CHAPTER 4: RESEARCH RESULT

This chapter includes the discussion of the result obtained from the data using the research design in chapter three. The respondent demographic profile, normality test, reliability test, correlation and regression testing for hypothesis 1 and 2, Hierarchical regression analysis testing for hypothesis 3 and 4, and T-Test for hypothesis 5 was included.

4.1 RESPONDENTS' PROFILE (FREQUENCY TESTING)

The demographic data and profile of the total participants (N=205) of the questionnaire will be discussed in this part. The demographic profile of the respondent was displayed in tabulated format in Table 4.1. However, these data will be broken down into each demography category. It will be displayed in percentage of each demography category and it is inclusive of gender, age group, ethnic group, current job position, years of service, and company,

Total number of 205 (N) samples of questionnaire was completed. Out of the 205 respondents, 56% are female and 89% of the respondents are between the age group of 20-29. About 97% of the respondents were at the executive level. Around 70% of the respondents were from IBM and 30% of the respondents were from HP. Since this study focused on the high performance work culture's company, and the employee's respond from operational team within IBM and HP, so, we can say that the demographic profile gathered from the respondent have aligned with the research objective.

Table 4.1: Demographical Profile of Respondents

		Frequency (N)	Percentage (%)
Gender	Male	93	45
	Female	112	55
		205	**100**
Age	20-29	183	89.2
	30-39	20	9.8
	40-49	2	1
		205	**100**
Ethic Group	Malay	75	37
	Chinese	110	53
	India	19	9.5
	Others	1	0.5
		205	**100**
Current Job Position	Executive	198	96.6
	Others	7	3.4
		205	**100**
Years of Service	< 1 year	86	42
	1 - 5 Years	114	55.5
	6 - 10 Years	4	2
	11 - 20 Years	1	0.5
	> 20 Years	0	0
		205	**100**
Company	IBM	120	58.5
	HP	85	41.5
		205	**100**

Note: Total complete questionnaire = 205 copies from IBM and HP

4.2 NORMALITY TESTING

A normal distribution of scores can be described by a symmetrical bell-shaped curve, the smaller frequencies towards the extremes of the data and the middle has the greatest frequency scores (Pallant, 2007). This bell-shaped curve can be located in the histogram of the normality test of each individual item. If there was a bell-shaped curve on the histogram of the normality test, then the objective is achieved which proved that there was an even distribution of the data obtained. Checking the bell-shaped curve on histogram can be very vague at times since it is almost impossible to get a perfect bell-shaped curve. By checking on the value of the Skewness and kurtosis test, we were able to tell if the normal distribution exists. Pallant (2007) advice it is normal for the values to fall between -2.00 and +2.00 hence in that case we can assume it is a normal distribution.

From the result as shown in table 4.2, the value of Skewness and kurtosis for Gender, Ethic Group, Years of Service, and Company fell between -2.00 and +2.00, which fitted the requirement of normality. However, Age, Gross Monthly Income and Current Job Position did not fell between the ranges. Age did not fell under normal distribution ranges, as IBM and HP's operational support team comprise of young workforce between 20-29 years old. Besides, since all the respondents came from the same background of the current job position, so, they have similar gross monthly income. Besides, the value of Skewness and kurtosis for Independent Variables (High Performance Work Culture and Participative Leadership), Mediating Variable (Innovative Work Behaviour) and Dependent Variable (Innovative Output) are all fell between -2.00 and +2.00, which also meet the requirement of normality.

Table 4.2: Summary of Descriptive Statistic

	Min	Max	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Age	1.00	3.00	1.1171	.35140	3.060	.170	9.314	.338
Gender	1.00	2.00	1.5463	.49907	-.188	.170	-1.984	.338
Ethnic Group	1.00	4.00	1.7366	.64083	.413	.170	-.133	.338
Gross Monthly Income	2.00	4.00	2.1073	.35452	3.499	.170	12.514	.338
Current Job Position	4.00	5.00	4.0341	.18205	5.168	.170	24.955	.338
Year of Service	1.00	4.00	1.6098	.55475	.339	.170	.266	.338
Company	1.00	2.00	1.4146	.49386	.349	.170	-1.897	.338
Innovative_ Output	1.60	5.00	3.5951	.67197	-.799	.170	.660	.338
High_ Performance Work_Culture	1.42	4.92	3.6325	.73286	-.914	.170	.852	.338
Participative_ Leadership	1.40	5.00	3.6312	.64306	-.798	.170	.754	.338
Innovative_ Work_ Behavior	2.00	4.92	3.5187	.59745	-.486	.170	.391	.338

