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Seeking higher order construction of cognitive abilities in a psychosocial learning environment

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ABSTRACT

In this study, we created a psychosocial learning environment consisting of five types of interaction, namely: student collaboration; specific learning objectives and curriculum coherence; learning facilities; independent learning; and constructivist instruction. This research aimed to determine the scope in which the five modes of contact improved students' learning outcomes in higher order cognitive abilities. This quantitative study involved form four accounting students (N=352) in Malaysia who completed a self-administered questionnaire that included the higher order cognitive abilities (HOCA) test, the instruments of students' perceived learning environment, and zone-specific demographic data. The results showed two of the five inventory of students' perceived learning environment (ISPLE) scores. Specific learning objectives and curriculum coherence, were the most significant predictors and strongly correlated with higher order cognitive abilities. Even the components of the psychosocial learning environment impact HOCA in most subjects. However, researchers have obtained new findings that explain other factors that need to be studied to evaluate or encourage HOCA in accounting subjects. Thus, the researcher suggests further research using self-learning methods through modules to assess and promote HOCA in accounting.

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1. INTRODUCTION

In response to challenges posed by 4.0 industries, the Malaysian Ministry of Education has proposed educational revisions, including its goals and school curriculum [1], [2]. The Malaysia Educational Development Plan (MEDP) 2013–2025 outlines the country's plans for transforming its educational system to one of the highest possible standards. In order to prepare students for the 21st century, the MEDP 2013–2025 placed a strong emphasis on teaching them higher order cognitive abilities. The MEDP 2013–2025 gives information skills, media and technology literacy, job and life skills, and innovation and learning skills priority as 21st-century capabilities [3]. Higher order cognitive abilities (HOCA) are among the 21st-century abilities included in the six students' MEDP 2013–2025 goals [2]. Students with tremendous challenges posed by 4.0 industries are highly marketable and competitive in the global economy [4]–[6].

Several accounting studies practices that differ from traditional subjects have been implemented to free students' minds. For example, teachers must adopt inquiry-based, student-centered pedagogies, and students must integrate knowledge from multiple disciplines [7]. By transforming critical and creative

cognitive abilities (CCTS) into HOCA, accounting curriculum planning principles are now focused on developing optimal psychosocial learning environments that influence students' HOCA levels [1], [8]–[10].

The foundation of this study is Vygotsky's social constructivist theory, also known as Vygotsky's theory. According to Vygotsky, a person's cognitive development is determined by whether or not their social environment promotes learning. This concept is also acknowledged as one of the most influential cognitive development theories [11]. Figure 1 depicts how social interaction elements and culture influence an individual's social environment. Individual social interactions are typically characterized by the participation of others who are more capable than oneself and the assistance of educators in fostering cognitive development [12], [13]. The contribution of cultural elements and personal experiences to cognitive development is denoted by social culture [11], [12]. Thus, cultural and social ties contribute to forming an actual cultural environment that promotes the highest level of cognitive growth possible.

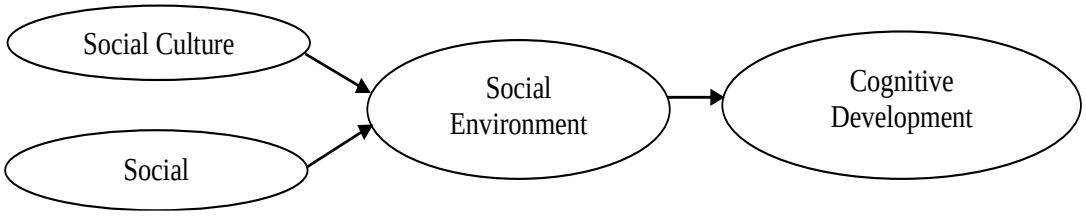

Figure 1. Theory of social constructivism [11]

Several researchers [14], [15] believed that psychosocial learning environments enhance students' learning and higher order cognitive abilities. In the Malaysian context of educational reform, Therefore, examining the relationship between the characteristics of the psychosocial learning environment and the HOCA of students may provide researchers and educators with valuable information [16]–[18]. In light of this, the following questions guided the conception of the current study: i) accounting student perceptions regarding the psychosocial learning environment; ii) variations by zone in accounting students' evaluations of their psychosocial learning environment; iii) relationships between HOCA and how students perceive the psychosocial learning environments in their accounting studies courses.

