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M. H. Alghamdi

Department of Self Development Skills, Common First Year Deanship, King Saud University, Riyadh, Saudi Arabia\\ Education and Training Evaluation Commission (ETEC), Riyadh, Saudi Arabia,
alaaeldinaa@agu.edu.bh

U. M. Ibrahim

Education and Training Evaluation Commission (ETEC), Riyadh, Saudi Arabia\\ Department of Educational Psychology, College of Education, Sohag University, Sohag, Egypt, alaaeldinaa@agu.edu.bh

A. E. A. Ayoub

College of Graduate Studies, Arabian Gulf University, Bahrain\\ Department of Educational Psychology, College of Education, Aswan University, Aswan, Egypt, alaaeldinaa@agu.edu.bh

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A Predictive Structural Model of Standards-Based School Evaluation on Student Outcome

M. H. Alghamdi^{1,2}, U. M. Ibrahim^{2,3} and A. E. A. Ayoub^{4,5,*}

¹Department of Self Development Skills, Common First Year Deanship, King Saud University, Riyadh, Saudi Arabia

²Education and Training Evaluation Commission (ETEC), Riyadh, Saudi Arabia

³Department of Educational Psychology, College of Education, Sohag University, Sohag, Egypt

⁴College of Graduate Studies, Arabian Gulf University, Bahrain

⁵Department of Educational Psychology, College of Education, Aswan University, Aswan, Egypt

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Abstract: The current study examined the relationship between school leadership, school environment, teaching and learning strategies, and students' performance on national assessment in math and science. In addition, it examined the mediating role of teaching and learning strategies in its relation to school leadership, school environment, and students' performance in math and science as well. Study data was utilized from two datasets. First, the School Evaluation Standards scale (SES), which includes three subscales: school leadership, school environment, and teaching and learning strategies was utilized from a total of 711 schools that were randomly chosen from Saudi Arabia. Second, these school average scores in national assessment of math and science were collected. The finding revealed that there were direct and indirect effects of school leadership, school environment, teaching and learning strategies on students' performance in math and science. Furthermore, teaching and learning strategies played as mediator between school leadership and school environment and students performance in math and science. The results of the research provided insights on how school evaluation standards (SES) affect academic performance and learning outcomes. Educational policy makers can benefit from the results of this study by evaluating school performance assessment standards and the level of practices to gauge the degree of application in real world practices and determine the room for improvements.

Keywords: School evaluation, standards, students' performance, learning outcomes, Saudi Arabia, national assessment.

1 Introduction

Over the past years, the school evaluation has received wide attention from educational policy makers. The school evaluation approaches have changed and varied across contexts of countries. These changes were often the result of debates among politicians and educators. This has led to a heavy spread of the use of school evaluation standards in developed countries as a method to ensure the quality of education in their educational institutions (Ehren, 2016).

Today, school evaluation has become an integral part of school systems across the world. It is accorded special significance as an instrument for improving school effectiveness and the ability to manage change and transformation. Also, an input for continuous development and improvement in light of its major impact on ensuring a quality educational system and its positive effect on educational outcomes and consequently on national development and competitiveness.

One of the forms of ensuring the quality of education is the pursuit of countries to participate in TIMSS and PISA tests. These tests give a clear picture about the country's progress comparing to other countries. These tests evaluate the performance of a country in light of the learning outcomes, and so it can obtain advanced positions globally and in national assessment as well. Hopfenbeck et al., (2018) stated that the use of TIMSS and PISA data has attracted great attention over the past two decades. PISA conveys social, cultural, economic and educational factors that may influence students' academic achievement. Several of these factors are related to the heart of the educational process presented in teaching and learning process (OECD, 2009). AlSadaawi (2010) mentioned that TIMSS assessment provides accurate data and honest explanations about the quality of education for the participating countries. Kavli (2008) and Caygill (2012) stated that TIMSS and PISA are used to define aspirational objectives for future achievement and as measures of current and future achievement.

Saudi Arabia participates in several international studies, such as TIMSS, Progress in International Reading Literacy Study (PIRLS) and most recently the OECD Program for International Student Assessment (PISA). The results of these studies reveal that there has been a consistent low student achievement. According to PISA 2018, students in Saudi Arabia

*Corresponding author e-mail: alaaeldinaa@agu.edu.bh

consistently scored lower in mathematics and science compared to OECD countries and lower in mathematics and science compared to other participating countries in the Middle East and North Africa region (MENA).

