

## SELECTION AND REVIEW OF MEASUREMENT ITEM OF STUDENTS' LEARNING ENVIRONMENT

Seri Bunian Mokhtar<sup>a\*</sup>, Saemah Rahman<sup>c</sup>, Helan Nor<sup>c</sup>, Seri Intan Mokhtar<sup>d</sup>, Norliza Md Yusof<sup>e</sup>, Rosli Idris<sup>f</sup>

<sup>a,b</sup> Universiti Kebangsaan Malaysia, Selangor, Malaysia

<sup>c,e</sup> Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS), Kedah, Malaysia

<sup>d</sup> Universiti Malaysia Kelantan, Kelantan, Malaysia

<sup>f</sup> Politeknik Sultan Salahuddin Abdul Aziz Shah, Malaysia

*mseribunian@yahoo.com*

### ABSTRACT

The learning environment plays important roles in the cognitive, effective and social students. Reviewing the learning environment is given due attention to this day because of its importance in helping to improve learning outcomes. This study will look at the selection and review of the measurement items of learning environment factors in Technical Institutions in the country. Variables to be examined in this study are assessment, teaching approaches, learning community, learning resources, work load, the clear objectives. Respondents consisted of 455 final semester engineering students. Data were analyzed descriptively for reliability (Cronbach Alpha values) and factor analysis was used to obtain 6 factor solutions (Eigenvalues and KMO) using SPSS 17 software. Results showed that 6 factor solutions with Eigen values above 1.0. The value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy  $0.868 > 0.6$  is adequate for inter-correlation while Barlett Test was significant (Chi Square = 5962.485,  $p < 0.05$ ). The anti-image correlation matrix by The Measure of Sampling Adequacy (MSA) is more than the value of 0.5. Items O2, PP6, PP7, PP5, P1, SP3 and SP4 dropped based on the criteria by Hair et al (2006), where each item should exceed the value of 0.50. Total variance explained for this loading was 61.51 %.

**Key Words;** *assessment, teaching approach, learning community, learning resources, work load, clear objectives*

### INTRODUCTION

The concept of the learning environment has started in the 1930s, when Lewin & Murray examine the learning environment on human behaviour. According to Lewin (1936), environmental and individual are determinants of human behavior. Lewin's ideas were developed by Murray (1938) using the Model of Needs-Pressure to clarify the relationship between individuals (I) and environment (E). Murray concluded that human behavior is influenced by individual needs and environmental demands. The study of learning environments was initiated by Walberg at the end of the 1960s and developed by Fraser in the early 1980's. The studies of learning environments are still relevant until today because of its importance in helping to improve learning outcomes.

Moos (1974) who studied the characteristics of individuals in an environment of human had categorized them into three dimensions which are relationship, personal development and maintenance and change of the system. Relationship dimension assessed the nature and relationships, the level of involvement, support and assistance given by individuals in their psychosocial environment. Personal developmental dimension assessed individual progress towards the self-enhancement such as examination, the grade given and awards received. The third dimension, maintenance and change of a system, assessed the extent to which the environment is regulated, clarity of the classroom rules controlled, objective and goals of

study. Fraser (1998) has conceptualized that learning environment refers to the social context, psychological and pedagogy in which learning occurred affects the attitude and students' achievement. There are many ways to assess the psychosocial environment, but according to Kuert (1979), self-reported questionnaires are the most common approach used to assess the psychosocial environment. Using student perceptions to evaluate the learning environment are also significant because the students are people who are directly involved in the learning environment.

The learning environment was seen by the researcher (Ramsden 1991, Biggs 1999) as the quality of teaching and learning in which the context occurs. Through a survey conducted by Ramsden (1979) using quantitative and qualitative dimensions, found that the learning environment consists of; inter-student relationship factor, commitment to teaching, work load, teaching methods, career relevance, clear goals, the social atmosphere and the freedom to learn. His findings by quantitative data are supported by his qualitative data findings. According to Ramsden, students will appreciate the environment in which educators are always trying to help them to learn. Ramsden (1991) and McInnis et al (2001) perceived learning environment could be categorized into:

**a) Good Teaching**

Teaching is a process or activity of the delivery of knowledge, cultivate new confidence, change attitudes or behaviour of students. During the process of teaching, teachers need to make reformation based on the ability of students in a class. Meanwhile, learning means the changes in behavior or achievement of students in certain aspect. A lecturer should use various suitable methods so that effective learning process can take place. Sharifah Alwiah Alsagoff (1983) stated that a teacher skilled in choosing appropriate methods and techniques for the subject taught is known as an effective and versatile teacher. However, if the same methodology is used on a different person, it might no longer be effective because of the different individual characteristics and individual different learning approaches. An effective teacher should master various methods and techniques that are appropriate in teaching according to his/her students (Sharifah Alwiah Alsagoff, 1983). Especially in the learning of practical work, teachers should be adequately prepared and controlled all learning activities closely so that the teaching process are not chaotic. According to Aziz Nordin (1991), a responsible and effective instructor must have the ability, the skills, is constantly learning, possessed good attitude and always followed the current developments in the field of education in order to master the demands of learning curriculum and have appropriate and effective expertise. A lecturer that successfully developed the personality and delivered his/her knowledge effectively to the students is called a lecturer with quality. A wise lecturer will plan effective teaching that will directly benefit the students in the future (Baharin, Othman, Syed & Haliza 2007). Wise approach is suggested by the teaching of Islam as well. Words of Allah SWT in Al Quran:

*'Call on thy path (O Muhammad) with wisdom and good advice and teaching them and communicate with them in a better way, surely thy Lord that he also knows best who are guided. (Surah Al-Nahl 16:125)*

Thus, instructors, teachers or lecturers are the main factors that contributed to excellent academic achievements of students (Widad Othman, 1998). Furthermore, the lecturers also acted as role models in guiding and educating students to demonstrate positive attitudes toward their academic achievements. Lecturers need to augment current techniques for teaching and learning to enhance students' interest on certain subjects. Lecturers may extend the classroom discussion so that students have the opportunity to take their views (Baharin, Othman, Syed & Haliza 2007).

**b) Learning Resources**

The facilities available in an institution of learning play an important role to meet the learning needs of students. According to Ee Ah Meng (1989), classroom environment plays an important role for the success of the teaching process. With a warm atmosphere and equipped with basic facilities, teaching and learning process would run more smoothly. The location of a good school or college which is not too noisy is the perfect environment to increase the interest and convenience of students in the learning process. In a beneficial learning environment, teachers can teach well, students also can study in a calm manner. Thus, teaching and learning process could achieve the optimum level (Mohd Noh Bahar, 1994). Physical conditions such as light, temperature, air quality and completeness in a lecture hall should be of concern prior to beginning of the teaching and learning process. Comfortable environment will enhance students' interest in learning and they will also focus on the lesson delivered by the lecturer. Use of appropriate teaching aids can facilitate teaching and learning effectiveness (Haji Kamarudin Kachar, 1989). Studies conducted by Norlia (2006), investigated the relationship between environment, element of input and output of students found through multiple regression analysis that environmental factors such as the academic facilities is a significant contribution. Studies conducted by Kamaruddin Tahir (2010) in assessing the level of community college students' generic skills revealed that the environment is a significant contribution to the generic skills of students to college. This study involved a sample of 776 and showed that the learning facility is a significant contribution to the students' generic skills development. This study was supported by a research conducted by Norlia (2006) to identify the school climate management and its relationship with the attitude of students in four different streams. The findings show that there is a significant relationship between aspects of the learning facilities to students' attitudes.

**c) Learning Work Load**

Workload is defined as the responsibilities of work to be undertaken by a student in a learning process. Workload which is too heavy is detrimental to the students in the learning process (Baharin, Othman, Syed & Haliza 2007). Studies conducted by Kember and Leung (1998) found that workloads do affect student achievement levels. Students, who are burdened with heavy duties, did not have time to apply their thinking skills in completing their tasks.

**d) Assessment**

Assessment is a system that includes activities to collect information about strategies, teaching and learning activities for analysis and decision making in order to take appropriate actions such as planning of a more effective teaching and learning activities (Mok, 2009). Assessment procedures include aspects of testing, analysis measurement and data conclusion. The assessment is conducted to see whether the teaching and learning activities undertaken to achieve the planned objectives. Assessment given to students should be able to assess the overall capability and not just focus on the facts alone. Assessment should be conducted in a formative and summative manner. Among the types of assessment used were quizzes, assignments, tests, exams, presentations and projects or research.

**e) Learning Community**

Learning community is a community that involves the interaction of students, friends and lecturers in the learning environment. A study conducted by Kamaruddin Tahir (2010) in assessing the level of community college students' generic skills found that environmental factors contribute significantly to the level of generic skills acquisition in college students. Sample of 776 persons were involved in this study. It showed the interaction between peers is the highest contributor followed by interaction with the lecturers who teach. The study conducted by Norlia (2006) also obtained similar results in evaluating the relationship between environment and elements of input and output of students. Multiple regression analysis revealed that environmental factors such as the quality of academic interaction are a major contribution.

