UNDERSTANDING OF LEARNING STYLES AMONG INTERNATIONAL AND LOCAL STUDENTS ON ACADEMIC PERFORMANCE IN HIGHER EDUCATION INSTITUTION IN MALAYSIA

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Abstract: Learning style is the manner of an individual process, obtains and studies new and challenging information. It is vital because students' academic performance is related to learning preference styles. In some occasions the poor academic performance is still rising among university students and it brings a universal concern, especially for developing countries like Malaysia. Thus, this study reports the learning styles that would be preferred by international students and local students in higher education institutions in Malaysia. VARK model was introduced by Felder Fleming to examine learning style which includes Visual (V), Auditory (A), Reading (R), and Kinesthetic (K). Data were collected using VARK questionnaire developed by Fleming and Mills (1992). The finding of the survey demonstrates a significant relationship between the four dimensions measured visual, auditory, reading/writing, and kinesthetic. The result developed provides recommendations for the educators to implement effective teaching strategies and materials for student learning preferences and to benefit future researchers.

Keywords: Learning Styles, Academic Performance, and VARK Model, International and Local Student.

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Research Background

The effect of student mobility from one country to another country has become a vital feature to higher education (Singh, Schapper, & Jack, 2014). Report of Ministry of Education Malaysia (2015) pointed out that there was an increase of 70% student enrolment from 2004 to 2014 which about to 1.2 million of student enrolled in Malaysia. Besides that, in 2014, Malaysia also has been ranked as one of the highest population of international students in the academic circles among Malaysia's peers such as developed Asian economies (Hong Kong, Singapore, South Korea, Japan), ASEAN neighbours (Indonesia, Thailand, Singapore), and countries with comparable GDP per capita (Chile, Mexico) (Ministry of Education Malaysia, 2015). This also indicates that Malaysia has successfully held 2% of the international student population around the world (Munir, Aida, & Shukran, 2016).

A popular country for students in academic since the development of Malaysia into international higher education and Malaysia can be recognised as a new fast-educational hub, it has improved tremendously during past decade. The Ministry of Higher Education is committed to monitor its vision of turning the country into a well-known education place for students around the world. It leads to the improvement of institutions and government towards various learning styles perceived by international students and the circumstances of attracting and retaining students has to be diversified (Organisation for Economic Co-operation and Development [OECD], 2013; Rahman, 2016). Besides that, instructors should also understand the students' learning styles to assist students with the challenges they face in learning as the valuable information for their teaching material (Nasiri, Gharekhani, & Ghasempour, 2016).

The preferences of learning styles are different from one to another (Almigbal, 2015). Learning style is the manner of an individual processes, obtains and studies new and challenging information (Kadir, 2013). Keefe's study (as cited in Lee & Sidhu, 2015) also defined the learning style as the indicators which consist characteristics such as cognitive, affective and physiological characters that direct an individual to respond to the learning environment. It is important to know that, students who are given the suitable assistance on their preferred style will get better score on their tests, fact knowledge, attitude and efficiency in learning (Kadir, 2013). Students knowing their own learning preferences can permit them to use numerous tactics to improve their learning and thus educational satisfaction (Al-Sauld, 2013). Therefore, Students' performance is related to learning preferences styles.

Al-Sauld (2013) proposed grade point average can define a student's academic performance in different backgrounds. By using CGPA, in example, cumulative grade point average, it represents the overall score of students' performance throughout semesters (Fiagborlo & Kunu, 2016). Mushtaq & Khan (2012) and Almigbal (2015) held that students' academic performance can be measured using GPA because the use of GPA is to measure student's result and it mainly focus in the student performance in semester.

