Learning Approaches among UKM Health Sciences Undergraduates and Postgraduates
(Pendekatan Pembelajaran dalam kalangan Mahasiswa Prasiswazah dan Pascasiswazah Sains Kesihatan UKM)

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ABSTRACT

Students' learning approach can be categorized as either a deep learning approach or a surface learning approach. The present study aims to evaluate the learning approaches among health sciences undergraduates and postgraduates, identify predictors of learning approaches, and investigate the relationship between learning approaches and academic accomplishment. The respondents of this study were 130 undergraduates and 70 postgraduates. A revised two-factor version of the Study Process Questionnaire was administered to assess students' learning approaches. The result showed that the predominant learning approach among the undergraduates and postgraduates was deep learning. Postgraduates (35.21 ± 3.54) were significantly higher ($p<0.05$) in deep learning than undergraduates (32.61 ± 5.71). The surface learning approach was highest among fourth-year undergraduates ($p<0.05$). Gender and working experience were factors associated with learning approaches in postgraduates. There was no significant correlation ($p>0.05$) between students' learning approaches and academic performance. This study's findings recommended curriculum and assessment system revision to foster a deep learning approach in health sciences undergraduates and postgraduates.

Keywords: Deep Learning, Health Sciences, Postgraduates, Learning Approaches, Surface Learning, Undergraduates

ABSTRAK

Pendekatan pembelajaran pelajar boleh dikategorikan sebagai sama ada pendekatan pembelajaran mendalam atau pendekatan pembelajaran permukaan. Kajian ini bertujuan untuk menilai pendekatan pembelajaran dalam kalangan mahasiswa dan pascasiswazah sains kesihatan, mengenal pasti peramal pendekatan pembelajaran, dan menyiasat hubungan antara pendekatan pembelajaran dan pencapaian akademik. Responden kajian ini adalah 130 prasiswazah dan 70 orang pascasiswazah. Satu Soal Selidik Proses Kajian versi dua faktor telah diberikan bagi menilai pendekatan pembelajaran pelajar. Hasil kajian menunjukkan bahawa pendekatan pembelajaran yang dominan dalam kalangan mahasiswa prasiswazah dan pascasiswazah adalah pembelajaran mendalam. Pascasiswazah (35.21 ± 3.54) adalah lebih tinggi secara signifikan ($p<0.05$) dalam pembelajaran yang mendalam berbanding prasiswazah (32.61 ± 5.71). Pendekatan pembelajaran permukaan dalam kalangan mahasiswa tahun empat adalah tertinggi($p<0.05$). Jantina dan pengalaman bekerja adalah faktor yang berkaitan dengan pendekatan pembelajaran dalam kalangan pascasiswazah. Tiada hubung kait yang signifikan ($p>0.05$) antara pendekatan pembelajaran pelajar dan prestasi akademik. Dapatan kajian ini mengesyorkan semakan sistem kurikulum dan penilaian untuk memupuk pendekatan pembelajaran yang mendalam dalam kalangan prasiswazah dan pascasiswazah sains kesihatan.

Kata Kunci: Pembelajaran Mendalam, Sains Kesihatan, Pascasiswazah, Pendekatan Pembelajaran, Pembelajaran Permukaan, Pra Siswazah

INTRODUCTION

There are two different levels of students' learning processing: deep-level and surface-level processing (Marton & Säljö 1974). This idea soon became the fundamental concept of "Student Approaches to Learning" (SAL) theory, which described the deep and surface learning approaches of students (Biggs et al. 2001). The deep learning approach referred to understanding the intended content, meaning and significance of the learning materials. In contrast, the surface learning approach referred to memorizing, rote-learning and reproducing the literal aspect of the studying materials (Marton & Säljö 1976).

Several instruments had been developed based on the SAL framework to assess students' approaches to learning and were widely used in educational research (Zeegers 2001). Deep learning appears to be the preferable learning approach compared to surface learning in tertiary education. Students are expected to critically comprehend the facts and ideas and apply their working lives after graduation. However, the relationship between students' learning approaches and academic performance remains the subject of debate. A growing body of evidence demonstrated deep learning was linked to better academic accomplishments (Mayya et al. 2004; Salamonson et al. 2013; Tarabashkina & Lietz 2011), whereas surface learning was associated with lower academic achievements (Hasnor et al. 2013).