Saudi Arabia began an unprecedented cross-sectoral reform agenda, which is worldly known as the Kingdom's Vision 2030. One of the basic aims of this vision is to improve the educational system in order to be able to improve learning outcomes and create highly skilled and productive learners who are ready to meet the needs of a 21st century, knowledge-based labor market. In order to improve learning outcomes, school evaluation is an important component of the educational systems as it gives tangible indicators of students' progress. Moreover, it constitutes a key element of the National Evaluation Framework in KSA, upon which the national evaluations conducted by the Education and Training Evaluation Commission (ETEC) are based.

Validity is a crucial feature of a good school evaluation system since a bad school evaluation system can lead to erroneous judgments, which can lead to misguided administrative interventions and policy decisions, as well as negative consequences for schools and teachers.

In light of the aforementioned, the current study aims to measure the validity of School Evaluation Standards that the ETEC has developed and used to evaluate schools in KSA. Additionally, the current study aims to measure the predictive power of School Evaluation Standards through measuring their predictive power on students' performance in mathematics and science.

2 Literature Review

School Leadership

School leadership is one of the most required improvement factors in the educational agendas of many countries. According to Cruickshank (2017), there have been various school reforms over the last 30 years, which aimed at raising student accomplishment levels. Because of these reforms, school leadership has become an important topic in education. This interest arises from the notion that by enhancing the working circumstances of their teachers and the climate and environment of their schools, school leadership may have a major impact on the quality of teaching and learning in their schools, and hence on student achievement.

Internationally, school leadership has been a focus in education policy agendas. It has a significant impact on student achievement by influencing teacher motivation and capacity, as well as the school environment. School leaders create the culture that enable schools to provide high-quality instruction, and so have an indirect but significant impact on student learning (OECD, 2016; UNESCO, 2018; World Bank, 2018). School leadership has been shown to have a direct and indirect impact on student progress (Dutta & Sahney, 2016; Heck & Hallinger, 2010; Hitt & Tucker, 2016; Leithwood, Sun, & McCullough, 2019; Sebastian & Allensworth, 2012; Tan, 2018).

Several education changes have been implemented in the last 30 years with the goal of raising student success standards. As a result of the complexity and ever-changing school environment these reforms have generated, school leadership is becoming increasingly important in internationally, as it is increasingly acknowledged as a significant factor in improving students' outcomes (Dhuey & Smith, 2014; Day, Gu & Sammons, 2016). The belief that a principal's leadership style can make a significant impact on the quality of teaching and learning in their schools is at the heart of school leadership. Instructional leadership and transformational leadership are the two most common types of leadership (Robinson et al., 2008). Instructional leadership, which include stating educational goals, planning the curricula, and evaluating the teachers' quality focuses on the students' academic progress (Day et al., 2016). While transformational leadership focuses on enhancing the quality of school teaching and learning, developing the performance of individuals, and organization through establishing school culture and vision (Shatzer et al., 2014). Research on educational leadership concludes that school principals possess an important position that can have substantial influence on teachers' teaching (Leithwood et al., 2020).

School Environment

The challenge of education today is to offer a proper environment that provides students with opportunities, which enable them to develop their skills and academic performance. One of the most important elements to achieve this goal is the school environment. Uhrain (2016) stated that school learning environment encompasses a number of strands, including the school's location, structure, organizations, interpersonal relationships, available materials, and communication patterns, administrative and supervisory procedures. Moreover, AChukwuemeka (2013) noted that the environment has a significant impact on the lives of all people, whether they are students, teachers, employers, or employees. A healthy and appealing school environment also enhances kids' pride in their schools and their desire to stay more time in school (Mgbodile, 2014). According to Shamaki (2015), the school environment is the focus of the education industry, on which success of teaching and learning depends. In addition, Ajao (2001) viewed that by supporting effective teaching and

learning, a school with an optimal learning environment helps to stir up predicted learning outcomes that would facilitate strong academic performance.

School environment has a noticeable effect on students' academic achievement (Brand et al., 2008; Thapa et al., 2013). Many studies proved the importance of the educational environment as one of the most important factors influencing student achievement. (Clifford, Menon, Condon, Gangi, & Hornung, 2012; Thapa et al., 2013). Tschannen-Moran and others (2006) showed that positive school environment increased students' academic achievement while a negative school environment reduces student involvement in school activities and learning (Chen & Weikart, 2008). The study of Kibriya and Jones (2020) revealed that various factors of school environment have a significant impact on the academic performance of students in different subjects.

The primary goal of Santos' research (2010) was to identify the relationship between the mathematics classroom environment and students' attitudes toward mathematics. This research aimed to determine the mathematics classroom climate in terms of cohesiveness, contentment, goal-orientation, and competition, as well as the level of students' attitudes toward mathematics in terms of worth, enjoyment, self-confidence, and motivation. The results of the study showed that there is a positive relationship between the quality of the school environment and the achievement in mathematics and the trend towards it.