**f) Program Goals/Objectives**

According to Wheeler's Curriculum Development Process Model (in Mok, 2009), formulation of curriculum should involve the goals and objectives of teaching and learning intended. Clarity of objectives presented to students facilitates students' understanding of content and skills needed to master the learning and produce the expected outcomes of the curriculum. Clarity of goals and learning objectives will influence the mastery of skills of students.

**LEARNING ENVIRONMENT FACTORS**

Barrie and Prosser (2003) states that from the perspective of the student learning, experience of students in the context of the learning and teaching is a function from past experience and current context and its relationship with the learning approach. To enhance the learning outcomes, the institution should be concerned about the context and experiences within the context of student learning (Barrie & Prosser 2003). The study about the learning environment outlines the students' personal factors (ability, motivation, prior knowledge, gender, race) and the learning context (program goals, evaluation, task load, good teaching, teaching approach) as factors that affect learning outcomes with the mediation of learning approaches (Biggs 1988, Entwistle & Ramsden 1983, Lizzio, Wilson & Simon, 2002, Ramsden, 1992, 1997; Diseth, Pallesen, Horland & Larsen 2006).

Learning environment factors studied by previous researcher are work load (Kember & Leung 1998, Lizzio et al 2002; Karagiannopoulou & Christodoulides 2005), evaluation (Kim 2002; Gijbels & Dochy 2006; Kember, Leung & Ma 2007; Karagiannopoulou & Christodoulides 2005) and good teaching (Kember & Kam 2000; Ramsden, Prosser, Trigwell & Martin, 2007; Cabrera, Colbeck & Terenzini, 2001; Karagiannopoulou & Christodoulides, 2005). While the assessment, work load, program objectives, a good teaching was submitted by other researchers (Lizzio et al 2002; Diseth, Pallesen, Horland & Larsen 2006, Kim 2002; Wilson & Fowler, 2005; Nijhuis, & Gijbels Segers 2008) and learning resources and learning community (Smith & Bath, 2006; McInnis, Griffin, James & Coates 2001) as part of the teaching context. Table 1 shows the learning environment researched by previous researchers.

Table 1: Learning Environment Factors

<b>No.</b>	<b>Factor</b>	<b>Researchers</b>
1.	Assessment	Ramsden (1991); Kember & Leung (2005); Gijbels & Dochy (2006)
2.	Work Load	Ramsden (1991); Biggs (1999); Kember & Leung (1998); Karagiannopoulou & Christodoulides (2005)
3.	Learning Community	Smith & Bath (2006); Kamaruddin (2010); Norlia (2006); Fraser (1998); Pascarella (1985)
4.	Learning Resources	Smith & Bath (2006); Kamaruddin (2010); Norlia (2006)
5	Teaching Approach	Ramsden (1979, 1991); Biggs (1999); Kember & Leung (2005)
6	Clear Objectives	Ramsden (1991); Biggs (1999); Kember & Leung (2005); Lizzio et al (2002)

## PROBLEM STATEMENT

Studies on the learning environment has evolved from 1960, thus, there are many instruments that have been produced by researchers who studied the field. Among the instruments that were developed by researchers in the past is the Course Experiences Questionnaire (Ramsden 1991), (McInnis et al 2001), WIHIC (Fraser 1998), Classroom Environment Scale CES (Moos 1979), My Class Inventory (Fraser & Fisher 1982). But none of the instruments were tested in Malaysia. Therefore, this study focused on determining the appropriate instrument based on the learning environment needs to be done for Malaysia.

## METHODOLOGY

Items to measure perceptions of learning environment used the Course Experiences Questionnaire CEQ (Ramsden 1991; McInnis, Griffin, James & Coates 2001) and What Is Happening In Classroom WIHIC (Fraser 1998; Dorman 2003). CEQ was developed by Ramsden (1991) to examine students' perceptions of learning environment at higher education institutions. According to Ramsden (2003) CEQ is a valid instrument and generated by articulating the theories of the relationship between students' experiences in teaching and learning outcomes. All items in this scale is designed to gauge the learning environment factors in various fields and institutions where students have direct experience and are able to comment (Lizzio et al, 2002). CEQ have been used by many researchers in the past to measure the perceptions of students' learning environment in the country (Goh 2005) and abroad (Lizzio et 2002, Diseth et al 2006, Nijhuis et al 2005).