On the contrary, other studies did not report a significant correlation between learning approaches and academic performance (Davidson 2003; Gijbels et al. 2005; Minbashian et al. 2004). The academic assessment system has been proposed as the possible explanation of the contradictory findings. Students can quickly obtain a good grade based on rote learning if the assessment system does not require a demonstration of deep understanding (Biggs et al. 2001). Students' learning approaches are closely linked to assessment practices. Multiple choice and short answer tests lead to a surface learning approach while essay or problem-based questions, which require students to demonstrate deep understanding, elicit a deep learning approach (Byrne et al. 2002).

Numerous studies have been carried out to examine students' learning approaches in the tertiary context. However, few had assessed the learning approaches, particularly in students of health sciences, both undergraduates and postgraduates. A recent study by Salamonson et al. (2013) reported first-year health sciences students had the lowest score of deep learning approach compared to students of nursing, medicine, engineering and medicinal chemistry. Nonetheless, students' learning approaches are dynamic and amendable. A revised curriculum to foster a deep learning approach had successfully encouraged a change towards a deeper learning approach in the first-year health sciences students of predominance in the surface learning approach (Walker et al. 2010). Therefore, the teaching institutes need to recognize the students' learning approaches and prepare them to be competent healthcare professionals. The present study seeks to evaluate health sciences' learning approaches, undergraduate and postgraduate students from Universiti Kebangsaan Malaysia.

METHODS

This study was a cross-sectional study to examine the learning approaches among health sciences undergraduates and postgraduates and its relationship with academic achievement. The study was conducted among 113 subjects Biomedical Science undergraduates from all years from the first year to the fourth year, Faculty of Health Sciences, Universiti Kebangsaan Malaysia session 2014/2015 and 70 postgraduates who enrolled in the coursework program in the Faculty of Health Sciences, Universiti Kebangsaan Malaysia. On the other hand, postgraduate students in research mode who did not have a grade point average (GPA) as their quantitative assessment of academic performance were excluded from the present study.

A survey questionnaire was used to collect the subjects' background information, including age, gender, marital status, working experience, and current cumulative GPA, which was a quantitative indicator of academic performance. Students' learning approaches were assessed using the revised two-factor version of the Study Process Questionnaire (R-SPQ-2F), which contains 20 items (Biggs et al. 2001). The subjects were asked to rate their agreement with each item on a 5-point Likert-scale (1 = this item is never or only rarely true of me; 5 = this item is always and almost always true of me). The R-SPQ-2F had good Cronbach alpha values and goodness-of-fit values via confirmatory analysis (Biggs et al. 2001). The survey questionnaire was distributed to the subjects during their lectures or practical sessions.

Statistical analysis was performed using SPSS version 22. All continuous variables were screened for normality distribution. Student t-test was employed to compare the mean score of learning approaches for two groups, whereas one-way ANOVA was used to compare

the mean score of learning approaches for more than two groups. Pearson's correlation was employed to determine the correlation between the score of learning approaches and academic achievement. A p-value of less than 0.05 was set as statistical significance.

RESULTS

Demographic Information

The demographic information present in Table 1. The mean age for the postgraduates was 29.6±5.15 years old. The majority of the students were female (78.8% in undergraduates while 84.3% in postgraduates), and the main ethnic group of these students was Malay (72.6 % in undergraduates and 65.7% in postgraduates). Among the undergraduates, 31% was a first-year student, 30.1% was second-year student, 24.8% was a third-year student, and 14.2% was a fourth-year student. For postgraduate students, 64.3% of them were single, whereas 35.7% of them were married. Twenty-seven of 70 postgraduate students (38.6%) had working experience for more than three years, 37.1% had no working experience or working experience below one year, and 24.3% had working experience between 1 year to 3 years. The mean cumulative GPA for undergraduates and postgraduates was 3.26 ± 037 and 3.42±0.32, respectively.

