The Mediating effect of School Culture in the relationship between Instructional Leadership and School Academic Achievement

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Abstract: Research generally suggests that the direct effects of principal’s leadership style on student achievement are minimal and many times no significant. The purpose of the study is to investigate the relationship between instructional leadership practices and school culture on school academic achievement among principals in the secondary school. Through the application of structural equation modelling, a mediated-effects model for instructional leadership was tested, using data from 16 secondary schools in the southern zone of Malaysia. The results provided substantial support for the model. The results indicated that there are significant and positive effects of instructional leadership on school culture. The findings indicated there are significant and positive effects of school culture on the school academic achievement. Although the principal instructional leadership was not directly related to school academic achievement, it did have an indirectly positive effect. Finally, from the results of mediation analysis it was found that school culture fully mediated the effects of instructional leadership on the school academic achievement. In sum, this study adds to the understanding of the intervening variable within the school that influence school academic achievement. Principals can affect the student academic achievement of their students indirectly using their leadership to develop an organizational culture and which in turn promote school academic achievement.

1. Introduction

Among the empirical research conducted globally in educational leadership that emerged over the past 30 years, few have been more significant than the focus on understanding linkages between school leadership and learning [29,47,49]. Schools can improve their learning outcomes regardless of initial achievement levels by changing key organizational aspects such as instructional leadership and teacher capacity [28]. Study in instructional leadership has advanced in finding its impacts on student achievement, however it is still not robust the impacts on student achievement is direct or otherwise. The novel findings of current research indicated that only little significant relationship between principal’s leadership and student achievement [4,16,37]. Thus, research has focused on indirect principal leadership practices [45,49] and is mediated by other factors such as their interactions with others, situational events and the organizational and cultural factors of the school [30,33,38]. The greater impact on student achievement had indicated from indirect models compared to direct models [50, 51]. Another approach to improve student achievement is through the creation of a positive school culture. The principal plays a crucial role in the development of a healthy culture [40]. Furthermore, school culture and teacher efficacy have been found to have mediating effects upon student achievement through school leadership [11, 48]. These findings suggest support for the indirect effect of school leadership, upon student achievement. Accordingly, more leadership research has been conducted to examine a range of other leadership activities in schools that influence instructional practices. Research evidence in Australia has also indicated the indirect relationship between school leadership and student achievement [26,52]. Principals indirectly influence student achievement in reading and mathematics through feedback and evaluation practices that shape teachers’ job satisfaction and achievement orientation [9]. Amidst the existing arguments on the relationship of school leadership and student learning, research to understand the contribution of leadership to student learning conducted by scholars in many different school contexts has supported the conclusion that school leadership affected learning by creating structural and socio-cultural processes that develop the capacity of schools for academic achievement [47,12,14,23]. According to Leithwood [39], principals as ‘change agents’ and through transformation of the school culture principals can impact on the school outcomes. Moreover,
Maslowski [46] advance expressed that an affiliation exits between administration qualities and practices and school culture and that distinctive school societies can be related to various results for student achievement.

A positive school culture may have a significant influence on the academic and social. The culture of an organization impacts every aspect of the schooling process, especially student achievement [53]. Peterson [17] suggests that culture is built within a school over time as teachers, school leaders, parents and students work together. It is the school culture that often influences the staff success of the students within schools [54]. When a school exhibits characteristics of a positive school culture, there are fewer suspensions, increased attendance rates, and increased achievement on standardized test scores [3,5]. Despite the need for strong leaders in the public schools, the research examining leadership qualities in public school administrators has been weak with few studies requisite leadership style specifically to student outcome. For sure, many researchers need adequate proof to legitimize guarantees about significant leadership effects on student achievement has proceeded onward to incorporate inquiries regarding how those impacts happen. No research to date has explored these constructs in conjunction with one another in a secondary school population in Malaysia. The need to the identification of effective initiative leadership mediators provide uncertain direction to practicing leaders who are in the matter of selection where best to focus their endeavors.

2. Purpose of Study

The purpose of this study is to examine the mediating effect of school culture in the relationship between instructional leadership practices and school academic achievement. The hypothesis tested in this study:

H1. Instructional leadership has positive direct effect on school academic achievement.

H2. Instructional leadership has positive effect on school culture

H3. School culture has positive effect on school academic achievement.

H4. School culture mediates the relationship between instructional leadership practices and school academic achievement.

