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CONTENTS

THE USE OF PEANUT AND SESAME SEEDS AS NATURAL COAGULANT IN THE WATER TREATMENT

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ABSTRACT

Natural coagulants are now proving to be good substitutes for chemical coagulants due to their availability, cost effectiveness, nontoxic and biodegradable natures. In this research work, the treatment of highly turbid surface water by coagulation method with sesame and peanut seeds as a natural coagulant has been investigated. This study investigates the potential, suitability, effectiveness and efficiency of sesame and peanut seeds as an environmental friendly and natural coagulant for the treatment of high turbid water, and the effect of each one of the coagulant on the pH of the water, as well as a comparison between the two natural coagulant as which one is more effective in removing the turbidity from water. The sesame and peanut seeds have been used after extraction of the active coagulation component by distilled water and salt solution. The results obtained from the jar test showed that peanut seeds extracted with KCL could effectively remove 88.3% of the 340 NTU turbidity using only dosage of 20 mg/l, while sesame seeds extracted could remove only 79.7% of the 344 NTU turbidity using dosage of 60 mg/l . Moreover, the results showed that the peanut seed is more effective in removing the turbidity from water more than the sesame seeds as it is not that effective in removing turbidity from water. So, it has been demonstrated, in this work, that peanut seed is one of the promising natural coagulants for water treatment.

Keywords:
Coagulants, Environmental, Efficiency, Sesame, Peanut, Turbidity.

INTRODUCTION

In many developing countries, access to clean and safe water is a major problem. According to the UN, 1.1 billion people still do not have access to an adequate supply of drinking water and these people are among the world's poorest. Poor water quality is a key cause of poor livelihood and poor health with 80% of all diseases in developing countries being water related (OECD, 2006). The Millennium Development Goal number 7 and target 10 addresses the need to find better solutions/alternatives to halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation. Due to limited alternatives, surface water either from rivers or rain fed ponds has become one of the main sources of water supply. This water is vulnerable to various forms of pollution generated from different sources mainly households, agriculture and industries.

The most widely applied conventional water treatment technology consists basically of aeration, coagulation, flocculation, sedimentation, filtration and disinfection. When particles are slow to settle or are non-settling, the process is speeded up by coagulation and flocculation through the addition of certain chemicals known as coagulants. These processes are effective at removing fine suspended particles that attract and hold bacteria and viruses to their surface. They can remove up to 99.9% of the bacteria and 99% of the viruses from water supplies (CRC, 2003).

However there are constraints encountered in the use of chemical coagulants, such as scarcity of foreign currency for importation and inadequate supply of chemicals. Although aluminium is the most commonly used coagulant in the developing countries, studies have

linked it to the development of neurological diseases (e.g. pre-senile dementia or Alzheimer's disease) due to the presence of aluminium ions in the drinking water (Jekel, 1991). More so, large non-bio-degradable sludge volumes are produced containing residual aluminium sulphate needing treatment facilities to prevent further contamination into the environment.

As a consequence of the above mentioned drawbacks, there was a need to develop alternative, cost effective and environmentally friendly coagulants. A number of effective coagulants from plant origin have been identified: Peanut seeds (Birima et al., 2013), Sesame seeds (Abubakar et al., 2015), Nirmali seeds (Tripathi et al., 1976); Okra (Al-Samawi and Shokralla, 1996); red bean, sugar and red maize (Gunaratna et al., 2007), Moringga Oleifera (Jahn, 1988) and a natural coagulant from animal origin; chitosan. Natural mineral coagulants have also been used including fluvial clays and earth from termite hills.

This study investigates the potential of peanut and sesame seeds as environmental friendly and natural coagulants for the treatment of high turbid water. The peanut and sesame seeds have been used after the active coagulation component was extracted. Researches on peanut and sesame seeds for turbidity of water is very limited, however the seeds have been promoted locally for many purposes.

LITERATURE REVIEW

Water is a precious natural resource vital for sustaining life. It is in a continuous circulation movement (i.e., hydrological cycle), and is not uniformly distributed in time and space. Due to its multiple benefits and the problems created by its excesses, shortages and quality deterioration, water, as finite resource requires special attention (Pinderhughes, 2004).

Water treatment usually comprises water clarification and disinfection processes (Suarez et al. 2003). In conventional water treatment a series of processes including coagulation, flocculation, sedimentation, filtration and disinfection are often used (AWWA, 1990). A combination of several processes is usually needed to improve the quality of raw water depending on the type of water quality problems present, the desired quality of the treated water, the costs of different treatments and the size of the water system (Kalibbala, 2007).

Methods of water treatment from biological materials will indeed be effective in providing water at a very cheap and affordable price and at all times in every household. One method that has been practiced by people in some parts of the developing world is the use of locally available natural coagulants to improve turbidity and reduce bacteria in surface water (Ghebremichael et al., 2005).

ALUMINIUM SALTS

Common aluminium coagulants include aluminium sulphate (alum), sodium aluminates and polyaluminium chloride. Dry alum is available in several grades, with a minimum aluminium content expressed as 17% of A12O3. Liquid alum is about 49 % solution, or approximately 8.3 % by weight aluminium as A12O3. Alum coagulation works best for a pH range of 5.5 to 8.0. However, actual removal efficiency depends on competing ions and chelating agent concentrations. Sodium aluminate is an alternative to alum and is available in either dry or liquid forms, containing an excess of base. Sodium aluminate provides a strong alkaline source of water-soluble aluminium, which is useful when adding sulphate ions is undesirable. It is sometimes used in conjunction with alum for controlling pH. Polyaluminum chloride (PAC), another aluminium derivative, is a partially hydrolyzed aluminium chloride solution. Although still not widely used, it has been reported to provide stronger, faster settling flocs than alum in some applications (Hahn and Kunte, 1990).

PEANUT SEEDS AS A COAGULANT FOR TURBIDITY OF WATER

Attracting attention in recent decades is the use of the dried, crushed seeds as a coagulant. Even very muddy water can be cleared when crushed seeds are added. Solid matter and some bacteria will coagulate and then sink to the bottom of a container. The cleaned water can then be poured off and boiled (Birima et al., 2013).

Current studies have shown that peanut seeds can effectively remove 92% of the 200 NTU turbidity using peanut extracted with NaCl, KCL and other different salt solutions, while peanut seeds extracted with distilled water could remove only 31.5% of the same turbidity (Birima et al., 2013).

SESAME SEEDS AS A COAGULANT FOR TURBIDITY OF WATER

It is proposed that there is the possibility of using coagulant produced from sesame seed for water treatment. Just like other natural coagulant sources such as Moringa Oleifera seed, peanut seed is rich in minerals and vitamins. The seed is used for both nutritional and medicinal purposes. As such, using the seed in water treatment may neither result into any health problem nor can the sludge resulting from the treatment lead to secondary pollution, as natural coagulants have been described to be highly biodegradable (Abubakar et al., 2015).

Recently, researchers have shown that the use of natural coagulant is a promising solution to chemical coagulant problem and that sesame coagulant could effectively remove 92% of the 200 NTU turbidity of the synthetic water used in their work (Abubakar et al., 2015).

METHODOLOGY

The Methodology of this research is a complete frame work of components which consist of the following:
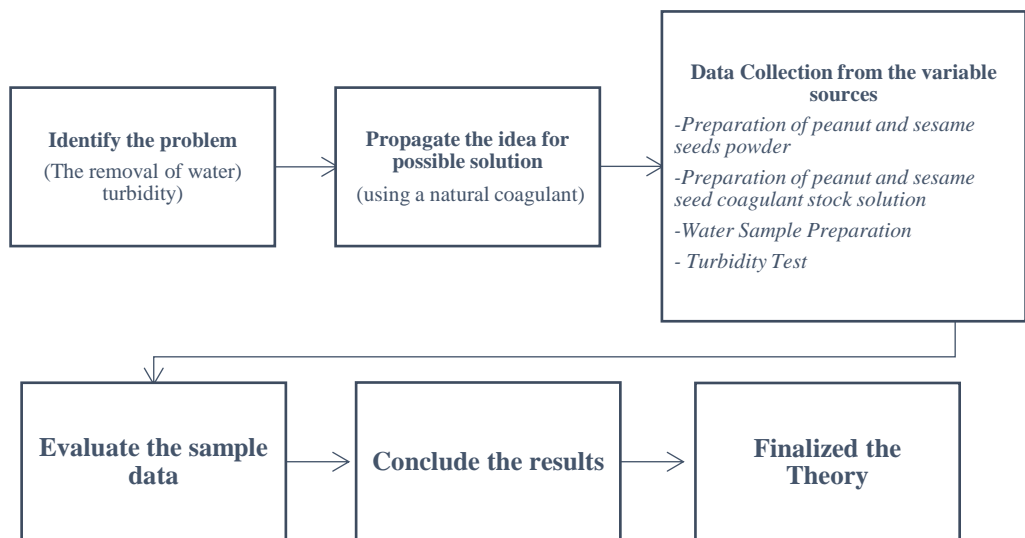
Figure 1: Research framework

Preparation of peanut and sesame seeds powder

In this study, the peanut and sesame seeds were obtained from local market at Kuala Lumpur, Malaysia. Good quality of peanut and sesame seeds were selected. The peanut seed cover was shelled by hand just before extraction. The extraction of the active ingredients was carried out by removing the shell to collect the kernel inside the shell. In order to ensure the efficiency of peanut seeds extraction, the kernels have been crushed and grinded to medium fine powder by using the domestic blender (Assparo, Model 900) every time when the preparation of peanut seeds extraction was needed. Then, for the sesame seeds, the seeds were cleaned and crushed into small particles using mortar and pestle. The ground sesame seed obtained was spread in a tray and left at room temperature for about 2 hours. The dried sesame seed powder was used as the coagulant for the treatment of the turbid water.

Figure 2: Peanut seeds grounded to powder form

Figure 3: Sesame seeds grounded to powder form

Preparation of peanut and sesame seed coagulant stock solution

Stock solution of peanut seeds extracted by distilled water at 20 000 mg/L was prepared by dissolving 20 g of the dry powder peanut seeds in 1000 ml of distilled water. Peanut powder (Figure 2) in 20 g suspension mixed with distilled water conducted inside a volumetric flask with working volume of one liter (1L). A magnetic stirrer bar was place inside the same volumetric flask and put it on the magnetic stirrer; creating stirring condition for active coagulant extracting process. The extraction process ended after 10 minutes and another 10 minutes left for settling process of passive coagulant. The resulting suspension was then filtered using a vacuum pump filter with filter paper of 70 µm pore size (Whatman). This filtrate is referred as stock solution of coagulant for coagulation process. The stock solution is prepared fresh for use when needed, since deterioration sets in if stored for more than two days at room temperature. The same procedure applied for sesame seeds (Figure 3) coagulant stock solution.

Water Sample Preparation

The sample for the turbid water was collected from Mines Resort Lake in Serdang, Selangor, Malaysia. About ten litres (10L) of turbid water sample was collected within 6 weeks period for the use of sample characterization and jar test. In each week, chose one day for sampling day. Storage of the turbid water sample was conducted using HDPE sampling bottle before transported to the Environmental Laboratory at Infrastructure University Kuala Lumpur within 30 minutes. The collected turbid water sample was distributed into six beakers with working volume of 500 ml. The initial turbidity concentration and pH for all six (6) water samples were recorded. The initial turbidity and pH of the turbid water were measured to be 344 NTU and 8, respectively.

Experimental Run

The turbid water sample was treated systematically by coagulation and flocculation process using a jar test apparatus. The coagulant dosages used in this study were ranging from 10 to 60 mg/l. During the coagulation, a rapid mixing at a rate of 110 rpm was performed for 3 minutes, and the remaining 7 minutes was used for slow mixing at 30 rpm to allow formation of flocs. After the treatment, the resulting mixture was left for 40 minutes to allow the formed flocs to settle at the bottom of the beakers. The treated water was then separated from the flocs by filtration using #40 grade Whatman filter paper. After the filtration, the treated surface water was sampled for residual turbidity measurement.

Turbidity Test

Turbidity is the measurement of relative clarity of a liquid. It is an optical characteristic of water and is an expression of amount of light that is scattered by some materials in the water when a light is projected through the water sample. The higher the intensity of scattered light, the higher the turbidity. The turbidity values of the water sample were measured by using a Turbidimeter 2100N, the Instrument in Nephelometric Turbidity Units (±0.01 NTU).

RESULTS AND DISCUSSION

The parameters including pH, temperature and turbidity have been obtained for the raw samples as initial readings in order to be compared with the treated samples are summarized in Table 1. The average for each parameter was 8.00 in pH, 30°C in temperature and 344 NTU in turbidity. Based on the value obtained for turbidity, shows that the Mines Lakes is under Class IV for National Water Quality Standard (NWQS)

Table 1: Characteristics of lake water taken from Mines resort city, Serdang

Parameter	Value Obtained (Optimum Value Chosen)
pH	8.00
Turbidity	344 NTU
Temperature	30°C

PEANUT SEEDS AS A NATURAL COAGULANT

Based on Figure 4 shown below, the pH level reduced for each of the jars after the peanut seeds coagulant stock solution was added compared to the initial reading. The reading was getting lower consistently until it reached the forth reading which pH 7.31 which is also the lowest reading recorded. The pH level later increased to pH 7.42 and 7.39. The optimum pH is usually between pH 6.5.9.5 (World Health Organization, 2007). The reading after the experiment decreased but it is still in the acceptable range.
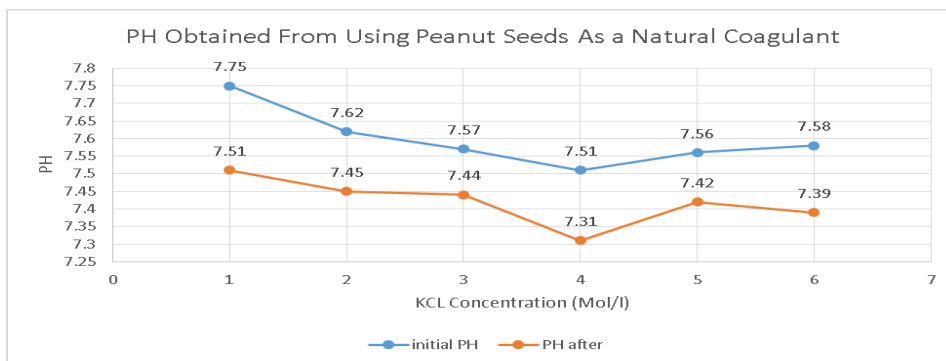
Figure 4: pH value obtained for using peanut seeds as a coagulant
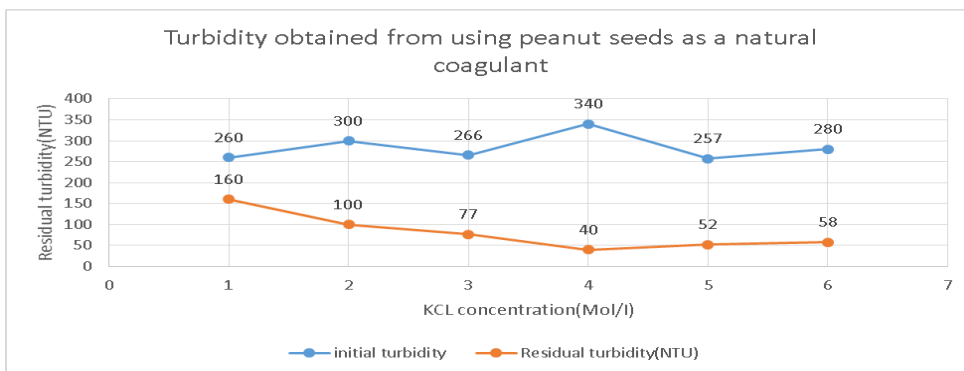
Figure 5: Turbidity obtained for using sesame seeds as a natural coagulant

Figure 5 shows a graph of turbidity against dosages, results were represented by residual turbidity the optimum value was obtained is 40 NTU at a concentration of 4 mol/l, the results after that became consistent as there was no big increasing or decreasing in the value as we increasing the KCL concentration.

It can be observed that the residual turbidity decreased with increasing the concentration of KCL, the decrease in coagulation activity at 6 mol/l could be due to saturation stage where by the KCL solution reached saturation stage at 6 mol/l.

The improvement of turbidity removal implied improvement in coagulation activity. This could be losing-up of the protein associations leading to more soluble and coagulation active species in solution, which means that addition of salt solution enhanced the breaking of protein associations, leading to increased protein solubility.

