

## Using Regression Analysis on Measuring Organizational Learning Capabilities (OLC) Dimensions

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**Abstract:** Regression analysis is a statistical technique that allows us to explain or predict on one variable on the basis of their scores on other variables. This paper advocates analysis using regression techniques that determine the significant relationships between OLC dimensions and knowledge performance among librarians. This study was carried out at selected university libraries in Malaysia. Questionnaires were distributed to 240 respondents to targeted librarians from middle and senior management levels of the selected university libraries. A total of 186 (78%) of respondents returned the questionnaire for further analysis. The results also found that OLC dimensions (*shared vision and mission* and *transfer of knowledge*) are significant predictor on estimating knowledge performance which showed highly significant. Furthermore, the results of correlation test showed that there were positive and significant relationships between the dimensions of organizational learning capabilities (OLC) and the knowledge performance. This study is significant to librarians and university libraries to realize the necessity of organizational learning capabilities in order to improve their knowledge performance in organization.

**Key words:** Regression analysis % Organizational learning capabilities (OLC) % Transfer of knowledge % University libraries % Librarians

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### INTRODUCTION

Multiple regression analysis is a statistical tool for understanding the association between two or more variables. It involves a variable to be explained which is called the dependent variable and additional explanatory variables that are thought to produce or be associated with changes in the dependent variable. Regression analysis is a body of statistical techniques which results to the formation of the relationship between a dependent variable and one or more independent variables. Therefore, the values of the independent variables enable prediction of the value of the dependent variable or likelihood of the occurrence of an event if the dependent variable is categorical [1].

In this study, a regression analysis might estimate the effect of the organizational learning capabilities' (OLC) dimensions on knowledge performance. Knowledge performance would be the dependent variable to be

explained or predict the OLC dimensions (*shared vision and mission* and *transfer of knowledge*) would be the explanatory variable.

With regards to academic literature, there are extensive studies on organizational learning capabilities (OLC) but only few can be found in a university library's setting [2]. For that rationale, two research objectives are identified which are:

- C To measure the effect of OLC dimensions (*shared vision and mission* and *transfer of knowledge*) on knowledge performance using regression analysis
- C To determine the relationships of OLC dimensions and knowledge performance.

From the objectives, two hypotheses are formulated in order to know the prediction based on the relationship between respective dimensions. They are:

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**H1:** Organizational learning capabilities' (OLC) dimensions are not significant predictor on knowledge performance.

**H2:** There is no significant relationship between OLC dimensions and knowledge performance.

**Organizational Learning Capabilities (OLC):** In recent years, academicians and researchers have been deeply concerned about the concepts of organizational learning capabilities (OLC). Organizational learning helps the academicians and researchers to utilize the past experiences for adapting an organization to the outside variable and unstable environment and organization may continue its comprehensive performance [3]. In such environment, it is natural for the competitive advantages to be offered during the learning and education process in the level of staff and organizations. However, considering the importance and development of the organizational learning concept, many experts have started studying and analyzing this concept and offered different definitions about the organizational learning. According to Hayes [4], organizational learning is viewed as a vital component for effective organizations and it is related to the whole organization; from top management to each level of organization. Hence, organizational learning is a medium to enhance organization's productivity and performance.

**Shared Vision and Mission:** Shared vision is a well-accepted mission in a library's context. It encouraged the librarians to generate and contribute to the aspiration by satisfying and fulfilling the information needs among the users. Setting up the goals of achievements in each project and determined the vision and mission of organization may enhance the process of sharing knowledge among employees [5]. Therefore, the products and services provided are at higher level and the organization's business expanded. Determining the clarity of vision and mission in an organization is important in order to prevent the lack of performance of the organization itself [6]. Hence, shared vision is about developing sense of commitment in organization by designing the future images of principle and ambition as a guide to be successful [7].

