A STUDY OF KNOWLEDGE MANAGEMENT INFRASTRUCTURE CAPABILITY, RELIGIOSITY AND HIGHER EDUCATION PERFORMANCE IN KOLEJ UNIVERSITI ISLAM PAHANG SULTAN AHMAD SHAH

Muhammad Hafiz bin Yaakub[1]
Siti Fatimah binti Sudarmin[2]
Nurulhuda binti Othman[3]

Abstract

The purpose of this study is to investigate the indirect impact of religiosity on knowledge management infrastructure capability and perceived private higher education institutions' (PHEI) performance. Specifically, this study took place in Kolej Universiti Islam Pahang Sultan Ahmad Shah (KUIPSAS), Kuantan, with the participation of 37 academicians. Four hypotheses were generated to test the causal and moderating effect. This research is quantitative in nature and SmartPLS 3.0 was employed as the analytical tool. It is found that structure infrastructure significantly influences perceived KUIPSAS' performance (β=0.428). Conspicuously, no links were found between technology, culture and religiosity with perceived KUIPSAS' performance. Furthermore, no significant association is found in religiosity as a moderating variable between knowledge management infrastructure capability and KUIPSAS performance. The theoretical and practical implications are further discussed.

Keywords: Knowledge Management Infrastructure Capability, Higher Education Institutions' Performance, Religiosity

Abstrak

Kajian ini bertujuan untuk menyiasat kesan tidak langsung kewarakan terhadap keupayaan infrastruktur pengurusan pengetahuan dan tanggapan prestasi institusi pengajian tinggi swasta (IPTS). Secara spesifiknya, kajian ini dilakukan di Kolej Universiti Islam Pahang Sultan Ahmad Shah (KUIPSAS), Kuantan, dengan penglibatan seramai 37 orang pensyarah. Empat hipotesis telah disediakan untuk diuji kesan akibat dan moderator. Kajian ini bersifat kuantitatif dan SmartPLS 3.0 telah digunakan sebagai alat analisis. Hasil analisis menunjukkan infrastruktur struktur secara signifikan telah mempengaruhi tanggapan terhadap prestasi KUIPSAS (β=0.428). Secara jelasnya, tiada perhubungan ditemui di antara teknologi, budaya dan kewarakan dengan tanggapan terhadap prestasi KUIPSAS. Seterusnya, kewarakan tidak memainkan peranan yang signifikan sebagai pemboleh ubah moderator di antara keupayaan infrastruktur pengurusan pengetahuan dan tanggapan prestasi KUIPSAS. Implikasi teori dan praktikal dibincangkan selanjutnya.

Kata Kunci: Keupayaan Infrastruktur Pengurusan Pengetahuan, Prestasi Institusi Pengajian Tinggi, Kewarakan

INTRODUCTION

Malaysia has seen significant changes in its economy. Being in a knowledge-based economy (KBE) forces businesses to grow and sustain their competitive advantage by utilizing their

[1] Penulis merupakan Dekan Fakulti Pengajian Pengurusan, Kolej Universiti Islam Pahang Sultan Ahmad Shah (KUIPSAS)
[2] Penulis merupakan Pensyarah Fakulti Pengajian Pengurusan, Kolej Universiti Islam Pahang Sultan Ahmad Shah (KUIPSAS)
[3] Penulis merupakan Pensyarah Fakulti Pengajian Pengurusan, Kolej Universiti Islam Pahang Sultan Ahmad Shah (KUIPSAS)

knowledge and innovation (Seddighi, 2015). The wealth and value creation are not solely depending on tangible assets, but moving towards appreciating the intangible assets as forces behind organizational effectiveness (Andonova & Ruíz-Pava, 2016; Barão, de Vasconcelos, Rocha, & Pereira, 2017) and economic growth (Massingham, 2014).

In the new economy, the service sector has maintained to be the highest contributor to the Malaysian's Gross Domestic Product (GDP). Higher education has become one of its sub-sectors. Realizing its importance, Malaysian government has endorsed the establishments of PHEIs as a component of higher education industry. The rising needs of tertiary education and the "supplementary and complementary" roles of PHEIs to public universities have proven to be successful when the number rose to 521 institutions in 2007.

However, the PHEIs are facing serious issue of sustainability (Rusli Harun, 2015). In 2017, the number of registered PHEIs dropped to 483, where 33 of them ceased their operations. The liberalization of higher education industry has been identified as one of the causes that resulted to more establishments of international PHEIs, and thus increase competition among local PHEIs. In order to compete, PHEIs must realize their valuable resources and capabilities to achieve their objective and performance (Wernerfelt, 1984; Chen & Fong, 2015). Therefore, PHEIs' capability in managing valuable resources, especially intangible resources as required in the KBE should become the focus of local PHEIs to assist them in competing with international PHEIs.

Being known as knowledge-based organizations, PHEIs are involved in the knowledge creation, transfer, dissemination and learning to their clients and community (Wiig, 1997; Yasir, Majid & Yasir, 2017). In other words, PHEIs should be active and relevant to sustain in the KBE's competitive environment by continuously producing high quality graduates that will fit in the challenging knowledge workforce (Rowley, 2000; Songsangyos, 2012; Ali et al.,2014).

With regards to KBE, there was a growing interest on the application of knowledge management (KM) to enhance organizational performance, including PHEIs (Grant, 1996; Yasir et al., 2017). According to Wei Chong, Yen Yuen, & Chew Gan (2014), PHEIs require a supportive education infrastructure and R&D activities as enablers to a propitious knowledge-sharing environment. However, these activities are still lacking, especially in building the attitude and culture of the society to support KBE in Malaysia (Ramlee Mustapha & Abu Abdullah, 2004; Yigitcanlar & Sarimin, 2015).

The need to study KM practices in education industry is paramount because of the intense knowledge exchange that has been used to enhance firms' capabilities and lead to knowledge creation (Lai, Hsu, Lin, Chen, & Lin, 2014). According to Ragab & Arisha (2013), KM has been recognized as a tool to solve issues relating to organizational success. Therefore, it is crucial for organizations to tap the external sources of knowledge and enhance their internal capabilities.

With these awareness, this study attempts to examine the impact of KM, specifically in the organizational internal capabilities, on PHEIs' performance. Gold, Malhotra, & Segars (2001) are among the early scholars to initiate researches on organizational capability in managing knowledge, or known as KM Capability, which comprised of KM Infrastructure Capability (KMIC) and KM Process Capability (KMPC). According to them, such capability will enhance performance as new knowledge acquisition, internally or externally, are crucial

in enhancing performance through increase knowledge sharing (Abuazoum, Azizan, & Ahmad, 2013; Eftekharzade & Mohammadi, 2011).