SESAME SEEDS AS A NATURAL COAGULANT

Figure 6 shows the pH level obtained before and after adding sesame seeds into the water sample. The optimum level obtained was when a dosage of 60 mg/l of sesame was added into the water sample which gave a reading of pH 5.65. This reading showed that the water was beginning to become more acidic as the dosages increases. The higher the dosage used, the more acidic the water sample would become which was not very suitable to be used or consumed.
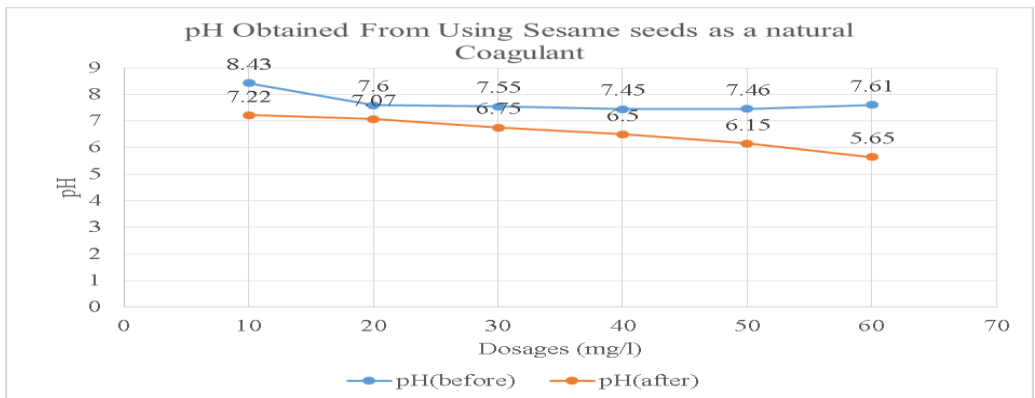
Figure 6: pH value obtained for using sesame seeds as a natural coagulant
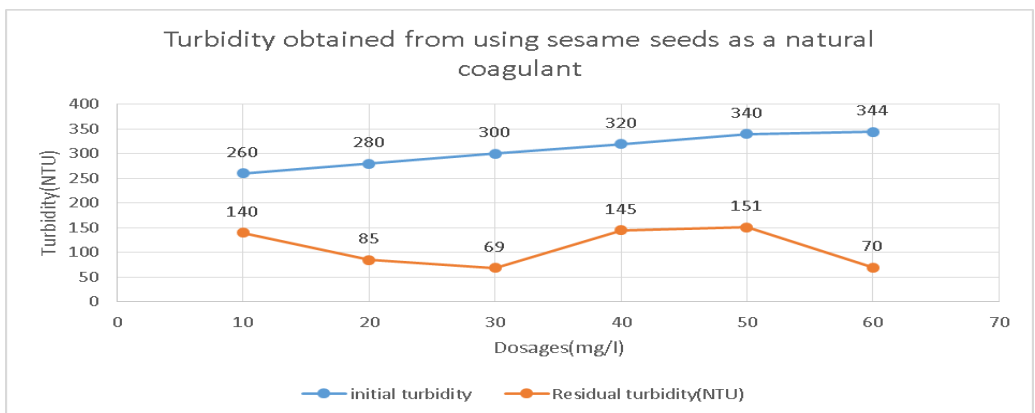
Figure 7: Turbidity obtained for using sesame seeds as a natural coagulant

Figure 7 shows a graph of turbidity against dosages. The optimum value was obtained at 69 NTU. The reading later increased before decreasing at a reading of 70 NTU. Once the optimum value had been achieved at a dosage of 30mg/l, the chances of the reading getting lower that value was slim. The reason the reading dropped could be due the highest amount of dosage of sesame used.

COMPARING EFFECTIVENESS OF SESAME SEEDS WITH PEANUT SEEDS

The comparison between sesame seeds and peanut seeds stock solutions showed how effective each one of the natural coagulant in removing the turbidity in the water sample. This would also provide a good opportunity for the water treatment plants in deciding which one of the natural coagulant was more effective that should be used for treating the turbid water.

% Removal = (Before – After) / Before x 100%

Table 2: Percentage removal of turbidity using Sesame seeds

Dosage (mg/L)	Initial (NTU) (Before)	Residual (NTU) (After)	Removal (%)
10	260	140	46.2
20	280	85	69.7
30	300	69	77
40	320	145	54.7
50	340	151	55.6
60	344	70	79.7

Based on Table 2, the addition of sesame seeds as natural coagulant had been applied for treating the turbid water sample. The dosage of coagulant from 10 mg/l to 30 mg/l showed that percentage removal of turbidity were continuing increased with increment of sesame seeds natural coagulant. At 40 mg/l of sesame seeds coagulant added to the sample, the percentage removal started to decrease. This condition occurred possibly due to the optimum dosage had been determined at 30 mg/l for the sesame seeds dosage of coagulant.

Table 3: Percentage removal of turbidity using peanut seeds

Dosage (mole/L)	Initial (NTU) (Before)	Residual (NTU) (After)	Removal (%)
1	260	160	38.5
2	300	100	66.6
3	266	77	71
4	340	40	88.3
5	257	52	79.8
6	280	58	79.3

Based on Table 3, the addition of peanut seeds as natural coagulant had been applied for treating the turbid water sample. The dosage of coagulant from 1 mole/l to 4 mole/l showed that percentage removal of turbidity were continuing increased with increment of peanut seeds natural coagulant. At 5 mole/l of peanut seeds coagulant added to the sample, the percentage removal started to decrease. This condition occurred possibly due to the peanut seeds dosage

was weak when binding between the colloid particles and it could not agglomerate to large aggregate and settled down to bottom.

The comparison between using sesame seeds and peanut seeds showed that peanut seeds had an advantage over sesame seeds as far as turbidity was concern because the peanut seeds had a higher percentage removal which is 88.3% compared to sesame seed which the higher percentage was 79.7% not very effective in removing the turbidity of the water sample.

CONCLUSION

Using sesame seeds as a coagulant was not very effective in removing the turbidity as it showed an optimum residual turbidity only at 69 NTU at a dosage of 30 mg/l, even the residual turbidity was increasing with every time we increased the dosage. Besides, the results showed that the addition of the sesame seeds as a coagulant could affect the water pH as the more we added the coagulant the more the water became acidic. Consequently, it was not a suitable coagulant to be used and consumed. The results also showed that using sesame seeds as natural coagulant removed the turbidity up to 79.7%. However, it seemed to be a promising method due to its environmental friendliness and could be very effective for low turbid water treatment.

For peanut seeds, the results proved that using the peanut seeds as a natural coagulant for removing the turbidity of water was very effective. The optimum dosage for the residual turbidity was 40 NTU at a concentration of 4 mol/l and with each time increasing the concentration the residual turbidity showed a consistent result. Adding peanut seeds into the water showed that it did not really affect the PH of the water. The optimum dosage was 7.31 and the optimum pH was usually between pH 6.5-9.5 (WHO, 2007). Therefore, it was considered it was still in the acceptable range.

Peanut seeds had a high potential for coagulation of turbid water with an initial turbidity of 340NTU. Thus, turbidity removal reached up to 88.3 %. The improvement of turbidity removal implied improvement in coagulation activity. This could be losing-up of the protein associations leading to more soluble and coagulation active species in Solution. Consequently, it could be concluded that the peanut seeds have a high potential of coagulation of turbid water; and that the protein associations inside the peanut seeds are responsible for coagulation activity. On the other hand the results proved that the peanut better than the sesame seeds in terms of the PH of the water as the peanut seeds doesn't affect the water PH, but the sesames seeds makes the water more acidic each time the dosages increasing.

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EVALUATION OF RIVER STABILITY BY MORPHOLOGICAL ASSESSMENT

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ABSTRACT

Streams and rivers form an essential link in the hydrological cycle. They are an open channel filled with water and sediments, a continuous processed from geo-morphological by natural reaction. Therefore, numerous hydro-morphological assessment methods have been developed in different countries during recent decades, like in the United States, Australia or German with notable differences in their aims, scales and approaches. Hydro-morphological assessment method is a deep integration between hydrology and geomorphology where inputs from several knowledge area and disciplines are brought together. It is a method that could not exist without invention across many disciplines. Health River Assessment can be used as a tool to make it easier to evaluate and design a stable channel in simple and powerful ways, as well as restoring the morphological appearance of a river to near a state of equilibrium geometry. Two methods have been selected to review the suitability and consistency of river health assessment for Malaysia's river which are OSEPI and CSI methods. Both methods were assessed using Morphological Assessment. Based on the result, it was clearly that there are inconsistencies observed between both indexes. Hence, both methods are not suitable for evaluating the ideal river in Malaysia. Since there is no study have been done for Malaysia's river, further study is important to establish a new Malaysia's River Health Assessment for evaluate the river health. Java programming was successfully created to evaluate river health using CSI and OSEPI method. This programming can be a reference to produce as a new tool for future river health assessment especially for Malaysia's River Health Assessment. River health assessment would be the best solution to alleviate those water related hazards and preserving originality of river landscape for future generation. Furthermore, it is necessary to evaluate the stability of the river before construct a bridge. A stronger foundation and factor of safety need to be increase when designing a bridge at unstable river.

Keywords:
Hydro-morphology, River Stability Index, River Health Assessment Tool, River Stability

INTRODUCTION

Over the years, erosion problems often occur and result in the changes of morphology. Some areas around the rivers encountered floods, frequently due to change of morphology that caused by erosion and sedimentation. Flood occurrence modifies the landforms each year. The modification of river landforms accidently induced the river bank to be instable. The collapse of river bank along the river network will endanger the land profile. The continuous process of this erosion pattern will reduce the capacity of river to contain incoming flow from the upstream. In short, the instability of riverine system has led to various catastrophes in the past such as river bank erosion, sedimentation and degradation of river bed. It has the greatest impact on the environment. Thus, having a tool to assess river stability is crucial to mitigate river related problem and restore riverine system to near equilibrium state. In Malaysia, there are lacking research have been done related to evaluate the river health condition. The established methods for other than Malaysia's river are numerous like in the United States, Australia or German.

Thus, main aim of this research is to review the established method for evaluating river health for Malaysia's river. Selective objectives were highlighted for this research as follows; i) to review the hydro-morphological assessment for river stability; ii) to collect hydro-morphologic database for Malaysia's ideal river; to develop a computer model using JAVA programming for hydro-morphological assessment. The study is significant to the development of River Health Assessment (RHA) as it will help to understand the characteristics and behaviour of the river morphology. Numerous benefits can be achieved from this research works. RHA can be used as a guideline to design natural stable channels and restoring the morphological appearance of a river to near state of equilibrium geometry. The RHA will also provide a relatively simple, easy and direct measurement to identify reaches for evaluating the stability. Moreover, after the data collected and analysed, RHA can store the hydro-morphologic database for a stable river. It is expected that this study should accord a better understanding towards the equilibrium geometry of a stable river and their associated flow structure. The development of channel stability index will provide a good basis towards restoring the Malaysia's river to original river landscape.

METHOD OF RIVER ASSESSMENT

Four main categories of river assessment can be divided such as riparian habitat assessment (RH), physical habitat assessment (PH), hydrological regime alteration assessment (RHA), and morphological assessment (Belletti, 2014). Each assessment has different methodology and procedure to evaluate river stability condition which depends on the aim and target of the result.

PHYSICAL HABITAT ASSESSMENT (PH)

Physical Habitat Assessment includes methods and protocols for the survey, characterization, and classification of physical habitat elements which can be described as river habitat surveys or physical habitat assessments (Platts, 1983; Plafkin, 1989; Raven, 1997; Ladson, 1999; Dunbar, 2009; LAWA 2000, 2002a, b). The assessment focused on in stream habitats or micro-habitats. The aim of PH was to evaluate the overall functioning of the stream by including information on ecology-related features, although they were not strictly habitat survey methods. Seventy-three physical habitat assessment methods were identified, illustrating that this type of assessment remained the most common approach for assessing the hydro morphological state of a river (Belletti, 2014).

RIPARIAN HABITAT ASSESSMENT (RH)

Riparian zones are an integral component of riverine systems, since their lateral and vertical structures depend upon hydro-morphological processes. However, the development of specific methods for assessing riparian conditions is relatively recent. Some indicators of riparian conditions are often included in one of the other types of assessment methods, but this particular category consists of methods that are specifically designed for the characterization of habitats in the riparian zone (Munne´ and Prat 1998), including some assessments of wetland clear distinction should be made between a river audit and a river condition assessment. A river condition assessment is a broader evaluation which places greater emphasis on physical processes, and aims to measure both pressure and response variables such as hydro morphological and biological indicators; as a basis for developing a clearer understanding of the cause–effect relationships that regulate observed changes in system conditions (Munne´ and Prat, 1998)

HYDROLOGICAL REGIME ALTERATION (HRA)

Hydrological Regime Alteration includes a further, independent, group of methods that produce hydrological assessments, particularly the development of specific indicators of hydrologic alteration (Richter, 1998; Poff, 2003), which can support assessments of the alteration of the natural hydrological regime. The output of these assessments is usually an index of the degree of deviation from unaltered conditions.

MORPHOLOGICAL ASSESSMENT (M)

Morphological assessment of a river involves evaluation of geometry of the river basin and how they respond to a number of processes and environmental conditions over period of time (Abdulkader, 2016). The assessment parameters are divided into three main groups, the morphology parameters, the hydraulics flow regime parameter and the sediment carrying capacity parameter. The morphology parameter can be separated into four categories: channel classification, instream features, bank and riparian zone and floodplain parameters. The hydraulics flow regime parameter can be separated into three categories: channel flow, channel geometry and flow resistance. The sediment carrying capacity parameter can be separated into four categories: sediment load, sediment production, sediment transfer, sediment deposition. Fryirs 2005 stated, a river audit permits assessment of river status by generating information on the presence and frequency of physical habitats and their characteristics. The method selection depends on the channel condition and available data collection. Some examples of assessment by morphological assessment methods are Channel Stability Index (CSI), Oklahoma Ozark Streambank Erosion Potential Index (OSEPI), Channel Condition Stability Index (CCSI) and River Hydromorphology Assessment Technique (RHA).

CHANNEL STABILITY INDEX (CSI)

Rapid geomorphic assessments provide a quick method for characterizing stream reaches, defined as lengths or segments of a stream with similar streambank characteristics in terms of bank height and stratigraphy, and their degree of stability (Simon and Downs, 1995). One of the most commonly used is the CSI. CSI was originally designed for areas that are highly sensitive to erosion, such as bridges (Simon and Downs, 1995). CSI required measurements of bed material, bed/bank protection, stage of channel evolution model, percent of channel constriction, number of piers in the channel, percent of blockage, fluvial erosion, meander impact from the bridge, pier skew for each pier, mass wasting evidence, high flow angle of approach, and percent of woody vegetation cover. The theme of data collection using CSI method was bed materials, geometry and morphology, cross section & longitudinal elevation. When streambanks near bridges are not the subject of a study, the CSI can be modified to eliminate the bridge/pier related criteria (Simon and Klimetz, 2008). Scores from each metric are summed to create an aggregate score, with a higher score indicating greater instability. Simon and Klimets, 2008 created the aggregate score is used to categorize each stream reach in a stability category: ≤10 is considered stable, between 10 and 20 is considered moderately unstable, and ≥20 is considered highly unstable.

OKLAHOMA OZARK STREAMBANK EROSION POTENTIAL INDEX (OSEPI)

OSEPI was developed by modifying CSI to produce specifically designed for larger-order streams in the area and to minimize the difficulty in determining some parameters and the quantity of materials needed to gather data. Many of the CSI parameters such as primary bed material, degree of constriction, and stage of the channel evolution model were homogeneous throughout the area and therefore were excluded from OSEPI. According to Healey (2012), metrics equivalent to or similar to those in CSI included the bank angle and the percentage of bank that showed evidence of mass wasting. In addition, the percentage of surface protection such as bank covered in vegetation, roots, large logs, and boulders; and percentage of the bank with established beneficial woody-vegetative cover were included in OSEPI but given additional weight in the RGA. The theme of data collection using OSEPI methods were bed materials, geometry and morphology, cross section & longitudinal elevation. Field and numerical modelling research has also demonstrated that the addition of roots to streambanks improves stability under a range of hydrological conditions (Wynn, 2004; Wynn and Mostaghimi, 2006; Pollen, 2007). Trees straining the bank were not considered beneficial vegetation. It should be noted that there is subjective evaluation included in identifying beneficial vegetation. The definition of beneficial vegetation could depend on root system shape and size as well as lean of a tree therefore, OSEPI users should carefully consider the impacts of these factors.

CHANNEL CONDITION AND STABILITY INDEX (CCSI)

CCSI presented here is designed to be a fast and cost-effective qualitative screening tool that will be informative to staff involved in condition assessment and Stressor Identification (Nutter, 2004) of biological and chemical impairments. This protocol was developed through consulting existing channel stability assessments (Pfankuch 1975; Simon and Downs 1995; Rosgen 2006; Magner, 2008, & Healey, 2012) and it included modifications that attempt to better characterize physical indicators of channel condition and stability observed in low- to mid-gradient streams in Minnesota. CCSI guidance manual provides a background in channel stability concepts and detailed descriptions of each metric. CCSI metrics rate channel stability indicators as they relate to channel form, function, and sediment continuity. The design of the CCSI worksheet and manual follows the Pfankuch guidance manual (Pfankuch 1975). Metrics from other channel stability assessments were consulted and incorporated into this assessment (Simon and Downs 1995, Arthington, 1998, Nutter, 2004, Rosgen 2006, Magner, 2008). Modifications to the original metrics and the scoring process have been introduced to broadly characterize stream conditions observed in Minnesota. There are 12 metrics. Each metric has five rating categories which were excellent, good, fair, poor, and very poor. The scoring strategy is intended to separate good sites from poor sites while allowing for sites that are in-between to be classified as moderately unstable (not good, not poor).

