

## THE ACTIVITY-BASED COSTING (ABC) IN THE INSTITUTIONS OF HIGHER EDUCATION (IHE): DO PRIVATE AND PUBLIC BRING A DIFFERENT?

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### ABSTRACT

**Background:** There are growing debates on the role and potential benefits between private and public Institutions of Higher Education (IHE), ranging from the social to the financial benefit. Among the most frequently economic arguments in favor to the private IHE are that it improves efficiency, giving greater accountability and increased diversity of choice and access from the increased resources flowing into education (James 1991). As the private IHE do not bring any extra burden on government expenditure as compared to the public IHE, Private IHE need an accurate cost to measure performance while for the public IHE need them to measure efficiency and increase accountability.

**Objective:** The objectives of the present study are to examine, i) the possible differences that may exist between two types of Institution of Higher Education (IHE) with regard to the three elements of diffusions of any innovation, ii) to rank those factors with the three elements and iii) to investigate how well the selected variables able to explain the diffusion of ABC, both in public and private IHE. The respondents were selected using disproportionate stratified random sampling method among two types of IHE, public and private. The data was collected using structured postal questionnaires. Out of 258 questionnaires distributed, only 139 were completed and useable.

**Results:** The results indicated that the types of IHE had statistically significant effect only on two of three tested elements of ABC diffusion, namely, Relative Advantage (RA) and Comparability (COM) with the Public IHE was more favourable toward the diffusion of ABC as compared to the Private. Even though two element of diffusion theory (RA and COM) stated to be based upon the TIHE, but they also share the same perception on the overall diffusion of ABC that may take place in both TIHE. The findings also indicated that both TIHE depended on different contextual factor to diffuse the ABC.

**Conclusion:** This is to conclude that only the Relative Advantage (RA) and Comparability of ABC are dependent to the TIHE. In comparison, the public IHE are more favored to diffuse ABC system as compared to the Private IHE, with the complexity was found to be the most significant element that caused the differences between these two TIHE. Furthermore, the multiple regression model showed that the selected contextual factors explained 51% to the possible diffusion in the Public IHE, as compared to only 10% of the diffusion of ABC in the private IHE.

**Keywords:** Types of Institutions of Higher Education, Activity Based Costing (ABC), Diffusion Theory.

### INTRODUCTION

In the modern economy, there are growing debates on the role and potential benefits between private and public Institutions of Higher Education (IHE) ranging from the social to the

financial benefit. Among the most frequently economic arguments in favour to the private universities are that it improves efficiency, giving greater accountability and increased diversity of choice and access from the increased resources flowing into education (James, 1991).

From the financial point of view, the private universities do not bring any extra burden on government expenditure as the resources are reduced. This is due to the expenditure per student in private universities was, in many instance, less than half that of public universities (James 1991, p. 196). Even though they (public and private universities) were formed in different platform and orientations, but the accurate calculation of cost per student (or per program) is still in demand. Private universities need an accurate cost to measure performance in the term of financial numbers while for the public universities, the accurate cost is needed the measure efficiency and increase accountability on how public resources was used to achieve the specific targeted outcome.

Traditional accounting method led university management to not having accurate knowledge in the costs of the service they provided. They have traditionally focused on meeting external reporting and basic management accounting needs – an extension of the institution's general ledger (Gordon & Fisher, 2011). The cost-management accounting system cannot be designed to satisfy largely the information requirements of financial reporting. Aldukhil (2012) mentioned that ABC serves to focus management's attention on the costs of the key activities, leading to a better understanding of what causes such costs and what changes are necessary to reduce cost. However, application of ABC in universities has concentrated primarily on activities of support departments such as libraries, computer support, payroll and procurement and not on all aspect of university operations (Gordon & Fisher, 2011; Maelah *et al.*, 2011).

The objectives of this study are, i) to examine whether there are differences perception toward ABC diffusion exists with regard to two type of IHE, ii) to examine the relationships between contextual factors and the elements of the diffusion of ABC, and iii) to investigate how well the selected variables able to explain the diffusion of ABC, both in public and private IHE.