Note: Valid N ((listwise) = 205

4.3: VALIDITY TESTING (FACTOR ANALYSIS)

Factor Analysis used to assess the number of factors and loadings of variables (Hair et al, 2006). The Bartlett Test of Sphericity and Kaiser-Meyer-Olkin (KMO) were used to assess the factorability of the data. The result in table 4.3 indicated that the Bartlett test of Sphericity is significant ($p < 0.01$) and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is greater than recommended value of 0.6. These results suggested that the factorability of the data was considered appropriate. For assessment of factor loadings, $\pm$ 0.3 to $\pm$ 0.4 are minimally acceptable and value 0.5 are generally considered practical significance. Complete rotation component matrixes

shown in table 4.4. Only items with factor loading value exceeding 0.4 are accepted. Some of the items have dual loading on more than one factor; however, only the one with the highest loading is considered, the rest are removed. Based on the result, all factor loadings fall in between 0.45 to 0.85 which is higher than the minimum acceptable range. But, as HPC6 is loaded together with IO1-IO5, therefore HPC6 need to be dropped from high performance work culture factor in following analysis.

Table 4.3: KMO and Bartlett's Test Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.918
Bartlett's Test of Sphericity	Approx. Chi-Square	6880.78
	df	561
	Sig.	.000

Table 4.4: Rotated Component Matrix

	Component			
	1	2	3	4
High Performance Culture				
HPC12	0.813			
HPC3	0.783			
HPC11	0.765			
HPC7	0.738			
HPC10	0.698			
HPC4	0.678			
HPC5	0.677			
HPC9	0.657			
HPC8	0.647			
HPC1	0.637			
HPC2	0.586			

Table 4.4, continued.

	Component			
	1	2	3	4
Innovative output				
IO4		0.790		
IO5		0.735		
IO3		0.710		
IO2		0.649		
IO1		0.565		
High performance culture				
HPC6		0.636		
Participative leadership				
PL3			0.734	
PL1			0.693	
PL2			0.617	
PL4			0.583	
PL5			0.457	
Innovative Work Behavior				
IWB3				0.856
IWB10				0.833
IWB5				0.830
IWB4				0.822
IWB11				0.786
IWB2				0.781
IWB6				0.780
IWB8				0.775
IWB7				0.770
IWB9				0.765
IWB12				0.735
IWB1				0.647

4.4 RELIABILITY TESTING

Reliability test is to prove that the selected scales are reliable to use (Pallant, 2007). Cronbach's alpha (α) is the coefficient of reliability. In this study, α was use as the measure of the internal consistency or reliability of a psychometric test score for a sample of examinees. Alpha range from zero to one, higher the number, the stronger the items grouped together statistically. Alphas (α) > 0.9 are great, > 0.8 are good, > 0.7 are ok, and > 0.6 are bottom line. In this study, all variables were α > 0.8 as shown in below table 4.5.

Table 4.5: Reliability Statistic

Variable	Number of Item	Cronbach's alpha (α)	Cronbach's Alpha Based on Standardized Items
High Performance Work Culture	11	0.941	0.942
Participative Leadership	5	0.883	0.885
Innovative Output	5	0.903	0.905
Innovative Work Behaviour	12	0.954	0.955

For high performance work culture, it was evaluated by twelve items scale, which was borrowed from Roodt (2007). The value of Cronbach's Alpha (α) Coefficient for this variable was 0.944, which was the second highest value after innovative work behaviour. Innovative work behaviour had the highest Cronbach's Alpha (α) Coefficient, which was valued at 0.954 for twelve items, borrowed from Jong and Hartog (2008) study on employee's innovative work behaviour: Measurement and Validation. Besides, participative leadership and innovative output variable had five items scale each also having high value of coefficient at 0.903 and 0.954 α respectively.