Problem Statement

Since international students become more concerned and the internationalisation of higher education for Malaysia is relatively a new initiative. It is inspiring to comprehend and understand the learning style between international and local students (Munir, Aida, & Shukran, 2016). Khoo, Karim, and Khuan (2014) stated that poor academic performance is the principle issue of international students. They claimed that the students' learning style may be a factor that affects their academic performance level. Mismatching of learning style with student's preferred learning style could lead to a low level of academic performance (Liew,

Sidhu, & Barua, 2015). Numerous students acknowledge the conflict of the inconsistency of teaching and learning styles and struggles themselves in adjusting to the new learning environment (Jayatilleke & Gunawardena 2016). The instructional teaching and learning method in one country may not be directly designed to the students from various backgrounds (Speece, 2012; Lam& Choi 2013). While a proper match of the students' learning process with their learning style will result in an efficient academic achievement (Almigbal, 2015).

Johari and Ahmad (2016), a research has been done in National University of Malaysia; there is a negative effect on local students' interest and apathy, understanding and academic performance when teaching method did not match with the students' learning styles with the teachers teaching techniques. Moreover, a study of Iberahim (2014) also states that students learnt with incorrect learning styles and inability of adapting learning styles with teaching method provided by teachers are the root problems of deteriorating of student academic performance. Many researchers (as cited in Johari & Ahmad, 2016) stated that students learnt the skills and learning methods without having a proper plan. The reason is that there is no specific supervision available for students to carry out their studies (Johari & Ahmad, 2016).

There are a lot of past researches on learning styles among medical students, but only few studies have explored the relationship between learning styles and the mean of students' final exam scores (Nasiri, Gharekhani, & Ghasempour, 2016). Different types of learning styles are necessarily applied to different subjects in order to optimally maximize the students' academic performance (Liew, Sidhu, & Barua, 2015). As a matter of fact many researchers did not find any difference between preferred learning styles and academic performance of students in same academic course (Almigbal, 2015).

There were many researchers have been carried out in Western and Eastern countries which focused in comparing both international and host countries students (Lam& Choi 2013; Westcott & Johnson, 2013; Hashim, 2012). However, a handful of literatures about the comparison of international and local students learning style in Malaysia were found in the review for this study (Singh, Schapper, & Jack, 2014). To redress this issue, this article attempts to explore and understand learning styles differences among international and locals students that can give a significant contribution towards education line in Malaysia. This research gap is yet to be completed.

Research Objective

General objective	General Question
-To determine the relationship of learning styles and students' academic performance among the international and local students in Malaysia.	-What is the relationship of learning styles and students' academic performance among the international and local students in Malaysia?
Specific objective	**Specific Question**
-To understand the relationship between visual learning style and academic performance among international and local students in Malaysia.	- What is the relationship between visual learning style and academic performance among international and local students in Malaysia?
-To understand the relationship between auditory learning style and academic performance among international and local students in Malaysia.	- What is the relationship between auditory learning style and academic performance among international and local students in Malaysia?
-To understand the relationship between reading learning style and academic performance among	- What is the relationship between reading learning style and academic performance among international

international and local students in Malaysia.	and local students in Malaysia?
-To understand the relationship between kinesthetic learning style and academic performance among international and local students in Malaysia.	-What is the relationship between kinesthetic learning style and academic performance among international and local students in Malaysia?

Literature Review
Identification of Model
VARK model has been selected for this research because it provides a general overview of the learning style's preferences, providing information and information (Renner, Laumer, & Weitzel, 2015). In addition, based on VARK model, each learners has their own learning style to learn academic learning; if the learners have different learning styles, the motivation of the learners will increase; And the learners will learn academic concepts using senses and different opinions (Nasiri, Gharekhani, & Ghasempour, 2016).

VARK model
Students' learning styles with different types can be identified by using different theories and multiple tools (Lee & Sidhu, 2015). Fleming had developed the VARK model in 1987 (Liew, Sidhu, & Barua, 2015). VARK model consists of four dimensions such as visual (V), auditory (A), reading/writing (R) and kinesthetic (K) and a questionnaire has been introduced for this model by the Felder Fleming to identify the learning styles (Nasiri, Gharekhani, & Ghasempour, 2016). Based on Phatchara, (2012) and Renner, Laumer, and Weitzel (2015), VARK model is known as sensory modality preference that concentrate more on the student's learning preferences in order to acquire new knowledge. It is a good channel to differentiate the learning styles of students.

