

Analyzing the awareness of green technology in Malaysia practices

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Keywords: Green technology; awareness of green practice

ABSTRACT – Environmental practices have been well studied but only a few studies have presented the green innovation practices of corporate firms. The main purpose of this study focused on the awareness of green practice which is concerted on organizational (Training Program/TP), environment (Government Regulation & Policies/GRP) and individual context (Knowledge/KG). A total of 108 questionnaires were returned out of 200. The results of the analysis indicated KG as the most influencing factors to the awareness of green practice according to correlation analysis. For the practicality of this study, green technology is anticipated to be well implemented when the individual knowledge understood these practices.

1. INTRODUCTION

The industrial sector, through its role in society, has contributed significantly to pollution and exploitation of the environment. The impact of climate change in the future will be a challenge in order to maintain the sustainability of the state [1]. To ensure the sustainability of social life, green practices become a liability to the industrial players. Numerous multinational enterprises are investing in researching and developing green products, establishing standards restricting the use of hazardous substances, and requiring suppliers to provide products that are free of hazardous materials at all levels of the supply chain [2]. In Malaysia, the government introduce energy policy to ensure the sustainability of energy, environment, economy and social. Besides, firms need to implement firm-oriented green innovation as well as customer-oriented green innovation in order to increase their performance [3–5]. Although many studies agreed that performances of an organization is very much depending on their characteristics of innovation adopted by them [6–8], the application of green technology has been regarded as a strategic industry in the 21st century which will accelerate more of its success. In terms of technology, green practice is a development and application of products, equipment and systems used to conserve the natural environment and resources, which minimize and reduces the negative impact of human [9]. The areas of engineering management become a pillar to practices of the green technology. Engineering

management concentrates on the application of engineering principles for the effective planning and efficient operations of managing manufacturing or industrial operations [10].

Creating awareness of green technology and its practice to employees can increase knowledge and reduce the negative impact on the environment. The purpose of this study is to identify the relationship between the influencing factors of awareness for green practice among executives of Flextronics Sdn. Bhd. and also identify the factor that most influence to the awareness and practice among staff. Figure 1 shows the theoretical framework of the study. This study focused on organizational context (training program), environment (government regulation and policy) and individual (knowledge of the executives). Therefore, H1, H2 and H3 there is positive relationship between training program, government regulation also knowledge and awareness of green practice [11,12].

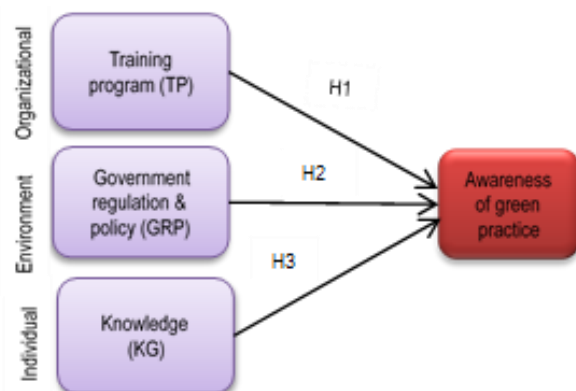


Figure 1 Theoretical framework.

2. METHODOLOGY

The method used in sampling was a convenience sampling, which is a type of random sampling technique. All the items of the questionnaire were measured on a 5-point Likert scale. The respondents of this study were management staff of the company. A total of 200 questionnaires were distributed via email but only 108 were returned. For data analyzing, this study applies correlation and Multi Regression Analysis (MRA).

3. RESULTS AND DISCUSSION

For the correlation analysis, TP showed a positive relationship with awareness of green practice but weak correlation ($.393^{**}/p = 0.00$). While, GRP ($.620^{**}/p = 0.00$) and KG ($.638^{**}/p = 0.00$) showed positive relationship and the correlation between both variables and awareness of green practice were moderate. Therefore, H1, H2 and H3 accepted for this study. Regression Analysis, $R^2 = .580$ implies that the independent variables (TP, GRP and KG) explain 58.0% of the variability of the dependent variable (awareness of green practice). Table 1 showed a summary of the statistical analysis. Figure 2 shows statistical diagram.

Based on the statistical results, the study has revealed KG as the most influencing factors that bring awareness of green practice on that organization. Drejer [13] mentioned that knowledge was a crucial tools to the implementation of technology innovation in the organizational. Study by Shi et. al., [14] indicated, the lack of knowledge on green technology and the durability of green materials.

Table 1 Summary of analysis.

	Correlation	p value (<0.01)	R ²	MRA
TP	.393**	0.00	0.154	R ² =0.580
GRP	.620**	0.00	0.385	
KG	.638**	0.00	0.408	

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



Figure 2 Statistical diagram.

4. CONCLUSION

Understanding which awareness of green practice determinant effect on implementation on it. The individual knowledge gives organization concerns about green practices that implemented in the current practices, this study address in the production filed and contributes to behavior formation in the implementation of green practices in the context of electronic sectors. Top management of the organization must meet all the understanding of the green practices to ensure the knowledge of green technology well delivered to the employees.

The study has limited the size of sample; more company should have been participating in the survey of green technology. A larger sample with more assorted qualities would have profited the study. Another conceivable change in the study could have been interviewing directly participants. This method could have included imperative subjective information and

more prominent understanding into the participants' idea and assessments.

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A guided ranking-based clustering using K-Means

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Keywords: Ranking-based clustering; K-Means

ABSTRACT – K-Means is a clustering technique that maps object features onto multidimensional coordinates and groups them based on location closeness. However, measuring closest distance can be doubtful when ranking representation of ordinal scale objects are not taken into account. An enhanced of K-Means algorithm called guided rank K-Means (GRank-K-Means) is proposed to achieve better and meaningful result of ranking-based clustering. Based on experiment to cluster marks of 92 students, it shows that by integrating ranking algorithm in K-Means as proposed in GRank-K-Means has improved result accuracy in ranking-based clustering consideration.

1. INTRODUCTION

In basic K-Means, certain objects that represent same rank may not be grouped together because each object is measured based on closest distance to the centroids rather than among themselves. As clustering result is influenced by initial centroids selection [1], they need also to be targeted towards relevant points of ranking-based cluster representation. Many suggestions have been made on initial centroids enhancement [2]. However, to our extent of knowledge, initial centroids configuration in representing meaningful ranking context is yet to be explored. Different selection of initial centroids may yield to different clustering ranking results due to local minima convergence.

S. Dhanabal and S. Chandramathi [3] has proposed determination of initial centroids to be based on the minimum, average and maximum objects at extreme ends using Euclidean distance. However, the initial centroids are considered at extreme ends of minimum and maximum points which may denote to certain ranking groups, the result still not accurate due to normal distance measurement issue which does not consider on ranking representation.

Meanwhile, ranking consideration in clustering was proposed through RankClus [4]. It improves the quality of clustering result by automatically assigning new object feature with a calculated rank for each cluster. The accuracy of clustering was improved by assigning the object with ranking information to be part of the clustering features. However, this technique may change the objects ranking sensitivity as the rank of a cluster was calculated based on the initial cluster result without considering the real rank on each object.

Pei et.al [5] proposes ComClus that is able to calculate centroids based on maximized posterior probability. However, this technique is only limited to networked object that requires relations information on the objects to be available (i.e. dependent features). In certain application, object relation does not exist such as mark of a student does not influence marks for other students.

As main concern in this study is on ranking-based clustering, ranking information can be used to influence K-Means result. Ranking information at certain degree is representing objects closeness based on their nearby rank location. So they can be used to guide K-Means clustering towards ranking-based result.

2. METHODOLOGY

GRank-K-Means algorithm integrates ranking algorithm to assign objects with ranking attribute that later will be used in guiding K-Means towards achieving better ranking-based clustering representation. The feature of objects must only be in ordinal representation so that the ranking can be meaningful.

2.1 Initial centroid selection

Initial centroid (m) is proposed based on ranking objects (R_i) consideration. Top rank of objects should be considered as initial center clusters consecutively as the concern is to see which objects are nearest to the first rank, second rank and so on. The formula is shown in Equation 1.

$$m_k = \{X_i | X_i \text{ is } \max_k R_i\} \quad (1)$$

Where $k = 1$ to K and $\max_k R_i$ is the k -maximum ranking object- i . k is representing centroid ranking order from highest rank (k) to the lowest rank (K).

2.2 Clustering process

Clustering process begin by measuring each object distance on each centroid (m_k) using Equation 2.

$$S_{ik} = \min_s \sqrt{\sum_j^D (X_{ij} - m_{jk})^2} \quad (2)$$

Where S_{ik} is set of object in cluster- k and $k = 1$ to K . The objects will be clustered under closest distance of the centroid.

2.3 Guided rank re-clustering

This step can eliminate inconsistency of ranking-based clustering by overwriting any lower-rank objects to be grouped together under the same cluster based on highest rank in each cluster using Equation 3.

$$S_{ik} = \{X_i \mid \min_k R_i \leq X_i < \max_k R_i \text{ and } R_i \in S_{ik}\} \quad (3)$$

Where S_{ik} is set of object in cluster- k , $\min_k R_i$ and $\max_k R_i$ is the lowest-rank and highest-rank of object in S_{ik} .

2.4 Centroid updates and iteration

Then new centroid (m) for each cluster need to be calculated using Equation 4.

$$m_{jk} = \sum_i^M X_{ijk} / M \quad (4)$$

Where M is the total of objects in cluster- k and $k = 1$ to K . Iteratively, step 2.2 to 2.4 is repeated until there are no changes to the centroids in all clusters.

3. RESULTS AND DISCUSSION

A Computer Organization and Architecture (COA) course's marks involved of 92 computer science students were used to be clustered into three clusters (c0, c1 and c2). The dataset composes of two features namely coursework mark and final examination mark. The initial centroids were chosen based on the top object's ranks at 92, 91 and 90 for c0, c1 and c2 respectively. The objects' rank was calculated based on the total achieved marks of the coursework and final examination

Table 1 shows that the purity value was better achieved when using the GRank K-Means (0.98) as compared to the basic K-Means (0.96).

Table 1 Purity value comparison.

Algorithm	Purity		Cluster	Classification (Total mark's percentages)			Max
				t1	t2	t3	
				0-39	40-74	75-100	
Basic	TotalMax	88	c0	0	2	2	2
K-	N	92	c1	0	32	0	32
Means	Purity	0.96	c2	2	54	0	54
GRank	TotalMax	90	c0	0	0	2	2
K-	N	92	c1	0	24	0	24
Means	Purity	0.98	c2	2	64	0	64

Meanwhile, Figure 1(b) shows that when performing GRank K-Means process on the basic K-Means algorithm, objects were clustered along with the ranking consideration from the highest rank cluster of c0 to the lower rank cluster of c1 followed by the cluster of c2.

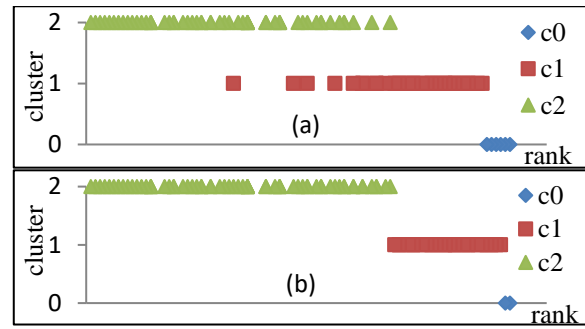


Figure 1 Clustering of ranked objects using (a) basic K-Means and (b) G-Rank K-Means.

4. CONCLUSIONS

Basic K-Means does not put much consideration on ranking-based clustering even for same scale of ordinal features involved. New additional step in K-Means algorithm was proposed to reassign any misaligned object closeness due to centroid constraint by using ranking information consistency guidance. Centroid initialization was also proposed based on top consecutive ranking objects to minimize bad local minimum convergence of K-Means. Experiment on the course marks dataset showed that ranking information can be included to guide the K-Means result in enhancing the accuracy of the ranking-based clustering.

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Implementation of green human resource management in Malaysia

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Keywords: Green human resource management; employee skills; employee knowledge; employee attitude

ABSTRACT – The main purpose of this study focused on Employee Knowledge (EK), Employee Skill (ES) and Employee Attitude (EA) towards the implementation of Green Human Resource Management (GHRM). The respondents of this study were management staff of Sony ECMS. A total of 150 questionnaires were distributed via email but only 100 were returned. The results of the analysis indicated ES as the most significant factors for organization to implement GHRM. For the practicality of this study, GHRM is anticipated to be well implemented when the employee skills are emphasized.

1. INTRODUCTION

In the context of technology, the organization should well fit to implementing green practice. In engineering management mentioned to ensure effectiveness and efficient planning, the organization must concentrates on engineering principles especially involve in green practice[1]. The incorporation of green/environmental concerns at organizations generally occurs through technical alterations in product and service projects and in production and operations processes [2]. Organisations should align their HRM practices towards their strategic goal, and that such practices should develop ES, EK and EA in ways considered supportive of a particular strategy [3].

Although there were many studies indicating the successful of a business determined by its performances from adopting certain innovation [4–6], GHRM has become a key business strategy for the significant organizations where HR departments play an active part in going green at the office [7] and as an innovation process in responding to pro-environments [8]. GHRM refers to using every employee line to encourage sustainable performs [9]. As such, practices are generally very complex, and most employees are not aware of green principles [10]. Additionally, the employee involvement and training to be central for the company's success [7]. GHRM is directly responsible in creating green workforce that understands, appreciates, and practices green initiative and maintains its green objectives [11]. Training and development is a practice that focuses on development of ES, EK, and EA, prevent deterioration of environment management is related to those dimension [12].

The purpose of this study is to identify the relationship between the EK (to our knowledge of the

employee as a role of internal environmental orientation, especially in the relationship between HRM) [13], ES (to ensure the development process; and providing employees with the skills to implement strategic management) [14] and EA (the employee attitudes to green management becomes positive and motivated to participating new green management activities) [15] toward the implementation of GHRM among executives Sony ECMS, Penang. Figure 1 shows the theoretical framework of the study. This study focused on EK, ES and EA towards GHRM. Therefore, H1, H2 and H3 have positive relationship with GHRM.

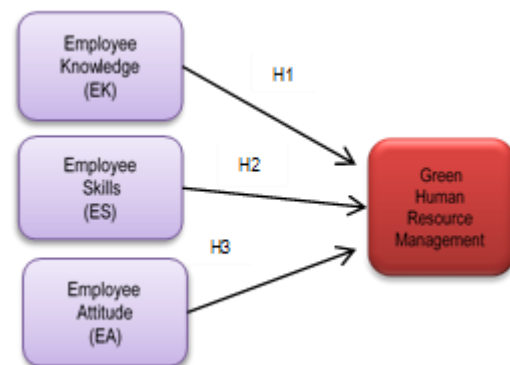


Figure 1 Theoretical framework.

2. METHODOLOGY

The method used in sampling is convenience sampling, which is a type of random sampling technique. All the items of the questionnaire were measured on a 5-point Likert scale. The respondents of this study were management staff of Sony ECMS. A total of 150 questionnaires were distributed via email but only 100 were returned. For data analyzing, this study applied correlation and Multi Regression Analysis (MRA).

3. RESULTS AND DISCUSSION

For the correlation analysis, EK showed a positive relationship with implementation of GHRM but weak correlation ($.427^{**}/p = 0.008$). While, ES shows moderate relationship ($.771^{**}/p = 0.002$). However, EA ($.380/p = 0.318$) showed not significant to the implementation of GHRM. Therefore, H1 and H2 accepted for this study. MRA, $R^2 = .599$ implies that the independent variables (EK and ES) explain 59.90% of

the variability of the dependent variable (implementation of GHRM). Table 1 showed a summary of the statistical analysis. Figure 2 shows statistical diagram.

Based on the statistical results, the study has revealed ES as the most influence factors that bring implementation of GHRM on that organization. J. Hughes and E. Rog [16] mentioned, organization should have the requisite skills to retain and engage valued employee talent. S. Ahmad [7] adds, professional skills of employee were needed to achieve green practices of the organizations. Furthermore, the organization faced shortage of labour skills as a challenge on implemented green practices [17].

Table 1 Summary of analysis.

	Correlation	p value (<0.01)	R ²	MRA
EK	.427**	0.008	0.070	
ES	.771**	0.002	0.095	R ² =0.599

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

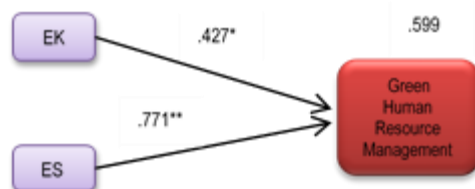


Figure 2 Statistical diagram.