Alpha determined by the strength of the bivariate relationships amongst all the items in the composite. If the internal consistency amongst items is high, the Alpha level will be high. Based on the results generated from reliability testing, it supported the appropriateness of the instrument used throughout the study. Therefore, the outcome of the instrument suits a higher level of analyses such as inferential and differential analysis.

4.5 TESTING OF HYPOTHESIS

The hypothesis testing was divided into three parts. For the first part, it is tested on the hypothesis of H1 and H2, on the relationship between high performance work culture and innovative work behaviour, as well as the relationship between participative leadership and innovative work behaviour. These were tested using correlation method. For the second part, it examined on hypothesis of H3 and H4 for Innovative work behaviour mediates the relationship between participative leadership and innovative output. Hierarchical regression analysis was used to test H3 and H4, respectively. As for the last part of hypothesis testing H5, it tested on the difference in innovative work behaviour between IBM and HP employees by using *t* test.

4.5.1 Correlation

Pearson's correlation was used to examine the relationship between predictor (High performance work culture and Participative leadership), and dependent variable (Innovative work behaviour). The Pearson correlation was +1 in the case of a perfect positive (increasing) linear relationship (correlation), −1 in the case of a perfect decreasing (negative) linear relationship and some value between −1 and 1 in all other

cases, indicating the degree of linear dependence between the variables. In this study, results of correlation obtained from SPSS were as below table 4.6:-

Table 4.6: Correlations Statistic

		High Performance Work Culture	Innovative Work Behaviour
High Performance Work Culture	Pearson Correlation	1	.461
	Sig. (1-tailed)		.000
	N	205	205
Innovative Work Behaviour	Pearson Correlation	.461	1
	Sig. (1-tailed)	.000	
	N	205	205
		Participative Leadership	Innovative Work Behaviour
Participative Leadership	Pearson Correlation	1	.478
	Sig. (1-tailed)		.000
	N	205	205
Innovative Work Behaviour	Pearson Correlation	.478	1
	Sig. (1-tailed)	.000	
	N	205	205

Note: Correlation is significant at the 0.01 level (1-tailed)

As expected, high performance work culture moderately correlated with participative leadership to supervisor-rated innovative work behaviour. The overall high performance measurement was significantly and positively related to the supervisor rated of the employee's innovative behaviour at ($r = 0.461$, $p < 0.05$). The same result was obtained for participative leadership measurement which also significantly and positively related to supervisor-rated innovative work behaviour at ($r = 0.478$, $p < 0.05$). Both indicated that high performance work culture and participative leadership would have direct and positive impact to employee's innovative work behaviour. If a company is able to create high performance work culture in the workplace providing clear organization

vision and mission, focusing core competency of individual employee and effective performance management, it will help to motivate employee innovative work behaviour. For instance, if the supervisor involves more in their employee in decision making and giving an acceptable authority to their employee, it can encourage employee's innovation work behaviour as well. With that, it supported the hypothesis H1 and H2.

4.5.2 Multiple Regression Analysis

Multiple regressions are an extension of bivariate correlation. The result of regression is an equation that represents the best prediction of a dependent variable from several independent variables. This analysis used when independent variables correlated with other independent variables, and with the dependent variable. Since both independent variables (high performance work culture and participative leadership) have significant and positive correlation at ($r = 0.746$, $p < 0.05$), so multiple regression testing were used in this study to test the relationship for both, predictors and criterion (IWB).

Table 4.7: Correlations between Independent Variables

		High Performance Work Culture	Participative Leadership
High Performance Work Culture	Pearson Correlation	1	.746
	Sig. (1-tailed)		.000
	N	205	205
Participative Leadership	Pearson Correlation	.746	1
	Sig. (1-tailed)	.000	
	N	205	205

Note: Correlation is significant at the 0.01 level (1-tailed)

From table 4.8, there were multiple correlations (R=0.503) of two significant predictors with the criterion (dependent variable). From the model, it shows the factors that influenced employee innovative work behaviour were both high performance work culture and participative leadership. These multiple correlations, R = 0.503 were greater compared to the individual variable correlation measurement (R = 0.461 and R = 0.478).