Concept of VARK model
VAK model previously has 3 major sensory modalities such as visual (V), aural (A), and kinesthetic (K).VAK model has been classified the learning preferences of the students based on their neural system when obtaining the knowledge. Fleming (as cited in Phatchara, 2012; Al-Sauld, 2013) expanded VAK to VARK model in order to distinguish the 2 categories of visual such as visual learners prefer to use graph or picture, while reading/writing learners prefer to use text for their learning styles. Flemings VARK model or VAK model is the most typical and extensively used theories in the field of learning style (Nzesei, 2015). However, this model was being used mostly in country other than Malaysia.

Review of Past Empirical Study
Academic performance

Study	Country	Data	Major Findings
Brau, Brau, Owen, and Swenson (2016)	USA	110 question survey of undergraduate students completed in Brigham Young University.	Student's academic performance can be influenced by, either positively or negatively factor, that impact to student grade and learning. Positive factors consist of GPA, attendance, percent of reading completed, self-rated marketing ability, and hours spent studying during exam period. While negative factors such as student wake up late, acknowledging with English language, and working at part-time may give undesirable response to grade.
Almigbal	Saudi	600 medical students were	There were no relationship between learning style

		utilized at King Saud University in Riyadh, Kingdom of Saudi Arabi	preferences and GPA.
(2015)	Arabia		
Al-Sauld (2013)	Saudi Arabia	113 first-year dental students at King Saud University in Riyadh, Saudi Arabia, were participated.	that there was a significant relationship between the mean value of GPA and learning style preference in same area Saudi Arabia.

Visual

Study	Country	Data	Major Findings
Koć-Januchta, Höfler, Thoma, and Prechtl (2016)	Germany	An interview questionnaire of 90 students in university in Germany.	Result shows that positive relationship between visualizer-verbalizer cognitive style and learning outcome.
Mohamad, (2013)	Malaysia	128 vocational education students in Building Construction in Johor.	Result shows that the dominant type of learners was the visual learner.
Vaishnav (2013)	India	200 students studying at standard. 8th to 11th in five different schools of Maharashtra state.	Result shows very negligible positive correlation was found between Visual Learning Style and academic achievement of students.
Safaa (2012)	Saudi Arabia	88 undergraduate EFL majors of Faculty of Education from Taibah University were participated.	The results show that there is a significant relationship between visual learning styles and memory strategies.
Karthigeyan and Nirmala (2013)	Tamilnadu State	582 higher secondary schools students in Salem district of Tamilnadu State.	The results show majority of student preferred visual learning style primarily which is the primary learning style of students' in second language learning.

Auditory

Study	Country	Data	Major Findings
Gonzales and Reyes (2016)	Philippines	Whole population of AB-Multimedia Arts students who were enrolled during the first semester of school year 2014-2015.	The study reveals that academic performance of students is correlated to auditory modality.
Veena & Shastri (2013)	India	35 to 40 undergraduate students of pure science and applied science courses from education institutions in Bangalore city.	Auditory learning style has been a preference of majority students and it is correlated with academic performance.
Carbonel (2013)	Philippines	100 students who were studied in College Algebra at Kalinga-Apayao State College.	The findings of the study shows that the students preferred more on auditory style of learning and it has a positive relationship with academic performance.
Vaishnav (2013)	India	200 students were participated from the class 9th, 10th and 11th standard of Maharasthra	Auditory has less significant relationship with academic performance as compared with visual and kinesthetic.

| Boström and Hallin (2012) | Sweden | There were 156 randomly selected from second or third year-students in one rural university in Sweden. | Result shown that nursing students were highly motivated, kinesthetic, and preferred authorities and conscious didactic action skills in higher education, as well as implementation of learning strategies for students. |