4. CONCLUSION

The study provides a better understanding on organization because, employee skill become most influencing factor to implementing GHRM. Based on the results, ES become crucial factors to implement green practice on organization. Therefore, top management of the organization must meet all the understanding of the green practices to ensure the ES delivered to the employees.

The ES gives organization concerns about GHRM practices that implemented in the current practices, this study address in the management filed and contributes to theoretical development of behaviour formation in the implementation of environmental practices in the context of this sector. The findings shed some light on ways to potentially enhance the effectiveness of implementing GHRM.

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Service quality on self-service technology in Malaysian retail industry

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Keywords: Self-service technology; kiosk, quality; satisfaction; loyalty

ABSTRACT – Self-service technology offers a great opportunity to consumers and retailers and gives significance contribution to national prosperity and quality of life. This study aims to explore the attributes of service quality for self-service technology in terms of self-service interactive kiosk system based on customer evaluation and interrelationship amongst the three major construct which are service quality, satisfaction and loyalty in a selected shopping mall in Malaysia.

1. INTRODUCTION

Self-service technology (SST) is rapidly growing and penetrating in shopping mall to reduce retailer costs while enhancing shoppers' shopping experience. Among numerous SST available, self-service interactive kiosk systems (SSIKS) have become one of the tested kiosk system in shopping malls.

With increasingly greater complexity of the retail atmosphere - density of growing competition, demanding customers and shopping attitudes of customers, the capability of retailers to offer a satisfactory service may be crucial and attractive manoeuvre to differentiate and actively satisfy the customers [1]. When consumer is satisfied with the service, they will tend to be loyal [2]. Therefore, retailers must continuously engage consumers and stir their interest in a given mall (Jones and Reynolds, 2006). In response to the wave of interactive technologies and to build excitement in customers and meet the rising of consumer expectations, self-service interactive kiosks will be the only technology to perform their service delivery process in order to best utilize emergent technology.

Many studies have been conducted mainly in relation to consumer adoption of kiosks in the context of airline service [3-4], banking [5] and overall use of SSTs [6]. However, research on self-service interactive kiosk system in shopping mall has received very little attention and its contribution to customers' loyalty in retail industry has not been studied up to the authors' knowledge. Therefore, this study aims to explore the attributes of service quality for self-service technology in terms of self-service interactive kiosk system based on customer evaluation and interrelationship amongst the three major construct which are service quality, satisfaction and loyalty in a selected shopping mall in Malaysia.

2. CONCEPTUAL FRAMEWORK

This study determine self-service interactive kiosk system service quality attributes and its impact on customer satisfaction and customer loyalty. Within the field of technology-based self-service options, attribute-based model [9] (speed, ease of use, reliability, enjoyment and control) are important factors in many service quality studies while the latest study on self-service technology [6] suggest another four factors from SSTQUAL(functionality, assurance, design, convenience) We believe the combination of these two model is the best fit to measure self-service interactive kiosk system service quality Construct measurement in this research is adapted from previous research [6-10]. Appropriate constructs in the context of shopping mall were considered. Service quality variables were adapted from customer satisfaction [7] and customer loyalty [8]. Overall theoretical framework was adapted from Dabholkar et al. [9-10] empirically validated multilevel model called Retail Service Quality Scale (RSQS). Figure 1 shows the proposed conceptual framework for this study.

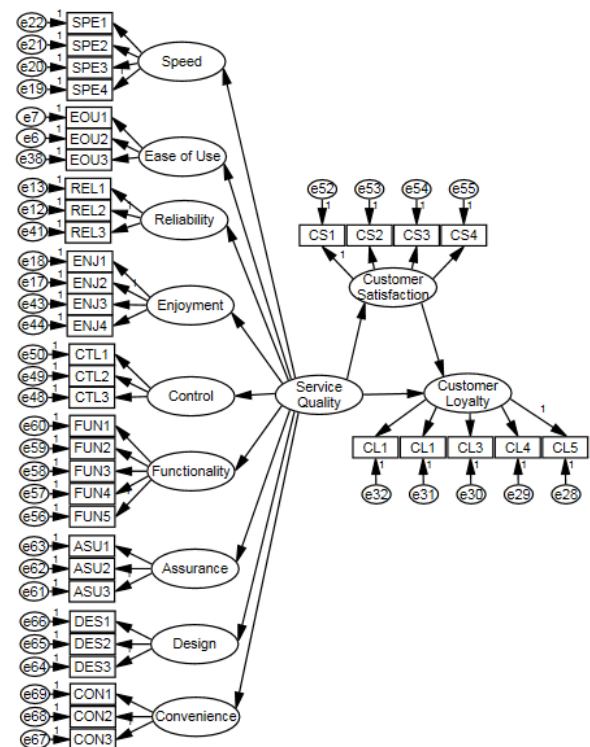


Figure 1 Proposed conceptual framework.

Hypothesis 1: SSIKS attributes (speed, ease of use, reliability, enjoyment, control, functionality, assurance, design, convenience) are the domains for service quality.

Hypothesis 2: SSIKS gives direct effect to customer loyalty.

Hypothesis 3: Customer satisfaction is the mediator for the model.

3. METHOD

This study use questionnaire to collect data. The measurement uses Likert scale ranged from 1 to 10. The questionnaires are distributed through face to face interview in March 2016 to potential respondents aged 16-60 years old whom have visited Tesco, Johor Bahru. 400 questionnaires are distributed, and 358 questionnaires were completed and deemed to be valid for data analysis in this study. The analysis method is structural equation modeling (SEM) using SPSS AMOS version 22. To test the model, the following ordered steps were followed. The steps included developing the theoretical model and conducting exploratory factor analysis (EFA) to test whether the correlations among variables are suitable for factor analysis. We examined the Kaiser-Meyer-Olkin (KMO) and Barlett's test of sphericity to determine the feasibility of factoring. The KMO of this research was 0.969 and Barlett result of $p < 0.05$ indicated the data was factorable. The data were analyzed using principal component analysis with varimax rotation. The total variance explained suggested the final solution should not extract more than two factors and the items with loading factor more than 0.7 were remained in either one factors. Then, we conducted confirmatory factor analysis (CFA) to assess the construct validity of the model. The steps involves constructing a path diagram, assessing model identification where 7 items have been deleted due to redundancies, evaluating estimates and model fit where the fitness indices of this research are RMSEA=0.066, CFI=0.963, Chi-sq/df=2.552, interpreting and analyzing the model, and the final model as explained in Kline [11] and Zainudin [12].

4. RESULTS AND DISCUSSION

The findings show that youngsters had higher tendencies to use self-service interactive kiosk system while shopping as they are mostly technology savvy. For the proposed conceptual attribute-base model framework, only one of the scale adopted from Dabholkar et al. [10] namely speed and functionality from Oliver [8] are validated for acceptance. Seven attributes were taken out from this study. This is an interesting finding and can suggest for further study to find out the factors that causes the changes of the model. Argument in this study are, this might be due to the measuring service quality using traditional scales may not appropriate in response to current trend for those youngsters that are savvy in technology and also because of the different culture between developed and developing countries. Figure 2 shows the new structural model.

In addition, this study has find that customer

satisfaction is a mediating variable in the relationship between SSIKS Service Quality and Customer Loyalty. The type of mediation here is partial mediation. In between, this study also has proven that SSIKS Service Quality has significant direct effect on Customer Loyalty and also has significant indirect effect on Customer Loyalty through the mediator, Customer Satisfaction.

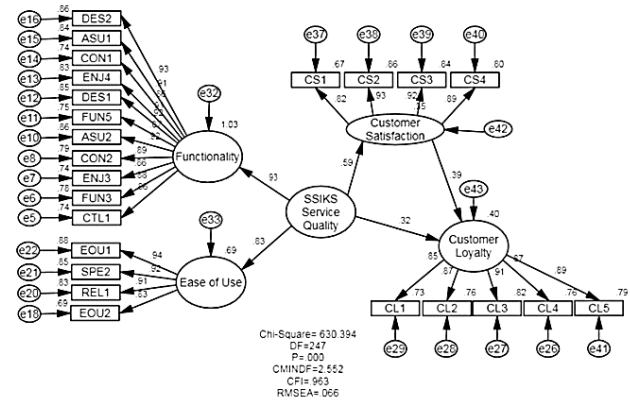


Figure 2: New structural model.

5. CONCLUSION

Exponential population growth with the increasing elite nation spur technological change in retail industry. Technological innovation utilization in retail industry is essentially important to increase service quality to fulfill the customer requirements and needs. Retailers have to put more effort in improving service quality in order to attract new customer segment while retain old customers. Retailers can specifically focus on these two factors (functionality, and ease of use) in order to evaluate SSIKS service quality to build long-term and mutually profitable relationship with customers. The quality of service has to be strengthen with the aid of technology. Keeping up with the trend of technology, self-service technology (SST) become a major trend in delivering service in shopping mall.

This paper has given a significant contribution in establishing the bridges amongst service quality, customer satisfaction, and customer loyalty in a shopping mall context.

ACKNOWLEDGEMENT

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The moderating effect of eco product innovation on ISO 14001 EMS and sustainable development

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Keywords: Sustainable development; automotive industry; eco product innovation

ABSTRACT – In the new century, eco product innovation became a mantra for organization to ensure future generation can meet their needs. Therefore, this research was drawing to enlighten its role to bridge the effective implementation of Environmental Management Systems (EMS) and sustainable development. 242 returned questionnaire were analysed via multiple regression analysis and CB-SEM. The results show that Formal EMS has no relationship with sustainable development while top management support significantly related with sustainable development. Also, eco product innovation play as a significant role to moderate the relationship between EMS strategy and sustainable development.

1. INTRODUCTION

The Environmental Management Systems (EMS) is defined as part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects. Under the umbrella of ISO standard, [1] mentioned that ISO 1400 is recognized worldwide as a firm's voluntary efforts to improve environmental performance. Firms that are EMS-certified are more proactive in implementing corporate environmental strategies in terms of environmental product design, reduction of material usage, and management aspect [2].

EMS proven as a solid bullet towards sustainable competitive advantage via exploiting physical capital resources, human capital resources [3], and organizational capital resources [4]. The adoption of EMS is approved as a critical strategy to bridge firms' environmental innovation as indicated by [4-7] and as a motivation to implement environmental product design, reduction of material usage, and management aspect mainly in the automotive industry [6-7]. However, limited empirical evidence to measure the relationship between EMS and sustainable development as well as the moderator effect of eco product innovation [10]. Thus, this research will shed light on the role of eco product innovation and to enlighten the relationship between those variables.

2. METHODOLOGY

The ultimate aim for this research is to identify and evaluate the antecedents of sustainable development. Therefore, the proposed theoretical framework of this research draw as in figure 1 below:

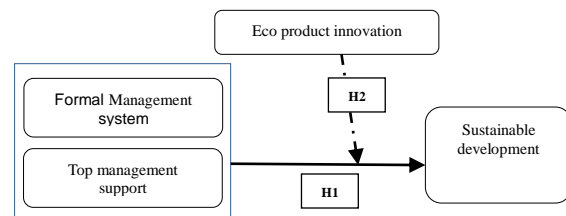


Figure 1 Theoretical framework.

The hypothesis for this research proposed as below:

H1: Environmental management strategy has a positive relationship to sustainable development

H1a: Formal EMS will lead to positive relationship with sustainable development

H1b: Top management support will lead to positive relationship with sustainable development

H2: Eco-product innovation has moderated effect on the relationship between environmental management strategy and sustainability development

3. RESULTS AND DISCUSSION

242 returned questionnaire were analyzed via SPSS and CB SEM. The majority who returned the questionnaires were from the central region (73%) as compared to the northern and southern areas by 10% and 17% respectively. Data analysis derived for both statistics proved that the data are free from missing data, outliers and multicollinearity. Also, data for the reliability (CR>0.7) and validity (AVE>0.5) were meet the requirement. Result for the hypothesis testing was tabulated in table 1.

This study does not support the previous argument of positive relationship between formal EMS with sustainable development. Meanwhile, in another coin, top management support shows significant positive

relationship with sustainable development in triple bottom line in terms of economy, ecology, and social. This finding is similar with [4] and [11] which indicated top management commitment and support explicit in the human factors embraced an important role because direction from the top management is crucial in the organisation [3], especially in the developing countries such as Malaysia to excel in environmental management [12]. In the bottleneck, the ultimate aim of EMS outcomes relies on twofold benefits; improving environmental and operations performances rather than society performance. Thus, the impact of formal EMS is not coping with sustainable development definition in terms of triple bottom line performance.

Table 1 Result of hypothesis testing.

Predictor variable	Criterion variable	Estimate β	S.E.	C.R.	P	Results
Formal EMS	Sustainable development	-0.03	0.02	1.44	0.18	Not Supported
Top management support	Sustainable development	0.173	0.05	2.39	0.000	Supported

Notes: *** p value < 0.01; ** p value < 0.05; * p value < 0.10 (one tailed test)
 *SE: Standard Error of Regression Weight, CR: Critical ratio for regression weight

The presence of moderator effects by conducting 3 steps hierarchical regression. In the first step, the effect of independent variable (EMS strategy) was examined. For the second step, the moderator variable (eco product innovation) was entered to evaluate whether the moderator variable had a significant direct impact on the dependent variable (sustainable development). In the last step, the interaction terms (EMS strategy * Eco product innovation) were entered to show the additional variance explained. Table 2, explains the moderating effect of EPI on the relationship between EMS strategy and Sustainable Development. To ensure the present of moderator effects, the final step (step 3) must show a significant R^2 increase with a significant F change value. According to table 2, the value of R^2 model 3 was increased (0.108) comparing to the model 1 (0.098). Therefore, the increment of R square shows that EPI has positive moderating effect on the relationship between EMS strategy and SD and then the null hypothesis was accepted.

Table 2 Result of moderating variable.

Model	Variables	Standardized coefficient B			Hypotheses
		Model 1	Model 2	Model 3	
Model 1	EMS	0.313***			
Model 2	EPI		0.251***		
Model 3	EMS*EPI			0.328***	
R^2		0.098	0.063	0.108	Supported
Adjusted R^2		0.094	0.059	0.104	
F		26.05	16.19	28.94	
ΔR^2			0.035***	0.045***	
ΔF			9.86***	12.75***	

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

In the case where a significant moderating variable effect is present, a technique suggested by [13] was employed to generate plots for each interaction was applied. This technique is more powerful to determine the interaction effect of moderator in the relationship between EMS and sustainable development. As shown in Figure 1, the EPI has moderating effect on the relationship between EMS strategy and SD. This analysis proven that a positive relationship between

EMS strategies with sustainable development is strengthening when the level of eco product innovation implementation is high.

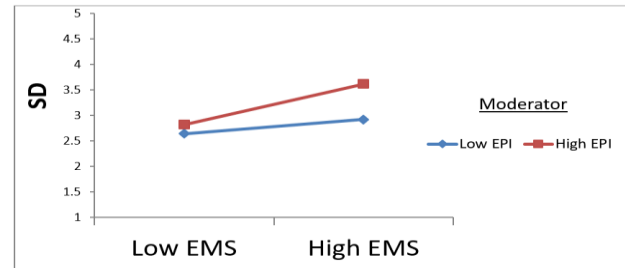


Figure 1 The moderating effects of EPI on the relationship between EMS and SD.

4. CONCLUSION

This study sheds doubt on eco-product innovation research in a developing country setting and indirectly stimulates knowledge growth through empirical evidence of the role of eco-product innovation as a moderator variable mainly in the automotive industry.

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New technology management to overcome municipal solid waste disposal problems in Melaka

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Keywords: Incineration; municipal solid waste; technology management

ABSTRACT – Exponential population growth and increasing number of tourist have generated a huge amount of municipal solid waste (MSW) in Melaka. This study aims to generate experts' opinions about the suitability to implement new technology management such as incineration technology to overcome the current disposal problems. This study use qualitative method by interviewing the top management of the secretariat of Melaka Green Technology Council and Melaka Green Technology Corporation. PESTLE analysis approach is used as an explorative research tool. The finding shows that Melaka is capable to implement the incineration technology in large scale.

1. INTRODUCTION

Exponential population growth and increasing number of tourist have directly contribute to 1200-ton municipal solid waste (MSW) per day [1] with the cost of disposing reaching up to RM90,000 daily in Melaka [2]. This has alarm a severe environmental and management cost problems. MSW is generated by households, offices, hotels, supermarkets, shops, schools, institutions, and from municipal services such as street cleaning and maintenance of recreational areas [3-4].

