

## A Study on the Relationship Between School Members' Intellectual Capital, Organizational Learning, Leadership Behavior, and School Performance: A Structural Equation Modeling Approach

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### Abstract

The purpose of this study was to identify the relationship structure among school members' intellectual capital, organizational learning, principals' leadership behavior, and school performance, taking 288 teachers from elementary and high schools in Taiwan as a research sample. The validated questionnaires were employed to survey school teachers' perspectives on these four constructs. All participants completed 53 items of validated instruments including Organizational Learning Inventory (OLI), Intellectual Capital Inventory (ICI), Leadership Behavior Inventory (LBI), and School Performance Inventory (SPI). The construct as well as the significant relationship between variables examined using SPSS 21 and Amos software package to conduct structural equation modeling (SEM). The result of a confirmatory factor analysis confirmed several fixed factors of the variables. The second findings of the study indicated that there was a significant and positive correlation among organizational learning, intellectual capital, principals' leadership behavior, and school performance. In the light of the findings, this paper discusses the importance of organizational learning and principals' leadership behavior in order to improve school performance. Implications, suggestions, and recommendations for teachers, policy makers, and educational stakeholders were discussed.

**Key words:** Organizational learning; Intellectual capital; Principals' leadership behavior; School performance; Structural equation modeling

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### INTRODUCTION

In the age of globalization, there are challenges in the professional education field. School should be more advancing the performance to ensure student acquisition of competencies needed for their future carrier. Previous studies noticed that school environments (i.e., effective principal leadership practices) are influences on school performance (Martin, Marcoulides, and Heck, 2012). Jackson and Lunenburg (2010) found that the school performance becomes crucial factors on student achievement and school accountability levels.

Principals, as the school leader, must proficiently manage the school environments that foster all school members, including teacher and staff (Bulach & Lunenburg, 2008). The study from eight general schools, Sajjad et al., (2013) noticed that the professional development program of the school members (i.e., school leadership) have a positive influence on improving school performance. School leaderships and professional developments are an indicator to review the school performance (Loertscher, 2009). Principals' leadership should encourage the staff members to develop their skills through continual learning to gain the goals during the process of school improvement (Yang, 2014).

On the other hand, the performance or sufficient knowledge and skills of school members are necessary for the learning process to meet the expectation of

school improvement (Finnigan, Daly, and Stewart, 2012). Thornton, Shepperson, and Canavero (2007) argued that organizational learnings needed to promote the organization improvement. The processes of organizational learning are not smooth as the plan; school leadership should manage their organization that encourages school members to resolve the challenging issues (Sabah and Orthner, 2007). It is important that organizational learning should be a priority for the future organizational development and not only depending on principal leadership, but also for all school members should involve in the school environment (Grandy and Holton, 2010).

Successfulness of the organization also depended from the members' intellectual capital those effects on organizational learning capability (Zarezadeh, Moeinaddin, and Nayebzadeh, 2014). The intellectual capital factors can be useful for the leader to set an innovation in managing organizational system as a way to face the challenges to retain an effective organization performance (Castro et al., 2012). Chang (2011) found that social capitals are having positive correlation with organizational learning. Hence, organizational members should continuously learn and develop their competencies to give advantage to the organization.

From the mentioned above, it is clear that teachers, staff, and school principals as school members become a crucial factor to enhance the level of school performance in the globalization era. They should develop the culture learning in a school environment in an effort to increase the competencies considering the function and role as educational institution members. Previous studies generally focused on the single-factor effect and limited to examine how these factors created interactive effects among variables (organizational learning, intellectual capital, and principals' leadership behavior) on the organizational performance in terms of hierarchical approaches and mediation effects. Thus, this study purported to explore the influential paths and the relationship structure of these internal and external factors related to the school performance.

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## 1. LITERATURE REVIEW

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### 1.1 Intellectual Capital

Previous studies have defined intellectual capital from various perspectives. Intellectual capital is a crucial knowledge and employees' skill as an organization resource to face the work word competitiveness (Choudhury, 2010). Kamukama (2013) agreed that intellectual capital is a precious tool that effect on organizational performance and produce lot of revenues to the organization. Cheng-Li and Fan-Hua (2011) argued, "Skilled intellectual capital as knowledge gained, practical experience, organizational techniques,

customer relationships, and professional skills, with which firms are able to enjoy competitive advantage in the market". Moreover, intellectual capital is a substance that employees acknowledged as ammunitions to gain advanced organizational goals (Ding and Li, 2010), and as a potential mediating factors to examine the organizations' innovative capabilities (Wang & Chen, 2013). Taliyang and Jusop (2011) defined intellectual capital as organizational wealth, including "technology, customer information, brand name, reputation, and corporate culture that are invaluable to a firm's competitive power".