With the advancement of industrial revolution, it is also important to integrate moral dimension in handling business and economic issues. Capitalism has resulted a separation of work values from the spiritual component among Western management practices (Rice, 1999; Ali, 2010; Göçen & Özğan, 2018). Within the social science literature, there has been an emerging interest in the use of religiosity as a predictor variable, although its application in the strategic management field is still lacking. Spiritualism in the context of religiosity is introduced in this study as a variable that contributes to PHEIs' competitive advantage. It contributes in developing employees' characteristics based on the values inculcated in the particular religion (Faizal, Ridhwan, & Kalsom, 2013). Therefore, it is believed that religiosity influenced an individual capability (Göçen & Özğan, 2018) and it increases PHEIs' capability.

Obviously a large amount of effort has been put on linking religiosity to individual human behavior that is related to the study of social science. Unfortunately, there is still a gap in the literature of the impact of religiosity on whole organization such as its overall performance. Thus religiosity is an additional dimension to be researched. This study takes place in a PHEI in Kuantan, Pahang, known as Kolej Universiti Islam Pahang Sultan Ahmad Shah (KUIPSAS), and three research objectives (RO) were identified as:

1. To assess the impact of KM Infrastructure Capability's components on KUIPSAS' performance.
2. To examine the moderating impact of religiosity on KUIPSAS' performance.
3. To test and validate the model of KUIPSAS' performance.

LITERATURE REVIEW

PHEIs' Performance

The performance of higher education institutions needs to be measured as they are facing sustainability issue because of the stiff competition (Abankina, Abankina, Filatova, Nikolayenko & Seroshtan, 2012; Lee, 1998). However, it is not an easy task as the measurement methods are not standardized. A review on eight literatures in higher education field has indicated that there exist two broad dimensions in higher education performance measurement, namely financial and non-financial measures (Rivlin, 1973; Kidwell, Linde, & Johnson, 2000; Ahmed Zebal & Goodwin, 2012; Montanaro, 2013; Tee, 2016; Sahney & Thakkar, 2016; Chinta, Kebritchi, & Ellias, 2016).

First, financial performance measures (e.g. ROI, ROC, cash flow and profitability) is paramount in measuring performance (Hamid, 2015). The financial measures reflect some form of organizational standing (Harlow, 2008). However, it is rarely used, mainly because many PHEIs are not-for-profit ventures and the elements to be measured are quite subjective and can be quite complex.

On the contrary, non-financial measures are more common in measuring PHEIs' performance. According to Zangoueinezhad & Moshabaki (2011), financial measure alone is not adequate to measure an organizational performance. Albekov, Romanova, Vovchenko, &

Epifanova (2017) conclude that the effectiveness of university education is quite closely related to management of its human capital as well as equality in quantity and quality of university education. Meanwhile, Chinta, Kebritchi, & Ellias (2016) used input-process-output approach to produce a matrix which uses benchmark from internal, external and aspirational parties to measure university performance. Using the same input-process-output approach, Sahney & Thakkar (2016) measured four HEIs in India using research, academic, teaching and consulting efficiencies. Meanwhile, the research component is considered as the most extensive measure of PHEIs' performance (Alcaine, 2016; Kidwell et al., 2000; Tee, 2016).

This study introduces four dimensions in measuring PHEIs' performance, financially and non-financially. These dimensions are: 1) academic effectiveness, 2) rating scores, 3) research capacity, and 4) financial performance. These four dimensions will be applied in measuring KUIPSAS' performance. Each dimension is discussed below:

1. Academic Effectiveness

Academic effectiveness has become the core measure of a PHEI's performance. PHEIs should continuously enhance the quality of their academic programs and services to achieve sustainable competitive advantage (Caruana, Ramaseshan, & Ewing, 1998). According to Ramachandran, Chong, & Wong (2013), the quality in PHEIs can be achieved by successful implementation of KM. Criteria used in measuring academic effectiveness were adapted from Delaney & Huselid (1996), covering the aspects of academic programs and academicians management.

2. Rating Criteria

The second dimension of PHEIs performance proposed in this study is rating criteria, which refers to the set of criteria used by Malaysian Qualifications Agency (MQA) and Ministry of Higher Education (MOHE) in MyQuest and D'SETARA evaluation. These criteria are important as they became determinant factors in attracting students and evaluating PHEIs' performance. The measures include: i) students (quality, participation with external organization, number of international students); ii) resources (physical infrastructure, financial sustainability, support services, staff ratio); iii) quality management system (certification, good management system, external participation, student satisfaction index); iv) program recognition (accredited programs, active programs); and v) graduate success (employability, employer satisfaction, recognition and awards to graduate).

3. Research Capacity

Research capacity is the third dimension in evaluating PHEIs' performance. It is a non-financial performance measurement related to research activities based on the input-output relationship. Sahney & Thakkar (2016) proposed that research can have three different efficiency components namely the research itself, its link with the academics and with the outputs or deliverables. Tee (2016) asserted that research is a performance indicator for universities in UK. This point was supported by Alcaine (2016), who emphasized the importance of research capabilities as a university's

performance measurement. Both studies emphasized on the research grant. However, it is not depicted in dollars and cents, thus considered as a non-financial measurement for a PHEI. Among the components of research to be measured are the ability to obtain research grants, completed research and the impact of research towards society.

4. Financial Performance

Financial indicator is rarely used to measure PHEIs' performance. However, it can be a crucial indicator for PHEIs' sustainability and academic performance. Montanaro (2013) had used financial data and ratios such as total operating revenues and viability ratio to measure universities performance. These measures however are not suitable as this study obtains information from individual academicians (unit of analysis) who have limited access on such financial data. Therefore, a financial measurement introduced by Tseng (2014) was adapted. She provided the items for financial performance within the context of KM Capability. In addition, the items were constructed from a perception perspective which makes them directly applicable to this study. Such perception measures of the financial performance can also be related to efficiency and effective management of resources (Sahney & Thakkar, 2016).

Knowledge Management Infrastructure Capability (KMIC)

KM Infrastructure Capability (KMIC) refers to the state whether a firm is ready with its set of roles, organizational structures and skills to successfully initiate a KM program (Davenport & Prusak, 2000). Alaarj, Zainal A.M., & Bustamam (2016) defined KM Infrastructure Capability as the enabling circumstances that assist the organization in the process to manage organizational knowledge. Pandey & Dutta (2013) justify that components of KM infrastructure had synergistic impact in ensuring a successful KM program. Imran (2014) concluded that technological and cultural aspects too have significant positive impact on banking performance in Pakistan.