Reading/Writing

Study	Country	Data	Major Findings
Cimmiyotti (2013)	America	95 students from second through fifth grade.	Result shows that there was a strong correlation between reading performance and academic performance
Owusu-Acheaw (2014)	Africa	1000 copies of questionnaire were administered on students of Koforidua Polytechnic in Ghana, Africa.	The result had shown that there is a positive relationship between reading habits and academic performance of students.
Karanja (2015)	Kenya	500 students from 10 public mixed day schools, 10 principles or deputy principles and 22 teachers.	The result shown that reading difficulties have a negative impact towards the academic performance.
Earl, James and Albrecht (2015).	Kwara	Data for 1,369 students in a total of 11 sections of introductory accounting courses.	Students who study more material earn higher exam scores than students who study less material. Not only that, students who self-select to do relatively more of their studying through reading text score higher on exams than do students who self-select to do relatively more of their studying through watching videos.
Issa, Aliyu, Akangbe, and Adedeji (2012)	Kwara	250 copies of the questionnaire were distributed to Mass Communication and Library and Information Science students at the Federal Polytechnic, Offa.	Although agreed that reading interests and habits relate closely with academic performance generally, they found it difficult to relate the inculcation and development of reading interests and habits to library use.

Kinesthetic

Study	Country	Data	Major Findings
Karalliyadda (2017)	Sri Lanka	74 students out of 94 of first year undergraduates in Rajarata university of Sri Lanka were participated in the survey.	The result has shown that 88% of the students prefer a Kinesthetic learning style, which has a positive impact on academic performance.
Bosman (2015)	Africa	240 students were selected from different forms, genders and nationalities at an independent multicultural senior school in the North West Province of South Africa.	The result shows that kinesthetic learning style has significant relationship with academic performance.
Abbas (2012)	Iran	100 EFL university English students who were between age of 23 and 28 in Islamic Azad University of Lahijan.	The result of the study stated that there was only 15% of the students are kinesthetic leaners.
Gonzales	Philippines	Kinesthetic learning style can be	Result shows that students who achieved satisfied

and Reyes (2016)		defined as the learners who obtain information or knowledge by carrying out some practices such as highlighting notes, drawing diagrams and images and recording notes.	academic performance preferred kinesthetic learning style.
Njoku (2016)	Nigeria	327 students were randomly selected from ten selected schools in the Local Government Area, Jigawa state, Nigeria.	The study showed that there is a significant relationship between kinesthetic learning style and academic performance where 217 students of the sample have better academic performance with kinesthetic learning style.

Hypotheses Development

Four hypotheses are developed for this study and are shown as follows:

H1a: There is a positive relationship between visual and academic performance among international students.

H1b: There is a positive relationship between visual and academic performance among local students.

H2a: There is a positive relationship between auditory and academic performance among international students.

H2b: There is a positive relationship between auditory and academic performance among local students.

H3a: There is a positive relationship between reading and academic performance among international students.

H3b: There is a positive relationship between reading and academic performance among local students.

H4a: There is a positive relationship between kinesthetic and academic performance among international students.

H4b: There is a positive relationship between kinesthetic and academic performance among local students.

Conceptual Framework

Figure 1 represents the conceptual framework of this study, in which the four dimensions of VARK (consisting of Visual, Auditory, Reading/Write, and Kinesthetic) are the independent variables (IV); while academic performance remains as the dependent variable (DV) studied.