## LITERATURE REVIEW

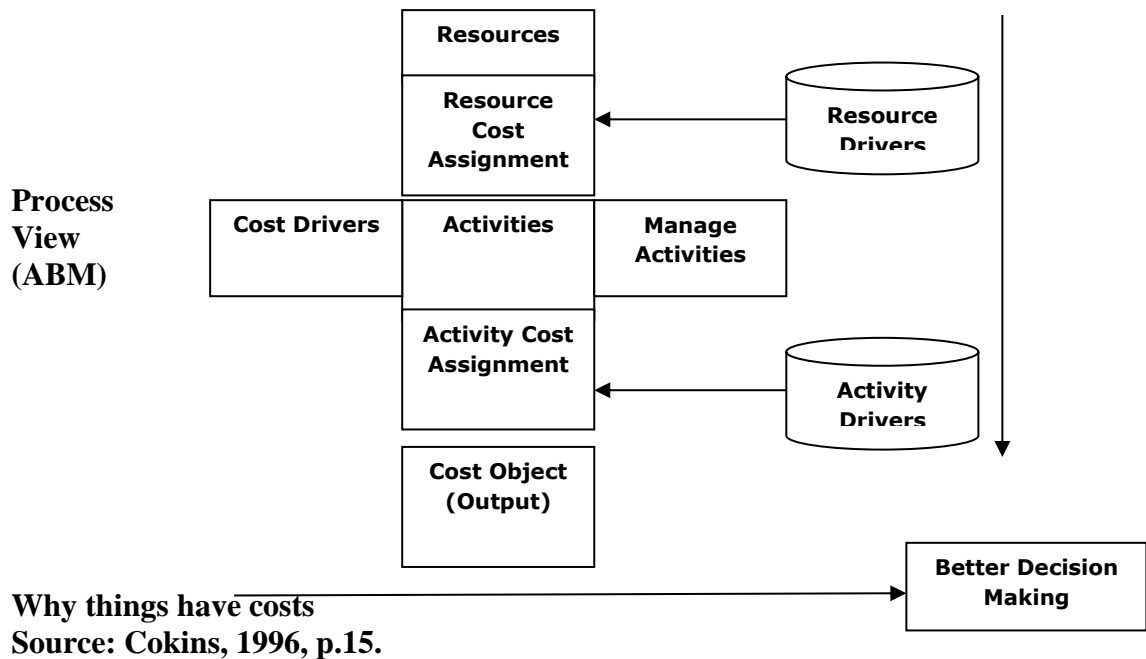
### Traditional Costing System versus Activity-based costing (ABC)

The traditional costing system (also known as the functional costing system) is a unit-based system where it assumes all costs to be classified as fixed or variable regardless of changes in the units or volume of production (Hansen and Mowen, 2000). As the traditional system is known to be simple and allocation intensive, it is only adequate for external reporting purposes. ABC, on the other hand, is a two-stage procedure used to assign overhead costs to products or services (Hilton, 2001). In the first stage, significant activities are identified, and overhead costs are assigned to activity cost pools in accordance with the way resources are consumed by the activities. In the second stage, the overhead costs are allocated from each activity cost pool to each product line in proportion to the amount of the cost driver consumed by the product line. ABC differs from traditional cost accounting, such that overhead costs are traced to products or services using cost pools and activity cost drivers rather than volume based overhead absorption rates. Basically, ABC assumes that products consume activities and activities consume overhead resources (Clarke and Mullin, 2001). Therefore, ABC is able to measure the cost and performance of activities, resources and cost objects. As such, ABC recognises the causal relationship of cost drivers to activities (Holst and Savage, 1999) and

can be viewed as “cost assignment” (refer to Figure 2.1: vertical axis) used for profitability analysis (Cokins, 1996). Additionally, ABC can be viewed from a process view (refer to Figure 2.1: horizontal axis) perspective.