Additionally, Hussi (2004) noticed that intellectual capital covering three factors, including human aspect, intra-organizational structures, and the external environment. Beikzad, Abdolapoor, and Esgandari (2012) believed that intellectual capital enhanced employee performances in their daily work. The organization gained the huge of advantages when more employees are practiced their intellectual capital knowledge and skills (Yang, 2007). Supporting that statement, Widen-Wulf and Suomi (2007) found that intellectual capital motivated employees' effectiveness and creativity to build the learning organization. Therefore, Hsu and Fang (2009) emphasized that organization should develop the employees' intellectual capital to promote their organizational learning capabilities.

### 1.2 Organizational Learning

Learning is the process through which an individual acquires knowledge, skills, attitudes, and opinions (Salim & Sulaiman, 2011). Organizational learning or organizational learning capability is about the ability of one organization in order to apply the accurate and appropriate management practices, its structures as well as the procedures, which enhance, facilitate, and encourage learning (Khalib et al., 2015). The process of developing new knowledge and insights derived from the common experiences of people within the organization and it has the potential to influence behaviors and improve a firm's capabilities (Sanz-Valle et al., 2011).

In the context of university, organizational learning is defined as "the ability of the institution as a whole to discover errors and correct them, and to change the organization's knowledge base and values so as to generate new problem-solving skills and new capacity for action" (Albrecht et al., 2007). University organizational learning is the way the university builds and organizes knowledge and routines, and uses the broad skills of their workforce to improve university performance (Abu-Tineh, 2011). There are five facilitating factors of organizational learning, including experimentation, risk taking, interaction with the environment, dialogue, and participative decision-making (Camps, Alegre, & Torres, 2011). Numerous studies show that cultures promote organizational learning individual, and as a result, improve organizational performance (Sony & Naik, 2012).

### 1.3 Leadership Behavior

Leadership is “the position or guidance of a leader and the ability to lead” (Niqab et al., 2015). The impact of the leadership behavior of the principal on a school’s ethos, culture and motivational climate are explicit and implicit in research globally (Naidoo, Muthukrishna, & Hobden, 2012). They argued

effective schools research shows that good principals influence a variety of school outcomes such as student achievement, motivation of teachers, well-articulated school vision and goals, effective allocation of resources, development of organizational structures to support instruction and learning as well as emotional well-being of staff.

Eginli (2009) reported the six dimensions of the form of leadership and their contribution on teacher’s intent to remain in teaching, leadership support and job involvement included provides vision, models behavior, fosters commitment, provides individual support, provides intellectual stimulation, and holds high performance expectations. Moreover, Rideaux (2011) discussed 11 components of key areas to which principals must pay close attention, there are (a) esteem, (b) acceptance, (c) empathy, (d) structure, (e) authority, (f) freedom, (g) thought, (h) activity, (i) change, (j) advantage, and (k) challenge. This study focuses on the three aspects of the principal leadership (*ie.*, provides vision, fosters commitment, and provides individual support) in an effort to explore principal leadership behavior. School performance can be monitoring from variety of way. Monitoring can motivate administrators and teachers to improve performance, and can be used to identify problem areas in the schooling system, also can assist administrators in determining the best allocation of resources, finally, it can be used to diagnose strengths and weaknesses in pupils’ mastery of curricular objectives, and therefore guide curriculum and instruction (Willms, 2004).

## 2. RESEARCH METHODOLOGY

### 2.1 Research Conceptual Framework

This is a quantitative research design and the objective of this study are to explore the construction and the relationship among the variables. The research goal was to determine how the intellectual capital affected school performance through the principals’ leadership behavior as well as their organizational learning. In addition, this study also investigated the mediating effects of both organizational learning and principals’ leadership behavior on school performance. There are three research questions in this study:

- (a) What are the fixed constructs among intellectual capital, organizational learning, principals’ leadership behavior, and school performance?
- (b) There is any correlation among intellectual capital, organizational learning, principals’

leadership behavior, and school performance?