According to Gold et al. (2001), technical, structural and cultural are three key infrastructures that enable the maximization of social capital. This study utilizes these three components, which are further discussed in the subsequent section:

1. Technology

Technology promotes the effective transmission of knowledge within and outside of firm. It is regarded as applied knowledge that helps to fulfill market expectations or needs (Mohamed, Stankosky, & Murray, 2006). Allameh et al. (2011) defines technology as "information infrastructure and its capabilities in supporting the knowledge management architecture". Previous studies have indicated that technology correlates with KM (Supar, 2012). According to Ali et al. (2014), ICT assist each of the knowledge creation process in HEI. However, technology infrastructure needs to be continually improved and top management must escalate the use of ICT in terms of "technological, pedagogical and content" support in various aspects of academic staff teaching and learning. (Lye, 2013). Tuanmat & Smith (2011) asserted that technology development had a positive impact on organizational strategy and performance. This positive relation between technology and organizational performance were also found

in another studies such as Huang, Wu, Lu, & Lin (2016) and Turulja & Bajgoric (2017). Therefore, it can be hypothesized that:

H1: Technological infrastructure has a positive effect on KUIPSAS' performance.

2. Structure

Organizational structure is a salient function of management to assist in the achievement of a firm's objectives (Wen, 2009). It can be defined by how work is divided into different tasks and the process of coordinating those works so it can be done in effective and efficient manner (Claver-Cortés, Zaragoza-Sáez, & Pertusa-Ortega, 2007). It also defines the functions or units and their relationship, explains the line of authority and maps the knowledge flows within the firm. Wen (2009) emphasized that structure.

A good organizational structure can provide a conducive knowledge sharing environment through the collaboration and support of the members of various teams. Walczak (2005) explains that structure encourages the exchange of tacit knowledge, enable learning and growth among employees. It is thus the top management responsibility to create such a structure to promote the knowledge sharing environment and behavior that will benefit both the employees and firm (Mohayidin, Azirawani, Kamaruddin, & Margono, 2007).

However, HEI structure is not directly comparable to that of a private corporation. It is unique in the sense that academicians tend to work in silo and cross-functional tasks are not common (Basu, Sengupta, & Lake, 2007). This is also endorsed by Bhusry & Ranjan (2011), and thus become one of the challenges to KM as it prefers a fluid and organic structure.

In a study in an Iranian refinery, Allameh et al. (2011) reported that structure has little effect on KM processes as compared to the effect of culture and technology. This contrasts to another finding in the same country but on an academic institution that organizational structure is perceived to be moderately important in implementing KM (Eftekharzade & Mohammadi, 2011). Therefore, a second hypothesis is developed as follow:

H2. Organizational structural infrastructure has a positive effect on KUIPSAS' performance.

3. Culture

Many scholars hold the view that culture is essential in shaping a firm's ability in managing knowledge effectively (Gold et al., 2001; Rašula et al., 2012). Culture is defined as "shared beliefs, norms, ethics and practices within an organization" which can be observed despite being intangible (Meso & Smith, 2000;Imran, 2014). Gold et al. (2001) further explained that corporate vision and corporate values are important in creating the culture of effective KM.

Culture is also perceived as being made up of different dimensions as Gupta & Govindarajan (2000) identified six of them such as IS, people, process, leadership,

reward system and organization structure. Later, Al-Alawi et al. (2007) identified five dimensions namely trust, communication between staff, IS, reward system, and organizational structure and these affected knowledge sharing among employees in public and private sectors researched in Bahrain. Generally though it has been established that good communication channel enables corporate vision and values to be inculcated throughout the organization. The third hypothesis is then proposed:

H3. Culture infrastructure has a positive effect on KUIPSAS' performance.

Religiosity

There is a rising interest in the study of religiosity and it concerns with beliefs and values. In addition, it is also dynamic in nature, personal in scope and influence how people formulate (cognitively) and make their living with full of purpose (Mokhlis, 2008).

The impact of religiosity within the business context is still understudied. There are literatures in social science studies that attempted to relate religiosity with organizational success. Zulkifli & Rosli (2013), found that religiosity moderates the relationship between entrepreneurial orientation and business success, while Osman et al (2013), identified religiosity as positively influenced employee performance. Both studies had implied that religiosity do have impacts on enhancing performance.

This study adopted Worthington's definition of religiosity as "the degree to which a person adheres to his or her religious values, beliefs and practices and uses them in daily living" (Worthington, Everett L. et al., 2003). The studies of religiosity are small in number and lacks depth although attempts have been made to relate it with students' campus life (Mayrl & Oeur, 2009) and universities academic program (Assegaf, 2012). No reports have been identified that link religiosity to neither knowledge management nor strategic management. Therefore, this study attempts to connect religiosity with KM and find whether it has a moderating role when measuring PHEIs' performance.

As the study of religiosity in relation with KM is still rare, there are opportunities to discover new possible outcomes that can be added to the related body of knowledge. There are also no identified studies of relationship between religiosity and job performance. However, it was found that religiosity had influenced employees' performance positively (Osman-Gani et al., 2013) and bring about business success (Zulkifli & Rosli, 2013). Collectively, this will eventually lead to enhanced overall performance. Therefore, the following main hypothesis is proposed:

H4. Religiosity has a positive effect on KUIPSAS' performance

Specifically, three sub-hypotheses are proposed as below:

H4a. Religiosity moderates the relationship between technology infrastructure and KUIPSAS' performance.

H4b. Religiosity moderates the relationship between organizational structural infrastructure and KUIPSAS' performance.

H4c. Religiosity moderates the relationship between culture infrastructure and KUIPSAS' performance.

From the literature review, a research framework is derived and shown in Figure 1.