**Figure 1**  
**Activity Based Cost Management Framework.**

**ABC (Cost Assignment View)**  
**Why things cost**



The benefits of ABC adoption can be recognised from the reasons this system is adopted (Sartorius et al., 2007). They (Sartorius et al., 2007) reviewed the literature on the reasons for adopting ABC in developed countries (i.e. the USA, UK, Canada, Greece, Ireland and Australia). The adoption of ABC has been identified for the following purposes: (i) cost accounting, (ii) cost management, (iii) performance measurement, (iv) decision making, (v) general management, and (vi) the fostering of better relationships (Harrison & Killough, 2006; Sartorius et al., 2007).

In the IHE, as to date there is no proper tool that really measures the accuracy of the cost in running the courses offered in the education industry. A research done in Islamic Azad University by Ali (2012) found that ABC system is more rewarding in determining the training courses compared to traditional costing. ABC system is also seen to be flexible with specific characteristics and enable the management to develop a cost accounting system (Manuel, 2011), able to focus on a specific faculty (Ismail, 2010) and support services (Krishnan 2006) in IHE.

In Malaysia, Amir et al. (2012) highlighted that ABC is able to improve the information visibility which enable the university management to understand the link between costs and activities in Public IHE. This study will examine the comparison that may exist between public and private universities in Malaysia.

## Diffusion Theory and ABC

Roger (2003) noted that the diffusion can be defined as the process through which new ideas, beliefs, knowledge, programs, technologies or practices are communicated over time among the members of a social system. He categorised the innovation into five characteristics, namely (i) Relative advantage, (ii) Compatibility, (iii) Complexity, (iv) Trialability, and (v) Observability. This study however, will only adopt three characteristics, relative advantage, compatibility and complexity.

In Malaysia, many researchers have done studies on the adoption and perceived usefulness of ABC in IHE (Amir et al., 2012; Hashim, 2011) but there was no comparison made between public and Private IHE on the diffusion of ABC as a management tool in IHE as this paper is trying to investigate.

## Contextual variables of the diffusion ABC in IHE

One of the objectives of the study is to investigate the relationship between the diffusion of ABC and 1) Environmental factors (represented by Cost Distortion and Satisfaction with Current costing system); 2) Organisational characteristics (represented by Size); 3) Technology (represented by the IT).

### Environmental factors

- **Potential for Cost Distortion.** This factor is associated with how likely the ABC will produce cost information that is significantly different from those generated by a traditional costing system (Lotfi & Mansourabad, 2012). As such, organisations including colleges and universities which offer multiple products and/or services are expected to perceive the diffusion of ABC and as being more useful than the traditional costing system. It is expected that the higher potential for cost distortion may also lead to the higher possibility of diffusing ABC in IHE.
- **Satisfaction with the Current costing system :** This variable indicates that the higher the dissatisfaction with the current costing system, the higher possibility to implement the ABC method (Hashim, 2012). He (Hashim, 2012) concluded that dissatisfaction with the current cost system does influence the diffusion of ABC information.
- **Organisational Characteristics**  
**Size :** This study used the number of students as an indicator of size as per study done by several researchers (e.g. Hashim ,2014)). Size has been found to have a positive relationship with the adoption of ABC system (Askarany et al., 2012). Do Public IHE share the same landscape with regards to the size as compared to the private IHE?

**Information Technology (IT):** Hashim (2014) found that, particularly in the Public IHE, the IT as one significant factor in the diffusion of ABC. The adoption of IT in the IHE administration support system and as a management tool is expected to change the nature of how work is done. All the discussions indicated that IT as one significant factors in the diffusion of ABC.

**Public and private IHE and ABC:** Private universities operate on the profit oriented basis and intend to offer programmes that have high private benefits rather than social benefits (Wilkinson and Yussof, 2005). Public universities, in the other hand, would offer the programmes that bring benefit to the government agenda. However, there are claims that

public universities is of higher quality than do the private universities, in terms of facilities and student-teacher ratio. In Malaysia, a study by Wilkinson and Yusoo (2005) compared the public and private universities in terms of enrolments, costs, facilities and quality and concluded that the public universities appear to be more efficient in terms of quality. Thus, although public universities appear to be less efficient in simple cost terms, they appear more efficient in satisfying the public demand for a superior quality of higher education.