- (c) How intellectual capital, organizational learning, and principals’ leadership behavior predicts school performance?

### 2.2 Population, Data collection, and Data analysis

This study employed a paper based questionnaire for data collection in order to explore the constructural relationship among the variables. The teachers in Taiwan were selected as a sample according to purposive sampling strategies. 320 respondents participated in the survey and 298 teachers returned questionnaires after two times follow-up. Finally, this study took 288 responses with complete and valid information representing a response rate of 90%. The collected data analyzed using SPSS 21 and Amos software package to conduct descriptive analysis, and structural equation modeling (SEM) among all of the variables.

### 2.3 Research Instruments

This study used 53 items of four standard questionnaires to collect the data, including intellectual capital inventory, organizational learning inventory, leadership behavioral inventory, and school performance inventory.

#### 2.3.1 Constructs of Intellectual Capital Inventory (ICI)

The ICI adopted from Ferreira (2010) to examine teachers’ intellectual capital conception. It used 13 items, including relational capital (5 items, with a reliability coefficient of .88), structural capital (4 items, with a reliability coefficient of .85), and human capital (5 items, with a reliability coefficient of .65).

#### 2.3.2 Constructs of Organizational Learning Inventory (OLI)

The OLI adopted from Noordewier et al. (1997) to measure teachers’ organizational learning. This questionnaire contained 11 items, with overall the reliability estimate for the entire scale is .91, to measure three dimensions, including shaping vision (4 items, with a reliability coefficient of .85), learning commitment (3 items, with a reliability coefficient of .85), and opening mind (4 items, with a reliability coefficient of .66).

#### 2.3.3 Constructs of Leadership Behavioral Inventory (LBI)

The LBI adopted from Eginli (2009) to measure principals’ leadership behavior. It is 14 items measure comprising three behavioral dimensions, with reliability for the total score was .97, including: (1) Provides vision included five items with a reliability coefficient (Cronbach’s  $\alpha$ ) of .91. (2) Fosters commitment included five items with a reliability coefficient (Cronbach’s  $\alpha$ ) of .90. (3) Provides individual Support included five items with a reliability coefficient (Cronbach’s  $\alpha$ ) of .90.

#### 2.3.4 Constructs of School Performance Inventory (SPI)

The measurement of SPI adopted from the Balanced

Scorecard System, that developed by Ho and Huang (2005). The questionnaire remained 13 items to identify specific school performance related to customer perspectives (5 items) with a reliability coefficient (Cronbach's  $\alpha$ ) of .84; internal business process (3 items) with a reliability coefficient (Cronbach's  $\alpha$ ) of .88; and innovation and learning (5 items) with a reliability coefficient (Cronbach's  $\alpha$ ) of .85. The reliability for the total score was .95.

### 3. RESULT

#### 3.1 Respondents' Demographic Backgrounds Analysis

The demographic profile of the respondents indicated (Table 1) that the participants included male ( $N=91$ ; 31.6 %) and female professionals ( $N=197$ ; 68.4%). Most of them have worked for over 16 years.

**Table 1.** Samples Demographic Backgrounds ( $N=288$ )

Items	Categories	Frequency	Ratio (%)
Gender	Male	91	31.6
	Female	197	68.4
Working experience	< 5 years	21	7.3
	6~10 years	34	11.8
	11~15 years	94	32.3
	>16 years	139	48.3
Position	Chairman	28	9.7
	Group leader	71	24.7
	Teacher	150	52.1
	The other	39	13.5

#### 3.2 Reliability and Validity Tests of Instruments in this Study

The observing of composite reliability (CR) and average variance extracted (AVE) with 12 factors (53 items) illustrated that all factors loading exceed 0.5 which are significant at  $p < 0.001$ , as a result all the items achieved the recommended value and they are valid. The results of testing instruments' validity and reliability are shows in Table 2.