2. RESEARCH METHOD

2.1. Survey template

This investigation employs a quantitative methodology and descriptive survey layout. A questionnaire was used to collect data to determine the influence of the psychosocial classroom learning environment on secondary school students' ability to engage in HOCA throughout their accounting studies. Research [19] stated that survey questionnaires can be utilized to thoroughly and succinctly explain the topics under consideration. Survey methodology, according to a study [20], entails gathering information to compare, describe, or explain knowledge, practices, and attitude. Additionally, a survey technique enables the researcher to interview participants personally [21] and extrapolate the results to the entire group. In this survey method, questionnaires and administered tests are used for data collection and analysis.

This study included two evaluation periods. The initial step is determining how students and teachers feel about the school's teaching and learning environment. There were two evaluation periods in this study. The initial step is determining how students and teachers think about the school's teaching and learning environment. In contrast, the Revision's Bloom Taxonomy-based HOCA evaluation test is the second phase [22]. Using the same sample as the first phase, this exam is designed to evaluate students' accounting knowledge in the fourth year of secondary school.

2.2. Participants in studies

In Peninsular Malaysia, 39,695 students study accounting, and a sample of 352 accounting students from each zone was selected. There are two types of populations in a study: target populations and populations used [20]. The study's target population comprised all secondary four students in Peninsular Malaysia who studied accounting. Currently, the population used includes Form Four students registered in accounting courses in the states of Negeri Sembilan, Selangor, Perak, and Terengganu, which respectively represent the Southern, Central, Northern, and Eastern Zones of Peninsular Malaysia.

The researchers utilized Cochran's method, recognizing enormous populations, sampling error, and the normal distribution assumption. According to Kotrlik *et al.* [23], the adjustment takes continuous-data variables into account and estimates an error margin of .3, an alpha of .5, and a t value of 1.96. According to general guidelines [23], for calculating allowable margin errors for social and educational studies with continuous data, margin errors=3 were employed. As a result, Table 1 displays the sample size that best represents the zone for this study.

Table 1. Several participants as exemplars

Region	State	Sample
Southern	Negeri Sembilan	58
Central	Selangor	124
Northern	Perak	100
Eastern	Terengganu	70

2.3. Research instruments

Created a series of HOCA tests on accounting studies [24]. In contrast, Chen *et al.* [15] developed a series of questionnaires drawn from inventory of students' perceived learning environment (ISPLE) as the key instruments for this study. The questionnaire and test cannot be distributed without the written consent of the original authors, which the researchers have obtained via email. The test was translated into Malay, and the modified version had a reliability coefficient of 0.86. There were 35 items used to measure the psychosocial learning environment dimension. The ISPLE employed a Likert-type scale ranging from strongly agree to disagree. The maximum achievable score on a standard and formal school exam measuring HOCA was one hundred points.

2.4. Data analysis

Analysis that used in this research is related to quantitative method which is by using descriptive statistics like mean and standard deviation. It is because this study looked at how students in Peninsular Malaysia rated their school's psychosocial learning environment for accounting classes, as well as how those ratings varied by zone. Apart from that, the associations between students' perceptions of the psychosocial learning environments provided by accounting studies and their capacity for HOCA were explored using inferential statistics in the form of multiple regression. Based on the clarification on the types of analysis that used in this research, researchers believe that by using mean, standard deviation and multiple regression, it will help and contribute the best outcomes from the research.

3. RESULTS AND DISCUSSION

3.1. Interpretations of the psychosocial classroom learning environment by accounting students

The overall standard deviation value on the ISPLE, as shown in Table 2, was 0.40 (Mean=0.42). The study discovered that the perception of psychosocial learning environments is most significant on four of the five ISPLE scales: student collaboration (SD=0.53, M=4.20), independent learning (SD=0.50, M=4.11), specific learning objective, and curriculum coherence (SD=0.51, M=4.03), constructivist instruction (SD=0.53, M=4.17). In comparison, only one scale in ISPLE-learning facilities reflects the intermediate level (SD=0.50, M=3.60). A total of 304 (86.36%) students reported that the level of student collaboration was moderate, respectively. There were 44 (12.50%) students rated constructivist-oriented instruction as average, while 306 (86.93%) students rated it as high. There were 288 students (81.82%) had high levels of autonomy, while 64 students (18.18%) ordered it as moderate. Overall, 144 students (40.91%) thought the quality of the learning facilities was excellent, while 198 students (56.25%) thought it was average. In addition, 273 (77.56%) of students rated the coherence and clarity of the curriculum as high, while 79 (22.44%) thought it was moderate.