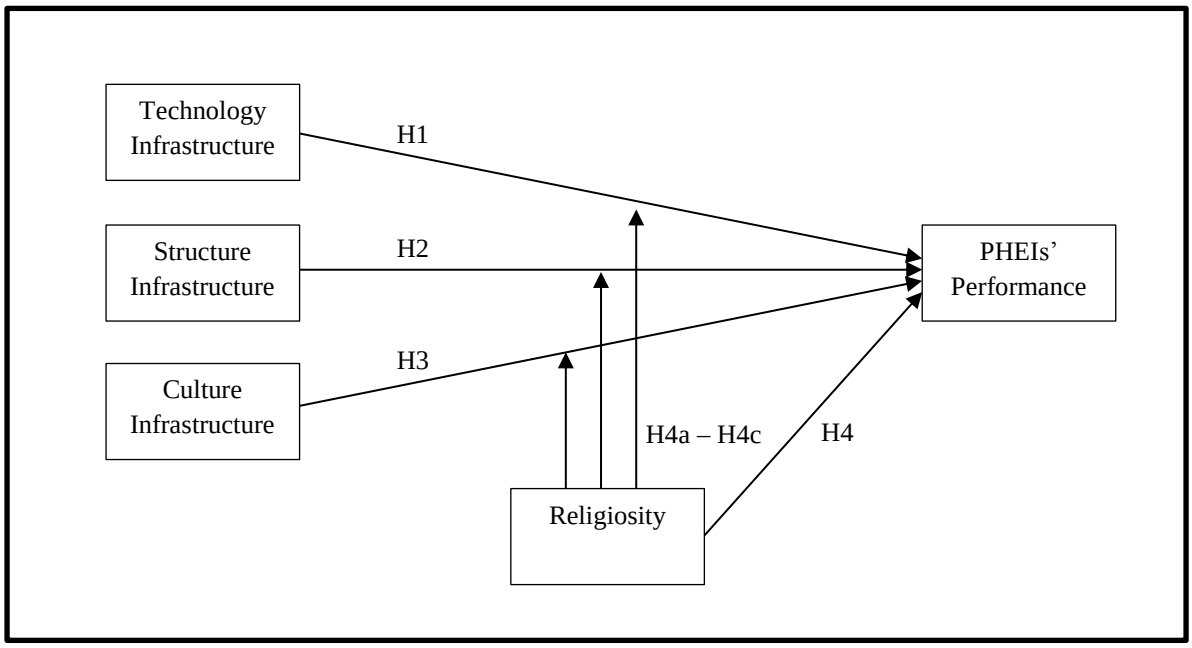

Figure 1 Proposed research framework

METHODOLOGY

A structured questionnaire was used to obtain data from 97 academicians in KUIPSAS through convenience sampling. The respondents were targeted among individuals at management levels who are aware of and able to describe the KM Capability. Subsequently, 37 questionnaires were received and considered for data analysis after the screening process.

This study employed an online questionnaire as the instrument of data collection. A scale from 1 to 7 was used for constructs KM Infrastructure Capability and religiosity (1-strongly disagree to 7-strongly agree), while a scale from 1 to 5 was used for construct perceived KUIPSAS' performance (1-strongly disagree to 5-strongly agree). The scales were made differently to measure different constructs with purpose to minimize the common method bias as proposed by Podsakoff, MacKenzie, Lee, & Podsakoff (2003).The sources of the measurement instruments and number of items are shown in Table 1.

Table 1 Sources of measurement items

Variables	Number of items	References
KM Infrastructure Capability		
a) Technology	4	Yang & Chen (2007)
b) Structure	4	
c) Culture	4	
Religiosity	10	Worthington, Everett L. et al. (2003)
PHEIs' performance	22	Delaney & Huselid (1996), Tseng (2014), Zangoueinezhad & Moshabaki (2011)

A data cleaning process was done to ensure that they are cleaned and prepared for further analysis. Firstly, the data was found to have no unusual straight lining patterns and missing values. Therefore, all 37 responses were accepted. Next, no outliers were detected by using statistical tests of case wise diagnostic and Mahalanobis Distance. Therefore, the data was fit for further analysis.

RESULTS

Analysis of multivariate assumptions

According to Hair, et al. (2014), multivariate analysis refers to all statistical techniques that simultaneously analyze multiple measurements on individuals or objects under investigation. It has been a predominant method in strategic management research field. Five tests were conducted to fulfill the multivariate assumptions, namely: 1) normality, 2) linearity, 3) homoscedasticity, 4) multicollinearity, and 5) common method bias.

Normality was checked using skewness and kurtosis value. The analysis produced skewness and kurtosis values each below 3 and 8, which conclude that the data are normal as proposed by Kline (2011). However, the Kolmogorov-Smirnov analysis indicated that all variables are normal (considering $p>0.05$), except for religiosity. The Mardia multivariate kurtosis coefficient value was 38.26, which is higher than the threshold of 35. Therefore, the data set used is considered as not normal and justifying the application of PLS-SEM as a statistical method for further analysis. Next, linearity was assessed by examining the scatterplots of the variables. According to Jusoh (2008), the linearity assumption is fulfilled when the scatterplot graph shows an ellipse pattern, which was achieved from this data set.

Then, the homoscedasticity was observed visually. Using regression scatterplot, no funnel shape was formed which, indicating assumption of homoscedasticity has been met as

suggested by Field (2009). Multicollinearity is then checked using Variation Inflation Factor (VIF), Tolerance Statistic and Condition Index. It was found that all VIF values were below than 10 as proposed by Myers (1990) and Allison (1999). The tolerance statistics values were all above the threshold of 0.1, which according to Field (2009), escaped from a serious multicollinearity problem. However, the Condition Index value of 45.669 is higher than the proposed cutoff value of 30 as suggested by Tabachnick & Fidell (2013). According to Farahani, Rahiminezhad, Same & Immanneshad (2010), this problem can be handled by PLS-SEM. Therefore, it is concluded that multicollinearity was not problematic in this data set.

Finally, common method bias (CMB) was checked to avoid measurement error and validity between constructs. A Harman single-factor test was conducted to identify CMB. The first factor of eigenvalues was 41.5% that explained the total variance of 83.45%. It is concluded that the first factor is explaining slightly below the threshold of 50% as recommended by Chen & Chengalur-Smith (2005). CMB was also examined using inter-construct correlation as suggested by Bagozzi, Yi, & Phillips (1991). It was found that all correlations are below 0.90, indicating no severe CMB presence.

Evaluation of measurement model

Measurement model exhibits the relationship between research constructs and their indicator variables. Two types of validity were assessed, the convergent validity and the discriminant validity (Hair et al, 2014).

Convergent validity

The convergent validity of the measurement is determined from the loadings, average variance extracted (AVE) and the composite reliability (Hair et al., 2014). The loadings were all acceptable except for CI4 (0.687), OP1 (0.666), OP15 (0.691), OP18 (0.627) and RE8 (0.596). Removal of these items does not increase the AVE, therefore these items were retained as suggested by Hair et al. (2014). Item RE1, RE2, RE3, RE4 and RE5 were deleted because of the weak loading values. The construct reliability were all above 0.70 and AVE values were higher than 0.50 as suggested by Hair et al. (2014). All results are shown in the Table 2 below.

Table 2 Convergent validity

Constructs	Items	Loadings	Cronbach	rhoA	CR	AVE
Culture	CI1	0.793	0.782	0.814	0.859	0.607
	CI2	0.883				
	CI3	0.738				
	CI4	0.687				
PHEIs Performance	OP1	0.666	0.967	0.969	0.97	0.596
	OP2	0.766				
	OP3	0.774				
	OP4	0.791				
	OP5	0.767				
	OP6	0.761				

	OP7	0.794				
	OP8	0.845				
	OP9	0.764				
	OP10	0.771				
	OP11	0.81				
	OP12	0.799				
	OP13	0.794				
	OP14	0.736				
	OP15	0.691				
	OP16	0.714				
	OP17	0.727				
	OP18	0.627				
	OP19	0.888				
	OP20	0.827				
	OP21	0.857				
	OP22	0.769				
Religiosity	RE10	0.796	0.814	0.86	0.868	0.571
	RE6	0.776				
	RE7	0.734				
	RE8	0.596				
	RE9	0.85				
Structure	SI1	0.757	0.89	0.895	0.925	0.758
	SI2	0.883				
	SI3	0.956				
	SI4	0.874				
Technology	TI1	0.765	0.834	0.86	0.886	0.66
	TI2	0.773				
	TI3	0.874				
	TI4	0.834				

Discriminant validity

This study further evaluates discriminant validity to ensure that a reflective construct has the strongest relationships with its own indicators in the PLS path model (Hair et al., 2014). It can be measured when the square root of each factor's AVE was larger than its correlation with other factors (Fornell & Larcker, 1981; Chin, 1998). Table 3 indicates the results of the analysis and the discriminate validity assessed by using the correlation of latent variables, wherein the square roots of the average variances were calculated for each of the constructs along the diagonal. It is found that all square roots of AVE were larger than their corresponding coefficients of correlation with other factors, except for construct perceived PHEIs' performance. It can be concluded that construct perceived PHEIs' performance (0.772) has a discriminant validity problem with construct structure (0.793). Therefore, HTMT analysis was executed.