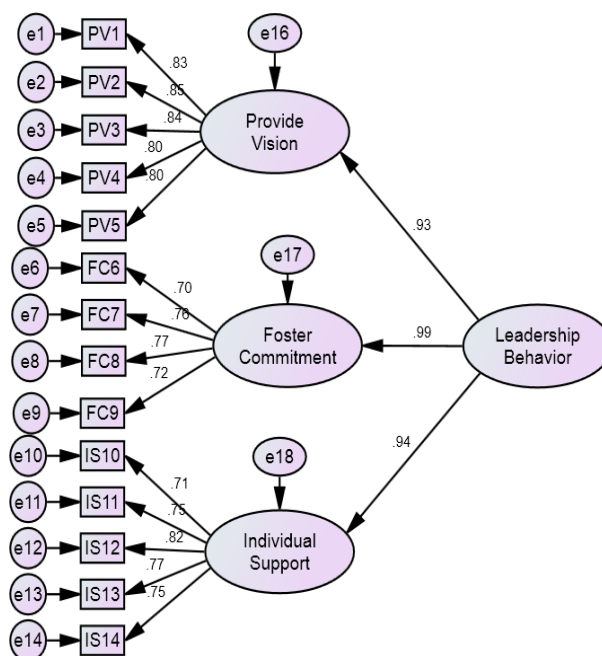
**Table 2**  
: Results of validity and reliability testing

Variables	Factor loading	AVE	CR	Cronbach's $\alpha$
<b>Leadership Behavioral</b>				
- provide vision	.93	0.91	0.97	0.91
- fosters commitment	.99			
- provides individual support	.94			
<b>Intellectual Capital</b>				
- relational capital	.84	0.86	0.95	0.87
- structural capital	.97			
- human capital	.96			
<b>Organizational Learning</b>				
- shaping vision	.92	0.79	0.92	0.86
- learning commitment	.95			
- opening mind	.80			
<b>School Performance</b>				
- customer perspectives	.84	0.86	0.95	0.88
- internal business process	.99			
- innovation and learning	.95			

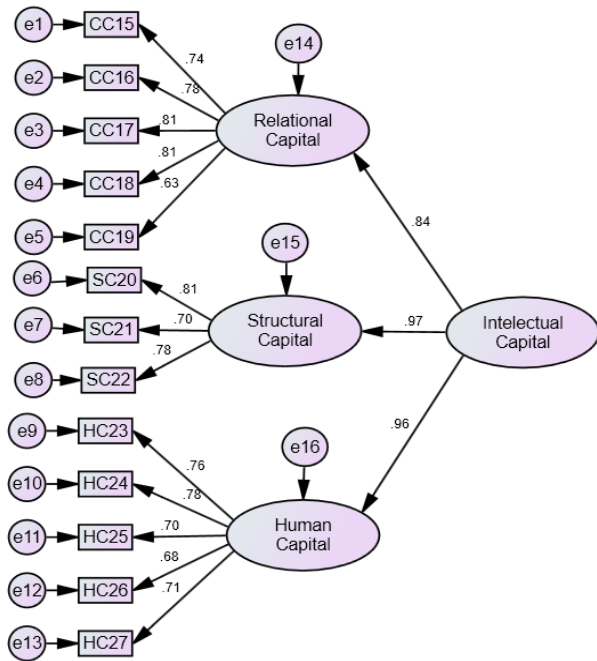
Initially, the calculation of the average variance extracted (AVE) was to verify the evidence of convergent validity. The AVE values of leadership behavior, intellectual capital, organizational learning, and school performance were 0.91, 0.86, 0.79, and 0.86 respectively. Finally, the examining of composite reliability (CR) was in order to confirm the parameter of internal consistency, with a coefficient of leadership behavior (0.97); intellectual capital (0.95); organizational learning (0.92); and school performance (0.95) being observed.

#### 3.3 Confirmatory factor analysis (CFA)

The next steps are exploring the construct among all variables. Figure 1 give information of the second order confirmatory factor analysis (CFA) of principals' leadership behavior. There are three dimensions evaluating for the fixed construct on principals' leadership behavior, including provides vision (5-items; 0.80-0.85), foster commitment (4-items; 0.70-0.77), and individual support (5-items; 0.71-0.82), with positive factor loadings value for each constructs are 0.93, 0.99, and 0.94 respectively. Figure 2 shows the second order confirmatory factor analysis (CFA) of intellectual capital. There are three fixed construct examined on intellectual capital variable, including relational capital (5-items; 0.63-0.81), structural capital (3-items; 0.70-0.81), and human capital (5-items; 0.68- 0.78), with positive factor loadings value for each constructs are 0.84, 0.97, and 0.96 respectively.