These mix results showed that even though they (public and private universities were formed in different platform and orientations, but the accurate calculation of cost per student (or per program) is still in demand. Private universities need an accurate cost to measure performance in the term of financial numbers while for the public universities, the accurate cost is needed the measure efficiency and increase accountability on how public resources was used to achieve the specific targeted outcome.

## THEORITICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

### Theoretical framework Different perceptions of among campus cluster

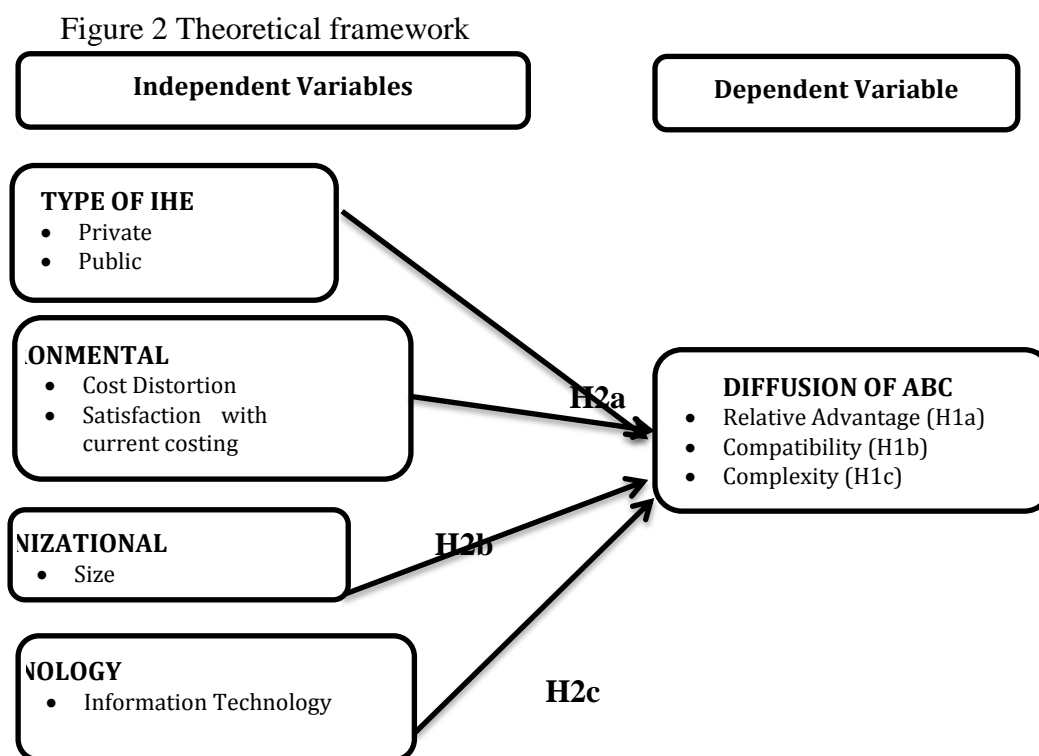


Figure 2 showed the theoretical framework for this study. It will examine the possible differences that may exist between public and private IHE with regards to the diffusion of ABC as an innovation. The three innovation characteristics by Rogers (2003) were the basis of the analysis. The assumption of positive perception of ABC diffusion among IHE leads to the following hypothesis:

H1: There is no significant different between Public and Public IHE with regards to the ABC implementation.

H1a: There is a significant different between Public and Public IHE with regards to the relative advantage of ABC

H1b: There is a significant different between Public and Public IHE with regards to the compatibility of ABC.

H1c: There is a significant different between Public and Public IHE with regards to the complexities of the ABC implementation.

### Environmental factors and the diffusion of ABC

This study also intends to investigate the relationship between the diffusion of ABC as an innovation in the organisation and 1) Environmental factors (represented by Cost Distortion and Satisfaction with Current costing system); 2) Organisational characteristics (represented by Size); 3) Technology (represented by IT), as noted by the following hypotheses:

H2: There is no significant different in the relationship between the environmental, organisational and Information Technology (IT) and the diffusion of ABC between Public and Private of IHE.

H2a: There is a significant different in the relationship between environmental (ENV) and the diffusion of ABC between Public and Private of IHE.