In Melaka, almost 99% of MSW management are via landfilling while incinerators are being used only on a very small scale basis, such as for medical waste disposal which is located at Sungai Rambai, Melaka. The Krubong landfill commissioned since the 1980s has reached maximum capacity with almost a billion tonnes of accumulated solid waste [5]. To overcome this problem, the authorities had opened a new landfill in Sungai Udang, Melaka in April 2015. However, the level of land-filling at the new landfill increased drastically which it has achieved about 5 levels of land-filling for the period of one year after it been operated [5]. This has urged the government to form a special cabinet committee to propose a more comprehensive waste management structure such as build an incineration plant in the region, especially within densely populated regions.

2. INCINERATION TECHNOLOGY

Incineration technology attracts the attention of some local and international scholars. Kadir et al. [6]

studied the salient issues, policies and waste-to-energy initiatives of incineration for municipal solid waste in Malaysia. Their analysis shows that the highlights the current issues and future directions as well as energy recovery initiatives associated with incineration of MSW in Malaysia. They also stated that incineration technology is known as waste-to-energy (WTE). In Malaysia, energy recovery initiatives are focused on the application of WTE as well as refuse-derived fuel (RDF) technologies. Aspects regarding MSW landfill gas capture and energy generation are also discussed since they may directly influence (or potentially compete against) the widespread adoption of RDF technologies. A relatively successful RDF pilot plant in Semeyih, Selangor, Malaysia is highlighted in their studied as a case study.

Besides, Manaf et al. [7] discussed practices and challenges of municipal solid waste management in Malaysia. They stated that the new promotion of solid waste management plan in Malaysia not only enhances social, economic and environmental efficiency, and promotes sustainable development, but it can also help resolve the dual crisis of nonrenewable resource depletion and environmental degradation. With the new legislative and institutional framework, the efficiency of solid waste management in Malaysia will be increased towards achieving Vision 2020 as a developed country.

Furthermore, Zhao et al. [8] evaluated the technology, cost, a performance of waste-to-energy incineration industry in China. Based on the development status of WTE plants in China, they make an analysis of the WTE incineration industry from two aspects. The one is the analysis of political, economic, social and technological (PEST) factors that influence the external and internal environment of this industry. The other one is the discussion of technologies, costs and performances of some WTE plants in China, including a detailed cost-benefit analysis. It proves that the external environment is conducive to the development of WTE incineration industry and this industry is faced with good market prospects. Thus, WTE plant has good profitability and economic benefit. Besides, WTE incineration has significant contribution to environmental benefits.

This study aim to generate experts' opinions by adapting PESTLE analysis approach to explore and investigate the suitability of implementation

incineration technology in Melaka to overcome the current problems such as the limitation of insufficient land resource and pollutants environment due to an inefficient and ineffective of landfills waste management.

3. METHOD

This study uses qualitative method by interviewing the top management of Melaka Green Technology Corporation (PTHM). PTHM is the secretariat for Melaka Green Technology Council which deal with matters related to municipal solid waste management in achieving the theme zero waste in Green City Action Plan for Melaka. The interviewing containing the questions about suitability to implement incineration technology for large scale in Melaka by adapting the PESTLE (Political, Economic, Social, Technology, Environmental and Legal) framework. PESTLE is an important tool used for market and environmental analysis and to support strategic decision making [9].

4. RESULTS AND DISCUSSION

The result shows that the incineration technology gained great positive comments for political, economic and technology factors due to the deficiencies of current landfills disposal method. Landfills disposal are associated with many problems, including the need to use large areas of land and the production of leachate, which has been shown to leak from landfills and pollute groundwater. Landfills also are known to produce a lot of methane which a great potent increase greenhouse gas emission [10]. Moreover, MSW incinerators are able to generate energy from wastes in the form of electricity or heat generation. Furthermore, incineration plant also can be promoted as tourist attraction such as Maishima Incineration Plant in Osaka, Japan [11].

Nevertheless, incineration technology received high negative impact on social, environmental and legal factors. In the absence of effective controls, harmful pollutants such as dust, dioxin, furan, mercury, arsenic, and lead might be emitted into the air which may affect environment and human health [12].

5. CONCLUSION

This research indicates that implementation of incineration technology in Melaka can overcome the problem such as the limitation of insufficient land resource and environmental issues brought by landfills disposal method. On top of that, with the improvement of heat recovery after incineration, this system makes it possible to efficiently generate clean electricity. This enabled Malaysia's incineration plants especially in Melaka to become safe and sound while generating electricity efficiently like other developed country such as Japan.

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Re-engineering of accounting information system as a tool for performance improvement

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Keywords: Re-engineering; accounting information system; performance improvement

ABSTRACT – The aim of paper is to explain how re-engineering of Accounting Information System (AIS) can improve performance of hospital. We use the Unified Modeling Language (UML) for re-engineering AIS, after previously using MYOB Accounting application. The research location is a private hospital in Indonesia. All software developed using UML especially for database server MySQL and PHP as the compiler. Research Methodology designed by Qualitative. Data collected by outside observation and relevant documentation. The finding research show improvement of hospital performance: register a new patient, make copies of receipts and prescriptions, setting up the bill patients, patient receipts print out. The fourth indicator shows shorter working time.

1. INTRODUCTION

The increasing number of patients in hospital also cause pressure on the administration. The administration and finance division is no longer able to serve the patients well. Many patients are less satisfied with the hospital service. Administration and Finance division includes a series of processes activities such as recording patient data, medical records recording, the recording of the cost of medical services, bills management, checkout/check-in cash and bank, as well as accounting. The complexities of an administration and finance as well as an increase in patients with a variety of problems that often accompany it have an impact on services to the patient so that it becomes old and inaccurate.

Administrative and financial conditions are slow and inaccurate can be addressed by implementing the computerized AIS. Applying the RS activities in computer programs by using MySQL for its database and using PHP as its compiler expected these problems can be solved with a relatively short time, about 2-5 minutes, or even less with a maximum error rate 5% [1].

2. METHODOLOGY

This study was run using a qualitative approach with the experimental method. Collecting data with documentation and observation. AIS has done re-engineering where using the application for MYOB Accounting into AIS that we have created with using MySQL and PHP are implemented at four in the

activities, Namely: 1) registration of patients new, 2) Make a copy of the receipt and prescription, 3) Patient Bill, 4) Print patient Acceptance. Before the completion of the recording time, the operator and the parties were given an explanation and understanding of the purpose and the technical operation of the new AIS as well informed about the ideal time of completion of each activity. Documentation is done by recording the time of completion of each activity is being carried out to maintain the validity of the observation and reliability of this research. Validity means that transactions are in accordance with the new AIS. Reliability in this research is the accuracy of the completion of each activity relationships by setting the ideal time as the time control the correct completion of activities in accordance with the new AIS has done re-engineering.

3. RESULTS AND DISCUSSION

The results of the experiment records for four activities are as in Table 1. Preparing a bill is shorter turnaround times. This poses a tremendous satisfaction for employees, especially nursing personnel section who daily do the job. This activity requires a high concentration, because during this time the work was carried out by the head of the nursing manually by moving and copying files medical treatment given to the patient, calculate the units of action, cherish every action appropriate tariff rates, multiplying thus becomes the unit of bill. Similarly, preparing print-out of receipts patients could actually saved. The cashier was afraid to make mistakes that result in errors chain on the financial accounting system and hospital. This condition brings of confidence that the software they use is really useful and will certainly speed the completion of the task. In the front office, the satisfaction of conditions of executive power after this re-engineering AIS.

During the front office clerk will record the patient's hand of cards that have been provided. At the same time the front office staff also noted a new patient data in patient book also manually by hand. These conditions give rise to feelings of twice the work for the same purpose. After that, with a new patient data input into a computer, it can be molded into a patient card has been provided and delivered to the patient to be stored and used when printing the bill or when the patient came back to the hospital. The data is also stored in the

data-base of the patient, so that the front office no longer noted in the patient. Work in the field of pharmacy or dispensary also faster for preparing print-out receipt and a copy of the recipe. Next if the operator has been accustomed to then be accelerated again so approaching the ideal time. This time savings can be utilized by the room attendant to serve the patient's family medicine or drug buyers with a better and more friendly for the administrative work can be done faster and more accurately. The accuracy of the results of the work because the operator simply enters quantity of drugs and medical supplies, while the price per unit will present itself in accordance with the price that has been dentry by the head of the Accounting and Finance.

Table 1 Outcomes 4 activities before and after re-engineering of AIS.

Activity	Before	After	Ideal
New patient registration	0 hour 05 minutes	0 hour 04 minutes	0 hour 03 minutes
Create receipt and prescription copy	0 hour 10 minutes	0 hour 07 minutes	0 hour 05 minute
Patient Bill	1 hour 05 minutes	0 hour 40 minutes	0 hour 20 minute
Print the patient receipt	0 hour 15 minutes	0 hour 11 minutes	0 hour 05 minute

All four indicators have been selected job is the dominant type of work going on at the hospital. All four types of work is also often a problem delays the administration and become a subscriber complaints the patient's family. Even some of executing the four jobs that are not comfortable to work in part because they felt "hard and heavy" carry out the work. They often complain that the work is hard and still added the risk of patient complaints.

The timing of the completion of the initial activity was referring to previous studies [2] while the ideal time

referring to Romney and Steinbart [3]. Efforts to re-engineering of AIS have been approaching the ideal time because: 1) Use of MySQL server for database and PHP as a compiler turned out better than MYOB Accounting application, 2) The operator of AIS recently been familiar with the old AIS who made the basis for re-engineering. These results were consistent with the predictions Marina and Wahjono [4] which states that continuous improvement will apply when the vision and mission of an organization is determined based cultures living within the organization itself.

4. CONCLUSION

The results of this study indicate that the re-engineering of AIS from MYOB Accounting with a self-designed AIS using the software and programming languages MySQL and PHP can lead to efficiency of time for driving continuous improvement.

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E-Commerce adoption among small and medium enterprises in Melaka

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Keywords: E-commerce; small and medium enterprises; Malaysia

ABSTRACT – Nowadays, the numbers of small and medium enterprises (SMEs) that use e-commerce systems are on the rise. Many have been influenced by the efficiency of internet and have adopted it into their businesses. Thus, the aim for this research is to study the factors that affect the adoption of e-commerce in SMEs in Melaka. A survey has been conducted among the SMEs at Melaka to identify the relationship between five dimensions (Perceived Ease of Use, Security, Relative Advantage, Perceived Compatibility, and Top Management Support). Results showed the significance of the dimensions proposed to the adoption of e-commerce in SMEs at Melaka. This research is useful for SMEs and other organizations to determine important factors when considering of adopting e-commerce into their business. Recommendation for future research is researcher can expand other factors that affect the adoption of e-commerce into their business.

1. INTRODUCTION

According to Pham et al. [1], e-commerce has been making significant contributions to reduction in costs of doing business, improved product or service quality, new customer and supplier penetration, and generation of new ways or channels for product distribution. All the benefits not only can be achieved in large company but also in SMEs. E-commerce is developing in the world and influencing all industries. This phenomenon has been expanding because of using the Internet worldwide according to Elahi et al. [2].

The main objectives of this paper are first, to study the key factors influencing the adoption of e-commerce among SMEs. Second, to define the rankings for these factors towards e-commerce adoption among SMEs and lastly to determine the most important factors on the determinants of e-commerce adoption among SMEs.

In this study, the researchers focus on the factors of e-commerce adoption among SMEs in Melaka. The research is mainly to identify the key factors of e-commerce adoption for SMEs. It is intended that the findings of the study contribute towards better implementation of e-commerce among SMEs not only in Malaysia but all over the world.

2. METHODOLOGY

The five dimensions of the factors of e-commerce adoption among SMEs in Melaka have been selected to be identified of their contributions towards adoption. In this study, the researchers choose quantitative research method as the methodological method through questionnaire to collect data from respondents as in previous study [3-4]. Targeted respondents are the SMEs at Melaka who adopt e-commerce. The questionnaire distributed in this study is used to measure the five dimensions stated in the theoretical framework. 200 questionnaires were collected of 219 distributed.

3. RESULTS AND DISCUSSION

3.1 Demographic

First, the researchers present the findings on demographic analysis of respondents. Figure 2 above shows the frequency and percentage of respondent demographic of type of business. Among 200 respondents, the total numbers of respondents that are running production sector business is 88 respondents (44%). The total numbers of respondents that are running service sector business is 112 respondents (56%).

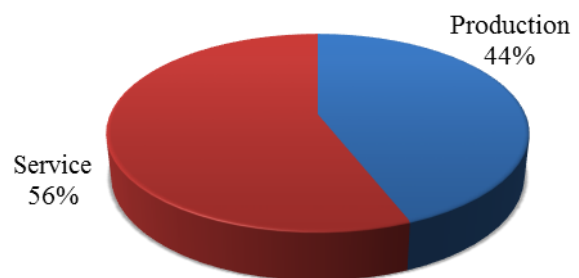


Figure 2 Types of business.

Figure 3 above shows the frequency and percentage of respondent demographic of period of using E-commerce. Among the 200 respondents, 79 respondents or 39.5% respondents is using e-commerce for a period of less than 2 years. 91 respondents (45.5%) respondents are using e-commerce for 3-5 years. The remaining of 30 respondents or 15% of respondents is using e-commerce for 6-10 years.

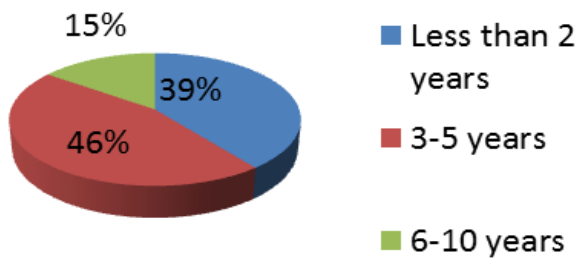


Figure 3 Period of using e-commerce.

3.2 Testing of hypotheses

H1: Perceived ease of use will positively affect the e-commerce adoption among SMEs

Based on the coefficient Table 1, it shows that there is a positive relationship between the perceived ease of use and e-commerce adoption factors among SMEs. The regression coefficient for the perceived ease of use is explained as when there is every unit increase in perceived ease of use, it will lead to the e-commerce adoption factors increase by 0.881 units with $p=.000$. Hypothesis 1 is accepted.

Table 1 Coefficients of perceived ease of use.

Model	Unstdnd. coeff.		Std. coeff.	t	Sig.
	B	Std. Error	Beta		
Constant	.357	.124		2.874	.004
Perceived ease of use	.881	.031	.894	28.086	.000

R²: .799

Dependent variable: Ecommerce adoption among SMEs.

H2: Security will positively affect the e-commerce adoption among SMEs

In Table 2, the P-Value shows the relationship is significant at 0.000 which indicates that the Security has significant relationship with e-commerce adoption. Hence, Hypothesis 2 is accepted.

Table 2 Coefficients of perceived ease of use.

Model	Unstdnd. coeff.		Std. coeff.	t	Sig.
	B	Std. Error	Beta		
Constant	.733	.188		3.891	.000
Security	.808	.049	.760	16.444	.000

R²: .577

Dependent variable: Ecommerce adoption among SMEs.

H3: Relative advantage will positively affect the e-commerce adoption among SMEs

The score of R square is 0.780, showing 78% contribution of relative advantage towards adoption of e-commerce. It is stated in Table 3 that the Beta is .883 while p-value is 0.000, showing significance between the relationship. Thus, Hypothesis 3 is accepted.

Table 3 Coefficients of relative advantage.

Model	Unstdnd. coeff.		Std. coeff.	t	Sig.
	B	Std. Error	Beta		
Constant	.225	.136		1.654	.100
Relative advantage	.915	.035	.883	26.523	.000

R²: .780

Dependent Variable: Ecommerce Adoption among SMEs.

H4: Perceived compatibility will positively affect the e-commerce adoption among SMEs

Table 4 shows that Perceived Compatibility scored (Beta=.887) and ($p=.000$). The p-value is less than 0.001, which shows the significance of the independent variable towards the dependent variable. Hence, the hypothesis is accepted.

Table 4 Coefficients of perceived compatibility.

Model	Unstdnd. coeff.		Std. coeff.	t	Sig.
	B	Std. Error	Beta		
Constant	.531	.122		4.338	.000
Perceived compatible	.851	.031	.887	27.084	.000

R²: .787

Dependent Variable: Ecommerce Adoption among SMEs.

H5: Top management support will positively affect the e-commerce adoption among SMEs

In Table 5, the P-Value shows the relationship is significant at 0.000 which indicates that the Top Management Support has significant relationship with the adoption of e-commerce in SMEs. Hence, Hypothesis 5 is accepted.