3. Theoretical Background

Past research of the role of principal practices and activities that may impact student achievement including encouraging a positive learning atmosphere, concentrating on student progress [10,31]. Researchers believed that principals can create, impact, and oversee school culture since leadership and culture are associated [8]. Furthermore, principals’ actions are central to the development of a school culture that is conducive to high levels of achievement and learning [18]. Besides, principals' activities are vital to the improvement of a school culture that is helpful for elevated amounts of achievement and learning [18]. Research finding showed that there is significant link between a positive school culture and increased student achievement [25]. Indeed, there is a positive and high-level relationship between the principals’ instructional leadership style and school culture. As a factor of school culture, school leadership was most significant influenced by instructional leadership [53]. The literature also demonstrates that schools with higher performance possess a school culture that gives important to concrete indicators such as rituals, traditions, symbols, heroes, stories, and ceremonies [7,17], and discrete indicators like beliefs, convictions, values, norms, philosophy, mission, vision, goals, assumptions, and moral values [17,55]. Thus, it is clear that school culture is associated with students’ academic achievement [1,13,20]. More specifically, higher performance in schools is attributed to effective and strong school cultures, while schools with lower performance are believed to possess negative school culture [56].
4. Research Method

This study used a quantitative research with descriptive correlational research design as a research method. Data collection method was using cross sectional survey and the instrument used was questionnaire. The population for this study was used daily secondary school in southern zone of peninsular Malaysia. Data collected from 16 government daily secondary school in district of Port Dickson, Kota Tinggi and Melaka Tengah. The study sample composed of 255 secondary school teachers. These participants were determined by using the stratified method. To ensure that the selected sample represents the population as a homogeneous, the selections samples are also grouped by the principal who has been managing the school was more than a year and teachers were at least one year of serving with the current principal.

5. Data Collection Tools and Analysis

The data collection tool for the current study was Principal Instructional Management Rating Scale (PIMRS) questionnaire designed by Hallinger and Murphy [31] to measure Instructional Leadership and School Culture Triage Survey developed by Christopher R. Wagner to measure school culture. School academic achievement was determined by Assessment for Form 3 (PT3) results for the year of 2014. The instrument representing three dimensions of instructional leadership: Defining and communicating the school goals, managing the instructional program, and promoting a positive learning climate. School Culture included three subscales: Professional Collaboration, Collegial relationship, and Self-determination. Results of Cronbach Alpha and Convergent Validity for Overall CFA Model are display in table 2. Data collected with the help of district officers in Port Dickson, district officers of Kota Tinggi and district officers of Melaka Tengah. The data collected from the survey were analyzed by Analysis of Moment Structures (AMOS) version 20-based SEM and Statistical Package for Social Sciences (SPSS) version 18.

6. Type-style and Fonts

Wherever Times is specified, Times Roman, or New Times Roman may be used. If neither is available on your word processor, please use the font closest in appearance to Times that you have access to. Please avoid using bitmapped fonts if possible. True-Type 1 fonts are preferred.

<table>
<thead>
<tr>
<th>No</th>
<th>Research Objective</th>
<th>Sub-Section</th>
<th>Relative Hypothesis</th>
<th>Applied Statistical Method</th>
<th>Utilized Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Determine the effect of instructional leadership practices on school academic achievement.</td>
<td>Direct effect of the variables</td>
<td>H1</td>
<td>Path analysis (SEM)</td>
<td>AMOS</td>
</tr>
<tr>
<td>2</td>
<td>Determine the effect of instructional leadership practices on school culture</td>
<td>Direct effect of the variables</td>
<td>H2</td>
<td>Path analysis (SEM)</td>
<td>AMOS</td>
</tr>
<tr>
<td>3</td>
<td>Determine the effect of school culture and school academic achievement</td>
<td>Direct Effects of the Variables</td>
<td>H3</td>
<td>Path analysis (SEM)</td>
<td>AMOS</td>
</tr>
<tr>
<td>4</td>
<td>Determine whether school culture mediate relationship between instructional leadership practices and school academic achievement</td>
<td>Mediation Effect of School Culture (SCU)</td>
<td>H4</td>
<td>Path analysis, Mediation Test, (using Bootstrap)</td>
<td>AMOS</td>
</tr>
</tbody>
</table>

7. Results

Results were based on research objectives and relative sub-sections, Hypotheses and Statistical Methods as shown in Table 1.

Table 1. Research Objectives and Relative Sub-Sections, Hypotheses and Statistical Methods.

On the other hand, Results of Cronbach Alpha and convergent validity for overall CFA model are displayed in table 2.
Table 2. Results of Cronbach Alpha and Convergent Validity for Overall CFA Model.