The morphological approach will be given a special attention for this research. Two existing methods (CSI, and OSEPI) will be used to study the stability of selected rivers. The morphological is direct measurement from the fluvial appearance; hence degree of reliability is higher compared to the other methods.

REVIEW OF CSI AND OSEPI PARAMETER

A review from Healey (2012), the studies were related to rapid geomorphic assessments to assess stream bank stability in Oklahoma Ozark streams. Their objective was to produce OSEPI where requires measuring the physicality of the river such as bank height, bank face length, river stage at base flow, degree of constriction, and average diameter of streambed sediment. Bank height was measured at the thalweg of the stream, while the degree of constriction was the relative decrease in channel width from upstream to downstream. Thalweg is depth of water at the deepest point along the cross section. They also measured the average diameter of streambed sediment (gravel, boulder/cobble, or bed- rock). The degree of incision was calculated from the depth of water at base flow (D) and the bank height (BH). It can be defined as the ratio of the elevation of base flow to the floodplain elevation, i.e., $D / (BH + D)$. Highly incised channels which were low ratio received a high metric score, and stable channels were scored low metric score. Percentage of the bank reinforced by riparian vegetation was estimated for each bank. Both banks were evaluated for evidence of fluvial erosion and mass wasting.

Simon and Down (1995) carried out an approach to evaluation of potential instability in alluvial channels. They started with initial site evaluation where a site evaluation form provided. The site evaluation form contained of information of (i) the site (index variables), (ii) the channel (hydraulic, geomorphic, and vegetative variables) (iii) the bridge, if present, and (iv) stage of reach evolution. Characteristics and conditions of the channel bed, channel banks, accumulation of debris and other causes of flow deflection, and the condition of riparian vegetation can be used to identify the degree of channel instability/stability. All these parameters were groups in 14 variables which are variable (i) bed materials, variable (ii) bed protection, variable (iii) channel evolution, variable (iv) the percentage of stream width constriction, variable (v) piers in the channel, variable (vi) to (viii) local scour and value of channel blockage, variable (ix) bank erosion, variable (x) value of meander impact point, variable (xi) existence of pier skew, variable (xii) mass wasting processes in the vicinity of a pier or abutment which it can lead to failure of the structure , variable (xiii) is the high-flow angle of approach to the site where it is used to indicate the potential for accelerated erosion on a particular side of the channel because maximum shear stresses and flow velocities and the last variable (xiv) the percent woody vegetative cover. All the data were recorded on paper and then entered into GIS database. The procedure used physical data from several disciplines extracted from the GIS database to calculate a channel-instability index (Ii) for each site. The greater value of Ii, the greater the potential instability of the site.

RESEARCH METHODOLOGY

This part presents the research works. The research started with the selection of an ideal river which located in Ayer Hitam Forest Reserve, Puchong, Selangor. The river name was Rasau River. Ayer Hitam Forest Reserve still contain untouched river basin as the remaining water catchment was enclosed by the surrounding hills and had not suffered great disturbance. Figure 1 shows the location of Rasau River. The field sampling involved three main themes which were river surveys, hydraulic geometry and hydraulic data. River survey was done by the measurement of the channel size at cross section and longitudinal section, such as the width, depth and slope. Depth of the river was measured at every 1.0m interval and the measurements were from the left bank to the right bank. The equipment used like auto level and tripod, measuring tape and staff of levelling. All the data then was transferred in HEC-RAS to get the river profile. About eight cross sections were selected based on different morphological appearance such as riffle pool, pool, cascade and step pool. Current velocity meter was used to

measure the velocity at each 1.0m interval of the river cross section. All the velocity data then was analysed to get the discharge of each cross section. Bed materials data was measured using Wolman Pebble Count for range of material size between 4 mm to 180 mm. For larger size of materials, measuring tape was used to get the size of the materials, while for smaller size; about 500g of the samples were collected and done on dry sieving analysis at laboratory. For this study, two methods of Morphological Assessment were choosing which were OSEPI and CSI method. The parameter needed by the OSEPI and CSI was programmed using JAVA Programming. JAVA programming is a secure, fast and simple programming that can easily produce a result of the river evaluation.

Figure 1: Location of Rasau River

RESULT AND DISCUSSION

This part explains the details assessment of Rasau River reach using Channel Stability Index (CSI), and Ozark Stream Erosion Potential Index (OSEPI). CSI and OSEPI were selected to review the established method for evaluating Malaysia's river. OSEPI and CSI indexes used different set of rating score to categorize the rating score. Rating for CSI was classified into three classes i.e. stable, moderately unstable and highly unstable, while rating for OSEPI was categorised into six classes i.e. highly stable, moderately stable, stable, unstable, moderately unstable and highly unstable. These two indexes used different parameters to categorize the level; hence it was quite difficult to find uniformity amongst them.

Evaluation of Rasau River using CSI and OSEPI method was successful. The evaluation is projected in Table 1. The rating scale for CSI was: Score values range 0 – 10 as the channel was stable, 10 – 20 as the channel was moderately unstable and > 20 as the channel was highly unstable (Simon and Downs, 1995). The results of CSI Index evaluation were Stable for cross section 1 until 3, cross section 4 until cross section 8 are in moderately unstable. While the rating scale for OSEPI was between 0 – 25 were highly stable; 26 – 35 were moderately stable; 36 – 45 are stable; 46 – 55 were unstable; 56 – 65 were moderately unstable and 66 – 85 were highly unstable (Healey, 2012).

Cross section	CSI Methods		OSEPI Method (Left Bank)		OSEPI Method (Right Bank)	
	Index Score	Index Class	Index Score	Index Class	Index Score	Index Class
CS 1	10	Stable	10	Highly Stable	10	Highly Stable
CS 2	7	Stable	10	Highly Stable	10	Highly Stable
CS 3	6	Stable	10	Highly Stable	10	Highly Stable
CS 4	10	Moderately Unstable	12.5	Highly Stable	12.5	Highly Stable
CS 5	12	Moderately Unstable	15	Highly Stable	15	Highly Stable
CS6	16	Moderately Unstable	17.5	Highly Stable	17.5	Highly Stable
CS 7	17	Moderately Unstable	20	Highly Stable	22,5	Highly Stable
CS 8	14	Moderately Unstable	27.5	Moderately stable	27.5	Moderately stable

JAVA programming was created to produce a simple, secure and fast result of the river health evaluation. Figure 2 shows the River Health Assessment interface. First, user needed to choose the method of assessment. Then, the user clicked 'Go' button. Figure 3 shows the interface of CSI method. Here, user needed to key in the required data based on the parameter required. Then, the user clicked 'Result' button to generate the result of river health assessment as shown in Figure 4. This programming could store or save the data so it would be easier to locate the history data when needed at any time.
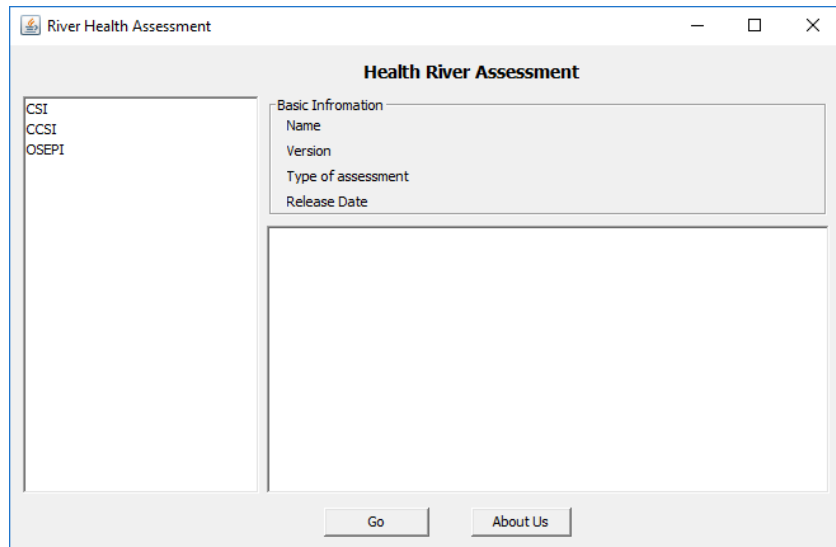
Figure 2 : Interface of River Health Assessment

Figure 3 : Interface of CSI method

Figure 4: Button for Result of the River Health Assessment

CONCLUSION AND RECOMMENDATION

The research focused on collecting geometry and morphological data of Rasau river to evaluate the river stability using OSEPI and CSI method. The use of CSI and OSEPI index successfully evaluated the level of channel stability at Sungai Rasau, Selangor. CSI evaluated that cross section 1 until 3 were in a stable condition, and cross section 4 until 8 were in moderately unstable. Meanwhile for OSEPI index, 7 cross sections were highly stable and at cross section 8 only moderately stable. From this result, it was evidently found that inconsistencies observed between both indexes such as:

a) Both indexes were using different weightage for each parameter;
b) Both indexes were using different set of rating score to categorize the level;
c) Both indexes were using different parameters to categorize the level; hence it was quite difficult to find uniformity amongst them.

Based on the review and result of both methods, the researchers concluded that CSI and OSEPI methods were not suitable to evaluate the health of river in Malaysia. Since there was no river health evaluation had been done for Malaysia's river, further study is important to establish a new Malaysia's River Health Assessment for evaluate the river health.

Java programming was successfully created to evaluate river health using CSI and OSEPI method. This programming could be amended for future river health assessment especially for Malaysia's River Health Assessment.

In the future, authorities or policy makers may use this research as reference to evaluate the river health for any cross section before initiate any rehabilitation or restoration work at specific cross section.

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POTENTIAL FACTORS FOR BLOOD DONATION AMONG NON-DONOR UNIVERSITY STUDENTS

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ABSTRACT

Voluntary blood donation is an action that benefits the blood recipient by providing safer blood supply. However, not all healthy young people have strong motivation to become blood donors. Therefore, this paper aims to identify motivational factors towards the intention to donate blood among non-donors in the university setting. This is a correlational study using an online survey approach on thirty-nine (39) respondents. The respondents are non-blood donor in Infrastructure University Kuala Lumpur (IUKL), Selangor. Seven (7) motivational factors were tested (attitudes towards blood donation, subjective norms, self-efficacy, '*ihsan*', social awareness, self-identity as blood donor and anticipate regret). Data were analyzed using Pearson-Correlation. Findings showed that three factors which are '*ihsan*', social awareness and anticipate regret were significant towards the intention to donate blood among respondents. These results implied that, by strengthening appropriate psychological factors as the key focus in blood campaign non-blood donor are potential to become blood donors. Future study should emphasis on identifying an appropriate campaign methods using the aspect of '*ihsan*', social awareness and anticipate regret to attract more non-blood donors among university students to become a blood donor.

KEYWORDS:
University Student, Attitude, Altruism, Blood Donor, Intention, Motivation

INTRODUCTION

Involvement in voluntary activities is related to the exclusive action with a charity concept, where it is different with the pro-social concept. According to Penner (2004), there are four criteria that differentiate volunteering with pro-social act. The four criteria are planned action, longer duration of engagement, the non-obligated aid and occur in the organization context. As such, based on the view of Penner (2004), volunteering can be summarised as an act by having a clearer criteria through planning and structuring, compared to pro-social behavior. Through planned activities, for instance the voluntary blood donors, is in line with the suggestion made by Penner (2004).

In blood donation, altruism or the action of sacrificing are constantly related to the behavior that benefits another party. Previous researches also reports that altruism value is the main factor that lead to the decision to donate blood (Piersma et al. 2017; Asamoah-Akuoko et al. 2017). The altruism of self-sacrifices by the blood donor includes the feeling of anxiety during the process, fatigue or having a bruise from the (Jaafar et al. 2018). All these aspects are seen as a form of self-sacrifice by the blood donor with the aim to benefit the recipient.

Even though the motivation to be involved in blood donation activities in general is constantly tied with positive acts, previous researches reports that blood donation also ties up with society's stigma. For example, Oliveira et al. (2013) speculate that for some people, they choose to become blood donors because of self-centered benefits, such as free blood test, especially for the HIV test. In other words, there is a possibility that blood donors are not driven by the altruistic factor but more towards self-gain. Based on the research, Oliveiraet al. (2013) conclude that the motivation to donate blood may varies.

As blood donation is related to the person's motive to be involved as a blood donor. Guiddi et al. (2015) relates the aspect of intentional-action as the factor that motivates people to involve in the activity. The stronger the intention to donate blood, the more likely the behavior will be executed. One of the theories that explained the intentional-action among blood donors is the Theory of Planned Behavior (TPB) pioneered by Azjen (1991). This theory suggests that intention is a proxy of an action. Intention portrays an action that is about to be carried out. However, the intention does not stand alone. Azjen (1991) proposed that intention is driven by three psychological factors which are attitude, subjective norm and perceived behavioral control. In short, the attitude, subjective norm and behavioral control lead to the intention, thus promotes an action. The application of TPB in the context of blood donation study suggested that intention is the main predictor towards a person's act to donate blood Guiddi et al. (2015). The intentional-act model in TPB has been improvised from time-to-time by testing of new psychology aspects that could help to explain factors that motivate people to donate blood. New aspects such as social responsibility, anticipate regret, good deeds, altruism, blood donor's identity and habit in donating lead to the development of the Extended Theory of Planned Behavior (ETPB) model (Wevers et al. 2014; Bagot et al. 2015).

Young people can be seen as a potential group to donate blood for a longer period. In line with Jaafar et al.'s (2017) suggestion, young people who started to donate blood on their early 20s and being consistent with the involvement as blood donors could help the blood recipient up to forty years. In addition, based on the National Blood Centre's in Malaysia, approximately there 42,775 students who are the young blood donors (National Blood Centre, 2014). Thus, one of the potential place to recruit healthy blood donors is the university. These young people are not only physically and mentally healthy, but in the same time they could serve as human capital to the prosocial activity. However, one of the biggest obstacle in recruiting blood donors among university students is the negative attitude towards the activity, such as needle anxiety or worrying about vasovagal reactions (France et al. 2018; Juliana et al. 2018). Moreover, most of the advertisements for recruiting blood donors in university setting continuously focus on emphasizing the act as good deeds, which may not strongly motivate them to donate blood. Therefore, based on the importance of recruiting young people to become blood donors, it is important to identify appropriate factors that could lead to strengthen their intention towards this activity. This information could help the National Blood Centre, Kuala Lumpur to organise more cost effective campaigns to recruit more blood donor among the university students. The objective of this study is to identify psychological factors towards the intention to donate blood among university students. We hypothesize that the intention to donate blood among non-donors university students is driven by seven factors which are attitude towards the blood donation activity, subjective norm, self-efficacy, identity as blood donor, social awareness, *ihsan* and anticipate regret.

LITERATURE REVIEW

The focus of the previous researches in voluntary behavior are more concentrated to individual participation through organizations that concern on the charity of certain groups such as orphans, hospital patients as well as special need people (Hyde et al., 2013). However for blood donors, their involvement in the society reflected the altruism behavior and saving life action. Furthermore, from the point of view from Healy (2000), blood donors are different than other types of voluntary activities. This is because the individuals who want to donate blood to for the independence of other individuals need to be fully prepared to enable them to carry out the act. This self-preparation is not only to ensure their own health as a healthy blood donor before and after donating blood, but also includes the preparation to give a healthy blood to the recipient.

This also involves mental preparation to overcome the fear of needles or controlling anxiety towards pain. As such, self-preparations that has to be done by the blood donor suggests that the act of donating blood is more complex compared to giving money and materials.

According to Ogboghodo et al. (2015), blood donors who act voluntarily are differs from paid-donors, individuals who donate blood because of money. These voluntary people are more concern with their health as the blood that they donate will be given to the person in need. This suggests that a safer and less risky blood supply comes from voluntary blood donors who donate with the intention to help other individuals. Therefore, to get a safe blood supply, it is important for the authorities who manage the blood supplies to generate more voluntary blood donors. However, it has not been easy for the authority that manages the blood supplies to recruit more voluntary blood donors (Dongen et al., 2013). This is because not all healthy individuals are willingly to donate blood due to factors such as needle and anxiety or have experienced vasovagal syncope such as fainting, feeling dizzy (France et al., 2018). In short, the effort to obtain voluntary blood donors is not an easy task.

Meanwhile, Griffin et al. (2014) suggests that there are no difference among donors and non-donors in term of social responsibility towards the society. In other words, the involvement of non-donors in any activities that benefited the society is in parallel with the donors. What are the factors that can motivate an individual to change from a non-blood donor to a voluntary blood donor. In the context of TPB and blood donation, Wevers et al. (2014) found that positive psychological factors such as happy feelings after successful donations can attract more blood donors to repeat their actions in the future. In addition, donors who perceived positive feeling after a successful blood donation such as joy and happiness. These positive feelings lead to the formation of the identity of a blood donor. Blood donors with strong sense of donor's identity are more likely to engage in this behaviour in the future (Jaafar et al., 2017). In short the stronger the identity of a blood donor, the higher his or her intention to donate blood. As to date, research on factors that influences the intention to donate blood is growing with the additional aspects such as altruism, self-efficacy, donors identity which are surely able to contribute in creating the intention to donate blood among non-donors. These additional factors lead to the formation of Extended Theory of Planned Behavior (ETPB).