Table 5 Coefficients of top management support.

Model	Unstdnd. coeff.		Std. coeff.	t	Sig.
	B	Std. Error	Beta		
Constant	.147	.148		.995	.321
Top management support	.916	.037	.871	24.927	.000

R²: .758

Dependent Variable: Ecommerce Adoption among SMEs.

From Table 6, all of these variables are having high relationship in which all the correlation coefficient is range between ± 0.71 - ± 0.90 . Perceived Ease of Use scored the strongest association with adoption of e-commerce in SMEs at $r= 0.894$, followed by Perceived Compatibility, Relative Advantage, Top Management Support and Security. Perceived Ease of Use also proved to be the most important factors on the determinants of e-commerce adoption among SMEs through the R square value where it contributes 79.9% to the adoption factor.

Table 6 Correlation of independent variables and dependent variable.

Variable	AD	EOU	SE	RA	PC	TMS
AD	1.00					
EOU	.894*	1.00				
SE	.760*	.824*	1.00			
RA	.883*	.915*	.786*	1.00		
PC	.887*	.921*	.759*	.912*	1.00	
TMS	.871*	.911*	.787*	.885*	.902*	1.00

Notes: AD, EOU, SE, RA, PC and TMS denote Adoption of e-commerce, Perceived Ease of Use, Security, Relative Advantage, Perceived Compatibility, and Top Management Support. *Significance at 0.01 (2-tailed)

4. CONCLUSIONS

The purpose of this study is to investigate the factors that affecting the e-commerce adoption among the SMEs in Melaka. The study is carried out to fulfill the research objective of this research, the researcher is able to fulfill all the objectives by applying through the correlation, reliability and regression test on the relationship of e-commerce adoption factors among SMEs with the independent variables which are perceived ease of use, security, relative advantage, perceived compatibility, and top management support.

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The role of experiential learning of facilitating business plan simulation in entrepreneurship education

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Keywords: Experiential learning; business simulation; entrepreneurship education

ABSTRACT – This paper objective to explore the role of experiential learning as one of the factor that facilitate the business plan in simulation. The business plan simulation has been developed using VBA function in Microsoft Excel to enhance student understanding in preparing business plan for technological entrepreneurship education. We have been run the simulation among 108 engineering students and the result is the experiential learning facilitate the most and play crucial role in enhancing their learning.

1. INTRODUCTION

The existing pedagogy to entrepreneurial education is focusing ‘about’ entrepreneurship [1] the approach is still unclear and the possibility still arguable [2]. Almost all the entrepreneurship outcome is to enable the student to prepare effective business plan [3] and agreed by [4] that business plan is a major courses provide in entrepreneurship education. Business plan course can bring into the focus ‘for’ entrepreneurship. The course itself is an experiential learning [5] and support by [6] that that technique focus on hands-on activities.

The entrepreneurship course take by engineering student called technology entrepreneurship [7] require them to prepare business plan. Business plan act as planning process outcome [8] that offer roadmap for potential investor [9] and also useful to predict future challenge [10]. The idea of business plan simulation is to make the business plan as integrative tools [5] because the business plan itself is a process of simulation [11]. The design of this simulation follow previous literature using spreadsheet [12–16] to make the simulation interactive we apply the VBA (Visual basic Application) adapt from [17–19]

The Business Plan Simulation Model adapting the use of logic model [20-21] and use experiential learning [22] constructive theory [23] and the outcome suing bloom taxonomy [24]. Figure 1 show the Logic Model of the Business Plan Simulation. The experiential part touch on the level of student participant, perceive the quality of simulation, degree of involvement, quality of instruction, group interaction, level of acceptance and satisfaction.

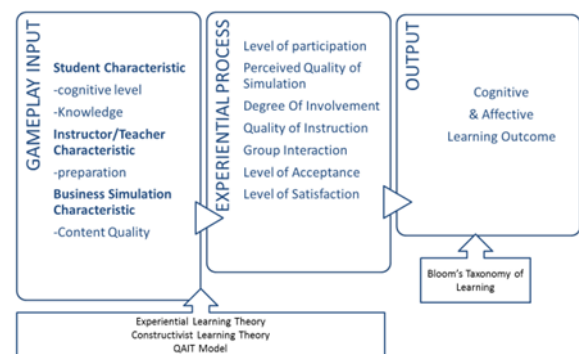


Figure 1 Business plan simulation logic model.

2. RESULTS AND DISCUSSION

SPSS use to analyse the data collected after the students use the simulation. The statistical measure using regression analysis show that the R-Square (on Table 1) from the model summary is .767 are close to 1. This regression equation (on Table 2) carries the meaning of the Business Simulation predict base on the following equation: Business Simulation score = -.082 (game) +.300 (student) + .049 (educator) +.215 (infrastructure) +.506 (experiential) + 6.780. Experiential learning score (Beta = .506, p,.05 are the best predictor that significant as compared to another score with the overall of R square .767.

Table 1 Model summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.876 ^a	.767	.756	2.52737

Predictors: (Constant), infrastructure, educator, student, game, experiential.

Table 2 Coefficients.

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
(Constant)	-3.517	2.327			-1.511	.134
Game	-.059	.055	-.082		-1.069	.288
Student	.306	.071	.300		4.309	.000
Educator	.053	.084	.049		.624	.534
Infrastructure	.348	.102	.215		3.407	.001
Experiential	.400	.060	.506		6.672	.000

Dependent variable: business simulation

3. CONCLUSION

The experiential learning factor contributes most of the simulation learning process by the engineering student is because they had been exposed to many types of simulation in their field. The extent of this business plan simulation highly recommends on the future to enable various role play of each business function to gain more experiential learning. Enhancing their knowledge on business plan course will guide them to understand the business core process as it will be useful to them if they decide to be entrepreneur after graduate.

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The effectiveness of viral marketing towards business Innovation in Malaysian firms

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Keywords: Technical leadership; viral marketing; business innovation

ABSTRACT – This paper objective is to investigate the effectiveness of viral marketing in Malaysia. The study has been done by using quantitative method with 384 respondents from Southern Region Malaysia (Selangor, Kuala Lumpur and Melaka). The result represent a blend of firm skills and business knowledge needed to develop innovative solutions in the fast moving and complex business problems. It's prepared for technical leadership roles and develop the skills to manage emerging technologies and the ability to assess economic needs. The concept of viral marketing towards business innovation shows that the elements of playfulness was the most influential factor that contribute to the effectiveness of viral marketing that exceptional judgement to marketers and firms in Malaysian market.

1. INTRODUCTION

Viral marketing communication is a consumer-to-consumer marketing tactic which employs the internet to encourage individual to pass marketing message to others [1]. The new wave of viral marketing has become the defining marketing trend of the decade [2]. Viral marketing exploits existing social media and networks by encouraging customers to share product information with their friends [3]. However this point of time, viral marketing communication is a new topic and facts about its nature, characteristics and dimensions have yet to be agreed and established [4].

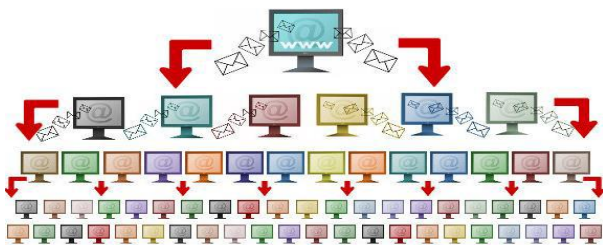


Figure 1 The spread of message with viral marketing.

Figure 1 above illustrates marketing strategy that involves creating an online message that's or entertaining enough to prompt consumers to pass it on other spreading the message across the Web like a virus at no cost to the advertisers [5]. According to [6], the great majority of business decision-maker feels it is now

much more difficult to manage news flow and reputation and that the internet, social media, and need to respond extremely quickly are key challenges. [3] echo the sentiment that inappropriate use of viral marketing can be counterproductive as it can create unfavorable attitudes toward products. To measure real viral marketing is a challenge because real viral marketing takes place in private conversations [7], hence a difficulty to measure what is said and what the effect is of the discussions. Thus, the understanding of viral marketing communication in marketing education is important to explore the effectiveness of viral marketing and its popularity among consumers. This study also determines the factors that influence the effectiveness of viral marketing.

In this study, researchers suggested there were six factors or variables which associate with effectiveness of viral marketing in Malaysia. Those factors are such playfulness, critical mass, community-driven, peer pressure, perceive ease of use and perceive usefulness. Researchers believed that these factors have strong relationship towards the effectiveness of viral marketing. Besides, this study also determine how effectively the consumers implement viral marketing campaigns to improve the fastest communication among consumers using latest marketing technologies. Great communication is important characteristic for business success, thus, software engineer that deal with this technology need to understand the element inside the viral marketing to ensure the effectiveness of their marketing strategy.

2. RESULTS AND DISCUSSION

The researchers used six types of online activities to identify the impacts of online contents that influenced the effectiveness of viral marketing. Those activities are about receiving spam e-mails from friends and people may they knew, sharing videos or online contents on social media, awareness towards the viral marketing campaigns, usage of the social media to share information or sending message to friends and family, read information shared by friends and family on social media and read and shared online message written by friends and people may they knew about products/services on social media. Software engineer spend a ton time to collaborate across those activities. Their job

often involves working across many parts of company communication with product management, support, operations, sales, customer, service and others.

According to [8], the average American household received nine email marketing messages a day in 2004. This comes down to 3,285 emails a year. Based on the result of this research, many people receiving spam emails and it means viral works were effective in Malaysia. Therefore, when a viral is received multiple times by one person, this could backfire by weakening the credibility of the viral as well as the brand, product or service the viral is referring to [3]. But People have learned to tune out a lot of standard marketing (spam), but people typically trusted and act on recommendations from friends. Based on the findings, the researchers concluded that these online activities were positively effects on viral marketing campaigns. This showed that, respondents were undergoing through viral marketing campaigns and attributes in their daily life on social networks.

Based on the output of Multiple Regression, the significance of playfulness was $0.000 < 0.05$. It concluded that the playfulness has strong significant relationship on the effectiveness of viral marketing. This significant of community-driven generate from SPSS was 0.034 which less than P value 0.05, it can be concluded that the community-driven has significant relationship on the effectiveness of viral marketing. The significance of perceive ease of use was $0.002 < 0.05$, this showed strong significant relationship between independent variables and dependent variable. Therefore, it can be concluded that perceive ease of use has significant relationship on effectiveness of viral marketing. Besides, the significance of perceive usefulness was $0.000 < 0.005$, this showed strong significant between independent variables and dependent variable. Therefore, it can be concluded that perceive usefulness has significant relationship on the effectiveness of viral marketing.

The result of this research is supported by The Model Deep Social Media use [9] stating that play is regarded as an intrinsic motivation for users who find interest and fun when using Facebook. According to [10], web sites that enhance visitors' perceived sense of control, entertainment, interactivity, and brand experiences are most likely to draw out positive consumers' attitudes. The results of the current research are in compatible with the results of [11] as entertainment adds value for customers and increases customers' loyalty thus, resulting in a positive attitude towards viral marketing.

3. CONCLUSION

This research was investigated the potential level on six variables that influenced the effectiveness of viral marketing. Viral marketing campaigns that were based around entertainment, surprise, and joy have a major impact on consumers' response towards them. Therefore, customers show positive response towards funny and amusing messages. Design a good viral

marketing campaign can develop the better understanding and boost the spreading of viral contents on social networks among consumers and also enhance the understand of marketing elements among engineers. Those elements need to be understand by the engineer to communicate well and continue to invest in improving communication skills. This investment will pay big dividends in the future especially in the development of technical leadership to manage emerging technologies.

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International business expansion strategy: The review of UAE family business

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Keywords: International business expansion; family business; UAE

ABSTRACT – Internationalization has become a key strategy of family businesses (FB). It is important for family business to expand their operations internationally to become competitive. This research examines the internationalization strategy of the family business in UAE in comparison to other countries. It provides a notion of the strategies used by family business in UAE to expand their operations in international markets. The findings of this study indicates that family businesses in UAE use joint venture, acquisitions, exporting, wholly-owned subsidiaries and franchising strategies. While, other countries' FBs use other approaches including foreign direct investment (FDI), mergers and acquisitions (M&A), strategic alliances, exporting and franchising.

1. INTRODUCTION

Internationalization refers to the most critical strategy used by any firm, but it has become an important strategy significantly [1]. The main reason behind internationalization is to own to growing market globalization, including family businesses or family Small and Medium Enterprises (SMEs) that were focused on the domestic market in the past. Various countries have been identified in relation to the use of internationalization strategy, but limited research has been done to evaluate the strategy with respect to family businesses. Fernández and Nieto [2] posit that international expansion is usually based on the opportunities present in international markets that can be exploited to achieve competitive edge. They [2] further elaborates that small and medium family businesses face various issues in relation to internationalization. This research is to examine the internationalization strategy of the family business in UAE in comparison to other countries.

2. METHODOLOGY

Ahamat & Chong [3] suggest that research methodology is an element which allows any researcher to systematically frame the study to address research questions and achieve research aims. Della Porta [4] posit that research refers to a collaborative human activity in which social reality is observed on objective basis with the focus on gaining a valid understanding of it. There are three major types of research methods, such

as qualitative research, quantitative research and mixed research. Creswell [5] stated that qualitative research method is an approach in which the researchers make knowledge claims based on constructivist perspectives that is different meanings of person's experiences that are developed socially and historically with the focus to design a theory of pattern. Hall [6] indicates that the quantitative approach is based on positivist perspective that consider it important to develop the focus of a study on observable facts. Mixed methodology is the combination of the qualitative and quantitative approaches. For this study, quantitative research method is used to collect primary data.

The population of the study is the top family businesses in UAE. On the other hand, the sample of the study is the 20 managers of top 10 family business in UAE. The sample was drawn with the help of random sampling to reduce bias and error and to equal chance to every participant. There are two types of data that need to be collected to conduct the study namely primary and secondary data. While, primary data is collected through questionnaire, the secondary data is collected through books, journals, reports and websites. This instrument is used because it is an inexpensive way to collect data as well as it is feasible in terms of convenience. The questionnaire included 10 close ended questions to be answered and to evaluate the situation of family business in UAE that use different strategies to internationalize their businesses. An informed consent was sent to the participants of the study to provide them assurance that their data will be kept private and their confidentiality will not be compromised. The collected data was then compiled and analyzed.

3. RESULTS AND DISCUSSION

The result indicates that most of the participants (80%) are interested in the internationalization process to expand their operations. On the other hand, 20% showed no interest in internationalization. The results are supported by Jabeen and Katsioloudes [7] and Shahid et al. [8]. The second element's examines the factors that influence the FBs to internationalize. In response, 20% of the participants identified that they internationalize their businesses due to globalization, 10% stated growing factor, 20% described factors of competition, 10% indicated the factor of increasing

market share and 40% stated that they internationalize due to all these factors. The result is supported by Fernández and Nieto [2] and Kontinen and Ojala [9].

The third element investigates the perspectives used by FBs to internationalize their businesses. 40% of the participants stated that they use economic perspective to internationalize their family businesses. 20% indicated process perspective, 20% rational perspective and 20% capabilities perspective. While the fourth context examines the modes of internationalization. In turn, 10% participants stated joint venture, 10% merger and acquisition, 10% franchising, 10% exporting, 10% wholly-owned subsidiaries, and 50% said all types of modes are used to internationalize FBs. These result reflects the notions of Fadol and Sandhu [10], Bell et al. [11], and Plakoyiannaki et al. [12].

The fifth was about the strategy used by Australian FBs. 40% participants stated that Australian firms mostly use exporting to internationalize their FBs. 20% said joint ventures, 20% merger and acquisition, and 20% franchising. Hence, the sixth element was about the strategy used by Japanese firms to internationalize the FBs. 60% participants indicated that Japanese firms use sequential acquisition to internationalize their family businesses. 20% full-scaled acquisition, 20% merger and acquisition and 10% franchising and exporting as supported by Graves [13]. The seventh element investigates the strategy used by Middle East FBs (i.e Bahrain and Oman). In response, 20% stated that these countries use joint ventures, 20% stated franchising, and 60% stated that they use both of them. Mellahi et al. [14] and Mostafa Khan and Jamal Uddin [15] supported these results. The last factor examined the most popular strategy used by UAE FBs. In turn, 40% participants stated that UAE FBs use joint ventures to expand the operations in international markets, 20% stated franchising, and 40% acquisitions. The results are similar to studies done by Hvidt [16], Nasra and Dacin [17] and Shahid et al. [8].