In general, accounting students viewed the classroom's psychosocial learning environment favorably. There were 282 (80.11%) of the 352 students who participated in the survey had a favorable opinion of their psychosocial learning environment, whereas 70 (19.89%) had a moderate view. Based on the outcomes in Table 2, 4 out of 5 scales achieved the high level in terms of student's perception of the psychosocial learning environment practiced. It means that nowadays, the management team at school and teachers already know the importance of a psychosocial learning environment to be focused on building an interactive learning environment to attract people to learning [25], [26]. Apart from that, interactive learning can be achieved through the implementation of education by using self-learning module (SLM) [27]–[29]. In

SLM, it enhances students' skills to become more independent and creative to settle down all the problems that occur that relate to the learning process [15], [30], [31].

Table 2. The ISLPE scales with mean, standard deviation, and explanation

Scale	Percentages (%) & Frequencies			Interpretation	M	SD
Students collaboration	304 (86.36%)	48 (13.64%)	0 (0%)	High	4.20	0.53
Specific learning objectives and curriculum coherence	273 (77.56%)	79 (22.44%)	0 (0%)	High	4.03	0.50
Learning facilities	144 (40.91%)	198 (56.25%)	10(2.84%)	Moderate	3.60	0.54
Independent learning	288 (81.82%)	64 (18.18%)	0 (0%)	High	4.11	0.50
Constructivist instruction	306 (86.93%)	44 (12.50%)	2 (0.57%)	High	4.17	0.53
Total	282 (80.11%)	70 (19.89%)	0 (0%)	High	4.02	0.42

Mean (Level): 3.68–5.00 (High); 2.34–3.67 (Moderate); 1.00–2.33 (Lower)

3.2. Students' perspectives of their psychosocial learning environment vary by region in peninsular

Peninsular Malaysian accounting students' impressions of their classroom's psychosocial learning environment were examined by region: Southern (n=58), Central (n=124), Northern (n=100), and Eastern (n=70). Table 3 displays the analysis of variance (ANOVA) findings, including a determination of whether or not there is a statistically significant difference in the means of the groups. The significance level is below the 0.05 threshold, showing 0.004 (p=004). As a result, many pupils in Peninsular Malaysia give different mean assessments of the psychosocial learning environment.

Table 3. Zones inside peninsular Malaysia's variance-difference analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	2.314	3	771	4.533	004
Within groups	59.222	348	170		
Total	61.536	351			

The results of the students' collaboration scale for each zone in Peninsular Malaysia are shown in Table 4. The table demonstrates a statistically significant difference between the perceptions of collaboration in accounting studies classrooms held by students from the Central and Southern regions (p=0.016 and p=0.001, respectively). In accounting studies classrooms, there were no significant differences in students' perceptions of collaboration between the two groups; Northern and Central (p=0.772), Central and Eastern (p=0.175), Northern and Eastern (p=0.637), and Southern and Eastern (p=0.448).

Table 4. The descriptive and inferential statistics for each region of peninsular Malaysia as determined by the student group

Variable	Southern (1)		Central (2)		Northern (3)		Eastern (4)	
	M	SD	M	SD	M	SD	M	SD
Collaboration between students	4.40	0.61	4.09	0.52	4.16	0.49	4.26	0.43
				Sig.				
Southern (1)	-		-		-		0.431	
Central (2)	0.001		-		-		0.175	
Northern (3)	0.016		0.772		-		0.637	
Eastern (4)	-		-		-		-	