METHODOLOGY

This correlational study used the survey method at higher education institution. University students were invited to answer online survey, two weeks before the blood donation day which was on 21st August 2017. Individuals who were interested in participating in this research were asked to participate as respondents by answering items related to the motivation of donating blood through online survey. Thirty nine (39) non-blood donor students were involved as respondents. The respondents answered 47 motivational items on blood donation which consisted of seven independent variables; attitudes towards blood donation, subjective norm, self-efficacy, '*ihsan*', social awareness, identity of blood donor and anticipate of regret. Dependent variable was the intention to donate blood. Attitude towards blood donation was assessed through 11 items related to the evaluation towards the blood donation activity (Example: very risky-not very risky). The other motivational aspects and intention to donate blood were access through Likert scale (1 = strongly disagree, 2 = disagree, 3 = sometimes agree, 4 = agree, 5 = strongly agree). The reliability of the tested aspects in this study was acceptable, Cronbach alpha value range from .687 to .918. The data was analysed using Pearson-Correlation. Figure 1 shows the conceptual framework of this research.
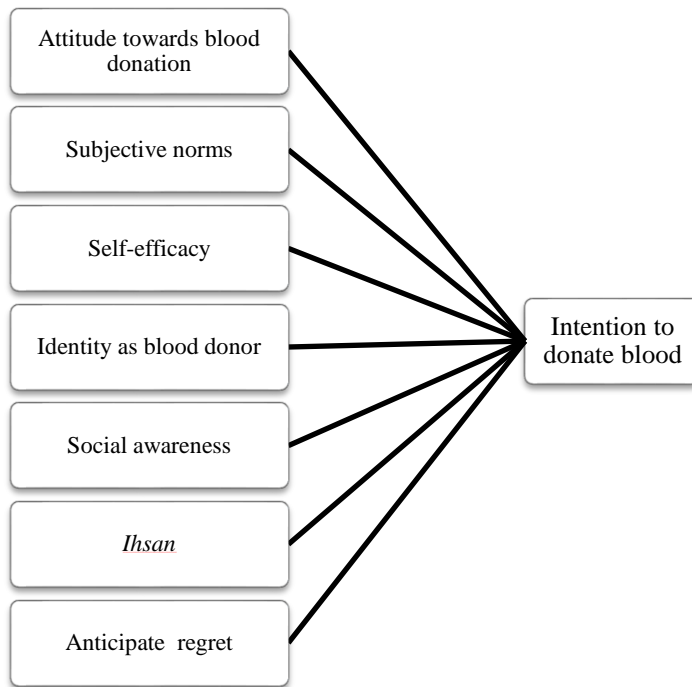
Figure 1: Motivation Towards the Intention to Donate Blood among Non-donor

RESEARCH FINDINGS

Background of Respondents

This research involved 39 non-blood donor students (female = 18, male = 21). The respondents were from ages 18 to 23 years old. This research received the participation of students from six faculties of the higher education institution (Faculty of Applied Science and Foundation Studies = 2 students, Faculty of Engineering and Technology Infrastructure = 8 students, Faculty of Architecture and Built Environment = 3 students, Faculty of Business and Accounting = 14 students, Faculty of Arts, Communication and Education and Communication = 6 students, Faculty of Creative Media and Innovative Technology = 6 students).

Reliability of the Motivational Aspect and Intention in Donating Blood

The reliability value in the motivational aspect and intention in donating blood in this research are shown in Table 1 below:

Table 1 : Item Reliability of the Motivational Aspect and Intention in Donating Blood

Aspect	Reliability Value (*alpha Cronbach*)
Attitude toward Blood Donors	.803
Subjective Norm	.687
Self-Efficacy	.687
Anticipate regret	.918
Ihsan	.708
Social Awareness	.825
Identity as a Blood Donor	.828
Intention in Donating Blood	.857

Motivation towards Intention in Donating Blood

Table 2 shows the mean value of the motivational aspect and the intention in donating blood among non-blood donor students.

Table 2 : Mean Value of the Motivational Aspect and Intention in Donating Blood

Aspect	Min	Standard Deviation
Intention in Donating Blood	3.137	.801
Attitude towards Blood Donation	4.002	.467
Self-Efficacy	3.692	.664
Subjective Norm	3.042	.551
Ihsan	3.779	.593
Social Awareness	3.782	.547
Anticipate regret	3.521	.898
Identity as a Blood Donor	3.019	.581

Seven motivational blood donation aspects towards the intention to donate blood were analysed through the Pearson-Correlation. The analysis found three motivational aspects namely *'ihsan'*, social awareness and anticipate regret, which has a significant connection to the intention in donating blood among non-blood donor students. Table 3 shows the results of the Pearson-Correlation analysis.

Table 3 : Pearson-Correlation Aspect Value towards Intention to Donate Blood

Blood Donation Motivation	Pearson-Correlation towards Intention to Donate Blood
Attitude towards Blood Donation	.215
Self-Efficacy	.285
Subjective Norm	.223
Ihsan	.382[*]
Social Awareness	.415[**]
Anticipate Regret	.451[**]
Identity as a Blood Donor	.282

DISCUSSION

In this research, it was found that respondents perceived themselves as having the intention to donate blood. The finding suggested that young people who were not donating blood had the intention to donate blood. Furthermore, respondents in this study perceived themselves as having positive attitude towards the blood donation activity. This result suggested that non-blood donors hold positive assessment towards the blood donation activity, even though they did not involve in the activity. In other words, they perceived the action of donating blood as positive, less risky, selfless act as well as benefit other people. In line with Guiddi et al.'s (2015) point of view, blood donation was perceived by the society in general as an action that closely related with self-sacrifice behavior. Our study found that intention to donate blood among non-donors were linked to three psychological factor; *'ihsan'*, social awareness and anticipate regret.

Through this research, *'ihsan'* which comprised of positive elements such as empathy as well as altruism could serve as a motivation factor towards the intention to donate blood. This indicated that people who perceived other people as important and showed empathy to them could become potential blood donors. On the other hand, Fennis et al. (2008) believed that any act that provided benefits to both parties (giver and receiver of charity) would further motivate a person to get involved in volunteering-oriented activities. From the giver side, personal benefits such as the increase in self-appreciation, proud and happy after executing the act could be seen as factors that drive a person to continuously involve in volunteering activities. It was also found through this research that the *'ihsan'* also exists in non-blood donors. This lead to the suggestion that *'ihsan'* could be a potential factor to drive a person into this activity.

Next, this research found that the anticipate regret was significant towards the intention to donate blood. The findings suggested that in the blood donation context, individuals who never donated blood could also have the motivation to donate blood through the feeling of guilt when they did not donate blood. In this study, the anticipate regret comprised the feeling of sadness or disappointment when a person did not execute the planned-behavior. Abraham and Sheeran (2003) argued that the anticipate regret is a forecast feeling that is expected by a person when a certain action could not be performed. In other words, anticipate regret is an expected feeling if they do not succeed in performing a certain action. Therefore, failure in performing the action will indirectly bring negative feelings. For a person who has successfully donated blood, positive feelings will be felt such as feeling proud or happy after successfully donating blood (Cohn, 2016). As for this study, this research finding suggested that for individuals who were able to donate blood and did not donate their blood could trigger the feeling of regret in them. For these young people, anticipate regret could serve as a part of the motivation to donate blood. In the context of this study, the intention to donate blood was motivated most by the anticipate regret (based on the strong relationship between anticipate regret and intention to donate blood), even if the individual had never donated blood. The finding indicated that blood donation was closely related with warm feelings. For the donors, a successful blood donation would enhance positive emotion. This might be the same situation for the non-donors. As mention by Guarnaccia et al. (2016) society perceived blood donation as one of the charitable activity. Therefore, it is acceptable in general that involvement in this act could bring positive emotion to the executer, and failure to do so will result in the feeling of regret. In other words, failure to perform this activity may bring to guilt towards other individuals.

It also worth to note that social awareness is related to the intention to donate blood among non-donor university students in this study. The results suggested that university students were aware with their responsibility to the society, especially those who were in the need of blood supply. One of the possible explanations to this finding was university students

were exposed with the society through their subjects or project. Therefore, involvement as blood donors could serve as a platform for them to channel their sense of awareness towards other people. The importance of social awareness in blood donation is also highlighted by Dogu and Hacioglu (2017) by suggesting that social awareness may play an important role to help in the retention of blood donors. As overall, findings from this research suggested that non-blood donor students were a potential people in becoming a blood donor through their psychological motivation.

CONCLUSION

Findings in this research are significant for developing an effective campaign strategy to attract more students, especially non-donors to come forth as blood donors. Through this research, the emphasis on campaign strategy towards the psychological aspects such as '*ihsan*', social awareness and anticipate regret is needed. It is recommended that for blood donation campaigns in the university settings, the organizer should use slogans related to these three aspects to attract more students to become blood donors. The use of appropriate words or sentences in campaign brochures that highlight these psychological factors such as "Donate blood while you have the chance. Don't regret later" (anticipate of regret), "We are concern, we donate blood" (social awareness) or "Create smiles when you become a blood donor" ('*ihsan*') has to be emphasized. With an appropriate campaign strategy, it will be easier to recruit more blood donor student with a more cost-effective strategy. In the context of limitation, the result from this study were limited to the number of low respondents, due to the purpose of data collection; the pilot test. The study also holds a tight timeline due before the blood donation campaign. Further research could focus on the effectiveness of blood donation campaign strategy with the importance of *ihsan*, social awareness and anticipate regret in recruiting more young blood donors among non-donors.

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ACADEMIC PERFORMANCE OF IUKL INTERNATIONAL STUDENTS IN MATHEMATICS-BASED AND SCIENCE-BASED SUBJECTS

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ABSTRACT

This study is to determine the level of academic performance of the international students in Mathematics-based and Science-based subjects in Infrastructure University Kuala Lumpur (IUKL) and the factors that influence the international students in studying both subjects. 291 respondents were randomly selected to answer the research questionnaires. They were chosen from five faculties in IUKL. Three types of analyses used in this research were the calculations of arithmetic means, Kruskal-Wallis test and Spearman's Rank Correlation. The findings showed that 60.1% of the international students have poor academic performance with CGPA below 3.000. It is also revealed that there are significant differences between the students' overall performance and their grades in both Mathematics-based and Science-based subjects. While the correlations between the students' overall performance and their grades was 0.544 for Mathematics-based subjects and 0.536 for the Science-based subjects. Further analysis showed that student-lecturer interaction, support services and student characteristics have significant differences with the students' grades in Mathematics-based subjects while for the Science-based subjects, only student-lecturer interaction had a significant difference with the students' grades.

Keywords:
Academic performance, International students, Mathematics-based subjects, Science-based subjects, Cumulative Grade Point Average (CGPA)

INTRODUCTION

Over the past decade, Malaysia has become the fastest growing destination for international students, showing an annual increase of over 16%. Its average ratio is almost 1:10 which is one of the highest proportions of international versus domestic students in the academic world. The Second Education Minister, Datuk Seri Idris Jusoh stated during the Educational Malaysia International Development and Marketing Convention 2015, Malaysia had 135,502 international students from 160 nations studying in public and private higher institutions in Malaysia as well as the international schools as at 31 December 2014. Out of the total, there were 74,996 international students studying in private tertiary institutions. This shows an increase of 29.9% from the year 2013 (The Sun Daily, 29 January 2015).

Infrastructure University Kuala Lumpur (IUKL), one of the private tertiary institutions in Malaysia with its vision to be a world-renowned infrastructure university also has a population of roughly 33% of international students at present. In Faculty of Applied Science & Foundation Studies (FASF), there is approximately 50% of the Foundation in Science students are international students.

With the increasing number of international students studying in overseas including Malaysia, there has been a growing interest in exploring the factors that influence their academic performance during their studies. Findings from Ali (2013), Ali et. al. (2013) and Freeman et. al. (2014) have shown that there are significant factors which influence the

academic performance of the high and poor achievers such as teaching style, the medium of instructions, assessment methods, students' attitude towards lecturers and much more.

In IUKL itself, it has been noticed that the international students face some difficulties to perform in the Mathematics-based subjects (MBS) and Science-based subjects (SBS) compared to the local students. Data of international students' results from FASF for three MBS and five SBS subjects were taken from September Semester 2014 final examinations. The data showed an average of 83.3% and 89% achieved the grades of B- and below respectively. Thus, this research investigated the factors why the international students faced difficulties to perform excellently especially in these subjects and discussed the methods to overcome the problems. The respondents of this research were randomly selected from students of the five faculties in IUKL; namely Faculty of Engineering and Technology Infrastructure, Faculty of Architecture and Built Environment, Faculty of Business and Accounting, Faculty of Creative Media and Innovative Technology and Faculty of Applied Science and Foundation Studies.

LITERATURE REVIEW

Mathematical knowledge is significant to students who undertake college science subjects, this includes even the biology subjects (Sadler and Tai, 2007). In another research by Nakakoji et. al. (2014), the level of mathematics knowledge is found to be an influencing factor to overall pass rates in science, technology, engineering and mathematics based diploma or bachelor programmes. In a research to investigate student performance on chemistry subject, the reason for poor performance is found to be poor basic knowledge in mathematics such as division, multiplication, fractions and ratios (Scott, 2012; Hoban et. al., 2013). In accordance with this, Becker and Towns (2012) found that students couldn't perform in physical chemistry subjects due to inability to transfer between mathematical and chemistry context.

Students are required to perform excellently in the pure mathematics and science courses as eventually they are required to take up applied mathematics and science-based courses throughout their programmes. Thus, a good foundation in these subjects is essential for their upcoming semesters till they graduate.

However, in the current circumstances, students are seen to perform poorly in these courses and producing low CGPAs. From past studies, Scott & Graal (2007) reported that lower CGPA points are due to the poor performance of students during their prerequisite undergraduate courses which consist of mathematics and science courses such as algebra, calculus, chemistry, biochemistry and many more. Student's academic performances are influenced by several factors either personal to the students or external. Mainly there are 3 major factors which influence low academic performance; students, parents and teachers/lecturers (Diaz, 2003). Nevertheless, it is to be noted that the influencing factors do vary from time to time due to the academic environment, individualistic factors and background, and cultural values embedded to the students.

STUDENTS

Student factor plays an important role in determining their academic performance. Obtaining a good grade in their studies depends on the amount of effort a student undertakes in his/her studies, revision and training for the respective courses undertaken (Ali et. al., 2013). In addition to this, previous educational background and knowledge on certain courses also do help the students in their preparation for the course (Anderson & Benjamin, 1994). Generally, students are given typical courses like calculus, algebra, physics and chemistry in their first and second years to strengthen their skills and knowledge. Students with good mathematics grades

in their high school, have a strong foundation to pursue these courses. Rylands & Coady (2009) found that secondary school mathematics results are the benchmark on the students' preparedness for undertaking university mathematics and mathematics-related courses. A recent research by Nicholas et. al. (2015) supports this finding. Analysis on students taking science based degree programmes shows that students with experience of undertaking higher level mathematics during their High School Certificate (HSC) are more successful in their first-year science and mathematics courses.

Attending classes at least up to 80% is made compulsory for all students in IUKL to ensure their commitment towards the subject. It is noted that students who are frequently missing their classes do perform poorly in their subject. Romer (1993) found that students' attendance is related to their academic performance. Though students can do personal studying to cover the syllabus missed, but most of the times either the students procrastinate and do not study or in certain cases, they do study but do not understand the syllabus and they have no one to refer to in the event of his classmates also are unsure or not very clear on the topics. At this point, they still are required to refer to their lecturers where most of the times students neglect to do so as to avoid reprimanding from their lecturer for being absent from the class. In the long term, these students tend to fall back in their studies. Thus, poor class attendance indirectly will influence the academic performance. In a study by Newman-Ford et. al. (2009), it was found that students skip classes due to the pressure from the assessment, the commitment required for team works, the mismatch between lecture presentation methods and also class timing.

PARENTS

Parents' education background influences the students' academic outcomes. An educated parent is able to assist or give guidance to their children on how to complete their homework, assignment or even teach and guide in certain topics that students are facing difficulties. It indirectly gives confidence to the students that they have a comfortable place to turn to if they don't understand their lecture. Especially for mathematics and science-based subjects, parents with a strong background in mathematics and science courses can assist in courses related to mathematics and science.

Next factor will be family economic status. A family with good financial standing are able to support the students financially through their education. At this point, the students have free mind to concentrate on their studies and not to worry about his/her tuition fees or working part-time to support himself/herself during the 3 or 4 years that they are enrolled in the programme (Ali et. al., 2013).