Tella (2008) believed that learning environment plays a major role in shaping the academic performance quality. As a result, Holzberger et al. (2020) recommended examining the association between academic performance and school-related characteristics because the latter can be actively modified and developed. Moreover, Bodovski, Nahum-Shani, and Walsh (2013) investigated the effect of the school's academic environment on students learning outcomes. The findings showed that students' academic performance development differs significantly between schools, and that students' improvement over time is better in schools with a better environment. Baafi (2020) confirmed that the students in senior high schools with a pleasant conducive physical environment perform better than those who experienced a learning environment that is not conducive. In addition, the study of Adolphus, Aderonmu and Naade (2021) explored the impact of school climate on physics teaching and learning in senior secondary schools. The findings of the study revealed that although Physics teachers enjoy a good working relationship with their students, both teachers and students maintained that their school environment was not friendly and conducive for teaching Physics. The study recommended all stakeholders in secondary schools provide a healthy school environment in order to promote the predominance of harmonious relationships that will improve effective teaching and learning of Physics, among other subjects.

Sahebzadeh, Kikha, Afshari and Kharadmand (2013) indicated that evaluation of student learning activities provided in lessons in a proper school environment revealed that there was a positive influence on the students' willingness to study and learn more effectively in different subjects. Similarly, the study of Godson and Ngussa (2020) revealed the positive relationship between school environment and the students' commitment towards the learning process. School management teams should cooperate together and work hard to improve the factors of the school environment that were necessary for effective learning. Moreover, the commitment of the students towards learning should be rewarded to motivate and encourage students to improve their learning outcomes. Moreover, Lawson (2021) studied the impact of the school learning environment on students' Chemistry achievement. The results of the findings revealed that school environment significantly influences students' learning of schools. Likewise, Rohatgi & Scherer, (2020) supported that positive school environment and motivation are linked to academic outcomes as good school environment improves the instructional quality and students' achievement.

Teaching and learning strategies

The teaching and learning process occurs because of interaction among components of the learning environment, including teacher, students, content, learning process and learning situation (Arul Laurence, 2012). Teaching and Learning involves processes, strategies, and activities centred around the students, meeting their needs, and developing their capacity for self-direction to organize, build, design, innovate, and produce forms of knowledge. Munna, Kalam (2021) stated that the transition of knowledge from teachers to students is the teaching and learning process. An educator identifies, establishes learning objectives, develops teaching resources, and implements a teaching and learning approach by the teaching and learning process. Learning, on the other hand, is a critical component that a teacher must consider when instructing children. Moreover, Spaul and Taylor (2015) believed that teaching and learning are core and that teaching time, teaching methods and time management are the most important aspects in the process, which impact on learning outcomes and students' performance.

The effect of school leadership and environment on teaching and learning strategies

School leadership has been found to have the second-largest in-school impact on student learning outcomes, after classroom teaching environment (UNESCO, 2018; VVOB, 2018). One of the solutions proposed to meet the 2030 Agenda for Education, which addresses the need to enhance the supply of trained teachers, is to strengthen school leadership in

order to improve teaching and learning (UNESCO, 2016). School leaders create the culture and organization that enable schools to provide high-quality instruction, and so have an indirect but significant impact on student learning (UNESCO, 2018; World Bank, 2018). Day et al. (2016) suggested that sharing leadership responsibilities with teachers and providing them with individualized learning opportunities improves outcomes within the school environment.

Dutta & Sahney (2016) and Al-Hasani & Othman (2017) argue that school leadership is broadly known as one of the main and vital factors the effect on teaching and learning and students performance. Moreover, the goal of the study of Wu, Shen, Zhang & Zheng (2020) was to determine the relationships among school leadership, teacher-related characteristics (e.g. work satisfaction, teaching self-efficacy, and collaboration), and science student achievement. The results revealed the positive effect among school leadership, teacher-related characteristics and the students' achievement of science. The results of a sample of PISA 2015 data from the United States demonstrated that school leadership had a direct and positive association with student science achievement. The quality of a principal's leadership style and its potential influence on educational or school outcomes are highly linked. To achieve the school's objectives, the administrator must employ an effective leadership style that inspires and motivates teachers (Nir & Hameiri, 2014). It can be concluded that school leadership has a measurable, if indirect, effect on student learning (Leithwood et al., 2006; Robinson et al., 2008; Hallinger, 2011).