CEQ has 6 original scales which are assessment, work load, good teaching approaches, program goals, self-abilities and development of generic skills. CEQ was modified by Wilson, Lizzio and Ramsden (1997) to 5 scales with the exclusion of ability. Changes to the CEQ was again made and additional scales such as student support, student quality, intellectual motivation, learning community and learning resource were added (McInnis, Griffin, James & Coates 2001) as optional scales. Based from the optimal scale, the learning community and learning resources were selected for this study. Furthermore, in this study, CEQ questionnaire was modified and combined with items from WIHIC questionnaire developed by Fraser (1998) and Dorman (2003). All the items examining the learning environments of respondents were based on Likert Scale as shown in Table 2.

Table 2: Description of Likert Scale

Description
1: Strongly Disagree
2: Disagree
3: Partially Disagree
4: Agree
5: Strongly Agree

This survey was conducted at the Technical Institute involving 455 engineering students attending their final semester. This study used a questionnaire instrument that contains 2 parts, part A and part B. Part A consists of items related to student demographics. Part B of the questionnaire is about learning environment consisting of six constructs adapted from the questionnaire of Ramsden (1991), McInnis et al (in 2001) and the Fraser (1998). Construction of these six constructs was based on the analysis of six constructs model and previous studies. Instruments used for this study must also meet the scheme of Moos ((1974), which categorizes people's environment into three dimensions of relationship, personal development, system maintenance and change as shown in Table 3.

Table 3: Learning Environment Factors Based on the Moss Scheme.

No.	Factors	Description	Moos Scheme
1.	Teaching Approaches	Good teaching, related to the quality of the teaching lecturer.	Relationship
2.	Clear Objectives	Clear objectives/aim; Indicator that shows whether the students were given clarification about how and what knowledge and skills that are being developed in their program.	System Maintenance and Change
3.	Assessment	Assessment; Shows the extent of quantity and quality of students' assessment's role.	Personal Development
4.	Work Load	Work Load; Gives perception about the burden and quantity of assignments in students' learning.	Personal Development
5	Learning Resources	Learning Resources; To which extent the learning resources are provided for the students.	System Maintenance and Change
6	Learning Community <ul style="list-style-type: none"> <li>• Peer Interaction</li> <li>• Cooperation</li> <li>• Equality</li> </ul>	Learning Community; To which extent the role peers influence the learning.	Relationship Personal Development

## FINDING

### Reliability of Instrument

The reliability of the items for the learning environment in Cronbach Alpha value that measures internal consistency of the variables is shown in Table 4. According to Babbie (1992), Cronbach Alpha values are classified based on the classification in which the reliability index of 0.90-1.00 is very high, 0.70-0.89 is high, 0.30-0.69 is moderate, and 0.00 to 0.30 is low. The results showed that the Cronbach Alpha for this instrument is on the classification of high and very high, higher than 0.70. According to Sekaran (2003), Cronbach Alpha value must be greater than 0.5. While Mohd Najid (1999), suggests a minimum value equal to 0.6. We can conclude that this instrument has high reliability since Cronbach Alpha value for all variables is more than 0.5 (Table 4).

Table 4. Value of Cronbach Alpha for Learning Approach

Variable	Number of Items	Number of Items Excluded	Cronbach Alpha Value
Assessment	5		0.77
Good Teaching Approach	7		0.79
Work Load	5		0.86
Teaching Objectives	5	1	0.79
Learning Community	5		0.86
Learning Resources	6		0.78

### Factor Analysis

To confirm that all six constructs being researched which are the instructional objectives, assessment, teaching approaches, work load, learning communities and learning resources, factor analysis was performed using the varimax rotation. Results showed (Table 5) that 6 factor solutions with Eigen values above 1.0. The value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy  $0.868 > 0.6$  is adequate for inter-correlation while Barlett Test was significant (Chi Square = 5962.485,  $p < 0.05$ ). The anti-image correlation matrix by The Measure of Sampling Adequacy (MSA) is more than the value of 0.5. Items O2, PP6, PP7, PP5, P1, SP3 and SP4 dropped based on the criteria by Hair et al (2006), where each item should exceed the value of 0.50. Total variance explained for this loading was 61.51 %. This value is sufficient as according to Sekaran (2003) the total variance explained must be more than 50 %.