TEACHERS / LECTURERS

Students learning preference is a crucial matter in assisting a student's academic performance (Harb & El-Shaarawi, 2006). Teaching styles or methods practiced by the lecturer must be in line with the students learning styles. In general, any class will comprise with students practising various learning styles. A lecturer must be competent to mould and nurture all types of learning preference of his/her students. The lecturer must be able to create new ways or methods that cater his/her students learning styles. In terms of learning preferences, Reid (1995) noted that it's an individual's nature of habits and preferred methods in acquiring knowledge. When a lecturer chose a particular method of delivering his/her lecture, only the respective group who are in the same mind of learning with the lecturer will benefit. This will affect the students' academic performance in the long run. Thus, good connectivity and interaction

between the lecturer and students during the lectures have a significant influence on the students' performance on the respective subjects (Ali, 2013).

OTHER FACTORS

Various studies were done on gender differences on academic performance. Park et. al. (2012) analysed Korean students' gender differences; the research found that students from single-sex school gain higher scores regardless its female or male schools. Research by Eisenkopf et. al. (2014) gave a positive outcome for performance in Mathematics subjects among female students from single-sex education. Also the female students from single-sex education background in UK showed better academic results (Booth et. al., 2013). In contrast, some other researches showed there is no relation between female and male students in their academic performance (Borde, 1998 & Hyde et. al., 2008).

In random, there are further factors as well that influence students such as students confidence level, emotional problems, poor infrastructure and lack of resources and textbooks (Zakaria & Bamidele, 2015, Ali, 2013).

METHODOLOGY

This study was a survey based research. A 6-point likert scale questionnaire comprising of three sections to collect information on personal information, factors influencing student's performance in MBS and SBS, and suggestions to improve academic performances, were distributed to the respondents. 24 items from the questionnaire were used for the analysis. The respondents in this research were randomly selected from Bachelor, Diploma and Foundation programmes from the five faculties in IUKL; which were Faculty of Engineering and Technology Infrastructure (FETI), Faculty of Architecture and Built Environment (FABE), Faculty of Applied Science and Foundation Studies (FASF), Faculty of Creative Media and Innovative Technology (FCMIT) and Faculty of Business and Accounting (FBA). A valid 291 questionnaires were collected from the respondents and used for analysis. SPSS 20.0 software was used to analyse the data collected. The three analyses used in this research were Arithmetic Means, Kruskal Wallis and Spearman's Rank Correlation.

FINDINGS

From the 291 respondents, 86.6% were male students while 13.4% were female students. It is to be noted here that IUKL population has higher male students than the female students. The respondents were segregated according to the faculties - FETI, FABE, FASF, FCMIT and FBA. The Figure 1 below shows the distribution of respondents as per faculties.

Chart 1: Distribution of respondents according to faculties
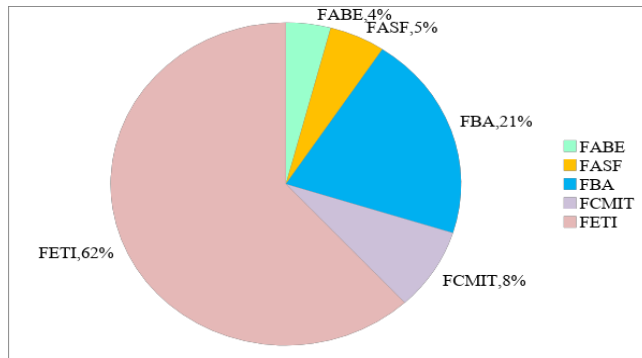
The highest percentage of respondents was from bachelor programmes (96.3%) and the rest were inclusive of students pursuing diploma and foundation programmes. For the purpose of this research, the students were categorized into two; good performing students and poor performing students. Good results were set at CGPA of 3.000 and above, while poor results were set at CGPA of below 3.000. The Figure 2 below shows the distribution of the CGPA bearers.

Chart 2: Good and poor performing CGPA of respondents
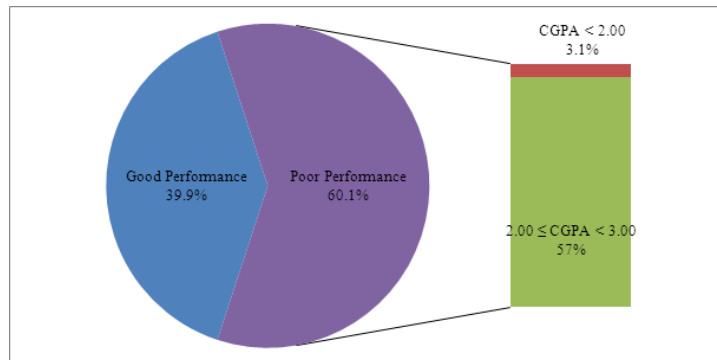
The grading system used in IUKL to evaluate the students is shown below.

Grade	Grade Points	Marks %
A+	4.00	95-100
A	4.00	85-94
A-	3.67	75-84
B+	3.33	70-74
B	3.00	65-69
B-	2.67	60-64
C+	2.33	55-59
C	2.00	50-54
C-	1.67	47-49
D+	1.33	44-46
D	1.00	40-43
F	0.00	0-39

This research specifically focused on students' performance in MBS and SBS. In this research, the outstanding result was set as A+, the good result was set from grade A to B and the rest was the poor result. The following figure shows the distribution of student's results for MBS.

Chart 3: Distribution of students' results for MBS.
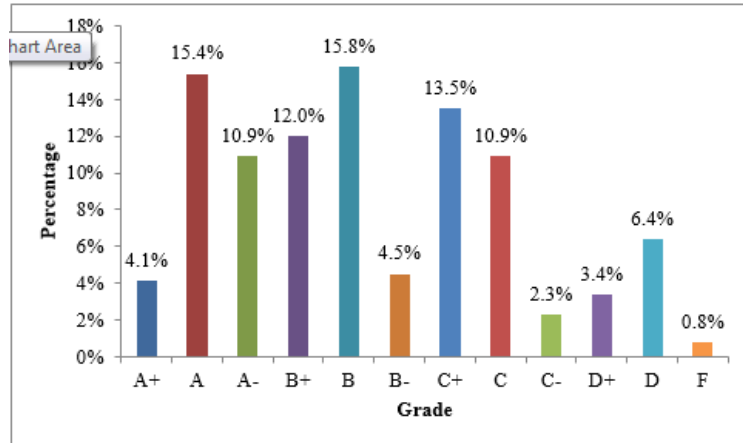
The next chart shows the distribution of student's results for SBS.

Chart 4: Distribution of students' results for SBS.
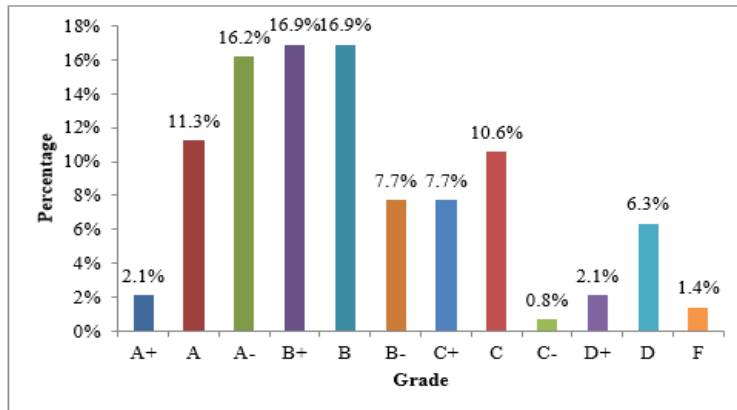
The students' results in SBS were also categorized as outstanding (A+), good results (A to B) and poor results (B− to F). It is found that only 2.1% of the respondents achieved outstanding results, followed by 61.3% achieved good results and the remainder 36.6% had poor results.

The level of academic performance of the international students in MBS and SBS was tested using Kruskal-Wallis. The first test involved two variables which are students' CGPAs and their grades in MBS. The null hypothesis is rejected (p-value = 0.000) and it was concluded that there is a significant difference between the two variables. The second test was repeated for

SBS. There is a significant difference between the students' overall performance and their grades in SBS (p-value = 0.000).

Further analysis using Spearman's Rank Correlation test for the grades for MBS and SBS showed a significant correlation (both p-values = 0.000) toward CGPAs. The rho value between students' CGPA and grades of MBS is 0.544 while the rho value between students' CGPA and grades of Science-based subjects is 0.536. These values reflected moderate correlation.

FACTORS THAT INFLUENCE STUDENTS' ACADEMIC PERFORMANCE

Factors that influence the students' academic performance analysed in this research were categorized into four groups which were student-lecturer interaction, support services, student interaction and student characteristics. The findings showed that student-lecturer interaction, support services and student characteristics had a significant difference with the students' grades in MBS (p = 0.036, p = 0.046 and p = 0.024) while they showed no significant difference between student interaction and the students' grades in MBS (p = 0.091).

Next, analysis on SBS showed that student-lecturer interaction had a significant difference with the students' grades in SBS (p = 0.040) while they showed no significant difference between support services, student interaction and student characteristics and the students' grades in SBS (p = 0.196, p = 0.723 and p = 0.290).

CONCLUSION

The findings showed that higher percentage of the international students (60.1%) had poor academic performance (CGPA below 3.000). It also showed that one-third of them scored below grade B for both MBS and SBS which were 37.7% and 36.6% respectively. The results obtained from Kruskal-Wallis test proved a significant difference between the students' overall performance and their grades in both MBS and SBS. While the correlations between the students' overall performance and their grades in MBS and SBS were moderate which are shown from the results of Spearman's Rank Correlation test. Additional Kruskal-Wallis test was done to determine the factors that affect and help students in studying MBS and SBS in IUKL. The results showed that student-lecturer interaction, support services and student characteristics had significant differences with the students' grades in MBS while there was no significant difference between student interaction and the students' grades in MBS. On the other hand, SBS results showed a different pattern where the student-lecturer interaction had a significant difference with the students' grades in SBS while they showed no significant difference between support services, student interaction and student characteristics and the students' grades in SBS.

RECOMMENDATION

Challenges in studying MBS and SBS are not limited to the poor performing students alone. Even the good performing students also face some challenges at one point of their education journey. These subjects are compulsory for the students to train the way they think and practice on how to solve problems. Thus, it is crucial to find ways and methods to help our students in tackling these issues.

Five top methods recommended for the students based on the research findings are as listed below.

i)   Do not skip class (72.2%)
ii)   Consult with lecturer on the lesson which are difficult to understand immediately (25.8%)
iii)   Study smart (25.8%)
iv)   Pay attention in class (25.4%)
v)   Do all assignment by oneself, do not simply copy from others (21.3%)

There are also some recommendations given spontaneously by the respondents which are useful.

"Always ask questions" (Student 266, male, BSAR)
"Be more friendly with other students" (Student 269, male, BITNT)
"Cultivate discipline" (Student 236, male, BEC)
"Do everything on time" (Student 226, female, BBA)
"Focus on the study and the reason behind this effort" (Student 182, male, BCE)
"Lecturer should always pay more attention to those students" (Student 6, male, BCE)
"Read last year final paper" (Student 162, female, BTCM)
"The teacher should force the good students to help the weak students" (Student 192, male, BCE)
"We just need better environment" (Student 130, male, BCE)
"Weak students also try to improve their selves not only waiting for help from others" (Student 195, male, BCE)

Overall, it is recommended that both parties should help each other in bringing up the poor students' academic performance. The weak one has to work for it as well as the good ones can help the peers in understanding the subject. Besides, lecturers also have to keep an eye on the poor performing students as well as coach them in their studies.

LIMITATIONS

Researchers faced difficulties in obtaining respondents to answer the questionnaire because many of them were reluctant to disclose their results.

SIGNIFICANCE OF STUDY

This research is significant to the academic communities, parents and students. It provides the educators with the information on the problems and factors influencing the students' performance hence they can find rooms for improvement on their teaching methods and provide better learning environment for the students. As for the parents, this research enlightens their understanding on the strengths and struggles faced by their children. Parents will be able to understand their children's problems, if any and give necessary advice and support to them. On the other hand, the students are able to overcome the problems that they are facing. In addition, IUKL is able to produce graduates with good knowledge in the two disciplines.

FUTURE RESEARCH

In future, it is suggested that researchers extend the sampling to the local students and make comparison between the performance of international and local students in MBS and SBS.

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EFFECTS OF BLOG, WIKI AND GOOGLE DOCS IN LEARNING ENGLISH LANGUAGE: A STUDY OF BANGLADESH AT TERTIARY LEVEL

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ABSTRACT

English language learners at tertiary level, nowadays, have become highly dependent on blogs, wikis and Google docs in learning English. The use of these new media tools has certain effects in learning English. The aim of the study was to define the effects of blog, wiki and Google docs in learning English language at tertiary level. The researcher used qualitative method in the study. To collect the data, six Focus Group Discussions(FGD) were conducted with 30 students. The collected data was coded following the data coding procedure and significant themes had emerged after coding. The findings of the study showed that the students of tertiary level use English learning materials from blog, wiki and Google docs. The study also found that learning of English language is stress free, motivational, context-free, easily accessible and less costly when students learn through blogs, wikis and Google docs. Moreover, the study found that due to multiple sources of the same language input including grammar, vocabulary and mechanics in blogs, wikis and Google docs, sometimes students became confused as there were some blogs and wikis which did not maintain standard or provided correct solution. The study recommends the institutions give the students a list of authentic blogs and wikis so that the students can learn authentic language inputs.

Keywords:
Effect, New Media, Blog, Wiki, Google docs, Learning English, Tertiary Level, Bangladesh.

INTRODUCTION

Technological revolution in education has made the learners largely dependent on new media tools. Specifically, the wider use of new media tools has made learning friendlier and easily accessible to the learners. To some the adoption of technology left mixed feelings (Hawkridge, Vincent, & Hales, 2018). Learners of English language worldwide are using different new media tools including blog, wiki and Google docs. These new media tools present learning materials as e-texts. The learners get access to these e-texts by using their devices at any time with internet connection or they can store important materials from the download options. In Bangladesh, learners of tertiary level use different new media tools for their English language learning purposes (Hasan & Labonya, 2016; & Hasan & Khan, 2017). So their choices for learning strategy has changed much during last decade and they are more akin to learn through digital technologies. Therefore, curriculum and learning techniques are immensely based on digital technology which facilitates them to learn even when they are far from them physically (Hasan & Khan, 2017). Learners widely use blog, wiki, and Google docs for enhancing their English language competencies. However, the effects of using blog, wiki and Google docs by the tertiary level learners are not widely defined. Therefore, the highest outcomes of learning through blog are not well-defined yet and the teachers of English at tertiary level are also facing challenges in implementing the curriculum.

The reason behind facing the challenges is that the students of current age are known as "Net Generation (Net Gen)" or "Digital natives" and their cognitive development is far

different from their preceding generation (Evans, 1995). Most recently, many researchers (Hasan & Khan, 2017; Susilo, 2014; & Jadhav et al., 2013; Chowdhury, 2012; Omar et al., 2012; Lee, 2011; Conole, 2010; & Tina, 2010) have indicated that learners have started learning English language skills consciously or subconsciously with the support of new media tools including Blog, Wiki, different apps, android phones, recording device, DVDs, YouTube, Social Networking Sites (Facebook, Skype, Quick Messengers, WhatsApp), e-books, English songs and movies with subtitles etc. For instance, in android phone, the users can use WhatsApp, Skype, and Messenger, thus, communicate with different groups of people within a short time (Jadhav et al., 2013). However, as stated, the effects of blog, wiki and Google docs in learning English are not widely defined by the teachers, planners of curriculum, and most importantly the researchers of English language skills in Bangladeshi context. Therefore, an investigation is needed to define the effects of blog, wiki and Google docs in learning English language at tertiary level.

Prospects of e-Learning for Bangladesh

Digitizing education sector has got an imperative attention in recent years. In Bangladesh ICT Forum (2009), National ICT Policy-2009 of Bangladesh has aimed at digitizing the learning in different stages of education. To fulfil the aim, government has established language labs with computers and internet access in the educational institutions and technical institutions so that informants can learn English language from the digital facilities. Patra et al. (2010) identified a few paybacks of e-Learning in Bangladeshi context. Patra et al. (2010) stated that for Bangladesh building infrastructure is not possible for providing education to all and the introduction of e-learning from a few institutions can reach huge number of students. According to Farid et al. (2018), e-learning through new media tools have different meaning in different contexts. Additionally, Bangladeshi students are found to be interested in adopting e-library and digital learning contents (Hossain et al., 2018).

Net Generation and New Media

Nowadays, the students are keen to use the benefits of newer technologies in learning formal and informal situations (Ang et al., 2018) and the educational institutions have to feed the students according to their demand for newness. In their study on distance education, Worley (2011) and others have stated that nowadays the higher education teachers and administrators are facing challenge in planning and teaching their students. Moreover, the students are also interested in learning through new media tools (Hasan & Khan, 2017). Therefore, curriculum and learning techniques are immensely based on digital technology which facilitates them to learn even when they are far from them physically.

In addition, English language is taught and learned with the help of new media tools in and outside the classroom. In most of the countries English language skills are learned with the incorporation of internet facilities including Google docs, wiki, Blog, YouTube etc. The use of these internet based learning tools are called as the new media tools which presents learning materials as e-texts instead of traditional printed materials. Different studies (Al-Timimi, 2018; Hanson-Smith, 2018; & Balaji & Chakrabarti, 2010) have shown that the use of new media tools like blog, wiki and Google docs have effects like more functionality, user-friendliness and so on in learning English language skills by the "Net Generation".