By fostering effective teaching and learning practices, a school with an optimal learning environment helps to stir up predicted learning outcomes that will facilitate strong academic achievement (Duruji et al, 2014). The results of the study of Odeh, Angelina & Dondo (2015) revealed that the climate, the discipline, and the physical facilities of the school has a significant influence on the academic achievement of secondary school students. According to studies, the educational environment influences students' commitment to learning.

For instance, by Nyoni, Nyoni and Bonga (2017) assert that school environment impact on teaching and learning strategies, making learning efficient and interesting. The findings also showed that when students are feeling comfortable regarding the school environment and that they feel at ease in the classroom, teaching and learning become easier. The data also demonstrated that resource availability has a significant impact on learning effectiveness.

In light of the prior empirical studies, it was revealed that there were a positive and significant relationship between school leadership, school environment, learning and teaching strategies with learning outcomes and students' performance. Additionally, they showed a positive relationship between school leadership, school environment and learning and teaching strategies. In light of the previously mentioned, the following hypotheses were stated:

H1: School leadership has a positive relationship with students' performance in math and science.

H2: School environment has a positive relationship with students' performance in math and science.

H3: Teaching and learning strategies has a positive relationship with students' performance in math and science.

H4: Teaching and learning strategies mediate the relationship between school leadership and students' performance in math and science.

H5: Teaching and learning strategies mediate the relationship between school environment and students' performance in math and science.

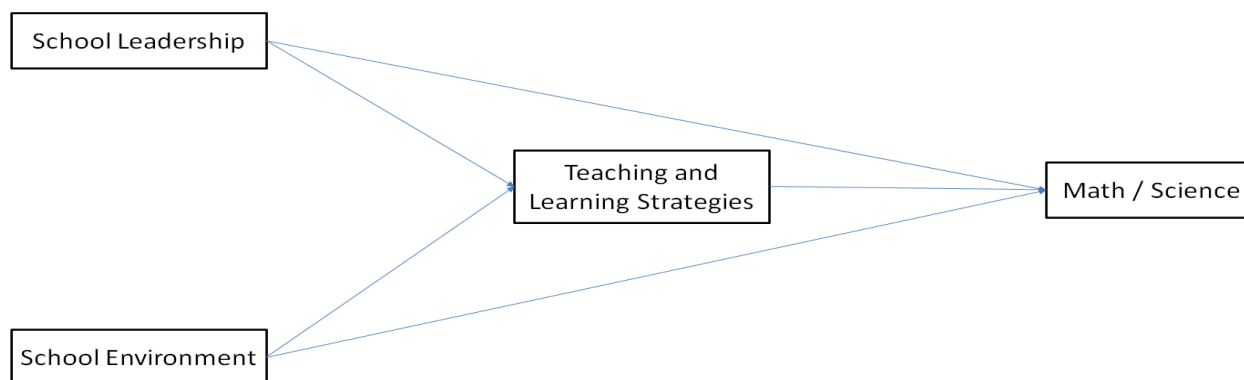


Fig. 1. depicts the relationships between research constructs.

3 Research method

Participants

The population of the study consisted of all K-12 public and private schools for males and females, in the Kingdom of Saudi Arabia. The number of the general education schools in various stages of education (primary / intermediate / secondary) in the Kingdom is (28,433) schools; (25,159) public schools with the percent of (88.5%), and (3274) private schools with the percent of (11.5%). The sample of this evaluative study included 711 schools that were selected randomly from all regions of the Kingdom by using stratified sampling method. 363 (52%) of the sample were female schools. In terms of the educational level, it consisted of 371 primary schools, 238 middle schools, and 102 high schools. This sample represents 2.3%, 2.4%, and 1.5% of the study population in the three stages, respectively.

Measurements Reliability and validity

School Evaluation Standards (SES) scale was measured with 52 items examined by Alghamdi et al., (2022), which includes three dimensions, they are: School leadership (26 items), School environment (19 items), and Teaching and learning strategies (7 items). Mediating variable include Teaching and learning strategies (7 items) based on Alghamdi et al., (2022), respectively. The responses to SES were evaluated in light of a rubric of four levels as shown in figure 2. The scale was administered to a sample of 711 schools to measure its validity and reliability.

Table.1 shows scales reliability, convergent validity, and discriminant validity where Cronbach's Alpha values for School leadership, School environment, and Teaching and learning strategies scales are above 0.80, which indicate high level of reliability. The standardized factor loadings for each item were all greater than 0.50, and the average variance extracted (AVE) values were greater than 0.67, which indicated that the measured variables were generally well convergent (Hair et al., 1998). All square roots of AVE values were greater than the Pearson's correlation coefficients between the latent variables, which indicated that the measured variables had good discriminant validity.

Table 1: Reliability, convergence validity, and discriminate validity for the research constructs' scales.