Table 3 Square root of AVE to correlations comparison

	Culture	**PHEIs Perf**	**Religiosity**	**Structure**	**Technology**
Culture	**0.779**				
PHEIs Performance	0.767	**0.772**			
Religiosity	0.624	0.684	**0.755**		
Structure	0.743	0.793	0.604	**0.87**	
Technology	0.078	0.172	0.191	0.164	**0.813**

A Heterotrait-Monotrait (HTMT) ratio analysis was executed to determine the discriminant validity. In the table 4, it is found that all HTMT ratios (bolded) in absolute value were below the 0.90 limit. After a bootstrapping procedure, HTMT values with confidence level 90% were obtained and expressed in the bracket under the HTMT ratio. As all the values are not more than 1.00, then the discriminant validity is established.

Table 4 HTMT ratio

	Culture	**PHEIs Performance**	**Religiosity**	**Structure**	**Technology**
Culture					
PHEIs Performance	**0.858** (0.725, 0.991)				
Religiosity	**0.753** (0.554, 0.93)	**0.718** (0.532, 0.896)			
Structure	**0.874** (0.725, 0.992)	**0.847** (0.71, 0.946)	**0.654** (0.473, 0.847)		
Technology	**0.201** (0.164, 0.711)	**0.227** (0.19, 0.6)	**0.257** (0.201, 0.685)	**0.213** (0.133, 0.59)	

Evaluation of structural model

Smart PLS 3.0 was used to examine the path analysis and to test the structural model of this research. In terms of path analysis, it can be concluded that structure infrastructure has the strongest influence on perceived PHEIs' performance (β=0.428). This is followed by culture (β=0.278), religiosity (β=0.188) and technology (β=0.067). It is also shown that the moderating effect of religiosity between technology and perceived PHEIs' performance is the strongest with β of 0.117. Figure 2 shows the diagram for overall bootstrapping result.

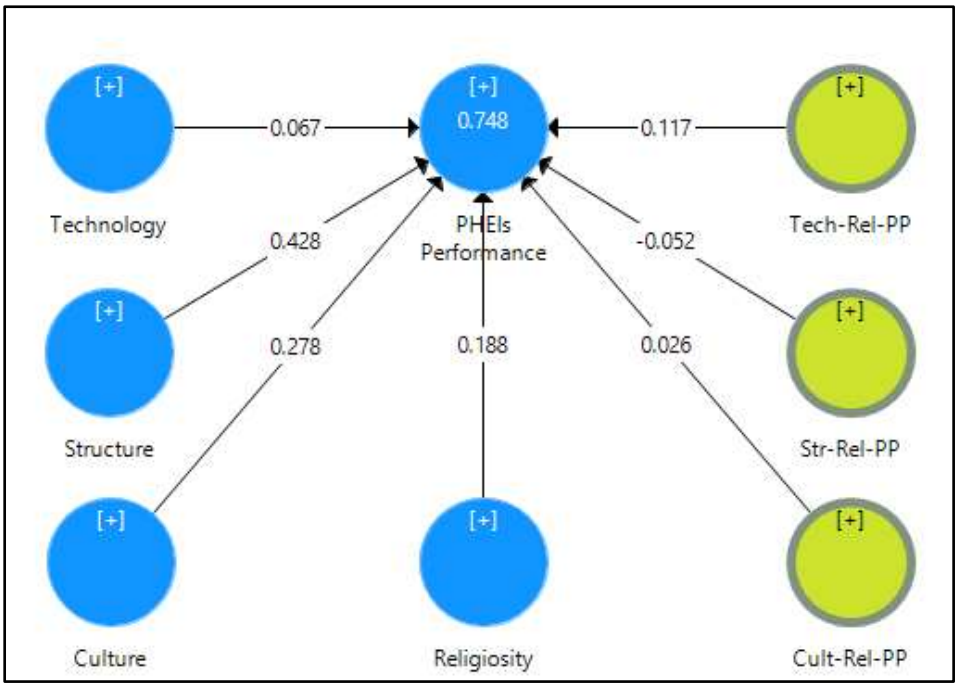

Figure 2 The bootstrapping results for structural model

A bootstrapping procedure was further executed in order to test the hypotheses. From Table 5, it is shown that only H2 (β=0.428, p=0.012) has been accepted. Next, the coefficient of determination, or R^2 value, is obtained to examine how well the research model is performing. The R^2 value for this model is 0.747. It indicates that 74.7% of the DV (perceived PHEIs' performance) is explained by various IV in this study.

Table 5 Regression summary

Hypotheses	Variable	β	Significance	Supported
H1	Technology -> PHEIs' performance	0.067	0.285	No
H2	Structure -> PHEIs' performance	0.428	0.012	Yes
H3	Culture -> PHEIs' performance	0.278	0.057	No
H4	Religiosity -> PHEIs' performance	0.188	0.131	No
H4a	Moderating effect 1: Tech-Rel	0.117	0.197	No
H4b	Moderating effect 2: Str-Rel	-0.052	0.402	No
H4c	Moderating effect 3: Cul-Rel	0.026	0.450	No

	N	R^2 (without moderation)	R^2 (with moderation)	Adj. R^2	Sig.
Model Summary	37	0.730	0.747	0.686	0.000

DISCUSSION AND CONCLUSION

This study attempts to extend the understanding of the relationship between KM Infrastructure Capabilities and KUIPSAS' performance by adding religiosity as a moderator in their relationship. An integrated framework was proposed and tested where the main construct KM Infrastructure Capability, are broken down to three sub-constructs, namely technology, organizational structure and culture and these are treated as factors that influence academicians' perception on KUIPSAS's performance. Religiosity is brought in as it is expected to moderate such relationship.