Research Question

The research question for the study is:
What are the influences of using blog, wiki and Google docs in learning English language skills?

Research Objective

The objective of the study is to:
define the influences of using blog, wiki and Google docs in learning English language skills.

LITERATURE REVIEW

Blogs, wikis and Google docs have certain influences in learning English language at tertiary level. The previous researchers have defined the influences of blogs, wiki, and Google docs in different contexts. The researcher has found different influences of blog, wiki and Google docs.

Blogs in Learning English

Blogs are thought to be one of the widely used web tools in learning English language skills. There are some studies which justify the use of blogs in learning English language skills. Blogs have become a part in learning language skills where English is a foreign language (EFL) (Aydin, 2014). The use of blogs in language learning contributes to gaining cultural knowledge, provides opportunities to explore the target culture, and increases cultural awareness. So, throughout blogging, language skills can be learned (Aydin, 2014). Moreover, computer-mediated communication with the use of blog helps learners to be exposed to the native speakers and learn different things from the native speakers with motivation (Henry et al., 2018). Even the learners who study in the native speaking countries learns to communicate in English as the learners get the benefit of cross-cultural interaction there (Lee, 2011). Additionally, communication through blogs enhances cultural interaction, competence, communication and exchanges (Lee, 2012). Thus, communication through blogs promotes learners' language skills day by day.

Blogs allow learners to learn outside the classroom, besides learning in the classrooms. Campbell (2003) introduces three uses of weblogs that can be utilized for learning outside the classroom. Three types or uses of blogs are tutor blog, learner blog and class blog. A tutor blog can perform three functions and first one is disseminating information to learners regarding course outline, assessment, homework, due dates of assignments etc. Second function is that the teacher can post different materials and websites for learners' study. Thirdly, the learners can give their feedbacks on classroom activities in the blog. Zheng, Yim and Warschauer (2018) found that blogs are used for writing purposes and it is an effective platform for writing development. Thus, learners get scope to develop their language awareness. Blogs facilitate English language learners with inquiries, frequent visits, commenting on the posts and receiving comments from the moderator (Tharwa, 2017).

Wikis in Learning English Language Skills

A Wiki is a website that allows any user to add content, and allows that content to be edited by any other user. Users can view, edit, and add information to a Wiki through its web-based interface, and a user does not need to know any html (Hyper-Text Markup Language) or other coding in order to use a Wiki (Frumkin, 2005). In English language teaching arena, teachers use a Wiki to assign activities for their students. The students who are supported by Wiki, they improve faster in enhancing their writing and new vocabulary skills (Pinto-Llorente et al., 2017; Khany & Khosravian, 2014).

The use of wiki helped students to work autonomously and the e-portfolio motivated them to learn and own the learning as well (Papadima-Sophocleous et al., 2012). So, Wiki is a good web tool for learning English language skills. Moreover, Wikis help students to work collaboratively and enhance their writing skill in EFL context besides their classroom activities. Students can improve their essay writing skill when they work collaboratively in Wiki-based writing projects (Aydin & Yildiz, 2014; Lin & Yang, 2011).

Google Docs in Learning English

For learning more beyond the classroom, learners hugely rely on Google Docs. Google Docs, a free web-based version of Microsoft Word, is a platform for learning language (Suwantarathip, 2014). Even the attitude of the collaborative group who worked with the support of Google documents and online medium for communication was positive towards learning English language learning. In this process of learning, the students did peer checking and peer correction activities using the Web 2.0 applications. The collaborative group is found motivated in learning English language skills using Google documents (Liu & Lan, 2016). Interaction through SMS (Short Messaging System) helps learners to read how another person constructs sentences and the new vocabularies for communication through English language (Collentine & Collentine, 2013). It is found that the group who worked collaboratively with the help of Google Docs did better than the group who worked collaboratively without the help of Google Docs (Suwantarathip, 2014). Indeed, learning through online is more relaxed than learning from the teacher in face-to-face communication.

METHODOLOGY

The researcher used qualitative research method from data collection to analysis part. The qualitative research method helped the researcher understand the phenomena from the perspectives of respondents (Hair et al., 2015). The sample size for qualitative research was small, the researcher used open ended questions, and the research approach was inductive (Hair et al., 2016).

In this study, the researcher used Focus Group Discussion (FGD) for collecting the data. A Focus Group Discussion is the process of collecting data through interviews with a group of people, typically four to six (Creswell, 2015). FGD is advantageous when the interaction among interviewees likely yield the best information and when interviewees are similar to and cooperative to each other (Creswell, 2015). The areas of discussion for FGD were adopted from the reviewed literature. There were 10 open ended questions for the FGD. The reason for using open ended questions was that open ended questions permitted the researcher to explore the reasons and to identify any comments that the participants might want to mention what may not be collected through close ended questions (Creswell, Plano Clark, Gutmann &

Hanson, 2003). In the beginning of the FGD, the researcher has ensured the ethical issues related to the participants.

The researcher had conducted six FGD with 30 respondents selected from tertiary level. In each FGD, there were five respondents. The duration of each FGD was from 30 minutes to 47 minutes. The ratio of male and female students were equal in the FGD. The researcher recorded the FGD in audio recorder and later transcribed the interviews to find out the emerging issues or themes. The researcher followed the steps of coding the qualitative data recommended by Creswell (2003). The results of the study were presented in few themes emerged for the FGD.

RESULTS

Digital Texts Are Attractive and Easily Portable

Among the different channels, blog, wiki, Google docs and to some extent Facebook presented language learning materials in text format. The presentation of the text materials in the new media channels was a bit different from the texts we find as hard copies, the informants said in the FGD. The main difference they said was the texts presented in the new media channels were more attractive and easily portable and they did not have to carry a heavy book nowadays. The findings of Pinto-Llorente (2017), Susilo (2014) and Chowdhury (2012) also found the same findings. Their smartphone could carry hundreds of books in a small space which allowed them to read the texts anywhere they wanted. The text materials presented in the blog, wiki, Google docs and Facebook were catchier. The informants said that,

> "We get the teaching materials in the channels like blog, wiki, Google and Facebook. These contents are more attractive and we enjoy learning here as it is stress-free." [F6I1]

> "I don't always use a large bag to carry all the books. My smartphone and tab are my bag and it carries all the textbooks I need. I can read from adobe reader." [F2I5]

Learners' Recommendation for Combination of Real classroom and Web-based Learning

However, the informants agreed that only new media channels were not enough to learn the skills of English language. They preferred a combination of real classroom teaching and the support of the new media channels when necessary. They said that sometimes they understood the usages of English from the class lecture by the teachers and sometimes they needed the support from the new media channels. Therefore, to them, a combination of real classroom and new media tools could help them learn better. The findings of Conole (2010) and Tina (2010) also showed the same results in their study. The informants, in the FGD, said that,

> "I don't think that we always need the support of new media channels for every topic we are taught in the classroom. We need the support when we make our assignments or in case we do not understand a topic in the classroom." [F3I2]

> "Okay, I agree that new media channels are okay for me in learning English. However, I have to think of some of my friends who are not that much tech savvy. They need more time to be accustomed to incorporate new media tools in learning English language skills." [F4I2]

Blogs, Wikis and Google as Supplementary to Class Lecture

To them, learning the essay or paragraph writing rules and techniques could be learnt from the lecture and feedback they received from their teacher. However, the support from the online media could help them learn better. They also said that from different blog posts they could learn grammar and as the grammar topics were presented in online so they could check anytime from their smartphone and learn from the grammar teaching blogs. The informants usually learned different language topics from the blogs like Grammarly Blog, English Grammar – Your guide to error-free writing, Ielts-simon.com, Daily Writing Tips, Reddit – Grammar, English Grammar Blog, OxfordWords blog - Grammar and writing help and many more. From the blog posts, the informants learned tenses, punctuation rules, adjectives, adverbs, determiners, direct and indirect speech, gerund and present participle (ing form), nouns, passive, possessive, relative clauses, the infinitive and verbs and verb tenses etc. Aydin (2014) and Lee (2012) also showed almost same findings in their study. The informants mentioned that,

> "Our learning from the posts in blogs and wikis are effective as these two new media channels presents language topics in comprehensive way. Even we get some videos from different blogs which are very inspiring and we love to spend time in this learning process." [F1I2]

> "Listen, I can now give grammar tests in online within short time. I don't have to waste paper and ink to learn grammar topics at present." [F5I3]

> "In my case, I learn from different images from Google containing English language items. What I do is I write those learning in my paper and later I repeat the learning." [F4I3]

Blogs, Wikis and Google Facilitates Quick Search of Language Contents

In the FGD, informants also said that when they needed to know any grammatical structure in a book, it took time to find out exactly what they looked for. However, when they searched it in the Google, they found the topic was explained clearly. They received multiple explanations of the same topic and could choose the best one. As there were multiple explanations and examples by the Native and Non-Native speakers of English, so the explications made the language input more comprehensible in the new media tools. Same difficulty was mentioned in the studies conducted by Worley (2011), Omar et al. (2012) and Jadhav et al. (2013). The informants pointed out that,

> "We get every topic of English language in the new media tools like blog, wiki and Facebook pages. Contents are presented as more comprehensible in the new media tools." [F1R3]

Enhancement of Reading and Writing Skills through Blog, Wiki and Google

The informants agreed that they could tremendously enhance their reading and writing skills from the blog. The teacher posted in the blogs and the informants made comment and replied to their friends' comments there. The teacher also gave remarks on the comments and replies

made by the informants in the blog posts. The enhancement of reading and writing skill was also stated by the previous researchers like Henry et al. (2018) Collentine and Collentine (2014), Aydin and Yildiz (2014) and Balaji and Chakrabarti (2010). They had a chance to acquire knowledge and improve their English language skills, specifically their reading and writing skill. The informants pointed out that as the teacher provided them replies virtually at any time, so they found blogging as a more comprehensible way in enhancing their reading and writing skills. One of the informants pointed out that,

> "If it was not blog, we must have not written as much as we write every day. Presentation of lots of contents in blog makes the learning easy and comprehensible to us." [F2I4]

Easy Option to Download, Store and Practice Tests

Google facilitated them with ample amount of reading materials which were mostly free for everyone. In the FGD, the informants pointed out that they did download different reading texts from Google and later they did annotate, paraphrase and solve the questions given with the reading text. In the testprepreview.com, they could give free reading tests where they gave test on MCQ (Multiple Choice Questions), fill in the blanks, finding main ideas, inferring and summary writing based on a given text material. The informants pointed out that the benefit of this online practice was that the answers were explained elaborately. Therefore, they could understand the reasons for correct and incorrect answers. They also sat for TOEIC Mock Test which had helped them develop their reading skill. All these were possible through Google they mentioned. The informants mentioned that,

> "I regularly read different materials in blogs, wiki and Google. This has enriched my vocabulary level. Now I can use variety of words in my writing." [F5I2]

> "My reading skills have improved much during last three years. The reason is that I always use the new media tools for learning English." [F2I5]

However, the informants also mentioned that sometimes they became confused while learning through blog, wiki and Google docs. They mentioned that when different sources in the blog, wiki and Google docs presented different information, then it became difficult for them to identify the accurate information. Some of the informants also mentioned that they preferred reading from the printed version of the language learning materials. They preferred printed version of the materials for enhancing their reading skill. Most of the informants agreed that blogs, wikis and Google docs should be used for information gathering and enhancing grammar, mechanics, reading skills and learning through entertainment.

DISCUSSION

From the findings of the study, it is evident that learning through blog, wiki and Google have positive effects on learning English although some of the learners suggested for a combination of both new media based and real classroom learning. The learners of tertiary level found blogs, wikis and Google docs were useful for enhancing their English language skills. To them, learning was amusing through the new media tools. The learners could download necessary e-texts or pdf files in their device within short time. They did not have to be compelled to spend immense cash just like the previous learners of previous generation. Moreover, the portable

capability of the e-texts made it simple to carry anyplace within the smartphone or portable computer. The learners could read the vital language related topics or story books from their smartphone. These facilities made English language learning simple and fast among the learners of tertiary level.

Moreover, besides the classroom teaching, learners used blogs, wikis and Google docs as a supplement. Whatever confusions they had related to grammar, syntax, mechanics, rhetoric and style of English language, they could search in numerous blogs, wikis and Google quickly. Thus, the learners could solve their individual language related problems by themselves. Another significant matter was that the learners of tertiary level checked their scores in different skills of English language within the free online language tests. The online tests were usually free and there was no need for a real teacher there. The virtual teacher instantly provided feedback to the learners who sat for the test through blogs. The reading and writing habit of the learner were often transformed into a skill of reading and writing through blog and wiki. Once the teacher asked the learners to answer or reply in the blog, they became more driven to try and do this. The explanation behind this can be that the "Digital Natives" feel more leisurely to reply virtually. On the opposite side, the teacher could reply the learners at any time. Therefore, learning English language through blog, wiki and Google was not bound to any place or specific time of the day.

Additionally, from the findings, it can be asserted that the teachers and learners of English language needed to pay more attention on the cultural appropriateness of the contents presented in the blog, wiki and Google docs. As some of the learners mentioned the need for cultural appropriateness of the language learning contents presented in the digital tools, the necessary materials for learning needed to be produced by the institutions for making the learning more effective. From the findings it could be stated that when the learners found the learning content topics related to their own and known culture, they became more enthusiastic to pay attention in learning from the digital contents.

Another important issue of learning through blogs, wiki and Google docs was that these digital tools focused more on improving learners' reading and writing skills. The two other language skills including listening and speaking remained untouched mostly in learning through these digital tools. From the findings, it could be affirmed that the learners still have the need for digital ways to enhance their listening and speaking skills. The institutions need to focus on these two skills and create platform so that the learners can equally strengthen their listening and speaking skills, and become good users of all four main English language skills.

However, from the findings, it was equally evident that some of the learners still cannot regulate themselves in learning through blog, wiki and Google docs. These learners of tertiary level still prefer learning from the printed learning materials. They found the digital texts boring to read. This happens due to socio-economic background and belated exposure of the learners to the digital devices. If the learners begin using digital devices earlier, they are supposed to find it comfortable in reading from the blogs, wikis and Google docs. However, the blog operators, e-text designers of English language ought to put emphasis in coming up with user friendly e-texts in order that all learners of tertiary level can benefit from blog, wiki and Google docs. In case the context demands a combination of both real teacher and digital contents through the blog, wiki and Google docs, the institution can recruit teachers who will be in charge of the institutionalized blogs in teaching and learning English. The teachers' quick reply to the learners' inquiries can make them active learners of language.

The implications of this study encompass the researchers, ELT (English Language Teaching) practitioners, existing theories, learners and policy makers. The researchers can use the findings in their future study and investigate with a bigger population. The ELT practitioners can use the suggestions made in the study in their teaching contexts and make

learning easily accessible to the learners. The learners can use blog, wiki and Google docs more effectively in the learning process and make their learning more interesting and motivating. Additionally, the policy makers can use the findings in planning curriculum and syllabus of English education in the context. The existing theories on the use of new media or technology in language learning can be revised based on the findings. Most of the theories given before the technological revolution in education sector ignored the cultural appropriateness of the language learning contents. Therefore, the cultural appropriateness of the digital contents to be used by the language learners globally needs to be revised in the existing theories.

CONCLUSION AND RECOMMENDATION

The English language learners of tertiary level mostly prefer using digital texts for enhancing their English language skills, specifically reading and writing skills. They enjoy learning from the digital texts as the digital texts are easily accessible, easily portable, less costly, motivating and a number of texts can be stored in their laptop or smartphone. The learners can test their language proficiency in different blogs and wikis free of cost which makes language learning cost effective. However, there are certain areas of digital texts presented in blog, wiki and Google docs which learners use for learning purposes. The presentation of language learning materials in the blogs, wiki and Google docs needs to be more learners friendly so that all learners find it motivating to learn English from blogs, wikis and Google docs. The study recommends for making the blogs audio-visual also so that the learners can also practice listening and speaking skills there. The learning materials need to be contextualised and it should be culturally appropriate. Finally, teachers need to select list of effective learning sources from blog, wiki and Google docs so that learners find learning more effective. The limitation of the study includes the specific context where the data was collected and therefore the findings may not be applicable to every context.

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LEARNING STYLES PREFERENCE, GENDER AND ENGLISH LANGUAGE PERFORMANCE OF EFL LIBYAN SECONDARY SCHOOL STUDENTS IN MALAYSIA

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ABSTRACT

The purpose of this study is to determine if there were relationships among learning style preference, gender and English language performance of EFL Libyan secondary school students in Malaysia. Specifically, the study was guided by three research questions focused on Libyan student's level of performance in EFL class in Malaysia, their learning styles and gender, and the relationship between students' learning styles and their English language performance. There has been a limited number of studies on Libyan secondary schools' student studying in Malaysia. This study was a correlational study involving 108 Libyan secondary school students in Malaysia. Data was analysed using the statistical package for Social Science (SPSS, version 20.0). The results showed that most learners who participated in this study had a medium proficiency level in the English language and majority of the Libyan students preferred independent learning style. It was found that there was a difference in the learning styles preferred by female and male secondary school students. The study also revealed that there was no significant relationship between students' overall learning styles and their English language performance and. Recommendations were offered. Future researches could use more than one school to obtain accurate results and could also focus on gender biases.