H2b: There is a significant different in the relationship between the organisational (ORG) and the diffusion of ABC between Public and Private of IHE.

H2c: There is a significant different in the relationship between Information Technology (IT) and the diffusion of ABC between Public and Private of IHE.

Other than that, it is worth to know to what extent the selected variables may bring the effect to the model on the diffusions ABC in both types of IHE. As such the following hypotheses will be tested.

H3a: The diffusion of ABC in the Public IHE can be explained by Environmental factors, Organisational characteristic and the Information Technology (IT).

$$YD_p = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \epsilon$$

H3b: The diffusion of ABC in the Private IHE can be explained by Environmental factors, Organisational characteristic and the Information Technology (IT).

$$YD_{pv} = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \epsilon$$

### RESEARCH METHODOLOGY

This study is the quantitative in nature with the questionnaires survey as its instrumentation.

- **Questionnaires and design**

The questions focused on the importance of potential cost distortion, degree of satisfaction with the current costing system, the size of the organisation and support system in IT as well as the diffusion characteristics. The survey questions in the form of closed-ended questions based on a five-point Likert scale. The questionnaire is divided into three parts, namely (i) The general information, (ii) The perception of the respondents towards the diffusion of ABC, and (iii) The contextual variables.

- **Pilot Test :**

A pilot test was conducted on the sample of 20 individuals identified through contacts prior to distribution of the survey instrument to the selected personnel. The respondents of the pilot study were not included in the sample of the present study.

- **Population and sampling**

The population consisted of the administrative staff of the academic that are involved with the budgeting and policy of the organization as well as the head of the academic department. The total population from both institutions is 392; 263 and 129 from Public and Private IHE, respectively.

This study utilized a stratified sampling method where a sample of members from each stratum can be drawn using either a simple random sampling or a systematic sampling procedure (Sekaran, 2003). The respondents were expected to have the required knowledge, i.e., that they have gone through the experiences and processes related to budget preparation for the institution.

Table 3.2 : Population and sampling

Institution of Higher Education	Population	Sampling
Private College	129	98
Public IHE	263	160
<b>Total</b>	<b>392</b>	<b>258</b>

## RESULTS AND DISCUSSIONS

### Descriptive analysis

Out of 258 questionnaires that sent out, there were 53.8% were returned and useable. That was consisted of 98 Private IHE and 41 questionnaires from Public IHE. Table 4.1 shows the percentage of the respondents.

Table 4.1: Response Rate

Type of IHE	Respondent	Percent
Private	41	29.5
Public	98	70.5
<b>Total</b>	<b>139</b>	<b>100.0</b>

- **Data Analysis**

The data was analyzed using the Statistical Package for the Social Science (SPSS) Version 18. The analysis of the data is performed in two stages: 1) to check the normality and reliability of the data collected; and 2) statistical procedure; MANOVA.

The normality test is performed to identify the normality of data using Kolmogorov-Smirnov statistics. As can be seen from Table 4.2, the data are not to be normally distributed. The Kolmogorov-Smirnov is used because the population is less than 2000 (Sekaran, 2003). However the graphical approach showed that all the data is shown as normally distributed. Thus for the present study purposes, to certain extent the data can be assumed to be of minimal violation to the assumption of normality.

Table 4.2 : Tests of Normality<sup>b</sup>

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
<b>Environment</b>	0.35	139	0.00	0.77	139	0.00
Cost Distortion						
Satisfaction with Current Costing System	0.38	139	0.00	0.74	139	0.00
Information_Technology	0.26	139	0.00	0.86	139	0.00
<b>Relative Advantage</b>	0.21	139	0.00	0.84	139	0.00
<b>Compatibility</b>	0.28	139	0.00	0.83	139	0.00
<b>Complexity</b>	0.33	139	0.00	0.81	139	0.00

a. Lilliefors Significance Correction

With regards to the reliability, results shown in Table 4.3 suggest that the internal consistency is considered acceptable.