**Transfer of Knowledge:** The growth and stability of organization depend on the motivation of the employees to learn in new things [8]. Besides, he added that

employees are advised to learn more in order to provide better situation and rapid growth of organization. Moreover, employees are able to upgrade their service level by providing better capabilities in organizational learning. Knowledge transfer and integration capability play an important role in producing the wide humanistic environment in one organization. Organizational learning capability encourages the process of generating ideas in an organization and somehow it generalized ideas with impact [9]. In addition, learning is a process of transferring knowledge from individual to other units and functions [10]. Thus, it provides the precise opinion regarding organizational learning environment.

**Knowledge Performance:** According to Nasher and Khairuddin [11], that there are strong relationship between all learning organizations' dimensions and also knowledge performance measure. Relationships between self-managed work-teams and the learning organizations dimensions can be determined by using four measures of performance: knowledge performance, financial performance, customer satisfaction and turnover play as a medium [12].

Organization needs to be more consistent towards the development and exchange of knowledge within and among organization. Higher management plays the important role in influencing knowledge sharing culture among employees [13]. This may be improving organizational performance. Knowledge sharing or transfer of knowledge is the main element in the organization in order to generate competitive advantages and improve organizational performance when employees vigorously substitute their knowledge.

## **MATERIALS AND METHODS**

Quantitative approach was adopted for this study. Selected university libraries in Malaysia were chosen as the study setting. The respective university libraries were University Technology MARA (UiTM), University Malaya (UM), University Kebangsaan Malaysia (UKM), University Putra Malaysia (UPM), University Sains Malaysia (USM), University Islam Antarabangsa Malaysia (UIAM), University Technology Malaysia (UTM) and University Utara Malaysia (UUM). Questionnaires were personally distributed to a total of two hundred and forty (240) librarians of the selected university libraries. The questionnaires consist of two dimensions of OLC (shared vision and mission and

transfer of knowledge) and knowledge performance. The questionnaire items were designed on a 1 (strongly disagree) through 7 (strongly agree) Likert scale. For the purpose of analysis, descriptive statistics include frequency and percentage while the inferential statistics include multiple regression analysis and Pearson's correlation of coefficient.

**RESULTS AND DISCUSSIONS**

**Reliability Analysis:** Table 1 exhibits the results of the reliability tests. From the table, it shows that Cronbach's alpha value of shared vision and mission (0.890) followed by transfer of knowledge (0.903) and knowledge performance (0.939) exceed 0.7 hence reliable. The value of this coefficient was considered high and acceptable.

**Profile of Respondents:** Table 2 presents the summary of respondent's profile. From the total of 186 respondents, 70.4% (131) of the respondents were female and 29.6%

(55) of the respondents were male. Majority (153 of 82.3%) are middle management staff compared to 33 (29.6%) holding senior management post. Slightly, more than half (95 or 51.1%) of the respondents had Bachelor's degree while 91 (48.9%) had Master's degree. Majority of the respondents belong to the 31 – 40 years of age group (83 or 44.6%), followed by 20 -30 years of age group (58 or 31.2%), 41 – 50 years of age group (37 or 19.9%) and 51 and above years age group which represents only 8 or 4.3%. More than half of the respondents (52.2% or 97) had worked less than 10 years, followed by 37.1% or 69 of those who had worked for 11 – 20 years, 9.1% or 17 who had worked for 21- 30 years and a small number (1.6% or 3) had worked for 30 – 40 years. In term of work department, respondents are quite well spread over seven different departments. The catalogue and classification department represents the most number of respondents (43 or 23.1 %). This is followed by the acquisition department (35 or 18.8%), reference service department (31 or 16.7 %) and automation and IT department

Table 1: Reliability Analysis

Variables	Number of items in a component	Cronbach's Alpha	Cronbach's Alpha based on standardized items
Shared Vision and Mission	7	0.889	0.890
Transfer of Knowledge	7	0.902	0.903
Knowledge Performance	14	0.938	0.939