<table>
<thead>
<tr>
<th>Construct / Item</th>
<th>Item / Parcel Indicator</th>
<th>Internal Reliability Cronbach Alpha</th>
<th>Convergent Validity</th>
<th>Factor Loadings</th>
<th>Average Variance Extracted (AVE)</th>
<th>Composite Reliability (CR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Leadership (ILD)</td>
<td>Defining school’s mission (DSM)</td>
<td>0.858</td>
<td>0.82</td>
<td>0.672</td>
<td>0.860</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Managing the instructional program (MIP)</td>
<td>0.81</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Promoting a positive school’s climate (PSC)</td>
<td>0.82</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Culture (SCU)</td>
<td>Professional Collaboration (PCL)</td>
<td>0.905</td>
<td>0.88</td>
<td>0.767</td>
<td>0.908</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collegial relationships (CRL)</td>
<td>0.89</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-determination (SDT)</td>
<td>0.84</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Academic Achievement (SAA)</td>
<td>1.000</td>
<td>1.00</td>
<td>1.000</td>
<td>1.000</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

a: Average Variance Extracted = (summation of the square of the factor loadings)/[(summation of the square of the factor loadings) + (summation of the error variances)]

b: Composite reliability = (square of the summation of the factor loadings)/[(square of the summation of the factor loadings) + (square of the summation of the error variances)].

The path coefficients and the results of examining hypothesized direct effects are displayed in Table 3.

Table 3. Examining Results of Hypothesized Direct Effects of the Variables in Structural Model.

<table>
<thead>
<tr>
<th>Path</th>
<th>Unstandardized Estimate</th>
<th>Standardized Estimate</th>
<th>Beta</th>
<th>C. r.</th>
<th>P-value</th>
<th>Hypothesis Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILD → SAA</td>
<td>0.062</td>
<td>0.0</td>
<td>0.079</td>
<td>0.079</td>
<td>0.9</td>
<td>9</td>
</tr>
<tr>
<td>SCU → SAA</td>
<td>0.182</td>
<td>0.0</td>
<td>0.299***</td>
<td>3.7</td>
<td>3</td>
<td>0.00</td>
</tr>
<tr>
<td>ILD → SCU</td>
<td>0.757</td>
<td>0.0</td>
<td>0.588***</td>
<td>8.4</td>
<td>4</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*p< 0.05, **p< 0.01, ***p< 0.001

As shown in Table 3, paths from School Culture (SCU) on the School Academic Achievement (SAA) and also paths from Instructional Leadership (ILD) on School Culture (SCU) were statistically significant as their p-values were all below the standard significance level of 0.05. Thus the hypotheses H2 and H3 were supported. Conversely, the direct effect from Instructional Leadership (ILD) on the School Academic Achievement (SAA) was not found as statistically significant as its p-value was 0.323, above the standard significance level of 0.05. Thus the hypothesis H1 was rejected. An examination of GOF indices indicates that the structural model for examining the mediation effect of School Culture (SCU) adequately fitted the data: χ² = 24.734, df = 12, p=0.016, GFI = 0.973, AGFI = 0.936, CFI = 0.987, TLI = 0.978, IFI = 0.987, RMSEA =0.065 and χ²/df= 2.061.

The values of R² for School Culture (SCU) and School Academic Achievement (SAA) were 0.32 and 0.25 respectively which satisfied the requirement for the 0.10 cut off value as recommended by (Quaddus & Hofmeyer, 2007). The coefficient parameters estimates are then examined to determine whether School Culture (SCU) mediates the relationship between Instructional Leadership (ILD) and School Academic Achievement (SAA) (i.e., H4). The path coefficients and the results of examining hypothesized direct effects are displayed in Table 4.
Table 4. Results of Examining Mediation Effect of School Culture (SCU).

<table>
<thead>
<tr>
<th>IV = Instructional Leadership (ILD)</th>
<th>DV = Student Academic Achievement (SAA)</th>
<th>M = School Culture (SCU)</th>
<th>Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Effect of IV on DV without M (path a)</td>
<td>0.363**(sig: 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Effect of IV on DV with M (path a')</td>
<td>0.12**(sig: 0.114)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect Effect of IV on DV through M (path bc)</td>
<td>0.236**(sig: 0.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect of IV on M (path b)</td>
<td>0.561**(sig: 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect of M on DV (path c)</td>
<td>0.420**(sig: 0.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mediation Effect</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of Mediation</td>
<td>Full</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothesis Result</td>
<td>H6) Supported</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*, **, ***: Contribution is significant at the 0.05, 0.01 and 0.001 level (2-tailed).