This study reveals that constructs technology and culture from KM Infrastructure Capability dimension were not influencing the perceptions on KUIPSAS' performance. The findings seems to violate prior understanding in KM research that positive links were found between constructs of KM Infrastructure Capability and organizational performance (Gold, Malhotra, & Segars, 2001; Tseng, 2014; Alaarj, Zainal A.M. & Bustamam, 2016). However, structure infrastructure was found to be significantly influenced the perceived KUIPSAS' performance among academicians (β=0.428, p=0.012). This result is consistent with the findings from Sabri (2005), Wang & Yang (2007), Hao, Kasper, & Muehlbacher (2012) and Farhanghi, Abbaspour, & Ghassemi (2013). Furthermore, the findings also provide no link between religiosity and perceived KUIPSAS' performance.

According to previous studies, religiosity was identified as a crucial prediction to many psychological and consumer behaviors. Albeit to play a moderating role on employee performance relationship (Osman-Gani et al., 2013), this study concludes that religiosity does not moderate the relationship of technology, structure and culture on perceived KUIPSAS' performance.

Tlaiss (2014) explained that the survival and stability within an organization had become crucial and thus the members will promote rules and systems through normative pillars that focus on appropriateness of behavior. In connecting the links, this study asserts that the academicians believed that a strong KM-supportive structure has been nurtured in KUIPSAS. This structure was perceived to contribute to better performance of KUIPSAS.

This paper makes several contributions to the literature. First, we contribute to the conceptualization of the religiosity as an important aspect of organizational performance. While many studies have focused on the importance KM and performance without the elements of value, this paper brings them together to explain their linkage and quantify the relationship. Second, this study is an attempt to explore religiosity as moderating variable in the relationship of technology, structure and culture on a PHEI's performance. Hence, the paper goes beyond the conventional finding to provide new insights. Although the paper does not develop a new theory, it will motivate scholars and practitioners to engage with the issues in different ways than they have in the past. Third, this paper also expands the application of strategic management in higher education industry. It is expected to enhance the sustainability of PHEIs in Malaysia within the turbulence of competition and liberalization of this industry.

LIMITATIONS AND FUTURE WORK

It is important to understand that this study has been interpreted within the context of its limitations. It requires additional researches that help in filling the study gap. First, the result of this study was analyzed based on a pilot study sample of 37 academicians in KUIPSAS, which is too small to generalize the findings. A larger sample size might be able to contribute on higher generalizability as it allows more statistical power and sophisticated analysis. It is also recommended to have further studies conducted qualitatively to increase deeper understanding of this research model. A comparative study between KUIPSAS and other PHEIs that offer Islamic studies as major academic programs can be conducted to test the applicability of the research model.

Second, this study only uses KM Infrastructure Capability as a prediction of perceived KUIPSAS' performance. The notion of "organizational capabilities" also requires researches to measure organizational KM Process Capability. Therefore, further researches should try to include KM Process Capability and tested with religiosity as moderator.

CONCLUSION

The higher education industry in Malaysia today is facing challenges and intense competition. Liberalization of higher education has exposed opportunities to international PHEIs to invest in Malaysia. Therefore, KUIPSAS must pursue for the best competitive strategies to ensure sustainability. Knowledge is a vital resource to be managed in creating competitive advantage. The current study explains the role of KM Infrastructure Capability (organizational technology, structure and culture) on perceived KUIPSAS' performance, with the moderating effect of religiosity.

This study provides insights and awareness to KUIPSAS on how to manage its knowledge infrastructure. According to the result, organizational structure that supports KM must be nurtured. Since PHEI is a place where knowledge is highly traded, it is possible to reduce the focus on establishing the culture of knowledge sharing. In addition, high moral values should be inculcated within the heart of academicians because it is proven that religiosity plays a crucial role that will drive towards higher organizational performance.

It is hoped that this study will help managers of PHEIs to better understand the need to create competitive advantage and reformulate their KM sharing strategies for further enhancement.

ACKNOWLEDGEMENT

This work was undertaken as part of the Research Program led by the Department of Research Kolej Universiti Islam Pahang Sultan Ahmad Shah (KUIPSAS) under the supervision of Deputy Rector of Research and Innovation. Funding support for this study was provided by the grant allocated by this department. Authors are indebted to the Rector, Deputy Rector of Research and Innovation KUIPSAS and the Department of Research KUIPSAS for their support and assistance. The opinions expressed here belong to the authors, and do not necessarily reflect those of KUIPSAS. Any correspondence should be emailed to mhafiz@kuipsas.edu.my.

REFERENCES

A.F. Ragab, M., & Arisha, A. (2013). Knowledge management and measurement: a critical review. *Journal of Knowledge Management*, *17*(6), 873–901.

Abuazoum, A. A. A., Azizan, N., & Ahmad, N. (2013). Knowledge Sharing for the Islamic Banking Sector in Malaysia. *International Journal of Computer and Communication Engineering*, *2*(3), 368–371.

Ahmed Zebal, M., & Goodwin, D. R. (2012). Market orientation and performance in private universities. *Marketing Intelligence & Planning*, *30*(3), 339–357.

Al-Alawi, A. I., Al-Marzooqi, N. Y., & Mohammed, Y. F. (2007). Organizational culture and knowledge sharing: critical success factors. *Journal of Knowledge Management*, *11*(2), 22–42.

Alaarj, S., Abidin-Mohamed, Z., & Bustamam, U. S. B. A. (2016). Mediating Role of Trust on the Effects of Knowledge Management Capabilities on Organizational Performance. *Procedia - Social and Behavioral Sciences*, *235*(July), 729–738.

Albekov, A., Romanova, T., Vovchenko, N., & Epifanova, T. (2017). Study of factors which facilitate increase of effectiveness of university education. *International Journal of Educational Management*, *31*(1), 12–20.

Alcaine, J. G. (2016). *Factors affecting institutional performance at high and very high research universities: Policy implications*.

Ali, A. J. (2010). Islamic challenges to HR in modern organizations. *Personnel Review*, *39*(6), 692–711.

Ali, N., Sulaiman, H., & Cob, Z. C. (2014). The Role of Information Technology for Knowledge Management Paradigm in Higher Education. *Journal of Information Systems Research And Innovation*, *6*, 59–67.

Allameh, S. M., Zare, S. M., & Davoodi, S. M. R. (2011). Examining the impact of KM enablers on knowledge management processes. *Procedia Computer Science*, *3*, 1211–1223.

Allison, P.D. (1999), Multiple Regression: A Primer, Sage, Thousand Oaks, CA.

Andonova, V., & Ruíz-Pava, G. (2016). The role of industry factors and intangible assets in company performance in Colombia. *Journal of Business Research*, *69*(10), 4377-4384.

Assegaf, A. R. (2012). The Closer Bridge towards Islamic Studies in Higher Education in Malaysia and Indonesia. *Creative Education*, *03*(26), 986–992.

Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing Construct Validity in Organizational Research. *Administrative Science Quarterly*, *36*(3), 421.