Variables Standards	Dimension s Sub-standards	Item Reliability STD Loading	Convergence Validity AVE	Discriminant Validity										Cronbach's Alpha
				School Leadership				Teaching and learning strategies				School environment		
	POC	IL	SC	ID	LEnv.	LExp.	LA	TSD	SB	SS				
School Leadership	POC	0.712 – 0.887	0.71	0.843										0.84
	IL	0.688 – 0.840	0.68	0.781	0.825									0.81
	SC	0.563 – 0.872	0.63	0.714	0.688	0.794								0.78
	ID	0.679 – 0.835	0.64	0.722	0.702	0.744	0.800							0.82
Teaching and learning strategies	LEnv.	0.691 – 0.878	0.67	0.691	0.659	0.719	0.705	0.819						0.79
	LExp.	0.659 – 0.896	0.64	0.700	0.710	0.672	0.683	0.696	0.800					0.83
	LA	0.753 – 0.894	0.69	0.738	0.636	0.751	0.639	0.740	0.706	0.831				0.80
	TSD	0.765 – 0.898	0.70	0.720	0.637	0.660	0.735	0.720	0.634	0.679	0.837			0.77
School environment	SB	0.759 – 0.872	0.71	0.771	0.714	0.619	0.778	0.668	0.655	0.700	0.672	0.843		0.79
	SS	0.674 – 0.864	0.67	0.693	0.627	0.703	0.689	0.617	0.707	0.656	0.704	0.774	0.819	0.81

POC: Planning and organizational culture; IL: Instructional leadership; SC: School community; ID: Institutional development; LEnv.: Learning environment; LExp.: Learning experiences; LA; Learning assessment; TSD: Teacher self-development; SB: School building; SS: Security and safety