Figure 1: Learning Styles affecting Academic Performance
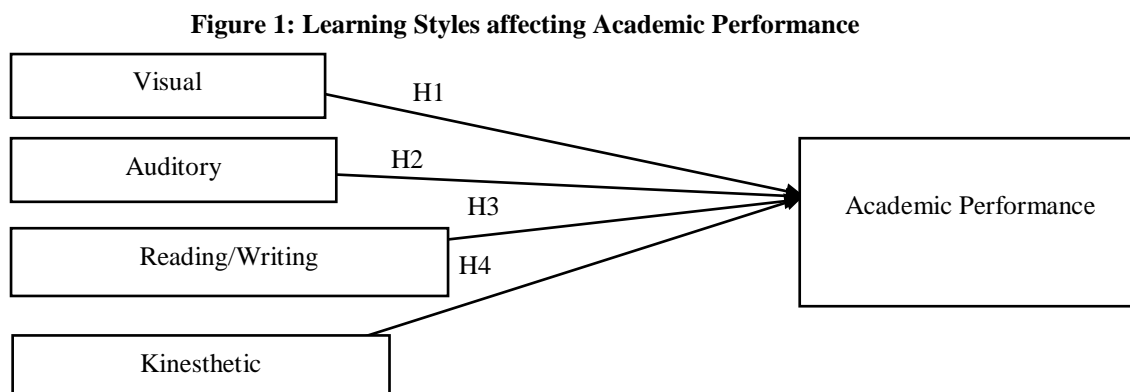
Adapted from: Khoo, Karim, and Khuan (2014)

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Research Methodology
Population and Sampling Procedures
International and local students in University were chosen as population. This population is able to represent the universities of international and local students in Malaysia. In consideration of budget and time constraint, sampling was used to collect data in this research where it can represent entire population (Saunders, Lewis, & Thorm hill, 2012). According to McLeod (2014), sample is defined as the selection of a representative group from a target population. Sampling is therefore preferred as indicating the entire population in a short period. Besides that, sample is cheaper and able to get the data quicker than a complete census (Lim & Ting, 2012).

To understand the international and local students preferred learning styles impartially, quota sampling technique was applied in which students' status were categorised as international and local student. Basically, quota sampling offers adequate statistical power for discovering the diversity group (Bornstein, Jager & Putnick, 2013). Acharya, Prakash, Saxena, and Nigam (2013) also argued quota sampling is easy to understand and does not need sampling frame to support the analysis. Therefore, the sample was divided and distributed equally (50:50) against international and local students to achieve the quota sample (Cashman, et al., 2013).

Data Collection Method
The survey questionnaires were distributed during the semester break on May 2017. The participants consisted of international and local students of undergraduates in Malaysian higher education of institution. The questionnaires were given by using self-administered method. According to Hinkin's study (as cited in Duncan, 2016), it is sufficient to recruit large sample for an item to respondent ratio ranging from 1:4 to 1:10. In this research, research questionnaire consists of 64 questions; therefore, the sample size will range from 256-640 units. Also, 400 of sample size were distributed to 200 international and 200 local students respectively in the ratio of (50:50) and 400 sample size is often considered as optimal in Ghauri and Gronhaug studies (as cited in Jenny, 2014).

Before the distribution was conducted, 40 set of pilot survey has been spread to test the validity of the questionnaire towards the students in Universiti Tunku Abdul Rahman (UTAR) (Bekker-Grob, Donkers, Jonker, & Stolk, 2015). The questionnaire was designed by adopting from VARK's official website (Fleming & Mills, 2017) and 20 international and 20 local students were randomly chosen.

As the pilot test has been passed, a total of 400 sets of questionnaires were distributed undergraduates in Malaysian higher education of institution. The participants were informed that these questionnaires were designed to measure their learning preferences, and the data collection was for the purpose to conduct the research findings. A number of 400 questionnaires were returned with a response rate of 67% whereby 268 sets of questionnaires were received and were usable for this study. This was because the survey questionnaires which consist of missing data and consistent data were filtered.

Variables & Measurement
In this study, total 64 items for the four learning preferences in order to evaluate the relationships between IVs and DV. The items were adopted from the VARK questionnaire provided by Fleming's model; however the students' responses will be scaled by using Likert Scale that was not originally supplied in the model (Wahyudi, 2012). It is amended on the

ground to suit the nature and context of the research. 5-point Likert scale would be used to evaluate those independent variables range from strongly disagrees to strongly agree. The Likert Scale restricted to five because it is easily be re-scaled with the resultant data being quite comparable and is likelihood to produce higher mean scores in some rating instruments (Walkinshaw, Milford, & Freeman, 2015). Also, agree to disagree scales can be used to measure a wide range of constructs and participants able to understand and provide their perception on it (Subedi, 2016).