INTRODUCTION

The formal language in Libyan schools is Arabic. The English language is considered a foreign language. In the past, there were specific periods where the teaching and learning of the English language was completely ignored due to political reasons which had affected the performance of Libyan students. It was very hard for them to achieve good grades in the English language subject in schools. Between the years 1993-1994, English language teaching was re-introduced to the Libyan educational system. However, so far Libyan students still face many challenges and difficulties of learning the English language, such as lack of qualified teachers, language laboratories at schools, and absence of teaching training programs (Elabbar, 2014).

Learners have different ways to learn. There have been several studies done to investigate students' learning styles and how they learn a second language or foreign language (Rebecca, 2003). It is important to note that learning style is a major factor that can influence students' performance and success. Students need instructional strategies to achieve higher scores (Ghwela et al, 2017). Kibasan and Singson (2016) found that Libyan students had significant differences in learning styles. Their learning styles differed from one to another. Moreover, the study also found that gender was one of the factors which affected learning styles.

Most of the Libyan students were visual learners, followed by kinaesthetic and few are auditory. Therefore, it seems that most students prefer to read the concepts from their books or hand-outs. According to Felder (1993) "students whose learning styles are compatible with the teaching style of a course instructor tend to retain information longer, apply it more effectively, and have more positive post-course attitudes toward the subject than do their counterparts who experience learning or teaching style mismatches. They preferentially focus on different types of information, tend to operate on perceived information in different ways, and achieve understanding at different rates"(Felder, 1993, p. 286). Among Libyan students, some studies showed that the attitudes of female secondary school students towards English are slightly more positive than that of male students (Zainol Abidin et al, 2012). This study is aimed at highlighting the contribution of learning styles which can boost Libyan students' achievements in EFL class. Hence, the study also sheds some light on the gaps in literature with respect to the Libyan secondary school students' learning styles and their English language performance in EFL classes.

RESEARCH QUESTIONS

Question 1: What are the learning styles preferred by EFL Libyan secondary school students in Malaysia?

Question 2: Is there a significant difference between learning styles and gender of students?

Question 3: Is there a significant relationship between learning style preference and English language performance among EFL Libyan secondary school students?

LITERATURE REVIEW

Karthigeyan and Nirmala (2013) found that among the five learning style categories, students preferred visual learning style primarily which was the predominant learning style of students' in second language learning followed by an auditory learning style which was secondary learning style preference of students. Next to auditory learning style, students preferred group and individual learning style. Students' least preferred learning style was kinaesthetic learning. According to Ariz Naqvi (2017), several studies have investigated the relationship between learning style and academic performance in various disciplines. He found that there was a strong relationship between converging learning style and performance scores of the students.

Dobson (2010) found that students had different learning styles. Students' learning was enhanced when instructors presented information using the particular styles that students preferred which then can reflect their performance. Mohamad, et al at (2011) discovered that a very successful learner learned in several different ways. On the whole, every student had a certain degree of preferences in each type of learning style, and the majority of them had dominance in one or more styles of learning. Within the learning style dimension, the findings revealed that the subjects strongly preferred the physiology type which included the visual, auditory and kinaesthetic elements.

The results of a study carried out by Tuan (2011) indicated that there were some significant relationships between students' learning style preferences and such variables as fields of study, length of tertiary study, gender, age, learning language experience, and English proficiency level. According to Tuan, traditionally, the teaching of EFL in Vietnam was dominated by a teacher-centred, book-centred, grammar-translation method and an emphasis on mechanical memory which resulted in a number of typical learning styles, with visual learning being one of them. Ali Sarabi et al. (2014) found that there was a significant difference between females and males regarding preferred learning styles. They found that female student preferred

using auditory learning styles more than males while male students preferred to use kinaesthetic learning styles more than female students.

Shabani (2012) in his study revealed that Iranian non-academic EFL learners used different learning styles as measured by the Paragon Learning Style Inventory (PLSI) (1998), with the majority of them applying Sensate and Judger styles. This means that they were more interested in what their five senses showed them rather than what their imagination told them. It also implied that they were less interested in what existed at present rather than what could exist in the future. They also liked to have things decided and life was likely to be planned and more orderly for them rather than flexible and spontaneous. Yemane et al. (2017) proved that there were preference differences among male and female students, significant associations between gender and learning style preferences were not found to be evident, therefore, instructors must integrate these of materials that assist in enhancing visual understandings. Results from the study showed a significant relationship between students' learning styles and their achievement in learning English. In comparison with monolinguals, bilinguals were superior in learning English.

Sahar (2017) found that the most of the Libyan students who participated in her study had a medium proficiency level in the English language. Meanwhile, the results showed that the majority of the Libyan students preferred competitive learning style. This study found that there was a significant relationship between Libyan students' overall learning styles and their EFL performance. Sana Ababneh (2015) investigated the relationship between Jordanian EFL students' learning styles and their level of proficiency and achievement in English as a foreign language. This study found that there was no statistically significant relationship between students' styles and their achievement in English, as the most of the students were considered to be poor in their English performance.

METHODOLOGY

The design of this study was quantitative in nature, i.e., descriptive and inferential as well. The research design used in this study was correlational to measure the relationship between two or more variables. According to Marguerite et al. (2008), the main purpose of correlational research is to determine, through the application of a quantitative statistical analysis, whether a relationship exists between the variables under investigation. The variables are examined to determine whether they have the relationship.

The number of students who participated in this study was 108 students, 66 were males and 42 were females, EFL learners in Libyan secondary schools in Malaysia. The ages of those respondents ranged from fifteen (17) to eighteen (18) years old. These students shared comparable abilities of the standard Arabic language and had been enrolled in the English as a foreign language class. In addition, they shared comparable linguistic, cultural and educational backgrounds. They had been taught English for two years in the secondary school.

Data collection

This study used Grasha–Reichmann student learning styles scales (GRSLSS) questionnaire. Grasha and Sheryl Reichmann developed the Grasha-Reichmann Learning Style Scales (GRSLSS) in 1974 to determine college students' styles of classroom participation (GRSLSS) (Simon, 2004). It comprised of 54 statements, 12 for the first learning style and each statement carried out five possible responses. The scaled values used against each response were strongly disagreed (SD)=1, disagreed (D)=2, not decided (ND)=3, agreed (A)=4 and strongly agreed

(SA)=5. English Language Test was administered by the teachers to all the participants to get their scores.

The data collection took place in Libyan secondary school students in Malaysia. The researcher handed out the questionnaires to the participants in their classroom. Then, the researcher informed the participants the purpose of the study and explained the questionnaire to them. The participants were given adequate time about 20 minutes to complete the task in the classroom. Then, the collected data were analysed based on the research questions of the study. The scores received by the participants after the English language test were recorded.

Data Analysis

The SPSS (Statistical Package for Social Science, version 20) was used to provide statistical information about the relationship between learning style preference, gender and English language performance among English as foreign language in Libyan secondary school students in Malaysia. Pearson product-moment correlation coefficient (PPMCC), was a measure of the linear dependence (correlation) between two variables, meanwhile T-test were utilized to answer the research questions.

RESULTS

The demographic data were used to describe the characteristics of the respondents who completed the questionnaire. This was critical to understand the representation of the sample. The demographic information facilitated a foundation comprehension of the distinctiveness of the sample population used in this study. The demographic characteristics of the participants in this study were analyzed using SPSS; descriptive analysis to obtain the frequency and percentage. The findings of the demographic characteristics were as follows:

Gender

Table 4.1 shows that the majority (n= 22; 61.1%) of the respondents were male; while the females accounted only 42 participants (38.9%).

Table 4.1 Gender distribution of the respondents in the study (N=36)

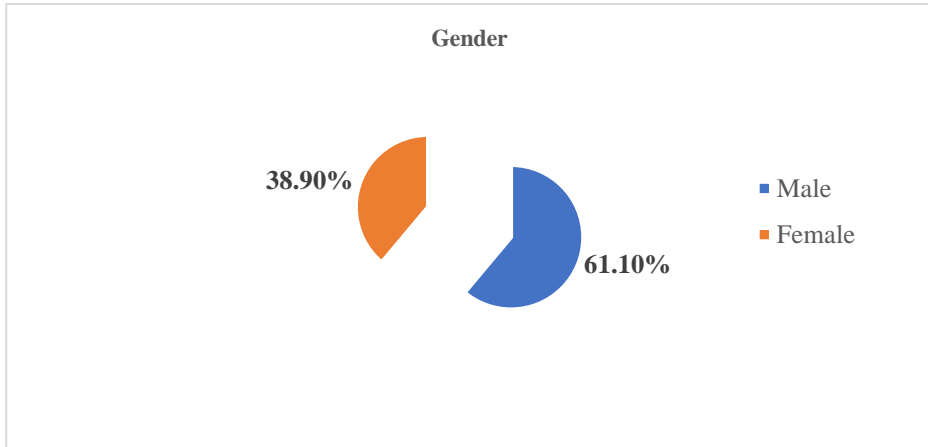| Program	Frequency	Percentage
Male	66	61.1%
Female	42	38.9%

Figure 4.1: Respondents' gender

The age of the respondents in this study ranged from 15 to 20 years old. The majority (n= 78; 72.2%) of the respondents were aged from 17 to 18 years old; followed by the respondents aged from 15 to 16 years old (n=21; 19.4%). While the smallest proportion of the respondents were aged between 19-20 years (n=9; 8.3%) (Table 4.2).

Table 4.2 Age of the participants in the study (N=108)

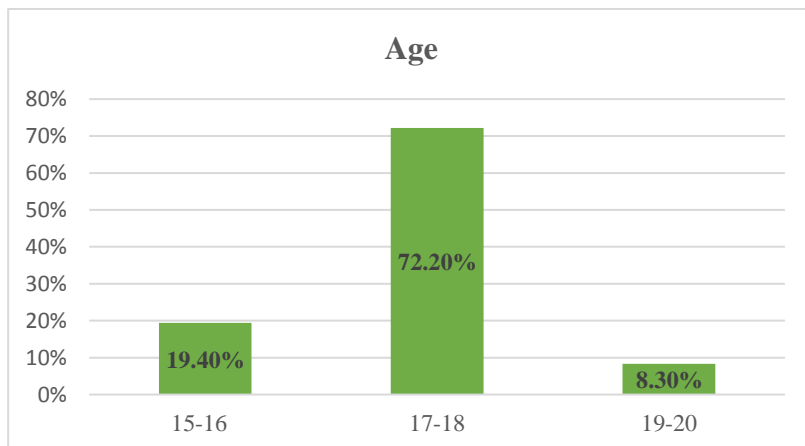| Age	frequency	Percentage
15-16	21	19.4%
17-18	78	72.2%
19-20	9	8.3%

Figure 4.2: Respondents' age

Respondents' English Language Performance

The result of this study indicated that the respondents' marks in the English Language Grade were ranged from 59 to 90; with the mean score of English Language Grade Mean=75.08 (SD± 7.27). The majority (n=60; 55.6 %) of the respondents obtained marks between 75-85 marks; followed by the respondents who scored marks between 65-74 (n=27; 25%). A small proportion of the participants obtained marks between 55-64 (n=12; 11.1%), and marks between 85-100 (n=9; 8.3%) as shown in Table 4.3.

Table 4.3 Respondents' English Language Performance (N=108)

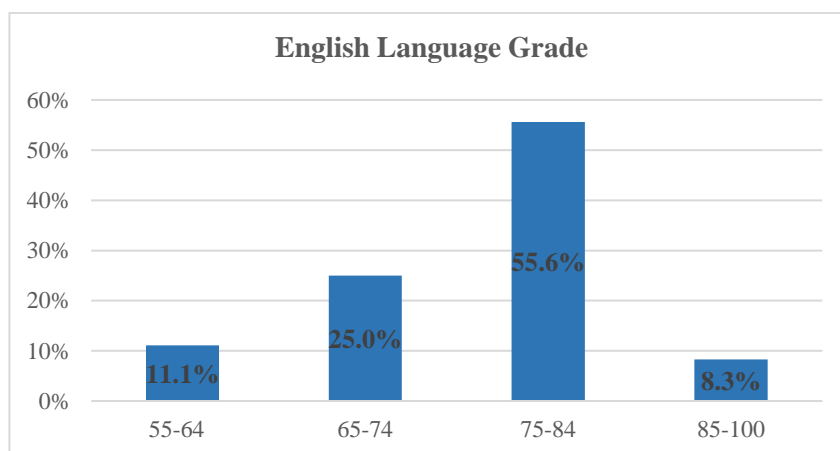| Marks	Frequency	Percentage
55-64	12	11.1%
65-74	27	25%
75-84	60	55.6%
85-100	9	8.3%

Figure 4.3: Respondents' English Language Grade

Respondents' Year of Study

The result of this study showed that all the respondents in this study (n=108; 100%) were in the final year of secondary school "third year" (Table 4.4).

Table 4.4 participants' year of study (N=108)

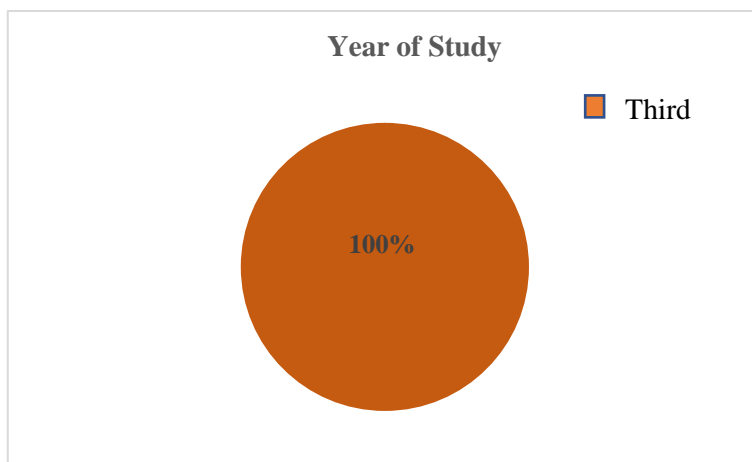| Year of study	Frequency	Percentage
Third year	108	100%

Figure 4.4: Respondents' year of study

Research Question 1: What are the learning styles preferred by Libyan secondary school students in Malaysia?

The results obtained from the descriptive analysis of Libyan students' English performance indicate that most of the participants of both genders who were surveyed, scored between 50 to 90; with mean score of English Language Grade Mean=75.08 (SD± 7.27) in their last semester's English language examination The majority (55.6 %) of the respondents obtained marks between 75-85 marks; followed by the respondents who scored marks between 65-74 (25%). Whereas a small proportion of the participants obtained marks between 55-64 (11.1%), and marks between 85-100 (8.3%). Hence, it is concluded that the Libyan students who participated in the present study obtained a variety of English marks. There was a similarity between this study and the study carried out by Sahar Ali (2017). She pointed out that EFL Libyan students in Malaysia obtained a variety of English scores ranging from high A to moderately weak C with slight differences between each band.

The comparison of the mean scores for each learning style shows that there was a considerable slight difference between the frequencies of the six learning styles used by the Libyan secondary school students in Malaysia namely: Avoidant, Participative, Collaborative, Independent, Dependent, and Competitive. The mean scores of the six learning styles ranged from 2.85 to 3.3. The result showed that the independent learning style recorded the highest mean total score (Mean = 3.31) among the six learning styles, this lead to conclude that the independent learning style) with mean score of 3.3, is the most preferred learning style; while avoidant style was reported as the lowest preferred learning style among the students (Mean =

2.85). The findings of this study were in contrast to findings from Sahar Ali (2017) as she pointed out the most participants preferred to be learning towards competitive, participative, and avoidant styles.

Table 4.3: Descriptive statistics of the six domains of learning styles scores, (N= 36)

Styles	(n)	Mean	SD
Avoidant	108	2.85	0.516
Participate	108	3.27	0.748
Collaborative	108	3.22	0.683
Competitive	108	3.29	0.700
Independent	108	3.31	0.879
Dependent	108	3.07	0.721

Research Question 2: Is there a significant difference between learning styles and gender of students?

Several studies have been conducted on difference between male and female in regards to their learning styles. Yulina Natsir et al. (2016) found that there was no difference between male and female students' learning styles. Natsir's finding contradicts the finding from this study as it was found that there was a significant difference in the overall learning styles between male and female respondents. This finding also does not support Garner-O'Neale and Harrison (2013) who did not find any significant relationship between gender and learning preferences. According to June Kibasan (2016), there was no significant difference according to gender and learning styles performance. Addition to another study proved that there was no significant difference between the learning style preferences of male and female nursing students using VARK learning styles questionnaire. According to Munir Shuib and Siti Norbaya (2015), there was no significant difference between male and female respondents with respect all four learning dimensions. Thus, this study showed that learning styles preferences among the USM ESL students did not differ by their gender. The same finding was reported by Yemane (2017). Different than other studies, the finding from this study supported that there was a significant difference between learning styles preference and gender.