Table 2: Summary of Respondents Profile

Variable	Category	Number of Respondents	Percent of Sample (%)
Gender	Male	55	29.6
	Female	131	70.4
Position	Senior management	33	17.7
	Middle management	153	82.3
Education level	Bachelor degree	95	51.1
	Master degree	91	48.9
Age	20 – 30 years old	58	31.2
	31 – 40 years old	83	44.6
	41 – 50 years old	37	19.9
	51 above years old	8	4.3
Work experience	Less than 10 years	97	52.2
	11 – 20 years	69	37.1
	21 – 30 years	17	9.1
	30 – 40 years	3	1.6
Work department	Administration	15	8.1
	Reference services	31	16.7
	Acquisition	35	18.8
	Catalogue and Classification	43	23.1
	Automation and IT	24	12.9
	Circulation	17	9.1
	Training and Support	6	3.2
	Others	15	8.1

Table 3 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.486 <sup>a</sup>	0.236	0.228	0.49627

a.Predictors: (Constant), Transfer of knowledge, Shared Vision and Mission

b.Dependent Variable: Knowledge Performance

Table 4: Significance of Regression Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.937	2	6.968	28.294	0.000 <sup>a</sup>
	Residual	45.070	183	0.246		
	Total	59.007	185			

a. Predictors: (Constant), Transfer of Knowledge, Shared Vision and Mission

b. Dependent Variable: Knowledge Performance

(24 or 12.9 %). There are less than 10% of respondents in each of the circulation department (17 or 9.1 %), administration department (15 or 8.1 %), training and support service department (6 or 3.2%) and other department (15 or 8.1%).

**OLC on Knowledge Performance Using Multiple Regression Analysis:**

The Model Summary (Table 3) shows that the magnitude of the Pearson's correlation coefficient (*R*) for the linear relationship between dependent variable and independent variables is 0.486. The *R* value also represents the correlation coefficient for the relationship between the observed value of dependent variable and the estimated value of dependent variable based on the regression model produced. The *R*<sup>2</sup> value (0.486 = 0.236) can provide information about the amount of variance in the dependent variable that can be explained by the independent variables based on the regression model produced. In this example, the independent variables, shared vision and mission and transfer of knowledge can explain 23.6% of the variance in the dependent variable, knowledge performance. The remaining 76.4% of the dependent variable might be explained by other variables and not included in the study. Naturally, if more factors or variables are added to the model that is useful to explain dependent variable (knowledge performance), then more variation can be explained. Thus, a better model for predicting the dependent variables can be produced. The value of Adjusted *R*<sup>2</sup> provides information about the amount of variance in the dependent variable that can be explained by the independent variable by using another set of data obtained from the same population. The value of Adjusted *R*<sup>2</sup> is usually equal or less than the actual value of *R*<sup>2</sup>. In this example, the value of Adjusted *R*<sup>2</sup> is 0.228 which is less than the actual value of *R*<sup>2</sup> i.e. 0.236. Besides, the value of standard error of the estimate

(0.49627) is the estimated variance of the dependent variable for each value of the independent variable.

Table 4 of ANOVA describes the significance of the regression model. Since the significance value = 0.000 < =0.05, the model is highly significant and can be used to explain or predict knowledge performance. The 'Sum of squares of regression' is 13.937 whereas the 'Sum of squares of residual' is 45.070. Thus, the 'Total sum of squares' is 59.007 (13.922 + 45.070). The value of the 'Mean squares of regression' is calculated by dividing the 'Sum of squares of regression' by the degrees of freedom for the numerator (13.937 / 2 = 6.968). Meanwhile, the value of the 'Mean squares of residual' is calculated by dividing the 'Sum of squares of residual' by the degrees of freedom for the denominator (45.070 / 183 = 0.246. The value for F-ratio is calculated by dividing the value of 'Mean squares of regression' by the value of 'Mean squares of residual' (6.968 / 0.246 = 28.294). The value of the coefficient of determination, *R*<sup>2</sup> can be obtained by dividing the value of 'Sum of squares of regression' by the value of 'Total sum of squares' (13.937/ 59.007 = 0.236). The variance of dependent variable (i.e. knowledge performance) that cannot be explained by the independent variables can be calculated by dividing the value of 'Sum of squares of residual' by the value of 'Total sum of squares' (45.070 / 59.007 = 0.764) or 1-0.236= 0.764.