The two factors had a significant effect size that explained 50.3% of the variance (R Square) to employee innovative work behaviour. The adjusted R^2 indicated that in the population, the two factors accounted for 25.5% of the variance in respondents' towards employee innovative work behaviour. 74.5% of the variance of the criterion is unaccounted. The regression was significant, as indicated by F-value of 34.17 ($F_{3, 202}$ = 34.17, $p<0.01$) in table 4.9. Based on t-value obtained from coefficients, it was significant ($p < 0.05$) to indicate that high performance work culture and participative leadership contributed to the prediction of employee innovative work behaviour as per table 4.10.

Table 4.8: Multiple Regressions Statistic

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.461	.212	.208	.53164
2	.478	.228	.224	.52614
3	.503	.253	.245	.51900

Note: *Model 1: Predictors: (Constant), High Performance Work Culture*

Model 2: Predictors: (Constant), Participative Leadership

Model 3: Predictors: (Constant), High Performance Work Culture, Participative Leadership

Dependent Variable: Innovative Work Behaviour

Table 4.9: ANOVA Statistic

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	18.406	2	9.203	34.165	.000
	Residual	54.412	202	.269		
	Total	72.817	204			

Note: Model 3: Predictors: (Constant), High Performance Work Culture, Participative Leadership

Dependent Variable: Innovative Work Behaviour

Table 4.10: T-Test Statistic

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
3	(Constant)	1.815	.211		8.583	.000
	Leadership	.281	.085	.303	3.317	.001
	Culture	.189	.074	.235	2.573	.001

Note: Model 3: Predictors: (Constant), High Performance Work Culture, Participative Leadership

In summary, correlation testing and multiple regression analysis supported H1 and H2, which proved that Participative leadership and High performance work culture significantly and positively related to employee innovative work behaviour.

H1 ➔ Participative leadership is positively related to innovative work behaviour.

H2 ➔ High performance work culture is positively related to innovative work behaviour.

4.5.3: Hierarchical Regression Analysis (Testing on Mediating Effect)

For hypotheses 4 and 5, it was tested on mediator x ➔ z ➔ y linkage in which high performance work culture and participative leadership (x) directly influence innovative output (y), and the existence of employee innovative work behaviour variables (z) mediated the relationship between high performance work culture and participative leadership and innovation. To infer support for partial or complete mediated models using hierarchical regression, several statistical conditions must be met (Baron & Kenny, 1986).

Three regressions analysis executed to make inference about the extent to which innovative work behaviour functions as a mediator. A fourth regression analysis provided information about the nature of the mediated relationship (complete or partial mediation). In the first analysis, the predictor block (high performance work culture /participative leadership) was regressed on the measurement on innovative output (x ➔ y). The second analysis, the mediator variable (innovative work behaviour) was regressed on innovative output (z ➔y). The third analysis, the predictor block was regressed on the mediator (x ➔ z). To conclude the support for a mediated relationship, each of these regression equations must be significant at $p < 0.05$.

The fourth analysis indicated the information about the nature of the mediation (partial or complete), a hierarchical regression analysis used in which innovative behaviour (the mediator) was regressed on the outcome measure (z ➔y) and high performance work culture, also, participative leadership (x) was added as a second step. Since adding x contributed significantly to the variance explained by the regression

equation, and z ➔ y remains significant, it was partially mediated relationship. Otherwise, it will be a complete mediator.

Based on the result indicated in table 4.11 and 4.12 below, it shows that all four regressions mentioned earlier were significant, $P < 0.05$. Since all four regressions were significant, it simply means that innovative work behaviour partially mediated with the IV (Participative leadership and High Performance work culture) and DV (Innovative Output) respectively. Therefore, H3 and H4 are partially supported.

H3 ➔ Innovative work behaviour mediates the relationship between participative leadership and innovative output.

H4 ➔ Innovative work behaviour mediates the relationship between high performance work culture and innovative output.