Barão, A., de Vasconcelos, J. B., Rocha, Á., & Pereira, R. (2017). A knowledge management approach to capture organizational learning networks. *International Journal of Information Management*, *37*(6), 735-740.

Basu, B., Sengupta, K., & Lake, S. (2007). Assessing Success Factors of Knowledge Management Initiatives of Academic Institutions – a Case of an Indian Business School. *The Electronic Journal of Knowledge Management*, *5*(3), 273–282.

Bhusry, M., & Ranjan, J. (2011). Implementing knowledge management in higher educational institutions in India: A conceptual framework. *International Journal of Computer Applications, 29*(1), 34–46.

Caruana, A., Ramaseshan, B., & Ewing, M. T. (1998). Do universities that are more market orientated perform better? *International Journal of Public Sector Management, 11*(1), 55–70.

Chen, Y.H., & Chengalur-Smith, I. (2015). Factors influencing students' use of a library Web portal: Applying course-integrated information literacy instruction as an intervention. *The Internet and Higher Education*, 26, 42-55.

Chen, L., & Fong, P. S. (2015). Evaluation of knowledge management performance: An organic approach. *Information & Management, 52*(4), 431-453.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Marcoulides, G. A, Modern Methods for Business Research*, (October), 295–336.

Chinta, R., Kebritchi, M., & Ellias, J. (2016). A conceptual framework for evaluating higher education institutions. *International Journal of Educational Management, 30*(6), 989–1002.

Claver-Cortés, E., Zaragoza-Sáez, P., & Pertusa-Ortega, E. (2007). Organizational structure features supporting knowledge management processes. *Journal of Knowledge Management, 11*(4), 45–57.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed. Mahwah, NJ: Lawrence Erlbaum

Davenport, T. H., & Prusak, L. (2000). *Working knowledge: How organizations manage what they know*. Harvard Business Press.

Delaney, J. T., & Huselid, M. A. (1996). The Impact of Human Resource Management Practices on Perceptions of Organizational Performance. *Academy of Management Journal*, *39*(4), 949–969.

Eftekharzade, S. F., & Mohammadi, B. (2011). The Presentation of a Suitable Model for Creating Knowledge Management in Educational Institutes (Higher Education). *Procedia - Social and Behavioral Sciences, 29*, 1001–1011.

Faizal, P. R. M., Ridhwan, a. a. M., & Kalsom, a. W. (2013). The Entrepreneurs Characteristic from al-Quran and al-Hadis. *International Journal of Trade, Economics and Finance*, *4*(4), 191–196.

Farahani, H. A., Rahiminezhad, A., Same, L., & Immannezhad, K. (2010). A Comparison of Partial Least Squares (PLS) and Ordinary Least Squares (OLS) regressions in predicting of couples mental health based on their communicational patterns. *Procedia - Social and Behavioral Sciences, 5*(0), 1459-1463.

Farhanghi, A. A., Abbaspour, A., & Ghassemi, R. A. (2013). The Effect of Information Technology on Organizational Structure and Firm Performance: An Analysis of Consultant Engineers Firms (CEF) in Iran. *Procedia - Social and Behavioral Sciences, 81*, 644–649.

Field, A. (2009). *Discovering statistics using SPSS*. Sage publications.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 39-50.

Göçen, A., & Özğan, H. (2018). An Analysis of Workplace Spirituality Debates. *Universal Journal of Management, 6,* 70-79.

Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of Management Information Systems*, *18*(1), 185–214.

Grant, R. M. (1996). TOWARD A KNOWLEDGE-BASED THEORY OF THE FIRM. *Strategic Management Journal*, *17*(Special Issue: Knowledge and the Firm), 109–122.

Gupta, A. K., & Govindarajan, V. (2000). Knowledge Management's Social Dimension: Lessons From Nucor Steel. *MIT Sloan Management Review*, *42*, 71–80.

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, *26*(2), 106–121.

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.

Hamid, M. R. B. A. (2015). Value-based performance excellence model for higher education institutions. *Quality & Quantity*, *49*(5), 1919–1944.

Hao, Q., Kasper, H., & Muehlbacher, J. (2012). How does organizational structure influence performance through learning and innovation in Austria and China. *Chinese Management Studies*, *6*(1), 36–52.

Harlow, H. (2008). The effect of tacit knowledge on firm performance. *Journal of Knowledge Management*, *12*(1), 148–163.

Huang, K., Wu, J., Lu, S., & Lin, Y. (2016). Innovation and technology creation effects on organizational performance. *Journal of Business Research*, *69*(6), 2187–2192.

Imran, M. K. (2014). Impact of Knowledge Management Infrastructure on Organizational Performance with Moderating Role of KM Performance : An Empirical Study on Banking Sector of Pakistan. *Information and Knowledge Management*, *4*(8), 85–99.

Jantunen, A. (2005). Knowledge-processing capabilities and innovative performance : an empirical study. *European Journal of Innovation Management*, *8*(3), 336–349.

Jusoh, A. (2008). *Hubungan Amalan Pengurusan Kualiti Menyeluruh dengan Tahap Pemindahan Teknologi : Suatu Kajian Empirikal Mengikut Perspektif Penyelidik Universiti*. (Unpublished doctoral dissertation). Universiti Utara Malaysia, Sintok, Kedah

Kidwell, J. J., Linde, K. M. Vander, & Johnson, S. L. (2000). Knowledge Management Practices in Higher Education. *Educause Quarterly*, *4*, 28–33.

Kline, R. B. (2011). *Principles and practice of structural equation modeling*. Guilford publications.

Lai, Y.-L., Hsu, M.-S., Lin, F.-J., Chen, Y.-M., & Lin, Y.-H. (2014). The effects of industry cluster knowledge management on innovation performance. *Journal of Business Research*, *67*(5), 734–739.

Lee, M. N. N. (1998). Corporatization and Privatization of Malaysian Higher Education. *International Higher Education*, *10*, 7–8.

Lye, L. T. (2013). Opportunities and Challenges Faced by Private Higher Education Institution Using

the TPACK Model in Malaysia. *Procedia - Social and Behavioral Sciences*, *91*, 294–305.

Massingham, P. (2014). An evaluation of knowledge management tools: Part 1 – managing knowledge resources. *Journal of Knowledge Management*, *18*(6), 1075–1100.

Mayrl, D., & Oeur, F. (2009). Religion and higher education: Current knowledge and directions for future research. *Journal for the Scientific Study of Religion*, *48*(2), 260–275.

Meso, P., & Smith, R. (2000). A resource-based view of organizational knowledge management systems. *Journal of Knowledge Management*, *4*(3), 224–234.

Mohamed, M., Stankosky, M., & Murray, A. (2006). Knowledge management and information technology: can they work in perfect harmony? *Journal of Knowledge Management*, *10*(3), 103–116.