Table 4.3 : Reliability Statistic

Research Construct	Number of items	Cronbach's
Satisfaction with current costing	5	0.75
Potential of Cost Distortion	6	0.61
IT	4	0.74
<b>Total</b>	<b>15</b>	<b>0.69</b>

### Differences Type of IHE towards the diffusions of ABC

The findings on the possible differences of IHE toward the Diffusion of ABC are presented in the following section.

Table 4.4 : Group Statistics

	TIHE	N	Mean	Std. Deviation	Std. Error Mean
RA	Private	41	3.05	1.43	0.22
	Public	98	4.20	0.96	0.10
COM	Private	41	2.85	1.01	0.16
	Public	98	3.13	0.83	0.08
COMPLEXITY	Private	41	3.37	0.83	0.13
	Public	98	3.32	0.65	0.07
DIFFUSION ABC	Private	41	3.17	0.99	0.16
	Public	98	3.31	0.63	0.06

As can be seen from Table 4.4, the Public IHE scored higher means across two dimensions of Diffusion elements suggested by Roger, 2003, namely i) Relative Advantages (mean = 4.20), and ii) Comparability (3.13). For the element of Complexity, private IHE scored slightly



higher means (Private = 3.37 versus Public = 3.32). Furthermore, the public IHE score higher mean i.e., 3.31 as compare to 3.17 for the public IHE with regard to the diffusion of ABC.

Table 4.5 : Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
RA	Equal variances assumed	12.29	.00	-5.51	137	0.00	-1.15	0.21
	Equal variances not assumed			-4.70	55.66	0.00	-1.15	0.24
COM	Equal variances assumed	6.65	.01	-1.69	137	0.09	-0.28	0.17
	Equal variances not assumed			-1.56	63.68	0.13	-0.28	0.02
DIF	Equal variances assumed	13.30	.00	-.96	137	0.34	-0.14	0.14
	Equal variances not assumed			-.80	53.96	0.43	-0.13	0.17

Table 4.5 showed the result for the Independent t test to test whether there is any significant different between Public and Public IHE with regards to the diffusion of ABC. As the results showed that only two elements of diffusions, with the *p-value* is lower than 0.01 then the null hypothesis need to be rejected (RA  $p < 0.05$ ; 0.00; COM,  $p < 0.05$ ; 0.01)). As such, the Relative Advantage (RA) and Comparability of ABC are dependent to the TIHE with the Public IHE more favorable as compared to the Private IHE. Another tested element, i.e., the complexity (COMP) was found failed to reject null. Furthermore, the two elements seen not to supported the overall diffusion of ABC due the  $p > 0.05$  ( $p = 0.34$ ) failed to reject null. Even though two element of diffusion theory (RA and COM) stated to be based upon the TIHE, but there is no difference of diffusion exists between TIHE.

The finding on the possible public IHE to favor the diffusion of ABC confirmed the earlier studies done be Lotfi and Mansourabad, 2012 dan Hashim, 2013. Lotfi and Mansourabad, 2012 noted that the IHE which offer multiple products and/or services are expected to perceive the diffusion of ABC and as being more useful than the traditional costing system. Hashim (2013) confirmed that the higher potential for cost distortion may also lead to the higher possibility of diffusing ABC in IHE. These findings, however contributed to the body of knowledge about higher chances of diffusion of ABC in public IHE as compared to the private IHE.

### The relationships of factors based on the Types of IHE

The second objective of the study is to identify whether the degree of importance is a function on the type of IHE. As the Friedman test was used to achieve this objectie, the Table 4.6 presented the results. Its compares the mean ranks between the related groups and

indicates how the groups differed. As can be seen, the RA recorded the highest mean (3.35 out of 5.00), followed by Complexity (2.88) and Comparability (2.59).