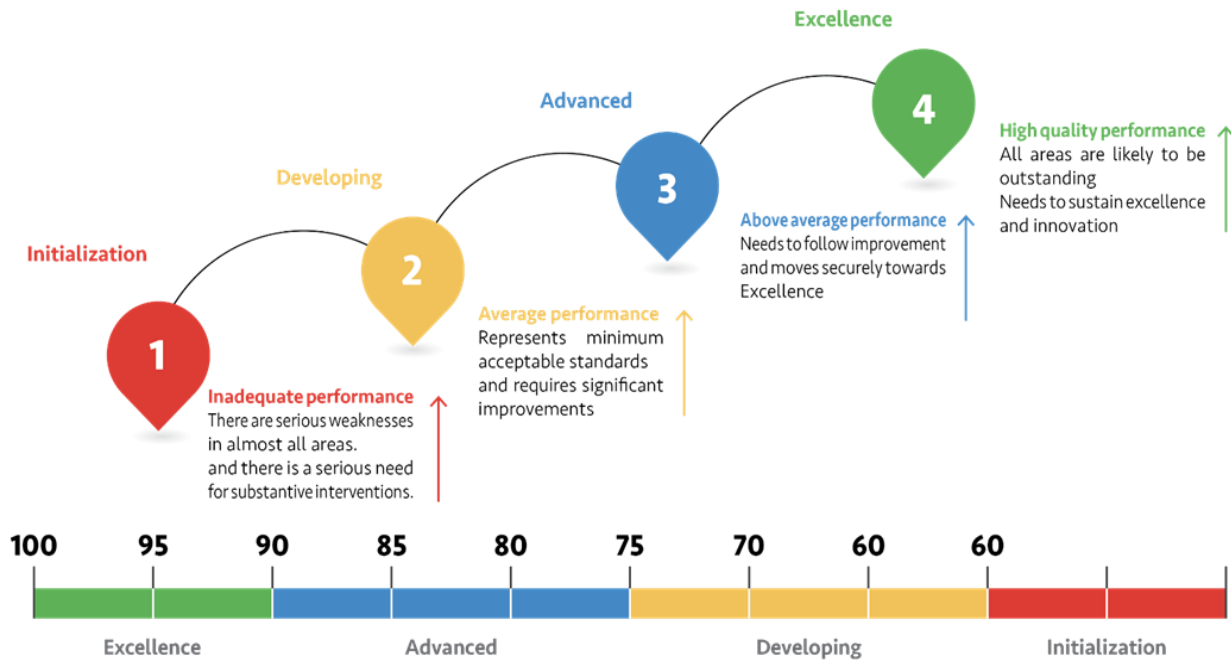


Fig. 2. The rubric of School evaluation standards

4 Results

Structural Equation Modelling (SEM) and Hypotheses Testing

To test the convergent and discriminant validity of the measurement model, the researchers compared the hypothesized four-factor model with other possible alternative models. LISREL (8.8) was used to carry out the Confirmatory Factor Analyses compared with other competition models. The theoretical four factor model (School Leadership, Teaching and learning strategies, School environment, and Math) had a better fit to the data [$\chi^2/df = 2.49$, root mean squared error of approximation (RMSEA) = 0.04, comparative fit index (CFI) = 0.93, Normed Fit Index (NFI) = 0.92, standardized root mean square residual (SRMR) = 0.05]. Table 2. Shows the results of CFA that the theoretical seven factor model had satisfactory discriminant validity. The Confirmatory Factor Analyses compared with other competition models, the theoretical four factor model (School Leadership, Teaching and learning strategies, School environment, and Science) had a better fit to the data [$\chi^2/df = 2.68$, root mean squared error of approximation (RMSEA) = 0.06, comparative fit index (CFI) = 0.91, Normed Fit Index (NFI) = 0.90, standardized root means square residual (SRMR) = 0.07]. Table 2. Shows the results of CFA that the theoretical seven factor model had satisfactory discriminant validity.

Table 2: Competitive measurement model comparison.

	Models	Factors included	χ^2	df	χ^2/df	$\Delta\chi^2$	RMSEA	CFI	NFI	SRMR
Math	One-factor	SL + SI + TAL + Math	162.67	36	4.52	83.15	0.15	0.77	0.72	0.13
	Two-factor	SL + SI + TAL, Math	139.10	35	3.97	59.58	0.12	0.82	0.78	0.11
	Three-factor	SL + SI, TAL, Math	102.53	33	3.20	23.01	0.09	0.88	0.86	0.08
	Four-factor	SL, SI, TAL, Math	79.52	32	2.49	--	0.04	0.93	0.92	0.05
Science	One-factor	SL + SI + TAL + Science	174.88	36	4.86	89.09	0.17	0.71	0.68	0.15
	Two-factor	SL + SI + TAL, Science	141.45	35	4.04	55.66	0.13	0.80	0.79	0.12
	Three-factor	SL + SI, TAL, Science	107.61	33	3.26	21.82	0.11	0.83	0.83	0.10
	Four-factor	SL, SI, TAL, Science	85.79	32	2.68	--	0.06	0.91	0.90	0.07

Hypotheses Testing

LISREL 8.8 was used to construct a structural equation model, where the bootstrap method based on deviation correction was used to test the multiple mediation effects. As given in Table 3, the results of the multiple mediator model_1 (School Leadership, Teaching and learning strategies, School environment, and Math) had a good fit ($\chi^2/df = 1.64$, RMSEA = 0.04, CFI = 0.95, NFI = 0.94, SRMR = 0.04). Figure 2 showed the results of SEM with the standardized coefficients for model_1. The results of the multiple mediator model_2 (School Leadership, Teaching and learning strategies, School environment, and science) had a good fit ($\chi^2/df = 1.92$, RMSEA = 0.07, CFI = 0.92, NFI = 0.90, SRMR = 0.06).

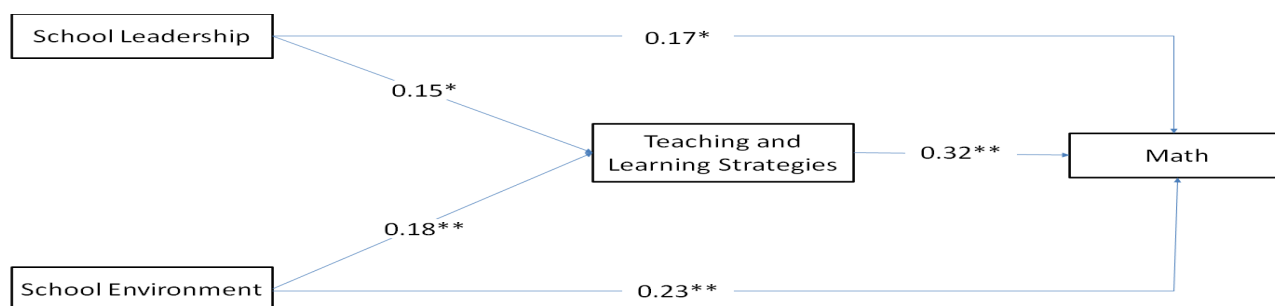
Table 3: Results of multiple mediating effects test.