4. CONCLUSION

It can be concluded from the above findings and discussion that internationalization is now important for every type of business like FB. Nevertheless, the globalisation has shaped the way business being run in the competitive environment. The major reasons identified that restrict UAE FBs to internationalization include fear of losing control, culture, and lack of resources, skills and capabilities. Hence, it is a challenge for UAE FBs to adopt abrupt structural business and culture changes in response to globalisation and internationalisation.

Ahamat and Chong [18] indicates that discovering and creating business opportunities for new venture creation are critical in shaping entrepreneurial actions and the intent to create potential business opportunities. Thus, to remain competitive, UAE policy makers may consider entrepreneurship educations and business initiatives to stimulate entrepreneurship activities both at the local and national levels. This could be done by promoting entrepreneurship at schools, colleges and

universities in UAE to develop a strong entrepreneurship ecosystem within the community. Further research on family business in UAE employing personal observation and in-depth interviews across different generations would be useful to examine the questions of FBs transgenerational changes and its impact on UAE economy.

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Information technology utilization for supply chain reengineering

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Keywords: Information technology; supply chain reengineering; competitive advantage

ABSTRACT – The emergence of information technologies (IT) has created numerous opportunities for supply chains reengineering. The utilization of IT in supply chain reengineering can contribute to competitive advantage, however, little attention was given, specifically in manufacturing industry. Therefore, this study examines the level of IT as a tool for supply chain reengineering to achieve competitive advantage among Malaysian manufacturing companies. Questionnaire was distributed through online survey and face-to-face. The results show that supply chain reengineering through IT utilization have a significant relationship to competitive advantage. This research contributes to the literature from past studies in achieving competitive advantage through supply chain reengineering.

1. INTRODUCTION

Supply chain management (SCM) defined that, as a marketplace demonstrated that competition in the market place is tough, companies in various sectors should focus on supply chain as a mean to survive [1-4]. However, managing supply chains are a challenging task because of barriers in the supply chain known as uncertainties. Uncertainty occurs in companies because managers miss out to pay attention for the potential increased in delivery delays and quality in the global supply chain networks [5].

The emergence of information technologies (IT) has created the opportunities for better SCM and has been used to facilitate business-to-business communication and coordination among supply chain partners. Notwithstanding the significance of information flow in supply chain management creates the impression that the level of information sharing, information quality and IT tools utilization still has not achieved the perfect ideal state. Moreover the interest in IT base can be excessive and this can be a major prevention to few firms. Furthermore, strategic information which is important in decision making is viewed as a restrictive property and can't be imparted with supply chain members. Information might be withheld because of the privacy of the information. This influences the supply chain perceivability and performance.

IT conceivably enormous driver of performance in the supply chain, as it directly influences each of the other drivers. Information management has the chance for supply chains reengineering, therefore supply chain

is more light-footed and more effective.

Reengineering has been adopted by many companies in order to improve their competitive position and increase their ability to provide customer satisfaction. Hammer [6] introduced the concept of reengineering as a way to "break away from the rules are outdated and basic assumptions underlying operations". Re-engineering of the supply chain is very pivotal in present [7]. Clark and Hammond [8] discussed the potential improvement in the supply chain of reengineering channel restructure the supply chain so that reengineering can be described as best option. Since reengineering results in a fundamental change in the way which the company conducts business activities, it is important that the reengineering program to develop processes that support the achievement of competitive advantage [9]. In addition, to achieve a competitive advantage, it is important that the reengineering program to develop processes that lead to higher levels of customer satisfaction and needs. This study will therefore examine the awareness and level of IT as a tool for supply chain reengineering to achieve competitive advantage.

1.1 Information technology and competitive advantage

As stated by Melo et al. [10] globalizations for economic activity clinched to fast advancement in information technology bring shorter product life cycle and more diminutive considerable measure of clients in terms of inclination. This viewpoint prompted in vulnerability and result in robust and well developed for supply chain become more vital. IT supply chain management of the most typical effect is to reduce friction between the supply chain partners through cost-effective flow of information [11].

Referring to Simchi-Levi et al. [12] in supply chain management, information technology makes a tremendous opportunity to create straight operational benefits from strategic advantage. It changes industry structures and even the rules of competition. Information technology is the key to business by implementing a centralized strategic planning and day-to-day operational focus to create strategic advantage of support. In addition, the supply chain is becoming more market-oriented by the use of IT.

H1 There is a positive relationship between information technologies to influence the competitive advantage.

1.2 SCM Awareness and competitive advantage

Supply chain awareness' simply means to understand the whole supply chain and its core processes and problems, as opposed to only understand and focus the own company's problems and neglecting the effects of the own company's behavior has on the entire system [13]. SCM awareness in organization it is to the requirement for interconnectedness and connections among accomplices that has brought forth an extensive variety of literature and research in the region of supply chain management [14]. Traditionally, this was an area that was very much confined to the background of a business' operations, with customers having little awareness of or interest in where products and services were sourced from.

H2 There is a positive relationship between SCM awareness to influence the competitive advantage.

2. METHODOLOGY

Respondents for this study were selected from the Federation of Malaysian Manufacturers online index databases in manufacturing industry. The questionnaires were distributed to 300 Malaysian manufacturing industries. Moreover, past studies have exhibited that senior managers or top management staff are more knowledgeable and can give valid and reliable information. The responses were received from 150 organizations through an online survey.

A multiple regressions analysis was conducted using SPSS version 21. As a way to collect data, researchers used online web-based questionnaire as the primary mechanism for the collection of data using online survey. In order to generate measurement items, descriptive research can utilize certain techniques including literature search, empirical study, and insight stimulation [15]. For this study, the questionnaire was outlined after an extensive review of the literature, focusing on generating several details that reveal the core theoretical constructs.

3. RESULTS

The hypothesis testing of Table 1 reveals that information technology has a significant relationship with competitive advantage in its current form. Information technology is significant that influence the competitive advantage in its current form as the significant value is <0.05 . The results show that the alternative hypothesis is accepted as a result rejected by the null hypothesis. It can be concluded that there is a positive relationship between information technology and competitive advantage is .007 in its current form. Hypothesis testing assumes that they are defined as assertions or conjecture about a population parameter, such as mean or variance of the normal population. A positive relationship between information technology and competitive advantage is significant (sig .007). Finally, the relationship between SCM awareness and competitive advantage showed positive relationship and the result is significant (sig .002).

Table 1 Hypothesis testing.

Variable	Significant
Information Technology	.007
SCM awareness	.002

In an exploration venture that incorporates a few variables, previously knowing the means and standard deviations of the dependent and independent variable, we might frequently want to know how one variable is identified with another. A Pearson connection matrix will give this data, that is, it will demonstrate the course, quality, and significance of bivariate correlation relationship between information technology and competitive advantage. The correlation coefficient is at 0.163 for information technology and competitive advantage in its present form, as shown in Table 2.

Table 2 Correlation analysis.

Variable	Significant
Information Technology	0.163

4. CONCLUSION

This study addressed the fundamental to have better understanding on utilization of IT for supply chain reengineering, which contributed to competitive advantage. This study shows that all respondent is aware of the vital role of SCM awareness to influence the competitive advantage in manufacturing industries. The finding showed that IT has the most significant relationship to competitive advantage. The use of information technology is emerging as an IT allows a great opportunity as the respondents have agreed that it makes great use of the operational benefits [15]. Along these lines of this study offers with the SCM literature writing is the long held conviction that SCM can get competitive advantage in manufacturing industries through supply chain reengineering.

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Developing Melaka mobile units greenhouse gas (GHG) emission profile

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Keywords: Greenhouse gas emission; global protocols; accounting for community emissions; mobile units

ABSTRACT – Having a clear picture of Greenhouse Gas (GHG) emission is essential to understand the spatial emission status and for international comparisons. This study aims to give an overview on how GHG from mobile units were measured and to produce a pioneer results reporting for Melaka. Data was collected from various sources such as federal government agencies, as well as private sectors. Results show that on-road transportations contribute the largest GHG (99.51%), followed by railway (0.38%) and lastly aviation (0.03%). These findings are important to assist the local government to identify the relevant strategies to overcome this issue, as well as to define mitigation programs and led policies to enhance livability in Melaka.

1. INTRODUCTION

Melaka is a growing state with the ambitious target to become a Green Technology City State by the year 2020. Melaka is a growing community and expected to rise the number of population more than 120,000 in between 2011 and 2020. An increase in population most likely will boost the demand for mobile units. Mobile units consist of three main subsectors namely on-road transportation, railway and aviation (landing and take-off) [1]. Other factors such as increasing distances, land use patterns, greater wealth and shortage of public transit options also contribute towards the increase of mobile unit usage especially by personal cars and motorcycles. Mobile units sector grows rapidly because it gives few benefits such as fast access to any geographical location on the world [2].

Nevertheless, increasing demand of mobile unit also bring calamities such as noise pollutions, congestions and pollutant emissions such as carbon dioxide which is one of the main greenhouse gas emission that may cause global warming [3-4]. Carbon dioxide (CO₂), carbon monoxide (CO), methane (CH₄), nitrous oxide (N₂O) and oxides of nitrogen (NO_x) are the examples of the greenhouse gas [5]. The usage of mobile units is believed will contribute towards rising the source of greenhouse gas emission such as carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) as well as ozone precursor gases such as carbon monoxide (CO), oxides of nitrogen (NO_x) and non-methane volatile organic carbon (NMVOC) [6].

Vehicles that run on combustion of petroleum-based products (like petrol) emanate carbon dioxide, one of the greenhouse gases associated with climate change. Fossil fuel burnt from mobile unit produced carbon dioxide [7]. Due to its abundance, carbon dioxide is believed to be the most critical greenhouse gas emission [8].

In order to encounter this problem, it is vital to understand and measure the total of greenhouse gas that already emitted to the atmosphere. This study tends to understand and analyse the total emissions that come from the mobile units.

2. METHOD

Four processes and guidelines have been applied to measure the greenhouse gas emission. The first process is to follow the global protocols and principles, next is to follow the guideline of accounting for community emissions by using the Harmonized Emission Analysis Tool Plus (HEAT +) for calculation purpose and finally, to use the variables in the greenhouse gas emission inventory as targeted variables to be measured.

2.1 Protocols and principles

The GHG inventory must comply with the approved principles of the Global Protocol for Community-Scale Greenhouse Gas Emission (GPC). It provides methodologies to aid the local governments in calculating the GHG emission and limits within the geographical boundaries.

The GPC has developed by cooperation of International Local Government Greenhouse Gas Emission Analysis Protocol (IEAP) (developed by ICLEI in 2009), World Resource Institute (WRI), ICLEI, and the C40 Cities Climate Leadership Group (C40) – supported by the World Bank Group, UN-Habitat and UNEP. The GPC is an international protocol that is formalized for the international standard of reporting for the sub-national governments across the world. The GPC measure emissions at the community level which has different needs and abilities in compiling inventories from national level.

The emissions are this study were calculated according to scopes, which is covered greenhouse gas (GHG) emissions from on-road transportation occur

within community boundary and produced through fuel combustion.

Top-down approach was chosen in this study to measure emissions because this approach is the most preferred by communities as the starter choice. This approach used fuel consumption as a proxy for travel behavior. Fuel consumption can be determined by how much of fuel sold to consumers. Emissions from the on-road transportation is calculated by multiplying GHG emissions factor for each types of fuel with total fuel sold.

2.2 Accounting for community emissions

Accounting for community emissions is a wide inventory and very helpful tool in establishing mitigation plans for the entire community. The community-level inventory includes emissions from community activities within Melaka boundary. Emission sources came from the stationary units, mobile units, waste units and agriculture, forestry and land use (AFOLU). The community-wide energy and emissions data also include energy consumptions and greenhouse gas emissions from facilities.

2.3 Harmonized emission analysis tool + (HEAT +)

HEAT + is a software package that uses a country-specific emissions coefficient data sets. It also aids the local governments to develop the GHG emission inventory, forecast growth of these emissions for coming year, evaluate GHG emissions reduction policies and ensure the action plan to reduce the GHG emission is ready. HEAT + provides an exceptional software environment to prepare a specific GHG inventories for a city in evaluating the benefits of policies for establishing the comprehensive action plans.

2.4 GHG inventory

Carbon dioxide (CO₂), methane (CH₄) and nitrogen oxide (N₂O) are used in this GHG inventory. These gases contribute nearly 99% of the world GHG emissions. The GHG inventory has been set up in terms of every Individual GHG emissions and the total carbon dioxide equivalent (CO₂e) emissions. To arrive at the CO₂e, the global warming potential (GWP) of every gas involved for a 100-year timeline is factored. The GWP gives the impact on the climate change by increasing temperature at the atmosphere, for every greenhouse gas (GHG) with reference to carbon dioxide (CO₂).

Methane gas has 12 years of lifetime and has 25 GWP for 100 years while Nitrous Oxide gas has 114 years of lifetime and has 298 GWP for 100 years. For emission factor that shown in Table 1, the value depends on the type of fuel use.

For activity data, it depends of the how much fuel sold on that particular year to generate the total fuel sold. It can be represented as TJ (Terajoule) or MJ (Megajoule). In order to estimate the GHG emissions, emission factor and relevant activity data are required. $GHGA = EFA \times DA$; where, GHGA = GHG emissions resulting from activity A. EFA = emission factor for activity A. DA = data for activity A.

Table 1 Emission factor of each fuel.

Road transportation	Emission factor		
	Carbon dioxide (tC/ TJ)	Methane (kg/ TJ)	Nitrous oxide (kg/ TJ)
Natural gas	15.3	50	0.1
Petrol (gasoline)	18.9	20	0.6
Diesel	20.2	5	0.6

Where: tC-Tonnes of carbon, Kg-kilogram, TJ-Terajoule

Energy consumptions and the direct GHG emissions from the particular activity determine the emission factor. Emission factor is differed over locations or even for differ technologies. For instance, the emission factor per km travelled would differ depending on the engine characteristics of the vehicle, fuel characteristics, driving style, weight of the vehicle and traffic patterns prevalent. In getting the accurate estimation of the GHG inventory, it is vital to use the suitable emission factor according to the location.

3. RESULTS AND DISCUSSION

There are many factors that contributed towards the direct GHG emissions such as volume of fuel, type of fuel used, mode of transportation, volume of traffic, type of vehicle and vehicle technology itself. The direct emission can be calculated by multiplying the fuel sold with the specific GHG emission factor for the fuel.

For the GHG emission side, the total GHG emissions from the transport sector were 1,165,109 tCO₂e in 2013 as shown in Table 2. Petrol and diesel consumptions by road transportations were the dominant contributors towards GHG emissions. Petrol was the most contributor towards the GHG emissions, which contributed around 58%, followed by diesel which contributed around 40% of the overall transport sector's GHG emissions.

Table 2 GHG emissions from mobile (fuel) combustion in transport sector 2012-2013.

Emission Source	GHG emission (tCO ₂ e)	Share (%)
Petrol (on-road)	684,331	58.70%
Diesel (on-road)	475,935	40.80%
CNG/ NGV (on-road)	46	0.00%
Diesel (public bus service)	21	0.00%
Diesel (rail)	4,412	0.40%
Landing and take-off - LTO (Aviation)	363	0.03%
Total	1,165,109	100%

4. CONCLUSIONS

Melaka Green Technology Corporation (PTHM) is the pioneer Malaysian government agency that have succeed in producing the measurement of GHG emissions in Melaka which is consider the pioneer in Southeast Asia. Hence, this study aims to give an

overview of the process and methodologies that has been employed by the PTHM to capture the GHG emissions from mobile units. This study essentially gives a significant contribution of ideas and guidelines for the other countries especially developing countries which in the midst of finding on how or where to start to measure their country's GHG emissions. Furthermore, this research has reported the pioneer GHG results from Mobile Units in Melaka. These findings are important to produce the Melaka mobile units' GHG profile and this information can assist the government to identify the relevant strategies and define mitigation programs as well as led policies to enhance livability in Melaka.

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UTeM undergraduate students' satisfaction on u-learn e-learning system

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Keywords: E-learning; information system; user satisfaction; institute of higher learning; Malaysia

ABSTRACT – This study investigates the factors influencing UTeM undergraduate students' satisfaction on u-learn e-learning System. The study adopted quantitative method to collect data and analysis, where 120 respondents from UTeM's students were chosen to answer the questionnaire survey regarding their satisfaction towards the said factors. From the result, there is a positive relationship between the four factors with the user satisfaction. In order to develop the high user satisfaction, the information system department of UTeM should look into the entire factor that has significantly influenced the user satisfaction.