Table 4.4: Results of t-test - differences in preferred learning style between male and female

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference		Lower	Upper
Lstyles	Equal variances assumed	.556	.461	-3.076	34	.004	-.77792	.25292		-1.29192	-.26392
	Equal variances not assumed			-2.889	22.343	.008	-.77792	.26926		-1.33584	-.22000

Independent Samples Test	Gender	N	Mean	Std. Deviation	Std. Error Mean
Lstyles	male	66	2.7364	.65214	.13904
	female	42	3.5143	.86278	.23059

*is significant at the 0.05 level (2-tailed)

The null hypothesis that there is no significant difference in preferred learning styles between male and female respondents is rejected. In other words, there is a significant difference between male and female respondents in the learning styles preferred.

Research Question 3: Is there a significant relationship between learning styles preference and English language performance among Libyan secondary school students?

The results show that there was no a significant relationship between English Language performance and overall learning styles (p>0.05). This study supports the finding from Gappi (2013) where she found that there was no significant correlation between the academic achievement and the learning style preferences of the participants. However, this finding is contradictory to a study carried out by Roslan (2011) where he found that there was a positive and significant relationship between the six independent variables, namely as independent, dependent, collaborative, competitive, participant and avoidant on the dependent variable - student's CGPA.

Table 4.5 shows that there was no relationship between respondents' English language performance and their preferred learning styles. There was no relationship between respondents' English language Performance and dependent learning style(r = 0.104, p= 0.548); independent learning style (r = 0.151, p= 0.381); collaborative learning style (r = 0.099, p= 0.567); participated learning style (r = 0.031, p= 0.859); competitive learning style (r = 0.145, p= 0.400); avoidant learning style (r = -0.055, p= 0.750). Furthermore, the result of this study showed the null hypothesis: "There is no relationship between respondents' Learning styles and English language Performance" is accepted. In other words there was no significant relationship between English Language performance and all learning styles.

Table 4.5: Person correlation English Language Performance and Learning styles

Correlations

		Dependent	Independent	Collaborative	Participate	Competitive	Avoidant
Scores	**Pearson Correlation "*r*"**	0.104	0.151	0.099	0.031	0.145	-0.055
	Sig. (2-tailed)	0.548	0.381	0.567	0.859	0.400	0.750
	N	108	108	108	108	108	108

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

*. Correlation is significant at the 0.05 level (2-tailed).

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

The findings of this study indicated that Libyan students' English performance the most of the participants of both genders who were surveyed, scored between A -D in their last semester's English language examination. Hence, it is concluded that the Libyan students who participated in the present study obtained a variety of English marks. There was a similarity between this study and the study carried out by Sahar Ali (2017), which pointed out that EFL Libyan students in Malaysia obtained a variety of English scores ranging from high A to moderately weak C with slight differences between each band.

The comparison of the mean scores for each learning style shows that there was a considerable slight difference between the frequencies of the six learning styles used by the Libyan secondary school students in Malaysia namely: Avoidant, Participative, Collaborative, Independent, Dependent, and Competitive. The result showed that the independent learning style recorded the highest total score among the six learning styles, this lead to conclude that the independent learning style is the most preferred learning style; while avoidant style was reported as the lowest preferred learning style among the students. The findings of this study are in contrast to findings from Sahar Ali (2017) as pointed out the most participants preferred to be learning towards competitive, participative, and avoidant styles.

Several studies have been conducted and found that there was a difference between male and female students in regards to their learning styles. However, Yulina Natsir. et al. (2016) found that there was no difference between male and female students' learning styles. Natsir's finding contradicts the finding from this study as it was found that there was a significant difference in the overall learning styles between male and female respondents. The finding from this study also did not support Garner-O'Neale and Harrison (2013) who did not find any significant relationship between gender and learning preferences. The results from this study also contrasted the findings carried out by June Kibasan (2016). She found that there were no significant differences according to gender and learning styles performance. Similarly, Munir Shuib and Siti Norbaya (2015) found that there was no significant difference between male and female respondents with respect all four learning dimensions. The same finding was reported by Yemane (2017).

This current study shows that there was no a significant relationship between English Language performance and overall learning. These findings confirm the results of a study done by Gappi (2013) who found that there was no significant correlation between the academic achievement and the learning style preferences of the participants. However, this present finding was contradictory to the study carried out by Roslan (2011) who found that there was a

positive and significant relationship between the six independent variables, namely independent, dependent, collaborative, competitive, participant and evident on the dependent variable - student's CGPA.

Based on the findings, the following pedagogical implications must be taken into consideration. Gresha (1996) stressed that students' learning style became the mechanism responsible for how they could be presented as the core of their disciplines. Furthermore, these were the reasons that led researchers to investigate predominant learning styles. The findings of this study are expected to assist the students to identify their own learning styles. Meanwhile, teachers have to follow the latest progress and the new teaching methods or strategies in accordance with the learning styles of the students. Curriculum designers and educational trainers should be implemented to improve teachers' performance with regards to catering to different learning styles preferred by the students.

Finally, the results of this study could assist learners, educators, directors, administrators, stakeholders and teachers to maximize the learning of English as a foreign language by aligning their teaching practices to students' learning styles. Furthermore, decision makers or stakeholders can use this study to enhance policy formulations with regard to teacher training; designing teaching and learning aids as well as taking the necessary consideration for the enhancement of the classroom environment that would be compatible with support students' varied learning styles.

RECOMMENDATIONS FOR FURTHER RESEARCH

This study aimed at discovering the relationships among learning style preference, gender and English language performance of EFL Libyan secondary school students in Malaysia. This study sheds light on some recommendations that take consideration for future research. Further research needs to be conducted to investigate the relationship between learning styles and secondary school performance in the English language by using a larger sample in order to obtain sufficient results. This study recommends further researches to use more than one school to obtain accurate results. In addition, future research has to focus on more gender biases and how it influences the learning of the English language.

CONCLUSION

The objectives of this study were to investigate the learning styles preferred by Libyan secondary school students and to determine whether there is a relationship between learning style, gender and English language performance. It was concluded that there was a difference in learning styles preferred female and male in secondary school students. The results showed that there was no significant relationship between learning style preference and English Language performance among EFL Libyan secondary school students in Malaysia.

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AWARENESS AND PERCEPTION AMONG IUKL ACADEMICIANS TOWARDS THE ISSUES OF SUSTAINABILITY FOR MALAYSIAN PALM OIL INDUSTRY

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ABSTRACT

Oil palm cultivation currently is one of the most controversial issues in worldwide in terms of sustainability. The aims of this research was to determine the preferred cooking oil consume by IUKL academicians. Besides that, it was also to determine the awareness and perception levels among IUKL academician towards the issues of sustainability in Malaysian palm oil industry. In this study, 150 sets of questionnaires were distributed manually to IUKL academicians. This questionnaire was divided into three sections. Section 1 about demographic information, section 2 about awareness level and section 3 was about perception level. The data gathered from the questionnaires were administered and analysed using Independent t-Test by using SPSS software. The result from this study showed that there is no significant difference between demographic information on awareness and perception towards the issues of sustainability in Malaysian palm oil industry. From this study, it is shown that the awareness among IUKL academicians was high towards the issues of sustainability in Malaysian palm oil industry. In future, it is recommended for researchers or academicians to determine the level of awareness and perception among students towards the issues of sustainability in Malaysian Palm Oil Industry as to promote sustainable agriculture and give positive reaction towards this 'golden crop'.

INTRODUCTION

The words "sustainable" is very popular in alternative energy circles because some people are concerned about how can Malaysia sustain the traditional energy resources such as oil and gas. In agricultural, the word sustainable implies the relationship to an ecological balance such as conserving an ecological balance by avoiding the depletion of natural resources. Palm oil is used in many products and a lot of people are probably not aware of this because there are so many edible oil available in the markets. People in the world consuming millions of tons of palm oil products as well as soap, cosmetics, toiletry products, pharmaceuticals and a whole host of industrial including lubrication oil. Palm oil is not only a renewable source because it is easy to grow but also biodegradable which means that they ensure environmentally friendly products (MPOB, 2014). The good demand for oil as well as biodiesel an alternative fuel will give colourful journey to Malaysia palm oil industry. However, issues of sustainability of palm oil such as environmental issues are part of the challenges that must be faced by industry in the future because of the rapid development of this industry creates many questions on the issues of sustainability.

LITERATURE REVIEWS

In Malaysia palm oil has been an important agriculture sector in the economy for the past three decade. The important role of this industry to the Malaysian's economy is not only because Malaysia depends substantially on oil palm for its foreign exchange earnings, but also because palm oil is used as a development tool in poverty alleviation program. Currently, Malaysia and Indonesia are the world's largest producer of palm oil that contributed almost 85% of world production (MPOB, 2014).

The palm oil has the distinction of being the most productive of all oil crops with an average yield in major producing countries of about 3-4 tonnes of mesocarp (palm) oil/ha/year. By contrast, the yields of most competing oil crops are typically less than one tonne/ha/year. This means that the productivity of oil palm is at least 3 - 8 times more than most oil seed crops. Thus, only 7 million hectares of oil palm are required to supply 20% of the world demand for oil and fats (1.09 billion tonnes), compared to the 80 million hectares of oilseeds needed to supply another 24% of this demand.

The rapid expansion of oil palm cultivation has raised concerns about the sustainability and environmental impact of oil palm plantations, in particular with regard to biodiversity, deforestation and air pollution. Conversion of primary forest to oil palm plantation accounted for more than 10% of deforestation in Indonesia and Malaysia between 1990 and 2010 (Koh et al. 2008). Issues of deforestation made by NGOs about the potential impact of palm oil plantation on environment and people could cause significant damage in the eyes of a consuming public that consider it as socially conscious (Suhaila, 2012).

Roundtable on Sustainable Palm Oil (RSPO) is sustainable. It is one of many certification labels to justify a sustainable palm oil practice. (Faris, Mukhamad, and Setiadi, 2017). About 20% of global 2015 palm oil production was certified by the RSPO (Garrett, Carlson, Rueda and Noojipady, 2016). Access to RSPO certification for those smallholders is important for two main reasons: first, it may enhance the sustainability of their production system, and second, it may be a prerequisite for market access if RSPO certified oil palm will become the norm. Globally, there are 3 million oil palm smallholders who contribute 40% of global oil palm production (RSPO,2016).

Sustainability research for palm oil has been increasing since 2004 with the majority research related to palm oil residue and lacks of other aspects, such as economic benefit (Hansen et al. 2015). Creating a sustainable oil palm industry requires technology, strategy, and solution to be able to adapt with industrial dynamics. (Wisena et al. 2014). Wisena (2015) wrote a structure of system element of change for sustainable palm oil management with oil palm certification, ISPO and RSPO, as the initiative action.

Long-term challenge facing the palm oil sector is the non-tariff barriers against palm oil in many important export markets, particularly the EU and the USA. These barriers are linked to the issues of sustainability and life cycle greenhouse gas reductions in biofuel uses. (James, 2009). According to Lim and Teong, (2010) and Kushairi (2014), in terms of technological advantage, Malaysia has relatively mature technologies in the oil palm sector. Malaysia has proven herself as being at the frontline for palm-based biodiesel with the successful invention of two biodiesel products: a summer and a winter palm biodiesel product.

In maintaining the competitiveness of the Malaysian palm oil in the world market, it is important that this sector continues to developed and adopted numerous environmentally sound and sustainable practices in the cultivation and production of the oil palm crop (Kamalrudin, and Ramli Abdullah, 2014).

OBJECTIVES

The objectives of the study can be summarised as follows:
- To determine the background of IUKL academicians.
- To determine the preferred edible oil consuming by IUKL academicians.
- To determine the differences between type of user (preferred palm oil and non-palm oil user) towards the awareness on the issue of sustainability.
- To determine the differences between type of user (preferred palm oil and non-palm oil user) towards the perception on issue of sustainability.

METHODOLOGY

Research Design
This study applied correlational design.

Research Location
The study was conducted at IUKL.

Sample Size
The total number of respondents for this study was 100 respondents.

Survey Methods
A set of closed ended questionnaire were given to respondents to answer through online and a face to face interview was conducted to obtain the data. The questionnaire consisted three section namely Section 1 for demographic, Section 2 for awareness and Section 3 for perception.

Data Analysis Techniques
Data were analysed using SPSS version 18. The data were subjected to descriptive analysis, and Independent t-Test.

Measurement
Table 1 indicates the Likert scale used in this study.

Awareness:
Respondents were asked to give their opinions on scale of 1 to 5. Respondents were asked to indicate the scale based on their awareness. There were 10 items tested which were in biodiversity, ecosystem, best management practices in oil palm plantation, sustainable agriculture practices in oil palm plantation, plantation land, sensitivity towards environmental issues, economic, cultural, sustainability and negative coverage in media about oil palm industries. The score range from 10 to 50. Higher score indicated more awareness among the respondents.

Perception towards the issue of sustainability for Malaysian palm oil industry:
Three Likert scale were used in this study. Respondents were asked to indicate the scale based on their perception towards the sustainability issue. There were three items tested which were environment, social and economic. The score range from 3 to 9, whereby higher score indicated more positive perception on the issues of sustainability.

Table 1: Likert Scale for Assessment in this Study

Scale	Description
Awareness	
1	Strongly disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree
Perception	
1	Less contribute
2	Neutral
3	Highly contribute

RESULT AND DISCUSSION

Table 2 indicates the respondent's background. Based on the survey, 32.8 % were male, and 65.2% were female academicians in IUKL. 87.0% of respondents were age between 26-40 years old while 13% were between 41-55 years old. There were three major races in IUKL which were 87% Malays, 8.7% Indians and 4.3% were Chinese. In terms of educational level, 91.3% were PhD and Master holders while 8.7% were bachelor holders. Among all the respondents, 69.6% had income level between RM2001-RM4000 while 30.4% were between RM4001-RM6000. 65.2% of respondents chose palm oil as their cooking oil while 34.8% preferred to use non palm oil as cooking oil.

Table 2 : Respondents' Demographic

Aspect	Percentage
Gender	
Male	32.8
Female	65.2
Age	
21-40	87.0
41-55	12
Race	
Malay	87.0
Indian	8.7
Chinese	4.3
Education level	
Degree	8.7
Master and above	91.3
Type of user	
Preferred palm oil	65.2
Preferred non-palm oil	34.8

Table 3 showed the percentage of type of cooking oil preferred by respondents. 65.2 % of respondents preferred palm oil as cooking oil while 17.4% preferred non-palm oil (Olive oil and Sunflower oil respectively) as their cooking oil.

Table 3: Preferred oil in cooking among IUKL academicians

Aspect	Percentage
Palm oil	65.2
Non-palm oil:	
Olive oil	17.4
Sunflower oil	17.4

Table 4 shows the descriptive statistic on awareness level between palm oil user and non-palm oil user. From the table, the level of awareness among respondents were high regardless what type of cooking oil they choose. An Independent T-test was conducted to measure the significant difference of awareness between palm oil user and non - palm oil user (Table 4). There was no significant difference in scores for palm oil user (M=35.00, SD=4.20) non-palm oil user (M=32.50, SD=4.84; t (21)=1.325, p=.21] towards their awareness on the issues of sustainability in Malaysian palm oil industry.

Table 4 : Mean For Awareness among Respondents

Type of user	Mean	SD
Palm oil user	35.00	4.20
Non palm oil user	32.50	4.84

As for respondents' perception towards the issues of sustainability, the result of t-test indicate that there was no significant difference in scores for palm oil user (M=62.0, SD=4.97) non-palm oil user (M=59.0, SD=5.97; t(21)=1.286, p=.21] towards their perception of environmental issues (Table 5).

Table 5 : Mean For Perception of the Sustainability Issues among Respondents

Type of user	Mean	SD
Palm oil user	7.07	4.97
Non palm oil user	6.87	5.97

CONCLUSION

From this study, it can be implied that, IUKL academicians were aware about the issues of sustainability for Malaysia palm oil industry. 62.5% of respondents were consuming the oil palm oil in daily life compared to 34.8% of non-palm oil user. In term of awareness level, respondents were aware on sustainability issue of Malaysian palm oil industry. For perception level, there was no significant different in term of perception between palm oil user and non-palm oil user. Therefore, it is very important for the Ministry of Plantation Industries and Commodities to educate and to increase consumer awareness, especially on the issues of sustainability to Malaysian citizens. Besides that, it is very important to remove the negative perception to ensure that palm oil in the country is within the boundary of sustainable development. Last but not least, the Ministry of Education also need to take part on these issues seriously to make sure educators and students are aware on the benefits and sustainability of the palm oil as a backbone of the economy. Palm oil is a natural product hence it could lead to more demand and commitment from the palm oil industry to attain sustainability and to remain sustainable in the future.

RECOMMENDATIONS FOR FUTURE RESEARCH

For future, it is recommended for researchers or academicians to determine the level of awareness and perception among students towards the issues of sustainability in Malaysian palm oil industry. It is very important for us to access them so that, our palm oil industry can sustain and expand successfully in global market and worldwide.

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