The results of the specific learning objective and curriculum coherence scale for each zone in Peninsular Malaysia are presented in Table 5. The data in Table 5 shows that students' opinions on the clarity of learning goals and the consistency of the curriculum vary significantly across the Northern and Southern regions (p=0.016) and the Central and Southern regions (p=0.000). There were no statistically significant differences in students' perceptions of specific learning objective and curriculum coherence in accounting studies classrooms between the Northern and Central regions (p=0.217), Northern and Eastern regions (p=1.000), Central and Eastern regions (p=0.309), and Southern and Eastern regions (p=0.058). Meanwhile, each Zone's ranking on Peninsular Malaysia's learning facilities scale is shown in Table 6. There were no significant variations in the students' evaluations of the classroom facilities between the Southern and Eastern regions (p=0.905), the Central and Southern regions (p=0.934), the Central and Eastern regions (p=0.553),

the Northern and Southern regions (p=1.000), the Northern and Central regions (p=0.884), and the Northern and Eastern regions (p=0.907).

Table 5. Descriptive and inferential statistics on specific learning objectives and curriculum coherence in each region of peninsular Malaysia

Variable	Southern (1)		Central (2)		Northern (3)		Eastern (4)	
	M	SD	M	SD	M	SD	M	SD
Specific learning objectives and curriculum coherence	4.25	0.62	3.90	0.47	4.02	0.45	4.03	0.42
				Sig.				
Southern (1)		-		-		-		0.058
Central (2)		0.000		-		-		0.309
Northern (3)		0.016		0.217		-		1.000
Eastern (4)		-		-		-		-

Table 6. Means, standard deviations, and one-way ANOVA for the learning facilities scale throughout Peninsular Malaysia's various regions

Variables	Southern (1)		Central (2)		Northern (3)		Eastern (4)	
	M	SD	M	SD	M	SD	M	SD
Learning facilities	3.61	0.72	3.56	0.53	3.61	0.49	3.67	0.36
				Sig.				
Southern (1)		-		-		-		0.905
Central (2)		0.934		-		-		0.553
Northern (3)		1.000		0.884		-		0.907
Eastern (4)		-		-		-		-

The student autonomy scale findings for each zone in Peninsular Malaysia are also included in Table 7. There is a significant statistical distinction between Central and Southern students' perceptions of independent learning in Accounting Studies classrooms, as shown in Table 7 (p=0.006). There was no statistically significant difference in students' ratings of their own ability to learn independently in Accounting Studies courses between the Northern and Southern hemispheres (p=0.769), Northern and Central hemispheres (p=0.057), Northern and Eastern hemispheres (p=0.816), Southern and Eastern hemispheres (p=0.345), and Central and Eastern hemispheres (p=0.610). Next, The Constructivist Instruction Scale scores for each Zone in Peninsular Malaysia are shown in Table 8. There were no significant differences in the accounting studies classroom between Southern and Eastern students' views of constructivist instruction (p=0.919), Central and Southern (p=0.169), Central and Eastern (p=0.614), Northern and Southern (p=0.928), Northern and Central (p=0.391), and Northern and Eastern (p=1.000).

Table 7. Statistics on the independent learning scale in Peninsular Malaysia, including mean scores, standard deviations, and one-way ANOVA for each zone

Variables	Southern (1)		Central (2)		Northern (3)		Eastern (4)	
	M	SD	M	SD	M	SD	M	SD
Independent learning	4.24	0.61	4.00	0.49	4.16	0.44	4.09	0.43
				Sig.				
Southern (1)		-		-		-		0.345
Central (2)		0.006		-		-		0.610
Northern (3)		0.769		0.057		-		0.816
Eastern (4)		-		-		-		-

Table 8. The constructivist instruction scale for each zone in Peninsular Malaysia: means, standard deviations, and one-way ANOVA

Variables	Southern (1)		Central (2)		Northern (3)		Eastern (4)	
	M	SD	M	SD	M	SD	M	SD
Constructivist instruction	4.26	0.63	4.10	0.56	4.20	0.50	4.20	0.37
				Sig.				
Southern (1)		-		-		-		0.919
Central (2)		0.169		-		-		0.614
Northern (3)		0.928		0.391		-		1.000
Eastern (4)		-		-		-		-

3.3. Effects of students' views of the psychosocial learning environment on their use of higher-order cognitive abilities in the field of accounting

The subjects had a mean score of 60.10 (SD=15.26) on the examination of their higher order cognitive abilities. The aggregate mean of 60.10 out of a possible 92 indicates that respondents' HOCA are around average. The bivariate relationships between the psychosocial learning environment scales and the ability to use HOCA were investigated using Pearson correlations. Student collaboration (r=0.19, p=0.05), specific learning objective and coherence curriculum (r=0.26, p=0.05), learning facilities (r=0.21), independent learning (r=0.23), and constructivist instruction (r=0.17) were all positively correlated with higher order cognitive abilities. Based on their findings, previous researchers have explained that the learning tasks, classroom practices, interactions between students and teachers, physical setting, and availability of resources all play a role in students' ability to effectively apply HOCA to their coursework [32].