The results showed no significant relationship between the Instructional Leadership (ILD) and School Academic Achievement (SAA); \( \beta = 0.079, \) C.R. = 0.989, p= 0.323. There is no direct effect of instructional leadership and school academic achievement. Although it was hypothesized that instructional leadership had a direct effect on school academic achievement, the data did not support this hypothesis. Hallinger and Heck [29] suggest that “although it is theoretically possible that principals do exert some direct effect on students’ learning, the linkage between principal leadership and student achievement is inextricably tied to the actions of others in the school” (p.24, 1996). The findings of this research support earlier studies from Gaziel [24] who suggested that “principals influence student learning indirectly by developing a school mission that provides an instructional focus for teachers throughout the school, this creates a school environment that facilitates student learning” (p.19). The current research supported finding research from Seashore Louis et al. [57] that concluded, “shared leadership and instructional leadership are important variables, but they are indirectly related to student achievement” (p.51) and also by Valentine & Prater [58] discovered statistically significant indirect relationship between five principal leadership behaviors and student achievement. The current research finding reaffirm and supports the belief that principals exercise a measurable, though small, indirect effect on student achievement [29,49,30]. Leithwood, Harris, and Hopkins [37] found that the way principals directly established positive, successful cultures of teaching and learning in schools had very powerful indirect effects on student achievement as school academic outcomes. This current research also aligned with Linda Bendikson [6] who studied the same correlational variables and one out of the six major and significant findings is that the school academic achievement is largely facilitated by instructional leadership in an indirect manner.

8.2. H2 (Instructional Leadership (ILD) has positive effect on School Culture (SCU))

The result of the standardized estimate of Beta was 0.588, indicating that instructional leadership has positive effect on school culture. This current study suggests that a positive relationship be established between instructional principal leadership and school culture. This finding indicated that teachers’ perception of the principals was highly in framing the school’s goal and communicates the school’s goal. The findings of the study also suggest that the two most eminent aspects of the culture of the school studied are professional collaboration and self-determination. This finding suggests principals...
who always communicate the school’s goal will build positive culture of collaboration among teachers to achieve common goals. Principals and teachers create culture such as professional collaboration to be organization effort and self-determination as an individual effort to enhance new knowledge that can create new pedagogical strategies in student learning. Principals always support this collaboration with professional development, monitor student progress and provide incentive for learning. The importance of teacher collaboration as the strongest positive element in the given school culture suggests that teachers’ formal and informal professional learning can best be enhance by building and sustaining the necessary opportunities for teacher collaboration within institutions. This kind of collaboration should definitely be promoted because it raises morale, enthusiasm, and efficacy of teachers; and helps them become more receptive to new ideas [19,22]. Since self-determination, by nature, is personal and cannot be imposed upon teachers, principals can be encouraged teachers to develop themselves and give opportunities for teachers to attend seminars and workshops. This finding aligned with Jurasaite-Harbison and Rex [34] in her research related to teachers’ workplace learning. Teachers are more likely to engage in this kind of learning in schools in which physical and social environments promote professional interactions [34].

This study outcomes show that instructional leadership statically has a noteworthy impact upon all variables of school culture, school leadership was most significantly influenced by instructional leadership. The current study also supports the finding from another study by DuPont [21], who examined a case study of the American Embassy School in New Delhi, the perceptions of the influence of principal instructional leadership on school culture. Various and solid connections were found between numerous instructional leadership variables and school culture elements recommending the significance of principals utilizing an instructional leadership approach. As instructional pioneers, principals can make a positive and collective school culture. By helping educators work together, imparting aggregate initiative, and conveying a mutual vision, principals can add to building up a positive and community oriented school culture.