Data Analysis
Profile of Respondents

Table 4.1: Respondents' Profile

	International students		Local students	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Gender				
Female	56	41.79	82	61.19
Male	78	58.21	52	38.81
Age				
18 or less	7	5.22	16	11.94
19 to 22	64	47.76	89	66.42
23 to 25	63	47.01	27	20.15
26 or greater	0	0.00	2	1.49
CGPA				
0.00-2.00 (Poor)	3	2.24	5	3.74
2.01-3.00 (Average)	76	56.80	86	64.24
3.01-4.00 (Good)	55	41.14	43	32.15
Level of Programme				
Foundation	19	14.18	6	4.48
Diploma	22	16.42	29	21.64
Degree	60	44.78	88	65.67
Master	33	24.63	11	8.21
Country				
USA	11	8.21		
UK	10	7.46		
Europe	28	20.90		
Asia	43	32.09		
Africa	20	14.93		
South East Asia	22	16.42		
Malaysia			134	100.00

Inferential Analysis
Pearson Correlation Coefficient

Table 4.2.1: Pearson's Correlation (International students)

Variables	**Visual**	**Auditory**	**Reading/ Writing**	**Kinesthetic**	**CGPA**
Visual	1.00000 <.0001				
Auditory	0.52442	1.00000			

	<.0001				
Reading/ Writing	0.31134 <.0001	0.45753 <.0001	1.00000		
Kinesthetic	0.45148 <.0001	0.53699 <.0001	0.46489 <.0001	1.00000	
CGPA	0.56598 <.0001	0.66434 <.0001	0.50669 <.0001	0.70643 <.0001	1.00000

<p align="center">Source: Developed for research</p>

Table 4.2.1 describes the correlation between the variables (visual, auditory, reading/writing, kinesthetic, and CGPA). Highest coefficient value is 0.70643, which is lower than 0.90 and all variables (visual, auditory, reading/writing, kinesthetic, and CGPA) appear to have low correlation to each other. Hence, there is no multicollinearity problem existed in this research. The P-value of all the independent variables are less than <0.0001 and therefore all the four independent variables (visual, auditory, reading/writing, kinesthetic, and CGPA) have significant correlation among each other.

<p align="center">Table 4.2.2: Pearson's Correlation (Local students)</p>

Variables	Visual	Auditory	Reading/ Writing	Kinesthetic	CGPA
Visual	1.00000 <.0001				
Auditory	0.49125 <.0001	1.00000			
Reading/ Writing	0.55748 <.0001	0.49562 <.0001	1.00000		
Kinesthetic	0.56478 <.0001	0.62099 <.0001	0.65146 <.0001	1.00000	
CGPA	0.51332 <.0001	0.51300 <.0001	0.53689 <.0001	0.56586 <.0001	1.00000

<p align="center">Source : Developed for research</p>

Table 4.2.2 describes the correlation between the variables (visual, auditory, reading/writing, kinesthetic, and CGPA). Highest coefficient value is 0.65146, which is lower than 0.90 and all variables (visual, auditory, reading/writing, kinesthetic, and CGPA) appear to have low correlation to each other. There is no multicollinearity problem existed in this research. The P-value of all the independent variables are less than <0.0001 and therefore have met the standardized requirement (P-value less than 0.05). It is concluded that all the four independent variables (visual, auditory, reading/writing, kinesthetic, and CGPA) have significant correlation among each other.

Multiple Linear Regressions (MLR)

<p align="center">Table 4.3.1: Summary of Model (International students)</p>

Root MSE	0.27097	**R-Square**	0.6510
Dependent Mean	2.94171	**Adj R-Sq**	0.6402
Coeff Var	9.21119		

<p align="center">Source: Developed for the research</p>

As shown in Table 4.3.1, the R square of the model of 0.6510 indicated that 65.10% of the variation in academic performance of undergraduates in Malaysian higher education of

institution can be explained by all the 4 IVs in this study (V, A, R, and K). Meanwhile, remaining 34.90% of the variation can be explained by variables other than V, A, R and K.