Collinearity (tolerance) statistics were analyzed before doing multiple regression using ISPLE scales to rule out multicollinearity among the predictor variables. Tolerance measures how much of a given independent variable's variation is not shared by any other independent variables [33]. When the tolerance value of a variable is 0.10, multicollinearity is present. The tolerance values in this investigation were over the threshold of 0.10, ranging from 0.29 to 0.68. According to the findings of this study, multicollinearity was not an issue. Table 9 displays the results of a multiple regression study of the predictive validity of the ISPLE scales for students' higher order cognitive abilities. According to the F ratio, there was a strong correlation between the linear combination of the ISPLE scales and the participants' deployment of higher order cognitive abilities.

Table 9. Multiple regression and correlation analysis of HOCA and psychosocial learning environments

ISPLE Scale	Relationships with higher-order cognitive abilities			
	β	r	p	SE
Students collaboration	0.02	0.19	0.81	2.02
Specific learning objectives and curriculum coherence	0.25	0.16	0.01	2.65
Learning facilities	0.11	0.21	0.04	1.68
Independent learning	0.09	0.23	0.35	2.81
Constructivist instruction	-0.09	0.17	0.18	2.43
F	9.517			
Df	378			
Adjusted R^2	0.101			

Based on their respective standard regression coefficients, two ISPLE scales were independent and significantly predictive of higher order cognitive abilities. Most strongly predicting in a favorable direction (b=0.25, p 0.05) were specific learning objectives and curriculum coherence. Higher-order cognitive abilities might be predicted by access to suitable learning environments (b=0.11, p 0.05). HOCA ability was unaffected by constructivist instruction, independent learning, or student collaboration. The hypothesized five-variable model explained 10% of the variation in higher order cognitive abilities, which is on the low end of a medium effect size.

Specific learning objectives and curriculum coherence are among the main contributors to students' ability to excel in the mastery of higher order cognitive abilities. This is because the establishment of specific learning objectives and curriculum coherence best describes an excellent education system practiced in Malaysia [34]–[38]. A fantastic and brilliant education system provides an easy way for teachers and students to achieve something that targets education. Providing complete and up-to-date learning facilities is also essential in influencing the development of HOCA among students. This is evidenced by the findings of this study and previous studies that explain the role of learning facilities as the highest predictors that affect students' HOCA [7], [15], [39].

4. CONCLUSION

Accounting Studies is a topic now undergoing reform in Malaysian secondary schools, and this study contributes to the body of knowledge by analyzing students' perspectives on the psychosocial learning environment in the field. The HOCA Test and ISPLE inventory, infrequently employed in prior research in the field, were also used to examine the connection between psychosocial learning environments and higher order cognitive abilities. Students in accounting studies classes across Peninsular Malaysia report a range of perceptions about their classroom's psychosocial learning environment, from excellent to poor, according to the recent study. The study also found that i) specific learning objectives; ii) curriculum coherence; and iii) learning facilities were statistically independent variables influencing students' evaluations of their

classroom's psychosocial learning environment. This study revealed that not every aspect of the psychosocial learning environment is conducive to the growth of higher order cognitive abilities. It provided scientific data to validate empirical studies regarding the relationship between psychosocial learning environments and the ability to execute higher order cognitive abilities. So, the suggestion to use modules to enhance students' accounting education skills is quite logical and can be more attractive in their learning process and learning strategies. Using the module as self-learning, students can train their thinking and learning skills to complete the task given as stated knowledge in the module. Apart from that, the outcomes of this research can be used to notify those who teach Accounting Studies in Malaysia, as developing HOCA through a focus on the psychosocial learning environment can result in tremendous success when teaching this subject in school.

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