Table 5 presents the coefficients of multiple regression. It shows the value of *B* (unstandardized coefficients) for the constant, the slope of the independent variable, 'Shared vision and Mission ' and 'Transfer of Knowledge' is 3.362, 0.301 and 0.128 respectively. For each set of data obtained from different samples in the same population, there will be a set of *B* value for the constant and the slope of the independent variables. The distribution of the value of *B* for the constant and the slope of the independent variables is normal if the assumptions of regression are met.

Table 5: Coefficients of Regression Model

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.362	0.314		10.717	0.000
	Shared vision and Mission	0.301	0.068	0.366	4.391	0.000
	Transfer of Knowledge	0.128	0.065	0.164	1.967	0.051

a. Dependent Variable: Knowledge Performance

Table 6: Relationships on OLC Dimensions and Knowledge Performance

		Shared Vision and Mission	Transfer of Knowledge	Knowledge Performance
Shared Vision and Mission	Pearson Correlation	1	0.631**	0.469**
	Sig. (2-tailed)		0.000	0.000
	N	186	186	186
Transfer of Knowledge	Pearson Correlation	0.631**	1	0.395**
	Sig. (2-tailed)	0.000	0.000	
	N	186	186	186
Knowledge Performance	Pearson Correlation	0.469**	0.395**	1
	Sig. (2-tailed)	0.000	0.000	
	N	186	186	186

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

Table 7: Summary of Hypotheses Test Results

No	Proposed Hypotheses	Result
1	H1 Organizational learning capabilities (OLC) dimensions are not significant predictor on knowledge performance	Not Supported
2	H2 There is no significant relationship between OLC dimensions and knowledge performance.	Not Supported

The standard deviation of the mentioned distribution of the value of *B* is known as the standard error. In this example, the value of the standard error for the constant and the slope of the independent variables are 0.314 (constant), 0.068 (shared vision and mission) and 0.065 (transfer of knowledge) respectively.

The *t* value was obtained by dividing the *B* value by its standard error. Therefore the *t* value for the constant was 10.717, shared vision and mission (4.391) and transfer of knowledge (1.967). The *p* value for the constant and the slope of the independent variable (shared vision and mission and transfer of knowledge) was less than 0.000 (<0.0005). These findings imply that obtaining the *t* value for the constant (10.717) and the slope of independent variable (4.391 and 1.967) was very low (<0.05), the null hypotheses were true or significant. Hence the null hypothesis was rejected and proposed hypothesis was then not supported. In other words, a predictor that has a low *p*-value is likely to be a meaningful addition to the model because changes in the

predictor's value are related to changes in the response variable. The summary of the results is presented in Table 7.

Relationships of OLC Dimensions and Knowledge Performance Using Pearson's Correlation of Coefficient.

Table 6 shows the Pearson's correlation of coefficient analysis was carried out to determine the relationship between OLC dimensions (shared vision and mission, transfer of knowledge) and knowledge performance. From the findings, shared vision and mission and transfer of knowledge are both associated with knowledge performance, with a positive linear low correlation at a 0.01 level of significance. The correlation between shared vision and mission and transfer of knowledge is the highest (0.631) followed by shared vision and mission and knowledge performance (0.469) and transfer of knowledge and knowledge performance (0.395). Therefore, the null hypothesis was rejected and the proposed hypothesis was not supported. The summary of the results is demonstrated in Table 7.

## CONCLUSIONS

The findings showed that there is a significant moderate positive relationship between the OLC dimensions and knowledge performance with both. Then, it was concluded that the first null hypothesis was rejected and the proposed hypothesis (*organizational learning capabilities' (OLC) dimensions are not significant predictor on knowledge performance*) was not supported. Meanwhile, shared vision and mission and transfer of knowledge are significant predictor in estimating the effects on knowledge performance. Therefore, it was concluded that the null hypothesis was rejected and also the proposed hypothesis (*there is no significant relationship between OLC dimensions and knowledge performance*) was not supported. Future study can focus on other OLC dimensions such as teamwork cooperation, organizational culture and other knowledge performance measurement. The outcome of this study is expected to improve the learning capabilities and skills among the librarians in university libraries.

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