Table 4.6

Rank (mean) of The Three Diffusion elements

	Mean rank
IV1TYPES	1.17
DV1RA	3.35
DV2COMPARE	2.59
DV3COMPLEXITY	2.88

Table 4.7

Friedman Test for the Diffusion elements

N	139
Chi-Square	251.463
df	3
Asymp. Sig.	.000

The table 4.7 showed the results of the  $\chi^2 = 251.46$ , **df = 3**,  $p < 0.005$ , indicated there is an overall statistically significant difference of three elements of diffusion between TIHE. As the Friedman test was limited to the overall differences, but does not pinpoint which groups in particular differ from each other, the post hoc tests was run and analysed

Table 4.8

Friedman Test for the Diffusion elements : Post Hocs

		N	Mean Rank	Sum of Ranks
DV1RA - IV1TYPES	Negative Ranks	2 <sup>a</sup>	15.00	30.00
	Positive Ranks	128 <sup>b</sup>	66.29	8485.00
	Ties	9 <sup>c</sup>		
	Total	139		
DV2COMPARE IV1TYPES	Negative Ranks	2 <sup>d</sup>	34.50	69.00
	Positive Ranks	118 <sup>e</sup>	60.94	7191.00
	Ties	19 <sup>f</sup>		
	Total	139		
DV3COMPLEXITY IV1TYPES	Negative Ranks	0 <sup>g</sup>	.00	.00
	Positive Ranks	128 <sup>h</sup>	64.50	8256.00
	Ties	11 <sup>i</sup>		
	Total	139		

a. DV1RA &lt; IV1TYPES

b. DV1RA &gt; IV1TYPES

c. DV1RA = IV1TYPES

d. DV2COMPARE &lt; IV1TYPES

e. DV2COMPARE &gt; IV1TYPES

- f. DV2COMPARE = IV1TYPES
- g. DV3COMPLEXITY < IV1TYPES
- h. DV3COMPLEXITY > IV1TYPES
- i. DV3COMPLEXITY = IV1TYPES

The Table 4.8 provides some interesting information on the comparison of three elements of diffusion of ABC between two types of IHE. The three elements of diffusion, namely , i) Relative Advantage, ii) Comparability and iii) Complexity were compared between two types of IHE, public and private IHE. As can be seen from the table 4.8, the complexity (COMP) proved be the most statistically significant element to bring difference on the diffusion of ABC.

Table 4.9 : Test Statistics<sup>a</sup>

	DV1RA IV1TYPES	DV2COMPA R IV1TYPES	DV3COMPLEXI TY - IV1TYPES
Z	-9.944 <sup>b</sup>	-9.576 <sup>b</sup>	-10.015 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000	.000	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

With regard to the TIHE, Table 4.9 prove to confirm the significant difference in diffusion of ABC with the public IHEs perceived of higher RA, COM and COMP of diffusion of ABC as compared to their counterpart in the private IHEs. The reported results were exploratory in nature because this study combined two variables (i.e., potential of cost distortion and Satisfaction with current costing system) into one factor (Environmental). As these two variables were known to be the most popular variables to diffuse of ABC as compared to the traditional costing, particularly in the profit setting (Lotfi & Mansourabad, 2012 and Hashim, 2012). As this result indicated that, in the IHE, the selected environmental factor (found in the profit setting) was not contributed at the same benefit. This might be due to the different operation orientation as well as the different basis of comparison. Unlike previous researches (for example Hashim, 2012, 2014) to compare between ABC and Traditional Costing system, this study however, took different form of comparison of diffusion of ABC as dependent variable and several selected factors as independents variable and compare their level of importantly between private and public IHE.

### Contextual Model and Types of IHE

The third objective of the study is to determine to what extend the selected independent variables (namely; i) environment, ii) Organisation characteristics, and ii) IT) explain the dependent variable (Diffusion of ABC). As can be seen from Table 4.8, there are two models, model 1 was meant for the Public IHE and Model 2 was for the Private IHE. For Public IHE, the model explains 51% to the possible diffusion of ABC while the same independent variables explain only 10% of the diffusion of ABC in the private IHE.