1. INTRODUCTION

E-learning as a teaching and learning strategy has provided a lot more opportunities for students in the learning process and may have contributed to their academic performance. This allowed flexibility to accommodate part-time study in or out of the classroom. Flexibility in e-learning allow student to learn on their own pace and provides wide access to the additional materials at anytime and anywhere. E-learning strategies have been introduced into public universities in Malaysia since 1996 [1]. The study explored the scope of e-learning as supplementary tool in delivering lessons. There is still no measurement that revealed the students' level of satisfaction with the use of u-learn e-learning System in FPTT, UTeM. Without the knowledge of students' satisfaction level, instructors will not be able to fully understand whether u-learn have meets its objectives and purposes, or its components require improvement [2-3].

The aims of the study are; 1) to study the relationship between the factors and students' satisfaction with u-learn; 2) to determine the most prominent factor that influencing students' satisfaction on u-learn; 3) to measure students' satisfaction towards u-learn e-learning System.

2. METHODOLOGY

2.1 Theoretical framework

Allen [4] indicated that it is very important that an e-learning delivery method match different types and levels of learning. This statement is supported by Shea et. al., [5] which indicate that student satisfaction is further enhanced when instructor focus on instructional delivery methods that promote student autonomy.

Northrup [6] suggests that students are expected to be more satisfied in distance learning environments if the course materials are relevant and useful, and involve real life examples, facts, and cases. Despite of that, the characteristics of course content also contributes to distance learning satisfaction [7].

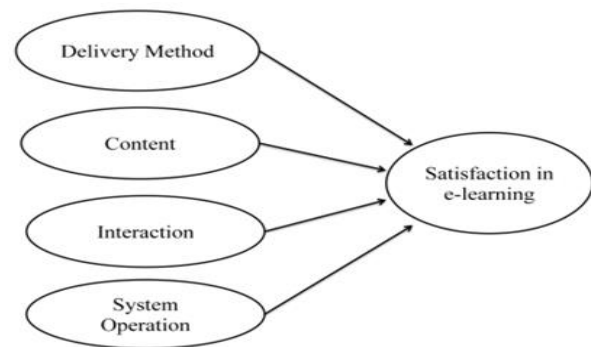


Figure 1 Theoretical framework of satisfaction in e-learning.

Hong [8] demonstrates that there is a positive relationship between students' satisfaction with student-instructor interaction and student-student interaction. Arbaugh [9] suggests that the more learners perceive interaction with others, the higher the eLearning satisfaction. This showed that interaction can influence student satisfaction in e-learning.

Many researchers agreed that learners' satisfaction rates increase with e-learning compared to traditional learning, along with perceived ease of use and access, navigation, interactivity, and user-friendly interface design [10]. Piccoli et al. [11] proposed that technology quality and Internet quality significantly influence satisfaction in e-learning.

2.2 Hypotheses

H1: Delivery method influence student satisfaction in u-learn.

H2: Content influence student satisfaction in u-learn

H3: Interaction influence student satisfaction in U-Learn.

H4: System operation influence student satisfaction in u-learn.

2.3 Research design

The research applied the quantitative method as its approach. A selected number of students were selected as the resemblance of the authority of the students at UTeM. The survey method using questionnaires are selected in order to generate quantitative of numerical data on students' satisfaction with e-learning [2-3]. In this study and questionnaire, the following attributes are chosen; attitude, knowledge, and behavior. The total number of respondents who answered the questionnaires were 120, consisting of undergraduate students from seven different faculties: FKEKK, FKE, FTMK, FKP, FKM, FTK, and FPTT. The results were then analyzed using SPSS 2.0.

3. RESULTS AND DISCUSSION

Table 1 shows the value of $R^2=0.580$. This means that the model explains 58.0% of the variance in Satisfaction on u-Learn. To assess the statistical significance of the result it is necessary to look in the table labelled ANOVA. The model in this study reaches statistical significance (Sig = .000, this really means $p<.0005$). The testing hypothesis is shown in Table 2 to 5.

Table 1 Model summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761 ^a	.580	.565	.556

a. Predictors: (constant), delivery method, content, interaction, and system operation

Table 2 Coefficients for delivery method.

Model	Unstandardized Coefficients		Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.812	.267		3.044	.003
Delivery Method	.718	.084	.620	8.547	.000

$R^2: .384$

a. Dependent variable: overall satisfaction

Table 3 Coefficients for content.

Model	Unstandardized Coefficients		Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.499	.255		1.957	.053
Content	.823	.081	.686	10.193	.000

$R^2: .470$

a. Dependent variable: overall satisfaction

Table 4 Coefficients for interaction

Model	Unstandardized Coefficients		Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.718	.198		8.668	.000
Interaction	.484	.069	.545	7.025	.000

$R^2: .297$

a. Dependent variable: overall satisfaction

Table 5 Coefficients for system operation.

Model	Unstandardized Coefficients		Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.081	.241		4.491	.000
System Operation	.647	.077	.613	8.384	.000

$R^2: .375$

a. Dependent variable: overall satisfaction

3.1 Discussion on research questions

The first research question is answered as shown in Table 2 to 5, whereby all the four hypotheses are supported. It means that all the constructs give a satisfaction in e-learning. For second research question, refer to Figure 2.

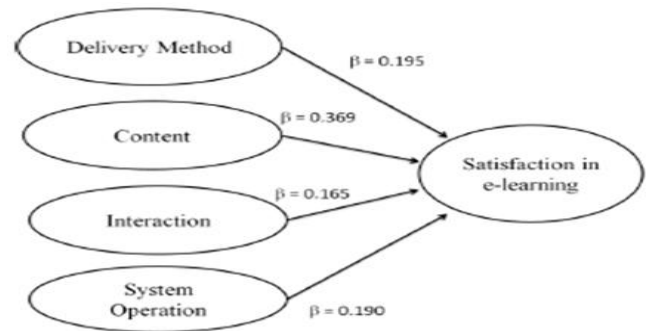


Figure 2 The Regression model between the factors and satisfaction on u-learn.

As seen Figure 2, the highest beta value is of Content ($\beta = 0.369$). This means that this variable makes the strongest unique contribution to explaining the dependent variable, when the variance explained by all other variables in the model is controlled for. For third research question, refer to Figure 3.

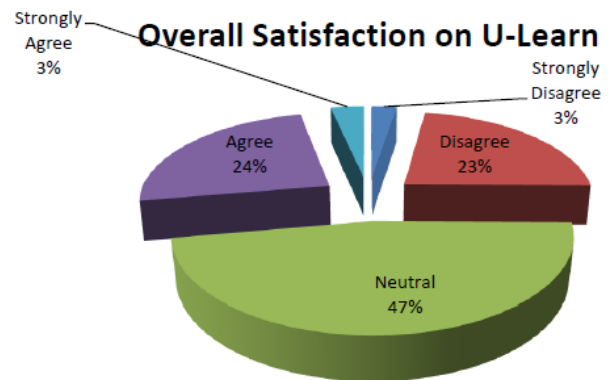


Figure 3 Overall satisfactions on u-learn.

The pie chart in Figure 3 shows the overall satisfaction of the students towards u-learn at UTeM. It can be concluded that majority of the students participated in this study have moderate level of satisfaction on u-learn.

4. CONCLUSION

Numerous studies show various impact of e-learning on the students. However, the creation of the system determines the effectiveness of the system on students' performances. Hence, through this study, it contributes theoretically on the need of improvement of e-learning. The four variables discussed in this research which are content, delivery method, interaction and system operation are one of many factors that would influence students' satisfaction in using the e-learning. Content is very essential to students who use u-learn as supplementary tool for in-class learning. It should be obvious by now that the approach of learning between online learning and in-class learning is different.

The data suggested that all of the independent variables that were studied had a statistically significant influence on students' satisfaction in u-learn. The objectives are successfully achieved when all the hypotheses are accepted. Insights gained through this research will provide useful information to higher education institutes regarding e-learning.

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Job performance among academics in Malaysian public universities

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Keywords: Job performance; academics; commitment

ABSTRACT – The successfulness of education always relates to the excellence and quality of academicians in the respective universities. Academics usually teach efficiently besides giving full commitment to the organization at their workplace. Academics are requested to have a better performance by fulfilling a series of requirements by the universities. However, if they are not satisfied, they may not be committed to deliver the best. In addition, there is a possibility that their job performance may not achieve the target. Hence, these research aims to study the level of job performance amongst academics in Malaysian public universities.

1. INTRODUCTION

The role of academics is broad and important. They are directly responsible in shaping the quality of the students. To be able to play the role effectively, academics need to be committed to their job as educators. Allen and Meyer [1] stated that, commitment refers to the attitude of the employees toward their organizations. Normally, the employees will commit if they are really satisfied with their present job.

The satisfaction normally depends on what the employees can get or receive from the job. Besides teaching, academics are required to conduct research and publish their works. They are also expected to be involved in administration as well as clerical work which add to the workload. This may result as mood disruption, stress and dissatisfaction or discontent. To avoid or overcome this, steps must be taken to ensure that the academics are satisfied with their job.

Therefore, there is strong need to understand the factors that contribute toward job performance among academics so that steps can be taken by the management to create conducive working environment that is in line with their expectation.

The increasing number of universities in Malaysia since the past few years, has driven management to set a more ambitious ultimate goal. Academics are requested to have a better performance by fulfilling a series of requirements, such as actively involved in journal publishing. This is in-line with Malaysia quest, that is to be a leading education hub in the Asia region.

However, it has been established that academics remain committed to their chosen vocation and continuously demonstrate commitment to their students despite undertaking increasing workloads,

administrative duties and conducting researches.

The importance of this study is to contribute benefits to various parties, whether the university, public universities and the state. Results from the study are expected to contribute towards the development of knowledge, especially in the field of human resource development in order to enhance the commitment of the academic staff at public universities nationwide.

The findings of this study could also assist public universities in gaining loyalty among academics who then contribute to obtaining a high-class standard of education in the Asia Pacific region.

2. LITERATURE REVIEW

Memari et. al. [2], in their study on The Impact of Organizational Commitment on Employees Job Performance, discover that the organisational commitment is positively and significantly correlated with job performance. The findings also reveal that the demographic variables such as, age of the respondents both in public and private sectors has no significant variation in their job performance. The results also indicate that the males were higher performers from female.

Joolideh and Yeshodhara [3] in their study on Organisational Commitment Amongst High School Teachers of India and Iran found that, Indian teachers had better organisational commitment in the affective and normative components, whereas Iranian teachers were found to have better organizational commitment in the continuance component. In both countries age groups and subject taught by teachers did not have any influence over their organisational commitment.

Meanwhile in her study on Organisational Commitment and Job Performance among 248 academics and administrative staffs in an accredited university in Manila, Tolentino [4] found that the respondents have a strong desire to remain with the university. Both the academic and administrative staff desire to stay in the university because they feel they ought to. The feeling is driven by their loyalty to the university. Academic staff has stronger affective and normative commitment than the administrative while the administrative staff have a stronger continuance commitment than the academic.

A study conducted by Tat et. al. [5] found that there are three factors of job satisfaction which is job design, salary and welfare, and management. The study

found that only one factor of job satisfaction which is job design has significant relationships with affective commitment.

Finally, study conducted by Salim et. al. [6] in Factors Affecting Organizational Commitment Among Lecturers in Higher Educational Institution in Malaysia found that the job satisfaction, job involvement and perceived organizational support have a significant relationship with the three subscales of organizational commitment. The results of this study suggest improvements in social change by increasing job satisfaction, job involvement, and perceived organizational support is an effective way to get committed human resources.

3. METHODOLOGY

This study employed a self-administered survey as a means to collecting data. A total of 300 questionnaires was distributed to respondents from the selected universities in Klang Valley and Melaka. Self-administered questionnaire form is the most common method for surveying or measuring people's interests, beliefs or perceptions.

The general objective of this study to explore what are the factors that contribute toward job performance among academics in Malaysian public universities. Besides that, it also aims to determine what are the types of commitment that mostly dominant the academicians.

A total of six measures were selected from established sources. These include measures of organisational commitment, job satisfaction, job performance and religiosity. In addition, a set of 12 items of demographic characteristics is also included.

4. RESULTS AND DISCUSSION

Out of 300 respondents, only 220 people who responded to a questionnaire that was given. The percentage of respondents who responded was 73.3%. Earlier findings show that, a total of 182 respondents were Malays (82 %), followed Chinese (7.3%), Indians (4.5%), and other races (5.5%). The majority of respondents were aged from 30-34 years (28.6%), then followed by 35-39 years (21.8%), 40-44 years (20.5%), 45-49 years (16.4%), 50-54 (16%) and above 55 years (16%). The result show that majority of respondents are from married person 83.6%).

In terms of length of service, majority of the academics have work for 10 – 15 years (78.6%). A total of 10.5% respondents have been working from 16 – 20 years, followed by 21 – 30 years (6.4%) and more than 31 years (4.5%).

Meanwhile for the basic income, there are 20.5% with total income RM 6501 to RM 7000, 19.1% get RM6001 to RM 6500, 11.8% get lower RM6000, 10.9% get RM 7001 to RM 8000, 9.5% get more than RM9000, 6.8% get RM 8001 to RM 8500, and 0.5% get RM 8500 to RM 9000.

The relationship between organisational commitment were investigated against job performance.

The reliability for job performance is 0.92. According to Sekaran and Bougie [7], reliabilities in the ranges of 0.70, is acceptable and those above 0.80 is considered as good. The results also indicate that there are significant relationship between job performance with organisational commitment ($r = .357^{**}$, $p = .000$). It can be concluded that job performance is positively related to organisational commitment. The variance of the variables is 12.7%.

5. CONCLUSION

Base from the findings, we can conclude that the levels of job performance among public universities academicians can be considered good. Majority of them may be satisfied with the salary and benefits allocated to them. Apart from that, only a few of the academics not be happy with the management as their work may not be appreciated significantly. In addition, some of the academics are worried of what would happen if they quit their job without having another lined up.

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Developing learning model in effective social entrepreneurship

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Keywords: Social entrepreneurship; effectiveness social entrepreneurship

ABSTRACT – This study established a learning model from the data of 230 entrepreneurs program students. The study tested a developed research model for examining the effectiveness of social entrepreneurship (ESE) that posits personality, motivation, social network and interest drive to the effectiveness of social entrepreneurship. The correlation results indicated that the motivation were the most significant factor towards the effectiveness of social entrepreneur. For the practicality of this study, social entrepreneurship can be well implemented through education to ensure potential successful entrepreneur and the sustainability of business.

1. INTRODUCTION

In a challenge for future development of green business [1], social entrepreneurship having profound implications in the economic system: creating new industries, validating new business models, and re-directing resources to neglected societal problems [2]. It holds a place in the curriculum of leading business schools, and it is the subject of numerous professional and academic meetings [3] and serve as an opportunity or driver for entrepreneurs to create social value [4].

Entrepreneurial education creates change in expectation, market structure, available resources and new knowledge emerges [5] to the next generation. A social entrepreneurial activity is influenced by sources of opportunities, stakeholder salience, and performance metrics [6,7] and also they see as important is quite different from those with a commercial intent [8].

Learning model should be developed so that the education system has a specific standard for social entrepreneurship. The demand for social entrepreneurship education has grown substantially, resulting in increased course offerings in universities globally [9]. In spite of the growing interest in this domain, little is known about what competencies are required for success as a social entrepreneur. Studies by Musa et al [10–12], identified factors contributed to the performances of organisation, but to go further, this study identifies a few factors contributes to the effectiveness of social entrepreneurship towards accelerating the economy. The study identifies the factors that can be developed for the effectiveness of the social entrepreneur. The factors are personality,

motivation, social network/SN, and interest toward entrepreneurs.

The purpose of this study was to identify the relationship between those factors and the effectiveness of social entrepreneur among students. Figure 1 shows the theoretical framework of the study, where the hypotheses, H1, H2, H3, H3 and H4 show anticipated of positive relationship to effectiveness social entrepreneurship.

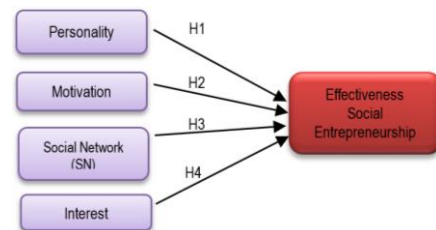


Figure 1 Theoretical framework.

2. METHODOLOGY

The method used in sampling is convenience sampling, which is a type of random sampling technique. All the items of the questionnaire were measured on a 5-point Likert scale. A total of 230 students took part in the survey. The respondents were UTeM undergraduates' students who had joined the social entrepreneurship program. For data analyzing, this study applied correlation and Regression Analysis.