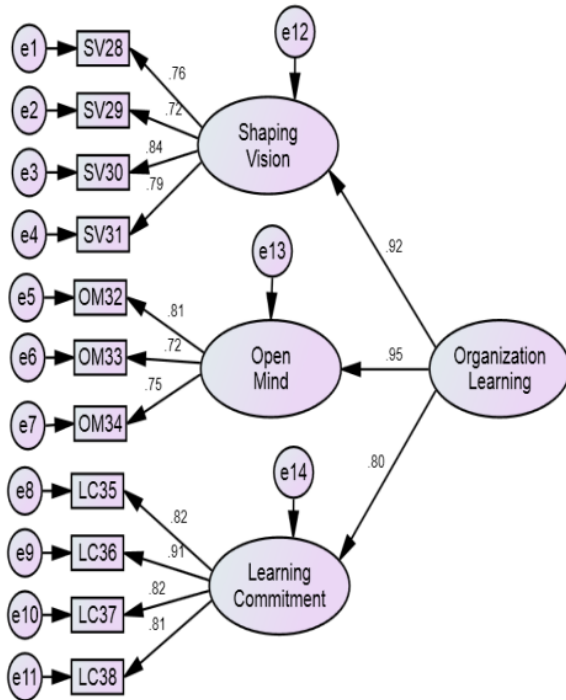


**Figure 1**  
Second Order CFA of Leadership Behavior

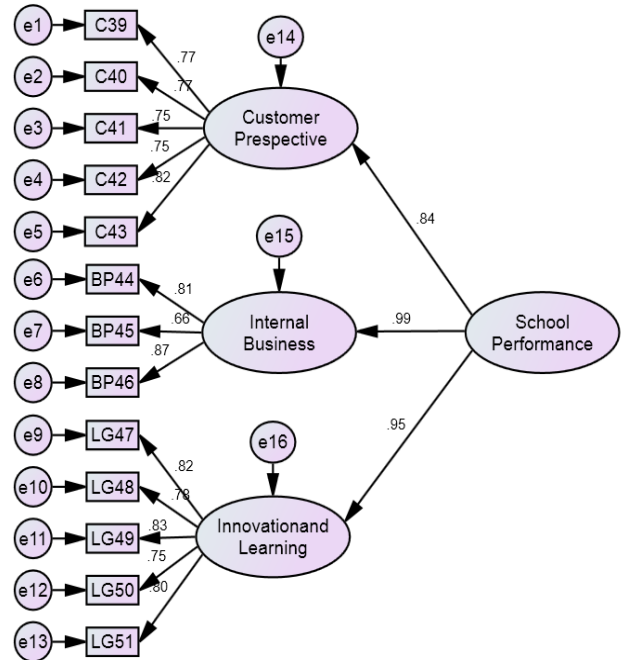


**Figure 2**  
**Second Order CFA of Intellectual Capital**

Figure 3 shows the second order CFA of organizational learning. There are three dimensions evaluating for the fixed construct on organizational learning, including shaping vision (4-items; 0.72- 0.84), open mind (3-items; 0.72-0.81), and learning commitment (4-items; 0.81-0.91), with positive factor loadings value for each constructs are 0.92, 0.95, and 0.80 respectively.



**Figure 3**  
**Second order CFA of Organizational Learning**



**Figure 4**  
**Second Order CFA of School Performance**

Figure 4 confirms the second order CFA of school performance. There are three fixed construct examined on school performance variable, including customer perspective (5-items; 0.75- 0.82), internal business (3-items; 0.66-0.87), and innovation and learning (5-items; 0.75-0.83), with positive factor loadings value for each constructs are 0.84, 0.99, and 0.95 respectively.

### 3.4 Correlations among Variables

The results on Pearson's product-moment correlation coefficient indicated significantly positive among the four variables. Additionally, there were high correlations between intellectual capital and principals' leadership behavior (0.739\*\*); organizational learning and principals' leadership behavior (0.752\*\*); school performance and principals' leadership behavior (0.745\*\*); organizational learning and intellectual capital (0.854); school performance and intellectual capital (0.812\*\*); school performance and organizational learning (0.840\*\*).