8.3. H3 (School Culture (SCU) has positive effect on School Academic Achievement (SAA))

The results of the standardized estimate of Beta was 0.299, indicating that School Culture has positive effect on school academic achievement. The results also indicated that school culture had a statistically significant impact upon school academic achievement with all three subscales on the School Culture Triage Inventory that some aspects of school culture can make a school as a place where teachers feel positive about their work. Positive school cultures are associated with higher student achievement, improved teacher collaboration, and improved teacher self-determination. This evidence has suggested that principals are in a unique position to influence school culture [19,36]. This current study results is important, this finding assumed that schools or institutions work best when people are committed to certain commonly held values and are bonded to one another by articulating professional collaboration, collegial relationships and self-determination to promote student learning and in turn have influence in school academic achievement. This result is aligned with research by Hatchett [32], who investigate the impact of school culture, teacher job satisfaction, and student attendance rates on academic achievement of middle school students. The result indicated that there was a positive relationship between the variables of the school culture triage score and the commonwealth accountability testing scores (CATS). The results of the multiple regression test revealed school culture triage score explain 24.7 per cent of the variation in academic scores. This current study also supports research by Bektas [35], who conducted a meta-study of the relationship between school culture and academic achievement. The meta-study by Bektas [35] reveals that school culture variable has a noteworthy effect on student achievement. Research by Angus J. Macneil, Doris L. Prater and Steve Busch [42], shows that students achieve higher scores on standardized tests in schools with healthy learning environments and culture. This current study also support the study by Cunningham [15], within one of Florida’s largest school districts was able to verify a significant relationship between student achievement in reading scores and School Culture Triage Survey. The findings revealed the higher the reading score on the state assessment, the higher the school culture score. The current study also aligned with the study conducted by Sheri Roberts McGuffin [43] who examine the relationship between high school principals’ leadership style, school culture, teacher efficacy and student achievement. Findings of the review have demonstrated that leadership style alone has delivered a blended picture in its relationship to understudy accomplishment; however school culture has a noteworthy, coordinate effect upon understudy accomplishment.

H4 School Culture (SCU) mediates the relationship between Instructional Leadership (ILD) and School Academic Achievement (SAA)
The results of mediation analysis indicated that School Culture fully mediated the effects of Instructional Leadership on the School Academic Achievement. The results indicated that instructional leadership had a significant indirect positive effect on school academic achievement through school culture with standardized indirect effect of 0.236 and P-value of 0.000. Principals in this data analysis perceived by their teachers as practice instructional leadership and create culture of collaboration among teachers that increase teacher’s self-determination to enhance new idea and knowledge in turn promotes school academic achievement. Principals typically have stronger effects on school processes than on student achievement but small, statistically significant contributions to achievement, independent of indirect effects through school processes, have been demonstrated. These finding suggest that principals should exhibit instructional leadership practices as these skills help develop the unity of vision and mission through the culture of professional collaboration, collegial relationship among teacher as well as self-determination. Instructional leadership practices can move the teachers out of isolation and toward a culture of openness for improvement. These findings are consistent with earlier research that has investigated the direct effects of leadership on student learning outcomes has reported weak effects, whereas research that has included mediating variables has reported significant effects [36]. Principals can increase cooperation, productivity, and commitment by encourage strong school culture that focus upon improving education. These findings are consistent with finding from previous studies [53,21,2]. Alig-Mielcarek [2] suggested that practicing the three dimensions of instructional leadership will provide a good foundation for creating a climate that presses for academic rigor. However, principals will also need to provide resource support, through monitoring and informal discussions, that teachers have materials and classroom supplies to teach the curriculum effectively.

Another result derived from the analysis was that, the standardized estimate of Beta was 0.588, indicating a positive relationship. It means, when Instructional Leadership goes up by 1 standard deviation, School Culture goes up by 0.588 standard deviations. For school principals, culture can be a tool to influence and control other people, and it can also be used as a means of providing coordination among school staff. Principal who practice instructional leadership can influence teachers and changing the school’s culture, set in motion the components of a learning community among teachers.

Research also suggests that principals who provide teachers with support and intellectual stimulation through professional development help to create a culture of collaboration and continuous improvement [38,59]. Principal gives opportunity to the entire teacher enhance their knowledge through professional development. Teachers can learn different strategies that he or she can use during teaching and learning to get the student engage with the learning activities, get them to talk about their ideas and getting the students to express strategies in their own way to solve problems. Professional development can improve communication and collegiality relationship, more support from the principal in instructional work that create ‘open discussion’ to discuss instructional issues among principal and individual teacher during formal and informal supervision can improve student academic achievement. Principal cannot be everywhere and be expert in all aspects of instructional practice, so by creating good culture of ‘open discussion’ and professional collaboration, individual teacher then can collaborate about alternative instructional models that increase teachers’ levels of improving classroom practices. Collegiality among teachers will create more collaboration that guides teacher professional learning and continuous improvement. These findings reaffirm the recent work of Marks and Printy [44] that principal have positive effects on a school’s climate but may less direct way of improving classroom practice. Some studies highlight the fact that effective school leaders try to create a culture base on collaboration, support, and trust in their schools and suggest that this culture forms the basis of school members’ shared values and beliefs [41,27].

9. Acknowledgements

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10. References

List and number all bibliographical references in 9- point Times, single-spaced, at the end of your paper. When referenced in the text, enclose the citation number in square brackets, for example [2-4], [2, 5], and [1].