3. RESULTS AND DISCUSSION

For the correlation analysis, personality (.480**/p = 0.00), motivation (.666**/p=0.00), SN (.636**/p=0.00), and interest (0.621**/p=0.00) showed a positive relationship. Motivation shows the highest correlation with effectiveness social entrepreneurship. MRA, $R^2 = .196$ implies that the independent variables explained 19.6% of the variability of the dependent variable (effectiveness social entrepreneurship). Table 1 showed a summary of the statistical analysis. Figure 2 shows statistical diagram.

D. Jayawarna [13] in her work mentioned that motivation directs action and is constantly subject to change in light of experimentation and (fallible) learning. Additionally, social entrepreneurs are

motivated to address a social need, commercial entrepreneurs a financial need [14]. However, achievement motivation alone is not sufficient enough to explain for the drive to become an entrepreneur [15]. According to this study, all the variables it might be considered effective for social entrepreneur because the results showed a good relationship to the independent variable.

Table 1 Summary of analysis.

Variables	Correlation	p value (<0.01)	R ²	MRA
Personality	0.480**	0.00	.263	
Motivation	0.666**	0.00	.189	
SN	0.636**	0.00	.188	R ² = .196
Interest	0.621**	0.00	.144	

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

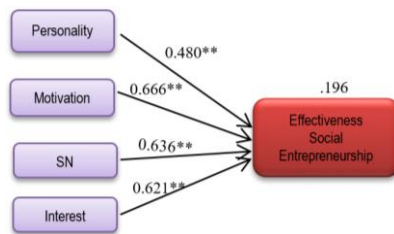


Figure 2 Statistical diagram.

4. CONCLUSION

The paper proposed a framework in respond to the nature of effectiveness of social entrepreneurship. All factors found to be positively related to social entrepreneurs. In the education field, all the factors should be taken into account to deliver knowledge to the potential entrepreneur. The study also provides a higher correlation factor (motivation). The roles of an educational institution become crucial tools to guide next generation who have an intention to build up business, according to the knowledge of motivations gained and for sure the potential social entrepreneur will rise up among them. It is very crucial for the educational institutions to provide content design in social entrepreneurship education that correlates with the needs of the social enterprise market place.

The study however has a limited size of sample, and it should have been expanded by involving more students in the survey. A larger sample with more assorted qualities would have profited the study. Another conceivable change in the study could have been interviewing participants directly. This method could have included imperative subjective information and more prominent understanding into the participants' idea and assessments.

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Risk model for first semester student using logistic regression

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Keywords: Risk model; data mining; decision tree

ABSTRACT – Diploma in Business Studies is a popular programme. However, more than 10 percent of the students failed to complete their studies on time, which is within six semesters. This study aims to identify factors that affect students' chances of graduating on time (GOT). This study uses logistic regression model and data split configuration. The predictive accuracies of the models in terms of misclassification rates and average squared error are compared. Hence, this study has proposed a methodology to predict at-risk students which can be adopted by other programmes and level of studies.

1. INTRODUCTION

Risk is the potential that a chosen action or activity will lead to a loss an undesirable outcome, or a loss. Risk is associated with personal rather than institutional or global in nature and can either be positive or negative. Institutions of higher learning (IHL) develop vision statement and strategic planning to facilitate the best learning outcome and offer learning experience to students. These are to ensure that students and their parents are confident with the learning activities provided by the IHL. However, even the best-managed organizations make mistakes. Any approach to risk must accept this fact [1].

As of the end of 2016, Malaysia has 20 public universities. Diploma in Business Studies is among the first programme offered at one of the branch of the university. It is a popular programme as indicated by the large number of students registered every semester since its introduction. Despite the availability of extensive research resources on higher education and graduation rates, there is still a substantial variation among different types of students and institutions that requires further research [2] using data mining approach [3-6]. Therefore, this study aims to identify factors that affect students' chances of graduating on time (GOT).

2. METHODOLOGY

Data mining defined as analysis of a large quantities of data that are stored in computers which is involves statistical and low artificial intelligence analysis usually applied to large scale data sets [3]

This study employs logistic regression models to predict the graduation outcome. Logistic regression is analogous to linear regression but predicts the probability of a categorical outcome instead of estimating the mean of a continuous variable [3-4]. In

order to select the significant independent variables, stepwise regression method is employed. Stepwise regression begins with a forward selection of variables based on sample regressions, and selecting variables based on partial F statistics. Variable significance is evaluated and if significant, the variable is added to the model and the partial F statistics recalculated for the next iteration. After adding a new variable, the significance of previously added variables is checked. The method stops when no remaining variables are found to be significant.

Several performance statistics are employed to compare the various methods applied in this study. In addition to the performance statistics, three different proportions of training to validation are selected for this study, 70:30, 60:40 and 50:50.

Statistics derived from a classification matrix are commonly used for assessing the accuracy of predictive models. For this study, the classification matrix is presented in Table 1. The primary event, graduate on extended time (GOET) and is denoted by '1', while the secondary event, GOT is denoted by '0'.

Table 1 Classification matrix.

Situation		Decision	
		GOET (1)	GOT (0)
Actual	GOET (1)	a	b
	GOT (0)	c	d

From the classification matrix, the performance measures are defined:

$$\text{Misclassification rate} = \frac{b+c}{(a+b+c+d)} \quad (1)$$

This statistic measures the proportion of incorrectly classified events (at-risk students) and non-events (not at-risk students). The above statistic is usually given in percentages.

Another measure of performance is the average squared error (ASE) defined below:

$$\text{ASE} = \frac{\sum_{i=1}^n (\rho - \hat{\rho})^2}{n} \quad (2)$$

Where ρ is the actual probability (either 0 or 1), $\hat{\rho}$ is expected probability, and n is the total number of cases or observations.

3. RESULTS AND DISCUSSION

3.1 Development of prediction model

The distribution of students by each binary target variables is shown in Table 2. GOT and GOET represent the students who graduated.

Table 2 The distribution of students by graduation outcome.

Binary Target Variables	
GOET (1)	GOT (0)
298 (14.2%)	1800 (85.8%)

Table 3 shows the results of the logistic regression model by split configuration. The model with the lowest misclassification rate (13.2%) and average squared error (0.68) is when the data is split 60:40. Hence, the result of this model is further discussed to describe the relationship of each significant course on the graduation outcome, particularly for the GOET subjects.

Table 3 Logistic regression model results by split configuration.

Split Configuration	Chi-Square p-value	Misclassification Rate	Average Squared Error
70:30	<0.001	0.140	0.68
60:40	<0.001	0.132	0.68
50:50	<0.001	0.142	0.69

Figure 1 shows the importance of each of the significant predictors, three courses, gender and intake. The results are similar to those of the decision trees with Financial Accounting 1 (ACC1), Mathematics for Business (MAT), and Islamic Course 1 (CTU1) identified as the courses that contribute to the failure of students to graduate on time. In addition to the three courses, GENDER (male or female) and INTAKE (December or July intake) are also significant determinants of graduation outcome. These results imply that students who faced difficulties in calculation-based subjects such as ACC1 and MAT were most likely to extend their studies before graduating. Since CTU1 subject is qualitative in nature, it requires a good communication skill.

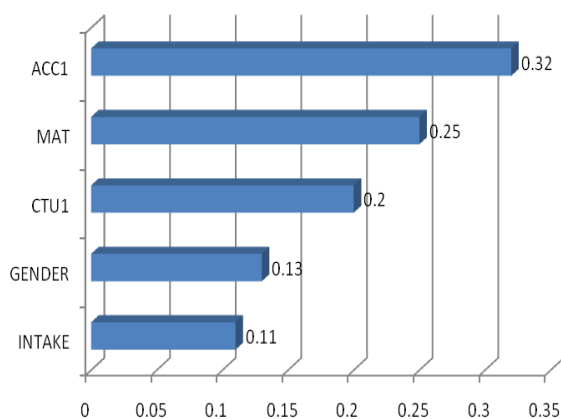


Figure 1 Variables importance of GOET vs. GOT for 60:40 logistic regressions.

3.2 Implementation of prediction model

In order to implement the best predictive model described above, new students from different intakes used as the scoring data. The size of the scoring data is 58 for the December intake, and 60 for the July intake. For the December intake, results for semester one and two are available, while for the July 2011 intake, only semester one result is available. For this purpose, the logistic regression predictive models are deployed.

Table 4 shows the list profile of students who were predicted to be at-risk of GOET. Out of 60 students for July intake, only one student was classified as a GOET. The actual results of this student show that, he failed both MAT and ACC1 but manage to pass for CTU1. However, for December intake the result shows that all students pass for each subjects. Hence, the predictive models are accurate in identifying MAT and ACC1 as courses of students' failure.

Table 4 The actual results of predicted students at-risk.

Intake	ID	Gender	Grade		
			MAT	ACC1	CTU1
July	AP	M	F	F	B+

4. CONCLUSION

Based on the above results and discussions, graduation outcome differs between males and females, as well as between the two intake semesters. In terms of the first semester courses, Financial Accounting (ACC1), Mathematics for Business (MAT), and Islamic Course 1 (CTU1) are identified as the most influential courses that determine students' graduation outcome. The results indicate that the identified predictive models are accurate and can be deployed to identify at-risk student students immediately after their first semester and this model can be implemented to all programmes or field of study such as engineering, management, education or others.

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Implementation assessment of e-Dem in context dimension

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Keywords: Program elements; dimensional evaluation context; Rasch model

ABSTRACT – This study was conducted to determine the dimensional context in assessment of Diploma in Mechatronics Engineering. The focus of this research is the applicability of program elements (E-DEM) in the context of the specified dimension. A total of 52 lecturers who teach courses for the program Diploma in Mechatronics Engineering student at the Polytechnic Ibrahim Sultan, Polytechnic Ungku Omar, Polytechnic Merlimau and Polytechnic Sultan Mizan Zainal Abidin involved in this study. Data were analyzed using descriptive methods Rasch Model in V36.5 Winsteps software. The results showed that all the elements of the program (E-DEM) in the context of a dimension that has been agreed upon by the respondent and at the high level implementation of Diploma in Mechatronics Engineering. Overall, the analysis shows a high level of all elements of the program (E-DEM).

1. INTRODUCTION

The curriculum is essential of any educational program and acting as a facilitator to deliver all the contents and objectives in the teaching process. The curriculum serves as guidelines and determining the boundaries of knowledge to be conveyed. The curriculum is defined as a set of lesson plans, scope and content of a subject in educational institutions or as a specific subject [1]. Nordin and Othman [2] explained the general curriculum is the curriculum for the subjects provided by the educational institution. However, there is more perspective to see the curriculum as a program of education to achieve a certain goal. They said curriculum can also mean teachers what to teach and what students need to learn. Based on the description above curriculum concept, Mechatronics Engineering curriculum is the result of a combination of the four disciplines of mechanical engineering, electronic engineering, control systems and computer science [3]. Referring to the definition of mechatronics, Grimheden [4] states mechatronics is an academic subject that emerged in the late 1960s and the very definition of mechatronics is always used as integration synergies mechanical engineering with electronic engineering and computer convey wise in their form of manufacture of industrial products and processes. Grimheden [5] claim evolution mechatronics engineering education in the

context of referring to the creation of more complex products with a focus on the synthesis of the analysis. This is a challenge for polytechnic graduates to compete in the job market today.

Therefore, revolutionary change and redesign the curriculum content, improve the teaching and learning approach in teaching and learning and develop new ways to assess students is among the initiatives taken by the Polytechnic Education Department towards meeting the criteria and standards issued by the Malaysian Qualifications Agency (MQA). A major change implemented by the Department of Polytechnic Education, Ministry of Higher Education is to implement a new curriculum that using outcome-based education approach (OBE). Referring to Yaman et al. [6], OBE approach was first introduced at the Polytechnic Ministry of Higher Education began in 2010 to meet the needs of the Malaysian Qualifications Framework.

2. MATERIALS AND METHODS

This study is a survey that assesses Diploma in Mechatronics Engineering program in the context of the dimensional model Stufflebeam [7]. In this study, the population for this study is 52 lecturers who teach courses for the program JM Diploma in Mechatronics Engineering student at the Polytechnic Ibrahim Sultan, Polytechnic Ungku Omar, Polytechnic Merlimau and Polytechnic Sultan Mizan Zainal Abidin. Sampling for this study was conducted by cluster sampling. In this study, quantitative data were obtained using a questionnaire. This questionnaire is using Likert scale with five options. To answer the research question, to what extent the applicability of program elements (E-DEM) in the context of the specified dimension? Data have been analyzed using Rasch Models and the result been shown by mean measure, mean score and level.

3. RESULTS AND DISCUSSION

Referring to the analysis of questionnaires using Winstep software version V3.69.1.11, as a whole showed a mean score and the mean size to determine the curriculum suitability for the Diploma in Mechatronics Engineering program elements (E-DEM) in the context

of the assessment dimensions are shown in Table 1. All elements of the program (E-DEM) in the context of the specified dimension have been agreed upon by the respondent at a high level on the curriculum suitability Diploma in Mechatronics Engineering. Referring to the table, learning outcomes measurement program recorded the highest mean value compared to other elements namely - 1.68 logit and the mean score is 4.30. Elements of the program objectives as well, the mean value are -1.10 logit sizes with the mean value score of 4.13. Through Education Program Objective elements anyway, the mean value is -0.97 logit size and mean score of 4.09 when the elements of the mission, size and value mean score was -0.79 logit and 4.03.

However, through the vision, the mean size and mean scores were -0.68 and 3.99. A high level of all elements of the program (E-DEM) showed very satisfied with the lecturers for all elements in the dimension of context. A negative value indicates that the elements of the program Learning Outcomes, Program Goals, Objectives Education Program, Mission and Vision very easy to be agreed upon by the respondents, the lecturers. The mean score of perceived reference to the logit. The greater the value of the logit on the logit of the respondents indicated they were easier to certify the items given and the smaller the value logit showed respondents increasingly difficult to certify the items given.

According to Stufflebeam and Shinkfield [7], the context of the assessment, the evaluation was to identify the strengths and weaknesses of the objectives that have been set by a program or institution. Therefore, in this study, context-dimensional evaluation is intended to assess the consistency of policies and objectives of the program elements (E-DEM) with a detailed plan. In this context dimension, it includes the vision, mission, program objectives, program educational objectives and learning outcomes. The study found that lecturer is highly agreed to the applicability of program elements (E-DEM) in the predetermined dimension context. This is expected as the model of strategic management.

Table 1 Analysis of respondents to the approval stage suitability of program elements in the dimension of context.

Program elements (E-DEM) Dimensions of Context	Mean Measure (logit)	Mean Score	Level
Program Learning Outcomes	4.30	- 1.68	high
Program objectives	4.13	- 1.10	high
Program Educational Objectives	4.09	- 0.97	high
Mission	4.03	- 0.79	high
Vision	3.99	- 0.68	high

4. CONCLUSION

In conclusion, the researcher believes lecturers agree that the level of compliance program elements (E-DEM) in the context dimension is high and satisfactory according to the dominant element of the program Learning Outcomes, Program Goals, Objectives Education Program, Mission and Vision. This study has also provided a validity that the program elements (E-DEM) in the context dimension is absorbed by the lecturers before they implement the curriculum. A high level of knowledge about the context in which lecturers can correlate continuity between all the elements of the measure.

Out of these elements, a pattern of assessment of implementation program shall be created for dimensional contexts. High level of result finding shown that those elements doesn't need to be improvised. Lecturers are likely very knowledgeable about the policies set by the Education Department of the Polytechnic as a stake holder. Thus, the stake holder has set a goal of a program designed to meet the needs of implementing the requirements in the industry today.

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Analysis of student performance using massive open online courses as blended learning approach in learning second language

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Keywords: MOOC; student performance; blended learning

ABSTRACT – Massive Open Online Course (MOOC) provides an effective learning platform with various high-quality educational materials accessible to learners from all over the world. However, there are still problems and challenges including assessment and lack of engagement. This paper analyses students' performance in using MOOC as a blended learning approach to learn a *Second Language*.

1. INTRODUCTION

Massive open online courses (MOOCs) provide people from all over the world the opportunity to expand their education for free without any commitment or prior requirements [1]. Among the popular MOOC platform includes Coursera, edX, FutureLearn, OpenLearning, and Udemy. MOOC in education must have three requirements; (i) assessment (ii) instructor and (iii) model [2].