### 3.5 The Discrepancy of Study Motivation and Study Psychology Relativity

From Table 3 statistics implied that study motivation and study psychology relativity remarkable. The research results state that many students study pressure from teachers and parents of expectation. On the opposite many teachers and parents are never giving students pressure on study rather in a claim and peaceful attitude about students study situation, the stress is in the truth from own wish or dream. When students meet heavy stress different people who will make different decision to deal with difficult problem and trouble. From results statistics state that the rate of 30.4% students choosing in the way

of internet breaking out of pressure. Internet is double sword, it's better for students using the internet under the introduction of teachers or parents. If teachers or parents instruction to students, the students will in science and optimistic attitude to use internet acquirement the healthy way of better both for psychology and physiology to cope with study pressure or study trouble in the progress of study. The statistics rate of 21.4% students will chat with classmates, which are a useful way to break out pressure. Chatting with someone, has two advantages on the one hand to make people friendly, on the other hand to get a better way to break out heavy study psychology pressure. The extent of school considering education important leave a huge influence on the attitude of students thinking about teaching assignments leading to many students giving up sleeping to finish teaching homework, the assessment of classmate influence student study attitude as well. Survey research feedback implied that the large number of students make full of study plan or schedule on high school. The students' grit and self-restrain will leave a good influence on the coping way of dealing with difficult question in the progress of stud, and many students choosing keeping on hardworking or reduce the long term study aim.

**Table 3**  
**Study Motivation and Study Psychology Relativity Remarkable**

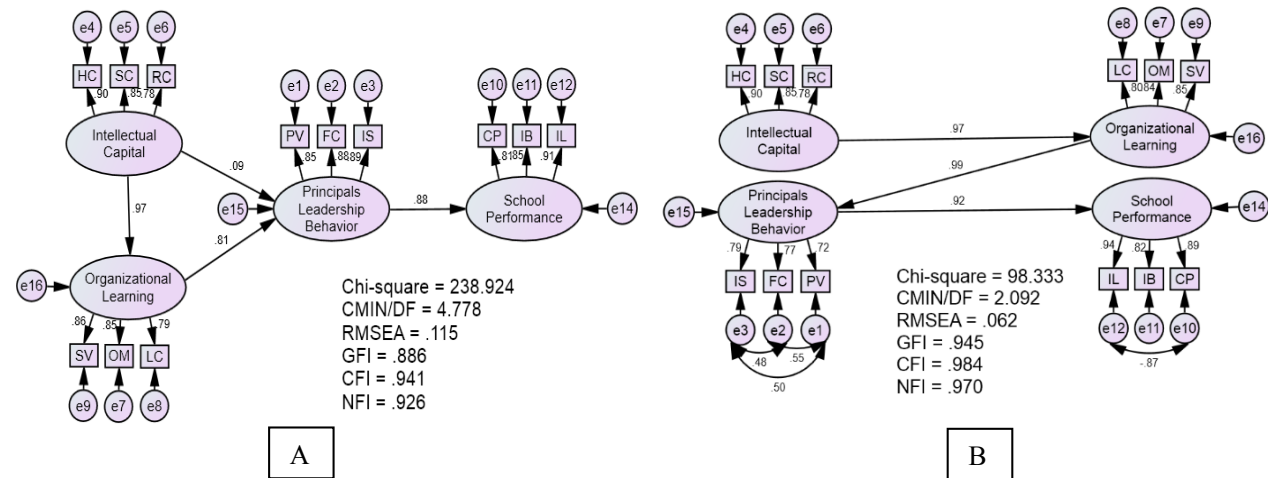
Constructs	1	2	3	4
1. Leadership Behavior	1			
2. Intellectual Capital	.739**	1		
3. Organizational Learning	.752**	.854**	1	
4. School Performance	.745**	.812**	.840**	1

Note. \*\*. Correlation is significant at the 0.01 level (2-tailed).

### 3.6 Structural Equation Model

One of the importance thing in structural equation model (SEM) is modeling the relationship among the variables. In this study, a two-step modeling was approached on the measurement of SEM. The latent constructs in the present study included intellectual capital, organization learning, leadership behavior, and school performance. Initially, intellectual capital was indicated by relational capital (RC), structural capital (SC) as well as human capital (HC). The organizational learning constructs was indicated by the shaping vision (SV), learning commitment (LC), and opening mind (OM). The leadership behavior constructs were indicated by providing vision (PV), foster commitment (FC), and provide individual support (IS).