Table 4.3.2: Multiple Linear Regressions: Parameter Estimates (International students)

Construct	Df	Parameter Estimate	Sandardized Estimate	Sandard Error	t	Pr > |t|
Intercept	1	-0.15738	0.21168	0	0.74	0.4585
V_AVG	1	0.16672	0.05449	0.19243	3.06	0.0027
A_AVG	1	0.29623	0.07082	0.28733	4.18	<.0001
R_AVG	1	0.12582	0.06094	0.12633	2.06	0.0410
K_AVG	1	0.37069	0.06026	0.40653	6.15	<.0001

Source: Developed for the research

Based on Table 4.3.2, all the IVs (V, A, R and K) has a positive relationship with DV (AP) as all the value of parameter estimate is positive (0.16672, 0.29623, 0.12582 and 0.37069 respectively) and all IVs are significant as the p-value is less than 0.05 which means. Hence, all the hypotheses (H1, H2, H3, H4, H5, H6, H7 and H8) can be supported.

Thus, the equation for the model should be written as:

$$AP = -0.15738 + 0.16672 \text{ (V)} + 0.29623 \text{ (A)} + 0.12582 \text{ (R)} + 0.37069 \text{ (K)}$$

According to the table above, all the IVs (V, A, R and K) has a significant association with academic performance as the p-value is less than 0.05. The relationship between V and AP is the strongest where every increase in K, the AP will increase by 0.37069, provided all other variables remain constant.

The tolerance value of each IV falls within the range of 0.57342 and 0.72262. According to Field (as cited in Yusoff, Mohamad, & Darus, 2013), tolerance value should not less than 0.1 to avoid the multicollinearity problem. Therefore, the results show no multicollinearity problem was occurring.

Table 4.3.3: Summary of Model (Local students)

Root MSE	0.38179	R-Square	0.4213
Dependent Mean	2.87940	Adj R-Sq	0.4033
Coeff Var	13.25925		

Source: Developed for the research

As shown in Table 4.3.3, the R square of the model of 0.4213 indicated that 42.13% of the variation in academic performance of undergraduates in Malaysian higher education of institution can be explained by all the 4 IVs in this study (V, A, R, and K). Meanwhile, remaining 57.87% of the variation can be explained by variables other than V, A, R and K.

Table 4.3.4: Multiple Linear Regressions: Parameter Estimates (Local students)

Construct	Df	Parameter Estimate	Standard Error	Standardized Estimate	t	Pr > |t|
Intercept	1	0.88263	0.21511	0	4.10	<.0001
V_ AVG	1	0.15970	0.07292	0.18965	2.19	0.0303
A_ AVG	1	0.14109	0.06528	0.19005	2.16	0.0325
R_ AVG	1	0.12582	0.07325	0.19980	2.15	0.0336
K_ AVG	1	0.37069	0.07707	0.21057	2.08	0.0399

Source: Developed for the research

Based on Table 4.3.4, all the IVs (V, A, R and K) has a positive relationship with DV (AP) as all the value of parameter estimate is positive (0.15970, 0.14109, 0.15731 and 0.16000 respectively) and all IVs are significant as the p-value is less than 0.05 which means. Hence, all the hypotheses (H1, H2, H3, H4, H5, H6, H7 and H8) can be supported.

Thus, the equation for the model should be written as:

$$AP = 0.88263 + 0.15970\ (V) + 0.14109\ (A) + 0.15731\ (R) + 0.16000\ (K)$$

According to the table above, all the IVs (V, A, R and K) has a significant association with academic performance as the p-value is less than 0.05. The relationship between V and AP is the strongest where every increase in K, the AP will increase by 0.16000, provided all other variables remain constant.