Effects	β	S.E.	Est./S.E.	95% CI		Goodness of fit test				
				Lower limit	Upper Limit	χ^2/df	RMSEA	CFI	NFI	SRMR
Model_1						1.64	0.05	0.95	0.94	0.04
Direct effect										
SL \rightarrow Math	0.17	0.068	2.50*	0.069	0.271					
SE \rightarrow Math	0.23	0.066	3.48**	0.138	0.322					
TAN \rightarrow Math	0.32	0.069	4.64**	0.243	0.397					
Indirect effect										
SL \rightarrow TAL \rightarrow Math	0.15	0.070	2.14*	0.074	0.206					
SE \rightarrow TAL \rightarrow Math	0.18	0.067	2.69**	0.125	0.235					
Model_2						1.97	0.07	0.92	0.90	0.06
Direct effect										
SL \rightarrow Science	0.15	0.073	2.05*	0.067	0.233					
SE \rightarrow Science	0.20	0.065	3.08**	0.124	0.276					
TAN \rightarrow Science	0.28	0.064	4.38**	0.197	0.363					
Indirect effect										
SL \rightarrow TAL \rightarrow Science	0.14	0.065	2.15*	0.052	0.188					
SE \rightarrow TAL \rightarrow Science	0.16	0.061	2.62**	0.111	0.209					

Direct and Indirect Effect

Model_1: Math

Table 3. Showed that there was a significant direct relationship between school leadership ($\beta = 0.17$, $P < 0.05$), school environment ($\beta = 0.23$, $P < 0.05$), teaching and learning strategies ($\beta = 0.32$, $P < 0.05$) and student math scores. The results suggested that school leadership, school environment, and teaching and learning strategies had a positive effect related to math scores. In addition, the results revealed that there was a significant indirect effect of “SL \rightarrow TAL \rightarrow Math” ($\beta = 0.15$, $P < 0.05$), and “SE \rightarrow TAL \rightarrow Math” ($\beta = 0.18$, $P < 0.05$). The results suggested that teaching and learning strategies played a mediating role between dimensions of school leadership and school environment and math. Figure 3 shows the results of SEM with the standardized coefficients for model_1.


Fig. 3. the results of SEM with the standardized coefficients for model_1 (Math).

Model_2: science

Table 3. showed that there was a significant direct relationship between school leadership ($\beta = 0.15$, $P < 0.05$), school environment ($\beta = 0.20$, $P < 0.05$), and teaching and learning strategies ($\beta = 0.28$, $P < 0.05$) and student science scores. The results suggested that school leadership, school environment, and teaching and learning strategies were significantly positively related to science scores. In addition, the results revealed that there was a significant indirect effect of “SL \rightarrow TAL \rightarrow Math” ($\beta = 0.14$, $P < 0.05$), “SE \rightarrow TAL \rightarrow science” ($\beta = 0.16$, $P < 0.05$). The results suggested that teaching

and learning strategies played a mediating role between dimensions of school leadership and environment, and science. Figure 4 shows the results of SEM with the standardized coefficients for model_2.

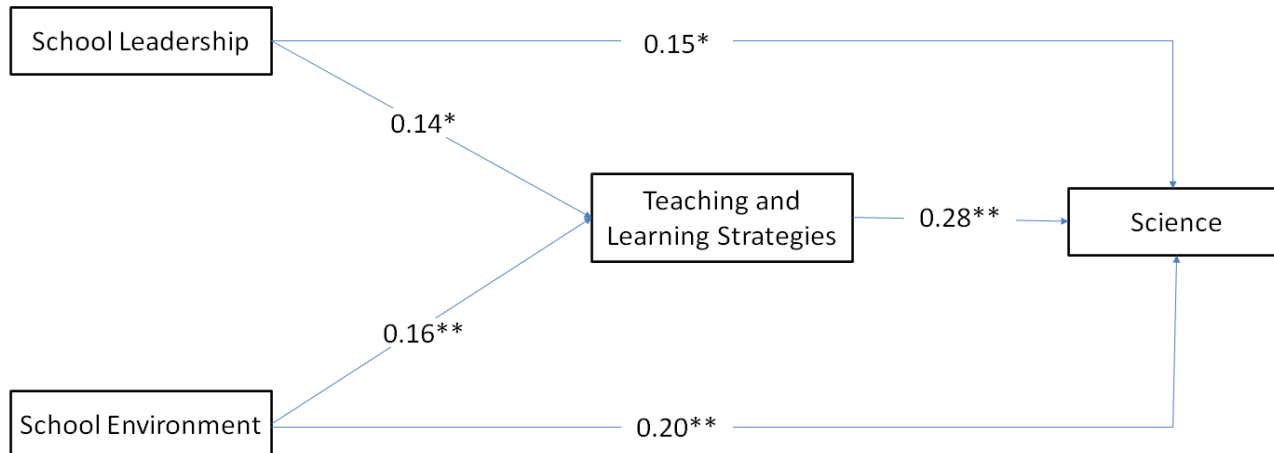


Fig. 4. the results of SEM with the standardized coefficients for model_2 (Science).

