and

students. This model can contribute to a new understanding of the theory of sustainable leadership style founded by Hargreaves and Fink (2012).

Acknowledgments

The author would like to take this opportunity to thank Universiti Selangor for the support received in the preparation of this literature review. The appreciation also goes to my research supervisor Assoc. Prof. Dr. Gunasegaran Karuppanan for guidance and encouragement. Without this support, it would not be possible for this literature review paper to be produced.

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