Table 4.10 : Chi Square Tests for ENV, ORG and IT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1 Public	0.51 <sup>a</sup>	0.26	0.20	0.90
2 Private	0.10 <sup>a</sup>	0.01	-0.02	0.64

a. Predictors: (Constant), ORG, ENVR, 4IT

Table 4.11 : ANOVA<sup>a</sup>

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1. Public IHE	Regression	10.193	3	3.398	4.23	0.01 <sup>b</sup>
	Residual	28.907	36	.803		
	Total	39.100	39			
2. Private IHE	Regression	.408	3	.136	.333	0.80 <sup>b</sup>
	Residual	38.408	94	.409		
	Total	38.816	97			

a. Dependent Variable: DIFFUSIONABC

b. Predictors: (Constant), ORG, ENVR, 4IT

These are then confirmed by the value of *F*-ratio in the **ANOVA** table (Table 4.11) for Model 1 shows that the independent variables statistically significantly predict the dependent variable,  $F(4.23) = 3.39$ ,  $p < .005$ , that is the regression model is a good fit of the data. This good fit of the model is not fit well for the private IHE,  $F(0.33) = 0.136$ ,  $p = 0.80$ .

Table 4.12 : ANOVA<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.638	0.74	.46	.868	0.39
	4IT	.497	0.17	.33	2.99	0.01
	ENVR	.225	0.10	.27	2.18	0.04
	ORG	.263	0.14		1.83	0.08
2	(Constant)	3.40	.420	0.07	8.10	0.00
	4IT	.04	.061		0.65	0.52
	ENVR	-.01	.068	-0.01	-0.10	0.92
	ORG	-.05	.079	-0.01	-0.66	0.51

The Table 4.12 indicated that how much the diffusion of ABC varies with the selected variable when all other independent variables are held constant. With regard to the selected factors, Public IHE showed that application of IT and environmental factors bring some effect to the diffusion with an association of  $p < 0.05$  (IT,  $p = 0.01$ ; ENV  $p = 0.04$ ).

These findings confirmed the earlier assumption on the failure of selected variable to explain the diffusion of ABC. The selected factors only explained 51% (in Public IHE) and 10% (in Private IHE). This gap, again explained the different orientation between these two TIHE as noted by Wilkinson and Yusoff, 2005. Unlike the public universities which noted to have a better quality, facilities and student-teacher ratio, the private IHE appeared to be less

efficient in term of cost and quality education provide to their students. Furthermore, the need for an accurate cost by both TIHE was triggered from different platform and orientations. Private IHE need an accurate cost to measure performance while the public IHE need them to the measure efficiency and increase accountability of resources used. The finding of this study confirm the inability of ABC to fulfill the private IHE need to use the ABC information to measure performance rather than to increase efficiency in the public IHE.

## **CONCLUSION, LIMITATIONS AND DIRECTION FOR FUTURE RESEARCH**

### **Conclusions**

A total of seven hypotheses that were tested and the findings may indicate several conclusions. First, as the independent t test indicated that that only two elements of diffusions, the Relative Advantage (RA) and Comparability of ABC are dependent to the TIHE. With regards to the overall diffusion of ABC, the TIHE don't showed any significant different to diffusion ABC in both TIHE. Second, the RA recorded the highest mean (3.35 out of 5.00), followed by Complexity (2.88) and Comparability (2.59). In comparison, the public IHE more favored to diffuse ABC system with all three tested elements of diffusion of ABC be statistically important significant difference on the RA and COM of ABC. On top of that, complexity was found to be the most significant element that caused the differences between two TIHE. And third, the public and private IHE in comparison showed that the selected model more favorable to the Public IHE and Model 2 was for the Private IHE. For Public IHE, the model explains 51% to the possible diffusion of ABC while the same independent variables explain only 10% of the diffusion of ABC in the private IHE.

### **Limitations and directions for Future Research**

The variables tested in the present study are limited only to the three contextual which may not fully explain the diffusion of the system. Another two elements proposed by Roger (2003), (namely: trialability, and observe ability) were not yet tested. Thus, for future research, all five perceived elements of an innovation (as proposed by Roger, 2003) should be tested.

Another limitation is the limited sample size which is to only one public and one private higher education institution. This may not represent the whole environment of IHE in Malaysia. Other than that, the survey used in the present study was based on questionnaires. Indirectly the questionnaires limit the explanatory information because the answers in the questionnaires are structured. This restricts the respondents from giving their opinion and further information. It is suggested that for future research, combined methods should be applied whereby questionnaires should be followed with interviews.

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