The tolerance value of each IV falls within the range of 0.43612 and 0.59824. According to Field (as cited in Yusoff, Mohamad, & Darus, 2013), tolerance value should not less than 0.1 to avoid the multicollinearity problem. Therefore, the results show no multicollinearity problem was occurring.

Discussion, Conclusion and Implications
Discussions of Major Findings
Visual
The p-value generated from the study showed that international students have p-value of 0.0027 whereas p-value for local students is 0.0303. This indicated, students with greater the visual learning styles able to perform greater academic performance.

Auditory
The result showed that auditory learning style has a positive relationship on academic performance among international and local students in Malaysia, which in line with result acquired in the studies of Boström and Hallin (2012), Gonzales and Reyes (2016), and Veena & Shastri (2013). The p-value of international students is 0.0001 whereas p-value for local students is 0.0325, this shows a significant relationship. In other words, students with greater the auditory learning styles, their academic performance will be greater. Thus, Veena & Shastri (2013) stated that most students prefer auditory learning style.

Reading/ Writing

The result indicated that students with greater the reading/ writing, learning styles able to achieve excellent academic performance. This is supported statistically with p-value of 0.0410 for international students and 0.0336 p-value of local students. Owusu-Acheaw (2014) claimed that the relationship arising between the readings/ writing and academic performance is due to reading habits. Therefore, good reading habits, enhance thorough understanding of questions and applicable skills compared to those with poor or doesn't possess reading habits. This finding agrees with Issa et al. (2012) that engaging in reading continuously considerably influences ones studying skills and subsequent academic performance.

Kinesthetic

The p-value of international students is 0.0001 and local students are 0.0399. The result indicated that the kinesthetic learning style has a positive relationship on academic performance among international and local students in Malaysia. This result is in line with the findings of Karalliyadda (2017), Bosman (2015), Gonzales and Reyes (2016), and Njoku (2016). In other words, students with greater the kinesthetic learning styles, their academic performance will be greater. According to Bosman (2015), found that the majority of male students were more inclined to be kinesthetic learners than female students.

Implication of Study

The used conceptual model is suitable for higher education institutions to use as a reference in maintaining and improving the students' academic achievement and the university education standards. Moreover, this research is essential to lecturers in universities as they can adopt the model to develop effective teaching methods and teaching materials will be prepared in accordance to students' learning styles which may draw students' attention during the learning process and enable them to sustain high commitment towards their academic performance. Besides that, the MOE will be able to design the curriculum based on the preferred learning styles of local and international student. This study enables students to have a better understanding of the questionnaire since the questions have been categorized into four dimensions, allowing the students to feel ease and not confused in filling up the questionnaire. In a nutshell, future researchers can utilize and apply this framework to conduct research on topics in relation to learning styles.

Limitation of the Study

It is essential to point out that there are some limitations in this study. First and foremost, the items of this research questionnaire has been set objectives which consist of 64 questions, however few students were not willing to fill up the questions because there were too many questions and asking about CGPA of students is too sensitive to students even though it took less than 20 minutes for them to fill up in detail. The second limitation concerns the responding rate of respondents from only one university. Due to time constraint plus with only 268 sets of questionnaire responses, relatively small sample size for this study, this cannot accurately describe the learning styles of international students that come from different countries. The lower response rate to questionnaires could result in bias for the research and cause the problem of the poor reliability of research findings that arises from low sample size studies (Button, et al., 2013).

Conclusion

All in all, the research is aiming to understand the learning styles of students both international and local. According to the research that we have conducted, most of the students have diverse preferences in learning. International and local students who mostly perceived kinesthetics styles as their core preference in learning would get a better score in their exam. This new finding provides an image for instructor in Malaysia to design their teaching materials related to demonstrations, simulations, videos and movies of real things, as well as case studies, practice and applications. Nevertheless, one method cannot fit all students. Hopefully, the instructor can design it by attracting to students with all learning styles at least at some of the time.

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