Mohayidin, M. G., Azirawani, N., Kamaruddin, M. N., & Margono, M. I. (2007). The Application of Knowledge Management in Enhancing the Performance of Malaysian Universities. *The Electronic Journal of Knowledge Management*, *5*(3), 301–312.

Mokhlis, S. (2008). Consumer Religiosity and the Importance of Store Attributes. *The Journal of Human Resource and Adult Learning*, *4*(2), 122–133.

Montanaro, M. K. F. (2013). *The influence of financial performance on higher education academic quality*.

Myers, R. (1990). *Classical and modern regression with applications* (2nd ed.). Boston,MA: Duxbury.

Nunnally, J. C., & Bernstein, I. H. (1967). *Psychometric theory* (Vol. 226). New York: McGraw-Hill.

Osman-Gani, Aa. M., Hashim, J., & Ismail, Y. (2013). Establishing linkages between religiosity and spirituality on employee performance. *Employee Relations*, *35*(4), 360–376.

Pandey, S. C., & Dutta, A. (2013). Role of knowledge infrastructure capabilities in knowledge management. *Journal of Knowledge Management*, *17*(3), 435–453.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, *88*(5), 879–903.

Ramachandran, S. D., Chong, S.-C., & Wong, K.-Y. (2013). Knowledge management practices and enablers in public universities: A gap analysis. *Campus-Wide Information Systems*, *30*(2), 76–94.

Ramlee Mustapha, & Abu Abdullah. (2004). Malaysia Transitions Toward a Knowledge-Based. *The Journal of Technology Studies*, (Hr D), 51–61.

Rašula, J., Vukšić, V. B., & Indihar Štemberger, M. (2012). The impact of knowledge management on organisational performance. *Economic and Business Review*, *14*(2), 147–168.

Rice, G. (1999). Islamic Ethics and the Implications for Business. *Journal of Business Ethics*, *18*(4), 345–358.

Rivlin, A. M. 1973. Measuring performance in education. In Milton Moss (Ed.), *The Measurement of Economic and Social Performance.* (pp. 411-437). NBER

Rowley, J. (2000). Is higher education ready for knowledge management? *International Journal of*

Educational Management, *14*(7), 325–333.

Rusli Harun. Pengarah, Bahagian Pendaftaran dan Piawaian, Jabatan Pendidikan Tinggi. 8 Disember 2015. Kementerian Pendidikan Tinggi Malaysia. *Isu IPTS di Malaysia* (Personal Interview).

Sabri, H. (2005). Knowledge management in its context: Adapting structure to a knowledge creating culture. *International Journal of Commerce and Management*, *15*(2), 113–128.

Sahney, S., & Thakkar, J. (2016). A comparative assessment of the performance of select higher education institutes in India. *Quality Assurance in Education*, *24*(2), 278–302.

Seddighi, H. R. (2015). A model of a firm's innovation and growth in a knowledge-based economy. *Journal of the Knowledge Economy*, *6*(2), 215-227.

Songsangyos, P. (2012). The Knowledge Management in Higher Education in Chiang Mai: A Comparative Review. *Procedia - Social and Behavioral Sciences*, *69* (Iceepsy), 399–403.

Supar, N. (2012). Technological Factors Affecting Knowledge Sharing among Academic Staff in Selected Malaysian Higher Educational Institutions and the Effect on Performance. *Journal of Education and Vocational Research*, *3*(7), 234–241.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics*. Allyn & Bacon/Pearson Education.

Tee, K. F. (2016). Suitability of performance indicators and benchmarking practices in UK universities. *Benchmarking: An International Journal*, *23*(3), 584–600.

Tlaiss, H. A. (2014). How Islamic Business Ethics Impact Women Entrepreneurs: Insights from Four Arab Middle Eastern Countries. *Journal of Business Ethics*, *129*(4), 859–877.

Tseng, S.-M. (2014). The impact of knowledge management capabilities and supplier relationship management on corporate performance. *International Journal of Production Economics*, *154*, 39–47.

Tuanmat, T. Z., & Smith, M. (2011). The effects of changes in competition , technology and strategy on organizational performance in small and medium manufacturing companies. *Asian Review of Accounting*, *19*(3), 208–220.

Turulja, L., & Bajgoric, N. (2017). Information technology, knowledge management and human resource management: Investigating mutual interactions towards better organizational performance. *VINE Journal of Information and Knowledge Management Systems*.

Walczak, S. (2005). Organizational knowledge management structure. *The Learning Organization*, *12*(4), 330–339.

Wang, D., & Yang, S. (2007). Impact of organizational structure and HRM on organizational performance. In *Engineering Management Conference, 2007 IEEE International* (pp. 164–169).

Wang, M.-H., & Yang, T.-Y. (2016). Investigating the Success of Knowledge Management: An Empirical Study of Small- and Medium-sized Enterprises. *Asia Pacific Management Review*, *21*(2), 1–13.

Wei Chong, C., Yen Yuen, Y., & Chew Gan, G. (2014). Knowledge sharing of academic staff. *Library Review*, *63*(3), 203–223.

Wen, Y.-F. (2009). An effectiveness measurement model for knowledge management.

Knowledge-Based Systems, *22*(5), 363–367.

Wernerfelt, B. (1984). A Resource based view of the firm. *Strategic Management Journal*, *5*(2), 171–180.

Wiig, K. M. (1997). Knowledge Management: An Introduction and Perspective. *Journal of Knowledge Management*, *1*(1), 6–14.

Worthington, Everett L., J., Wade, N. G., Hight, T. L., Ripley, J. S., McCullough, M. E., Berry, J. W. J. T., … O'Connor, L. (2003). The Religious Commitment Inventory-10: Development, refinement, and validation of a brief scale for research and counseling. *Journal of Counseling Psychology*, *50*(1), 84–96.

Yang, C., & Chen, L.-C. (2007). Can organizational knowledge capabilities affect knowledge sharing behavior? *Journal of Information Science*, *33*(1), 95–109.

Yasir, M., Majid, A., & Yasir, M. (2017). Nexus of knowledge-management enablers, trust and knowledge-sharing in research universities. *Journal of Applied Research in Higher Education*, *9*(3), 424-438.

Yigitcanlar, T., & Sarimin, M. (2015). Multimedia Super Corridor, Malaysia: knowledge-based urban development lessons from an emerging economy. *Vine*, *45*(1), 126-147.

Zangoueinezhad, A., & Moshabaki, A. (2011). Measuring university performance using a knowledge-based balanced scorecard. *International Journal of Productivity and Performance Management*, *60*(8), 824–843.

Zulkifli, R. M., & Rosli, M. M. (2013). Entrepreneurial Orientation and Business Success of Malay Entrepreneurs: Religiosity as Moderator. *International Journal of Humanities and Social Science*, *3*(10), 264–275.