5 Discussion

The results in table 3. showed that there was a significant direct relationship between school leadership and student math scores ($\beta = 0.17$, $P < 0.05$) and school leadership and science ($\beta = 0.15$, $P < 0.05$). Furthermore, the results revealed that school leadership had indirect effect with math ($\beta = 0.15$, $P < 0.05$), and student science scores ($\beta = 0.14$, $P < 0.05$). This result confirmed the observations of Dhuey and Smith (2014), and Day et al., (2016) who confirmed that school leadership having a key role in improving students' outcomes. The result of current study agrees with the prior studies which proved that school leadership has direct influence (Dutta & Sahney, 2016; Heck & Hallinger, 2010; Hitt & Tucker, 2016; Leithwood, Harris, & Hopkins, (2020); Sebastian & Allensworth, 2012; Tan, 2018) and indirect influence (OECD, 2016; UNESCO, 2018; World Bank, 2018) on achievement, academic performance, and learning outcomes.

The results also revealed that school environment had direct effect and a significant relationship with student math scores ($\beta = 0.23$, $P < 0.05$), and science ($\beta = 0.20$, $P < 0.05$). Additionally, the results revealed that school environment had indirect effect with math scores ($\beta = 0.18$, $P < 0.05$), and science scores ($\beta = 0.16$, $P < 0.05$). It confirmed that suitable and positive school environment improve the instructional quality and learning outcomes (Rohatgi & Scherer, 2020), attractive school environment makes for performance development (Chukwuemeka, 2013), School environment has a noticeable effect on students' academic performance (Brand et al., 2008; Thapa et al., 2013), and promotes students' pride in their schools (Mgbodile, 2014). The findings of the current study agree with previous studies. Santos (2010) indicated that there is a positive relationship between the quality of the school environment and the achievement in mathematics and the trend towards it. Lawson (2021) revealed that school environment significantly influences on students' achievement in Chemistry. Sahebzadeh, Kikha, Afshari and Kharadmand (2013) indicated that student learning activities provided in a proper school environment has a positive influence on the students' willingness to study and learn more effective in different subjects. Bodovski, Nahum-Shani, and Walsh (2013) observed that students' academic performance development differs significantly between schools based on school environment. Ajao (2001) believed that a school with adequate learning environment contributes to stir up expected outcomes of learning that will facilitate good academic performance, by encouraging effective teaching and learning strategies. In contrast, Tschannen-Moran and others (2006), (Chen & Weikart, 2008) showed that negative school environment reduces student participation in school activities and student learning. In the study of Adolphus, Aderonmu and Naade (2021) the findings of the study revealed that although Physics teachers enjoy a good working relationship with their students, both teachers and students maintained that their school environment were not friendly and conducive for teaching of Physics.

For teaching and learning strategies were a significant direct relationship with math ($\beta = 0.32$, $P < 0.05$), and science scores ($\beta = 0.28$, $P < 0.05$). This result confirmed the observations of Spaul and Taylor (2015) who believed that teaching and learning strategies are core and that teaching time, teaching methods and time management are the most important aspects in the process which impact on learning outcomes and students' performance. The result of the current study supported what Spillane et al., (2003) who confirmed that Effective school leadership indicated, positive and attractive school environment makes a difference and improving teaching and learning strategies.

6 Conclusion

The result of this study was very beneficial for both policy and decision makers in the education institutions in all levels. First, policy makers could evaluate school evaluation standards and the level of practices to gauge the degree of application in real world practices and determine the room for improvements. Furthermore, standing on the level of school leadership types and identify which practices could promote or hinder them. Second, Practitioners could identify the best teaching and learning strategies that satisfy learners' needs. In addition, practitioners could be aware of which practices that enhance the balance between teaching strategies and learning outcomes.

Overall, practitioners could design healthy school environment among all stakeholders to encourage the prevalence of harmonious connections that will enhance effective teaching and learning strategies. In this regard, Tella (2008) confirmed that school environment plays a major role in shaping the quality of learning outcomes. In addition, Baafi (2020) asserted that the learners with a pleasant physical environment perform better than those where the learning environment is not conducive.

Limitations and Future Research

This study was not free of limitations, because it included data collected from only 711 schools, and despite the relatively large sample size, it is considered not ideally representative of the school community in Saudi Arabia. It is suggested that future studies should conduct a study to test the causal relationships of the current research model by using large sample size. Future studies also could extend the study research model by adding other mediators such as number of teachers, number of students, number of classes, density of classes, stage, type of school, gender, etc as moderating variables.

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