2. RELATED WORKS

Current MOOCs are (i) lacking of personalized learning guidance, and (ii) intelligent assessment for individuals [3]. B. T. Wong [4] highlighted in MOOC, assessment is a big challenge for the large number of student to get detailed and timely feedback. T. Tenório et al. [5] mentioned that assessment can increase the performance of students at the same time it brings benefits to the teacher. J. Qiu et al. [6] listed the importance factors on student performance which include: (i) hard working, (ii) engaging, and (iii) homophily. A. Elbadrawy et al. [7], stated that student performance specific features include (i) cumGPA and (ii) cumGrade. J. W. Gikandi et al. [8] stated that analytical rubric helps students to (i) assess their learning, (ii) guide expected performance (iii) understand the purpose of assessment, and (iv) increase students' commitment. In this paper, we analyse students' performance using MOOC as blended learning approach in learning a *Second Language* course.

3. MATERIALS & METHODS

Samples: The study was conducted using two separate samples which involve two cohorts of students that took Mandarin course: Cohort 1 consists of 617 students in Semester 1 2015/2016, while Cohort 2

consists of 231 students in Semester 2 2015/2016. The MOOC courses were implemented as a blended learning approach for the two cohorts of UTeM students.

Design & Development: For Cohort 1, the MOOC design consists of 10 unit of lessons (each with lecture videos, dialogue videos & lecture slides), and 40 e-activities (with online quizzes, essay writing, self-video presentation, and audio listening assessment). For Cohort 2, the MOOC design was further improved which consists of 11 unit of lessons, and 45 e-activities.

Implementation: For each cohort, students were taught face-to-face by two language teachers and encouraged to enroll to the MOOC course implemented as a blended learning approach. Duration of the MOOC learning for each cohort was one semester. As part of the coursework assessment, each cohort was required to do a project. For Cohort 1, students were required to prepare & upload an essay written in Chinese characters, and self-video presentation of the essay. For Cohort 2, students were required to do a video presentation as a group project.

Instrument: Coursework Tests & Assignments that covers phonetics & vocabulary tests, and assignments on writing, presentation & group report (Tests: 30%, Assignments: 30%). Total marks for coursework is 60.

Data Collection Procedure: Data collection was conducted for one year. Coursework assessments were conducted throughout the one semester duration for each cohort. The MOOC lessons and e-activities were implemented as a blended learning to support the face-to-face learning conducted by the language teachers. Some of the assessments were conducted via face-to-face and some of it via MOOC.

4. RESULTS AND DISCUSSION

Table 1 shows the two samples used in this study showing the number of students using and not using MOOC for each cohort. As we can see in Table 1, Cohort 1, the first cohort introduced with the usage of MOOC, only 14.9% of the students used MOOC. In Cohort 2, the usage of MOOC has increased to 92.64%.

Figure 1 and 2 show the average coursework marks by students according to grades they obtained for Cohort 1 and 2 accordingly. The figures also indicate the number of students represented in each bar. Findings

show positive results of students using MOOC. In Cohort 1, although 92 students used MOOC to support their learning, we can still see that MOOC brought some improvement in their learning. Figure 1 show that all students that use MOOC passed the subject with at least C- as their grades, while 6 students that did not use MOOC got D+ and 8 students failed the subject.

Table 1 Shows the samples used in the study

Samples	Cohort 1 (Session I 2015/16)		Cohort 2 (Session II 2015/16)	
	N	%	N	%
Using MOOC	92	14.91	214	92.64
Not Using MOOC	525	85.09	17	7.36
Σ	617	100	231	100

This finding is further supported by the results in Cohort 2. Figure 2 shows that all students that use MOOC passed the subject with at least C+ as their grades, while 1 student that did not use MOOC got C and 2 students failed the subject.

Figure 3 and 4 strengthen this finding further. Students that used MOOC got better results than those not using MOOC. Figure 3 shows that 17.4% of students that use MOOC got A while only 9.9% of students not using MOOC got A. Figure 4 also confirms the finding whereby 20.6% of students using MOOC in Cohort 2 got A grade while only 11.8% of students that were not using MOOC got A grade.

5. CONCLUSION

This study presents findings on the implementation of a blended learning approach in learning a Second Language. Analysis using coursework marks and percentage of students' grades that compare students' performance that using and not using MOOC was conducted. The findings show that students using MOOC have better performance than those not using MOOC. In future, we will further analyze the effectiveness attributes of MOOC assessment.

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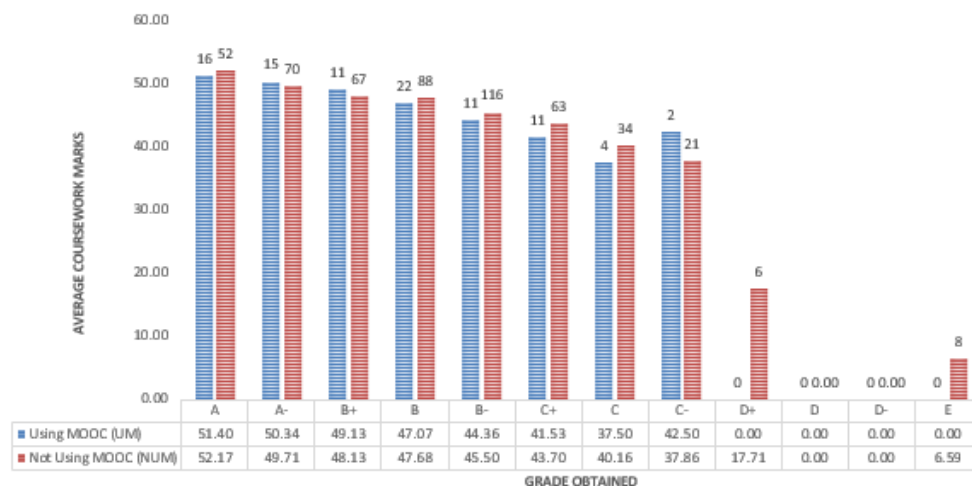


Figure 1: Average coursework marks for Cohort 1

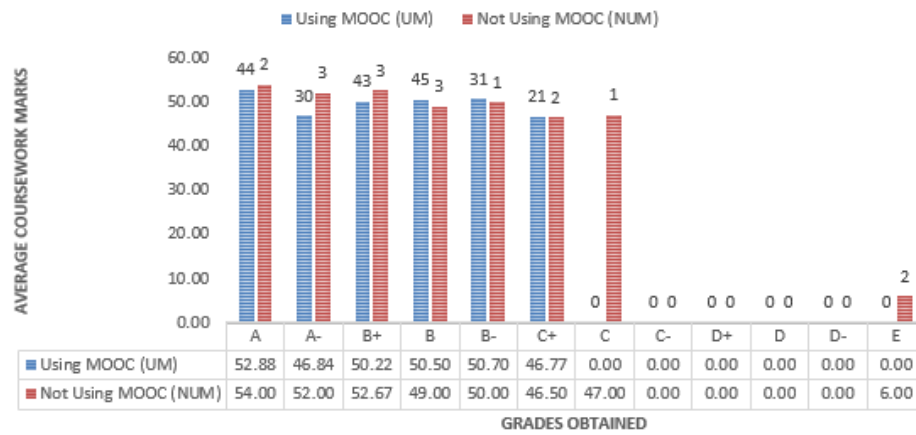


Figure 2 Average coursework marks for Cohort 2.

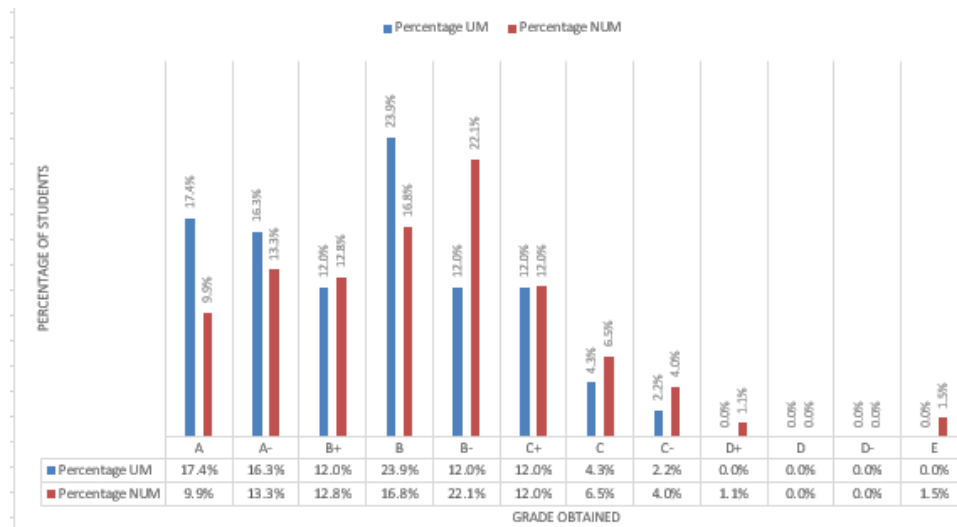


Figure 3 Percentage of students according to grades for Cohort 1.

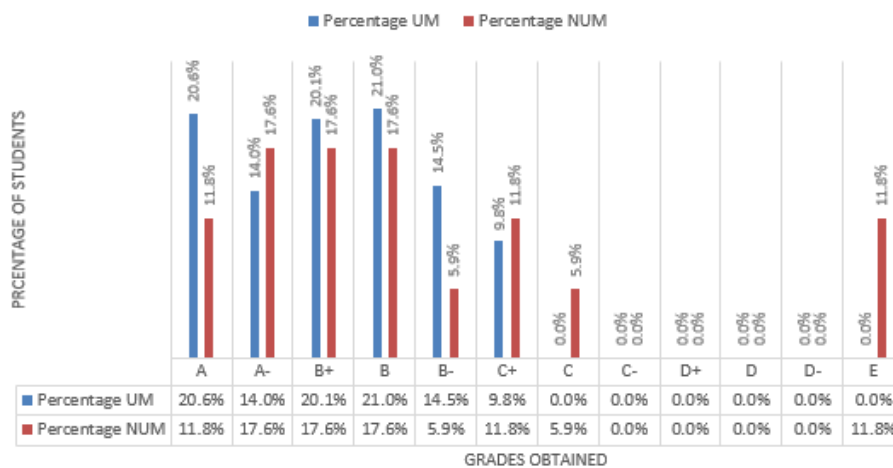


Figure 4 Percentage of students according to grades for Cohort 2.

Digital mobile learning devices: The implication on performance of higher institution students

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Keywords: Digital mobile learning; higher institution; student performance

ABSTRACT – The purpose of this study is to investigate the effect of digital mobiles learning devices on the academic performance of higher institution students. Data was collected from students of higher institutions around Malacca. A questionnaire survey was distributed to selected higher institutions in order to collect the data for the research. Samples for the study were selected using convenience sampling method. was used to select the samples. A total of 200 respondents was participated in the study. Regression analysis were conducted to examine the effect of digital mobile learning device elements on the higher institution students' performance. The results of this study indicates that perceived convenience has a significant positive relationship with student performance. The results also provide practitioners with guidelines for implementing digital mobile learning devices among institute of higher learning student.

1. INTRODUCTION

Mobile learning (m-learning) has gained a significant attention in higher education. Mobile devices such as netbooks, tablets or smart phones have become ubiquitous in the institutions of higher education. Almost all students current own mobile devices and about half of them own more than one. Furthermore, because these devices are highly personalized and collaborative communication tools, they provide the institutions of tertiary education with flexible tools for complementing the existing technologies and extending the learning beyond the classrooms and homes from remote places like train or bus stations where students do not have any access to computers.

The fast development of the Internet and information technologies has affected the way in which education is being presented [1].

As a result of increase growth of the Internet and information and communication technology, Learning Management System (LMS), mobile learning or m-learning have transpired as the new paradigm in modern education. In Malaysia context, mobile learning is widely implemented at tertiary education level. It is widely used to scaffold the teaching and learning ecosystem through Bring Your Own Devices (BYOD) policy to empower the flexibility for the stakeholders, namely teachers and students to engage in meaningful

lessons and communication via their mobile devices [2].

According to Bachmair et al. [3] mobile learning or 'm-learning' is the term used to describe the use of mobile devices as a tools in the learning process. Some strengths of m-learning are: portability-mobile devices can be used anywhere, inside and outside the classroom; convenience -their potential as a tool for collaboration and interaction and permanent connectivity (always on); information accuracy -the ability to obtain information suited to the context or situation and the possibility of adapting the content to every user according to their needs and expectations.

According to Cobcroft et al. [4] the adoption of mobile devices among higher institution students is a global phenomenon and provide tremendous opportunity. The new learning platform provide student with accessibility to global communication network and make it possible for them to learn anywhere and anytime. The objective of this new learning platform is to gain competitive advantages [5].

This study aims to analyze the effect of digital mobile learning devices adoption on the academic achievement of higher education students by partially employed the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Dodd et al. [6]. Only three variables were used in this research. In this research, performance expectancy operationalised as information accuracy, effort expectancy operationalised as perceived convenience and facilitating condition operationalised as per perceive portability. Figure 1 shows the proposed research model for this study, following by the hypotheses as follows:

H1: Perceive information accuracy is significantly related to academic achievement of higher education students.

H2: Perceive portability is significantly related to academic achievement of higher education students.

H3: Perceived convenience is significantly related to academic achievement of higher education students.

2. METHODOLOGY

The sampling frame for this research is higher institutions around Malacca. The convenience sampling method were used to select the sample. All the questionnaire items were measured on a 5-point Likert scale. A total of 200 completed questionnaires were

received from students' of four higher institutions around Malacca. Data were analyzed using reliability analysis, correlation analysis and Multi Regression Analysis (MRA).

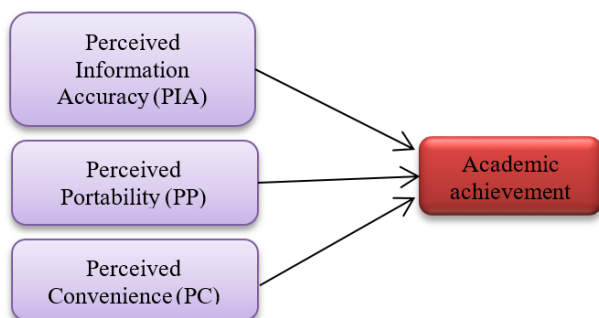


Figure 1 Conceptual framework.

3. RESULTS AND DISCUSSION

For reliable test, Cronbach's alpha for all variables are acceptable with .749 (good). For the correlation analysis, all the variables have a weak relationship with student performance (PIA: 0.212; PP: 0.215 and PC: 0.400 at p-value of 0.01). These results indicate that all the variables are valid and free from multi collinearity effect. For the Multiple Regression Analysis (MRA), the R-value is 0.415 indicate a weak level of prediction. $R^2 = 0.173$ implies that the independent variables (PIA, PP and PC) explain only 17.3% of the variability of the dependent variable (Academic achievement).

This study has revealed the existence of a significant relationship between PC and student performance (significant value 0.000). The correlation analysis has interpreted a moderate positive correlation between PC (correlation coefficient of 0.400) and student performance. According to this analysis, the result shows there is a partial significant relationship between independent and dependent variable of this study.

The results are partially significant may due to only three variables are taken in this study to represent the elements of DMLD towards the adoption of digital mobile learning devices. The results may have suggested there are many other factor that may contribute to student's academic achievement besides this three factor such as are the student well equipped for mobile learning, do they fully utilized the mobile devices for learning, does the infrastructure fully supported the used of mobile devices for learning and many other factors.

The study also has limited the size of sample; it should be expanded by including more users in the survey. A larger sample with more assorted qualities would have profited the study. Another conceivable change in the study could have been interviewing participants directly, and personal interviews could

possibly elicit greater information regarding participants' knowledge and attitudes. This method could have included imperative subjective information and more prominent understanding into the participants' idea and assessments.

4. CONCLUSION

This study provides a better understanding on the effects of digital mobile learning devices (DMLD) elements on student performance. The paper also mentioned the most dominant elements of DMLD towards the adoption of DMLD that brings better student performance is perceived convenience. Overall, it can be concluded that there are some elements of DMLD that can affect the adoption of DMLD.

In the 21st Century, mobile learning approach is become part of our life. The lifelong learning, the pervasive experience which were delivered through practical invisible devices use by almost everyone day and night and the personal network that deliver information to the eyes, ears and others senses make the learning accessible to everyone.

As mentioned by previous research mobile devices are highly personalized and collaborative communication tools, therefore they provide the institutions of tertiary education with flexible tools for complementing the existing technologies and extending the learning beyond the classrooms and homes from remote places like train or bus stations where students do not have any access to computers.

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