TABLE 1. Characteristics of students (n = 183)

	Undergraduate (n = 113)		Postgraduate (n = 70)	
	n (%)	Mean±SD	n (%)	Mean±SD
Age (year)				29.6 (5.15)
Gender				
Male	24 (21.2)		11 (15.7)	
Female	89 (78.8)		50 (84.3)	
Ethnicity				
Malay	82 (72.6)		46 (65.7)	
Chinese	12 (10.6)		17 (24.3)	
Indian	10 (8.8)		2 (2.9)	
Others	9 (8.0)		5 (7.1)	
Year of study				
Year one	35 (31.0)			
Year two	34 (30.1)			
Year three	28 (24.8)			
Year four	16 (14.2)			
Marital status				
Single	-		45 (64.3)	
Married	-		25 (35.7)	
Working experience (month)[a]	-			24 (54)
0-12 months	-		26 (37.1)	
12-36 months	-		17 (24.3)	
> 36 months	-		27 (38.6)	
Latest CGPA		3.26 (0.37)		3.42 (0.32)

SD = standard deviation; CGPA = cumulative grade point average; [a] data was presented in median (interquartile range) as it was skewed to the right.

Learning Approaches

The deep learning approach was the predominant learning approach in both undergraduates and postgraduates. The distribution of the undergraduate students by learning approaches were 61% deep learners, 9% of them were surface learner and 30% were non dominant. Postgraduate student were 78% deep learner and non-dominant 21.4%. No surface learner among postgraduate students.

Postgraduates had a higher mean score of the deep learning approach compared to undergraduates ($p < 0.001$) (Table 2). There was no significant difference in the mean score of the surface approach between undergraduates and postgraduates ($p > 0.05$). The mean score of the deep learning approach did not differ from the first-year to fourth-year undergraduates. However, fourth-year undergraduates had a significantly higher ($p < 0.05$) mean score of the surface learning approach than first-year undergraduates.

For postgraduates, female students had significantly higher ($p < 0.01$) mean score of the deep learning approach compared to their male counterparts. In contrast, the surface approach's mean score did not differ between the two genders (Table 3). On the other hand, married postgraduates had a significantly higher ($p < 0.01$) mean score of deep learning compared to single postgraduates. The mean scores of the surface

TABLE 2. Comparison mean score of deep learning approach and surface learning approach between undergraduates and postgraduates

	Deep Approach	Surface Approach
	Mean (SD)	Mean (SD)
Undergraduate (overall)	32.61 (5.71)	26.28 (6.75)
Year one	33.29 (5.35)	24.00 (7.09)
Year two	31.91 (6.65)	26.29 (7.49)
Year three	31.46 (5.58)	27.25 (4.71)
Year four	34.69 (4.09)	29.56 (6.13)[a]
Postgraduate	35.21 (3.54)[b]	27.46 (6.17)

[a] One-way ANOVA shows $p < 0.05$ for comparing year one undergraduates' surface learning approach mean score to year four undergraduates; [b] Independent t-test shows $p < 0.001$ for comparing postgraduates' deep learning approach mean score to undergraduates.

TABLE 3. Comparison mean score of deep and surface learning approach between gender, marital status, and working experience in postgraduates

	Deep Approach	Surface Approach
	Mean (SD)	Mean (SD)
Gender		
Male	32.09 (3.86)	29.55 (5.89)
Female	35.80 (3.18)	27.07 (6.19)
	$p = 0.001$	$p = 0.224$
Marital Status		
Single	34.33 (3.43)	27.64 (6.54)
Married	36.90 (3.21)	27.12 (5.56)
	$p = 0.004$	$p = 0.736$
Working experience		
0-12 months	33.92 (3.22)	29.00 (6.34)
12-36 months	35.18 (3.59)	29.65 (4.73)
> 36 months	36.48 (3.46)	24.59 (5.88)
	$p = 0.029$	$p = 0.007$

learning approach between these two groups were not significantly different(p>0.05). Postgraduates with working experience for more than 36 months had a significantly higher (p <0.05) mean score of deep learning approach than postgraduates with working experience less than 12 months. Postgraduates with working experience less than 12 months and between 12 to 36 months had significantly higher (p <0.05) mean score of surface learning approach compared to postgraduates with working experience for more than 36 months.