Table 4.11 - Hierarchical regression analysis (Participative Leadership)

Regression Analyses Testing for Mediation - Participative Leadership

Regression Model	Variable	R2	F model	R2 Adjusted	Sig.	Result
Model 1	Control Variable X -> Y	.390	129.940	.524	.000	Significant
Model 2	Control Variables Z -> Y	.250	67.529	.246	.000	Significant
Model 3	Control Variable X -> Z	.228	60.050	.224	.000	Significant
Model 4	Control Variable Z -> Y Add X	.665	80.230	.437	.000	Significant

Note: *X - Participative Leadership as the predictor*

Y - Innovative Output as dependent variable

Z - Innovative Work Behaviour as mediator variable

Table 4.12 - Hierarchical regression analysis (High Performance Work Culture)

Regression Analyses Testing for Mediation - High Performance Work Culture

Regression Model	Variable	R2	F model	R2 Adjusted	Sig.	Result
Model 1	Control Variable X -> Y	.495	199.377	.493	.000	Significant
Model 2	Control Variables Z -> Y	.250	67.529	.246	.000	Significant
Model 3	Control Variable X -> Z	.212	54.635	.208	.000	Significant
Model 4	Control Variable Z -> Y Add X	.731	116.004	.530	.000	Significant

Note: X - High Performance Work Culture as the predictor

Y - Innovative Output as dependent variable

Z - Innovative Work Behaviour as mediator variable

4.5.4: Independent T-Test

Independent-group T-test was appropriate when different group of participants had performed in each of the different conditions. In other words, when the participants in one condition were different from the participants in the other condition, the independent t-test was use to test for difference between two independent groups (such as IBM and HP) on the means of a variable (Innovative Work Behaviour). Since supervisor answered questions related to innovative work behaviour, therefore only supervisor responses were taken to perform t-test for both companies – IBM and HP.

Before reading the hypothesis test (Independent T-Test), there was a requirement to check on the homogeneity of variances, which is the Levene's test of equality of variances (Coakes, Steed & Ong, 2010). Innovative work behaviour was tested using

Levene's test, should the Alpha value of the Levene's test larger than 0.05, then we will assume equal variance. The results of the Levene's test on this dimension came out to be 0.08 (as shown in table 4.13), which was > 0.05. Hence, we assumed the equality of variances for this Independent T-Test and now can proceed to look into the result of the T-Test.

An independent sample t-test was conducted to compare the innovative work behaviour variable of the employee from IBM and HP. However, there was no significant differences in the scores for IBM employee (M=3.5431, SD=0.56) and HP employee (M=3.4843, SD=0.65); p> 0.5 (two-tailed) as shown in table 14. According to the results generated from T-Test and ANOVA, we do not have significant evidence to prove that there were differences on the innovative work behaviour score between two groups of respondents - IBM and HP employees. With that, we rejected the hypothesis below.

H5 ➔ There is a difference in innovative work behaviour between IBM's employees and HP's employees.

Table 4.13: Levene's Test

		Levene's Test for Equality of Variances	
		F	Sig.
IWB	Equal variances assumed Equal variances not assumed	2.99	.08

Table 4.14: T-Test Statistic

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
IWB	Equal variances assumed	.69	203	.489	.05874	.08481	-.11	.23
	Equal variances not assumed	.67	163.9	.500	.05874	.08695	-.11	.23

Table 4.15: ANOVA Test Statistic

	Company	N	Mean	Std. Deviation	Std. Error Mean
Innovative_Work_Behaviour	IBM	120	3.5431	.56011	.05113
	HP	85	3.4843	.64837	.07033

Table 4.16: Summary of Research Result

	Hypotheses Statement	Analysis	Result
H1	Participative leadership is positively related to innovative work behaviour.	Correlation & Multiple Regression	Supported
H2	High performance work culture is positively related to innovative work behaviour.	Correlation & Multiple Regression	Supported
H3	Innovative work behaviour mediates the relationship between participative leadership and innovative output.	Hierarchical Regression Analysis	Partially Supported
H4	Innovative work behaviour mediates the relationship between high performance work culture and innovative output.	Hierarchical Regression Analysis	Partially Supported
H5	There is a difference in innovative work behaviour between IBM's employees and HP's employees.	T-Test	Rejected

4.6: DISCUSSION OF RESEARCH RESULTS

This comes to the end of chapter four. All the relevance analysis completed through normality, reliability, correlation, regression and T-test methodology. Here we had gathered much of the results and findings from the data gathering in chapter three, and all hypotheses were tested. With five proposed hypotheses, only two hypotheses passed the test with significant evidence as per summary table above. We will be presenting and further discuss these findings in Chapter 5.