Finally, school performance was indicated by costumer perspective (CP), internal business process (IB), and innovation and learning (IL). The output of the first model approached (Figure 5) shows that the model failed on the value of root mean squared error of approximation (RMSEA). According to critical fit index: relative Chi-Square (CMIN/ DF) = 4.778 (< 5.0); comparative fit index (CFI) = 0.941 (0.8-1); goodness fit index (GFI) = 0.94 (0.8-1); normed fit index (NFI) = 0.93 (0.8-1); and RMSEA = 0.115 (0.01 -0.08). Thus, this measurement based on the framework model is weak satisfied with the data and reassembly needed to get the best models.



**Figure 5**  
**First (A) and Second (B) Model from the SEM Output**

Examination of the second structural models indicate a fix model fitness output are appropriate according to the criteria, presented in Table 4: relative Chi-Square (CMIN/ DF) = 2.092 (< 5.0); comparative fit index (CFI)

= 0.984 (0.8 ~ 1); goodness fit index (GFI) = 0.945 (0.8-1); normed fit index (NFI) = 0.970 (0.8-1); and RMSEA = 0.062 (0.01- 0.08).

**Table 4**  
**Output Results of Hypothesized Second Model Fitness.**

Indices	Model fitness	Criteria	Suggestion
Chi-square	98.333 ( $p=0.000$ )	$P<0.001$ ; $H_0$ =rejected	$H_0$ =rejected
Chi-square / df	2.092	< 5	Accepted
GFI	0.945	0.8-1	Accepted
NFI	0.970	0.8-1	Accepted
CFI	0.984	0.8-1	Accepted
RMSEA	0.062	0.01- 0.08	Accepted

## CONCLUSION AND DISCUSSION

Based on the statistic analyzed, the conclusion and discussion of proposed research questions are follow:

(a) What are the fixed constructs among intellectual capital, organizational learning, principals' leadership behavior, and school performance?

To answer this question, this study used the factor loading value from confirmatory factor analysis of intellectual capital, organizational learning, principals' leadership behavior, and school performance as in shown in Table 2 above.

It is clear from the Table 2 above, the result shows fixed construct for each variables, as follow: a) leadership behavior have three constructs (provide vision, foster commitment, and provides individual support); b) intellectual capital can be seen from relational capital, structural capital, and human capital;(c) organizational learning should have three elements: shaping vision, learning commitment, and opening mind; and d) school performance can be investigate from customer perspective, internal business process, and innovation and learning.

The school principals were foster their commitment and provide some individual support to the staff members, and as a leader they also should arrange the school vision for advancing the future organization. The staff members have high commitment of learning, they shaping the vision and opening mind with new things that make them becoming long life learning. The performances of school can be examining from internal business process, the innovation and learning process, and from the view of customer perspective.

(b) There is any correlation among intellectual capital, organizational learning, principals' leadership behavior, and school performance?

The results of Pearson's product-moment correlation coefficient were solved the second research questions. From Table 3 above, this study concluded that there is significantly positive correlation among variables. It is clear that, there are inter-correlation among each variable. In other word it can be said that, changing any variable value will give effect on the other variables.

When the staff members have a good view of intellectual capital, it was automatically increased their organizational learning and instantly changed the school principals' behavior on the way as a leader, also would boost their school performance.

(c) How intellectual capital, organizational learning, and principals' leadership behavior predicts school performance?

Fixed model fit output of SEM on Figure 5 and Table 4 above are adequate in order to answer this question. Most of the model fit criteria were accepted on the second models. The result from that fixed model was indicating that intellectual capital has high loading on organizational learning and principals' behavior support to enhance their school performance. It is clear that organizational learning and leadership behavior are become the crucial factors to predict school performance.

Performance of the schools would advance when principals have a positive support for all of the school staff members, and he/she should increase their commitment to the organization. Also they should have a big vision for the school future. On the other hand, school staff members have a duty to shape all of their visions, opening mind with all situation, and commitment to learning about the organization improvement. Hence, principals and school staff members ought to collaborate with each other to promote a better school atmosphere as mediating factors of intellectual capital in order to gain a great school performance.

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