There was no significant correlation between cumulative GPA and mean score of deep learning approach (p=0.505) as well as surface learning approach (p=0.250) (Table 4). The correlation remained non-significant (p>0.05) for subgroup analysis in both undergraduates and postgraduates.

TABLE 4. Correlation of deep and surface learning approach mean score with academic achievement

	Deep Approach		Surface Approach	
	r	p value[a]	r	p value[a]
Overall CGPA	-0.050	0.505	-0.085	0.250
Undergraduate students' CGPA	-0.127	0.181	-0.091	0.340
Postgraduate students' CGPA	-0.069	0.569	-0.145	0.231

[a] Pearson's correlation test; CGPA = cumulative grade point average.

DISCUSSION

The present study showed that the deep learning approach was the predominant learning approach among Malaysian health sciences undergraduates and postgraduates. However, we noticed that the surface learning approach higher among fourth-year undergraduates. This result demonstrated that the undergraduates adopted a superficial level of learning as they progressed, and this was in the opposite direction of the objectives of tertiary education. In a longitudinal study, a significant increase in surface approach overtime was reported (Zeegers 2001, Bonsaksen et al. 2017). Biggs et al. (2001) named this condition as "institutionalization of learning". Students became adaptive towards the assessment system and were able to pick up the tricks to perform well during the assessment as they progressed. Nowadays, a paradigm shift has taken place in enhancing teaching and learning. A different approach is employed in teaching and learning in this era of 4IR that enables deep learning(Sikhakhane et al. 2020). Students reported positive experiences towards the flipped learning approach's exposure, which supported the meaningful learning theory and student engagement model (Farah Mohamad Zain 2020). Through the flipped learning approach, the instructional approach's focus is no longer providing direct content to the students but to allow students to construct the knowledge themselves and be responsible for their learning (Farah Mohamad Zain 2020).

We also found that postgraduates had a higher score of deep learning approach compared to undergraduates. Similar findings were reported in medical postgraduates (Samarakoon et al. 2013) and nursing postgraduates (Sabzevari et al. 2013). Another study on Malaysian postgraduates also showed that deep learning was the preferred learning approach (Shaari et al. 2011). Samarakoon et al. (2013) proposed that competing for grades among medical undergraduates was the factor that promoted superficial learning. Besides, postgraduates who were older often adopt a deep learning approach (Salamonson et al. 2013; Zeegers 2001).

Regarding gender differences in the learning approach, the present study showed that female postgraduates are more likely to adopt a deep learning approach than male postgraduates. This result followed the previous research by Walankar et al. (2019) and Salamonson et al. (2013). The present study also reported that postgraduates with working experience were more likely accustomed to a deep learning approach than a surface learning approach. Postgraduates with working experience can critically examine the facts and ideas and relate them to their prior working experience (Shaari et al. 2011). A study among nursing students reported that married students adopted a surface learning approach due to their commitments and time constraints (Sabzevari et al.

2013). This finding contradicted the present study. One possible explanation for the finding discrepancy was the married postgraduates in the present study also had longer working experience and, therefore, more prone to the deep learning approach.

No significant relationship was identified between students' learning approach and academic achievement in both undergraduates and postgraduates. This result might imply that the present study's assessment system did not reward the deep learning approach and the surface learning approach was adequate to acquire good grades.

CONCLUSION

In conclusion, both Malaysian health sciences undergraduates and postgraduates predominantly adopted a deep learning approach. However, an increase in surface learning approaches in fourth-year undergraduates was noted. Gender and working experience were the determining factors of students' learning approaches. No significant relationship between learning approaches and academic achievement was established in the present study. This study recommended that the teaching institute reevaluate the assessment system and plan to elicit and foster a deep learning approach in health sciences students.

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