Table 5: Factor Analysis

Items	Objectives	Assessment	Work Load	Learning Community	Learning Approach	Learning Resources	Extraction
O1	.673						.540
O3	.829						.668
O4	.799						.655
O5	.757						.610
P2		.735					.598
P3		.785					.685
P4		.772					.609
P5		.714					.608
T1			.717				.517
T2			.837				.720
T3			.796				.684
T4			.815				.676
T5			.781				.652
KP1				.800			.688
KP2				.751			.672
KP3				.775			.651
KP4				.846			.726
KP5				.701			.591
KP6				.800			.557
PP1					.751		.485
PP2					.645		.589
PP3					.760		.544
PP4					.690		.516
PP5					.577		.430
SP1						.569	.568
SP2						.715	.681

SP5	.804	.689
SP6	.810	.540
Total		
Variances Explained		61.51%

## VI. Conclusion

The results showed that the Cronbach Alpha value classification is high and very high, which was more than 0.70. This instrument has high reliability in accordance with the classification of Babbie (1992), while the factor analysis indicated six factors which are instructional objectives, assessment, teaching approaches, work load, learning communities and learning resources. Each item shows a satisfactory loading of more than 0.5 (Hair et al). Thus, the questionnaire developed is suitable to be used to study the learning environment factors. The instrument is also suitable to be used in the context of education in Malaysia.

## REFERENCE

Al-Quran. *Surah Al-Nahl 16:12.5*

Aziz Nordin (1991). *Ke Arah Pembentukan Pusat Perawatan Pembelajaran*. Jabatan Pendidikan Sains dan Teknik, Fakulti Sains UTM, Skudai.

Babbie, E. (1992). *The practice of social research*. California: Wardsworth Publishing Company.

Baharin Abu, Othman Md Johan, Syed Mohd Syed Mansor dan Haliza Jafaar. *Kepelbagaian Gaya Pembelajaran dan Kemahiran Belajar Pelajar Universiti Di Fakulti Pendidikan, UTM Johor*. Tesis. Jabatan Asas Pendidikan Universiti Teknologi Malaysia ; 2007.

Barrie S. dan Prosser M. (2003). An aligned, evidence-based approaches to quality assurance for teaching and learning. Kertas kerja dibentangkan di Australian Universities Quality Forum. AUQA Occasional Publication.

Bigg, J. B. , Kember, D. dan Leung, D. Y. P. (2001). The revised two-factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology*. 71. 133-149.

Biggs, J. B. (1999). *Teaching for Quality Learning at University*. Buckingham: Open University Press.

Cabrera A. F, Colbeck C. L dan Terenzini P. T. 2001. Developing performance indicators for assessing classroom teaching practices and student learning: The case of engineering. *Research in Higher Education*, Vol 42, No. 3, m.s. 327-352.

Diseth A, Pallesen S, Hovland A dan Larsen S. 2006. Course experience, approaches to learning and academic achievement. *Education + Training*, Vol. 48, No. 2/3, 2006, ms 156-169.

Diseth, A. 2003. Personality and Approaches to Learning as Predictors of Academic Achievement. *European Journal of Personality*, 17, 143-155.

Dorman, J. P. (2003). Cross-national validation of the What Is Happening In this Class? (WIHIC) questionnaire using confirmatory factor analysis. *Learning Environments Research: An International Journal*, Vol. 6, pp 231-245.

Ee Ah Meng (1989). *Pendidikan Di Malaysia: Untuk Guru Pelatih*. K. Lumpur: Penerbitan Fajar Bakti.

Entwistle, N. J. & Ramsden, P. (1983). *Understanding student learning*, London: Croom-Helm.

Fraser, B. J. (1998). The birth of a new journal: Editor's introduction. *Learning Environments Research*, 1, 1-5.

Fraser, B. J. (1998a). Science learning environments: Assessments, effects and determinants. In B. J. Fraser & K. G. Tobin (Eds.), *International handbook of science education*(pp. 527-564). Dordrecht, The Netherlands: Kluwer.



- Fraser, B. J., & Fisher, D. L. (1982). Predicting student outcomes from their perceptions of classroom psychosocial environment. *American Educational Research Journal*, 19, 498–518.
- Gijbels D dan Dochy F. 2006. Students assessment preferences and approaches to learning: can formative assessment make a difference? *Educational Studies*. Vol. 32, No. 4, ms 399-409.
- Gijbels, D., Watering, G. V. d., Dochy, F., & Bossche, P. V. d. 2005. The relationship between students' approaches to learning and the assessment of learning outcomes. *European Journal of Psychology of Education*, 20(4), 327-341.
- Goh S. C . 2005. *Perceptions of Learning Environment, Learning Approaches and Learning Outcomes. A Study Of Private Higher Institution in Malaysia from Twinning Program*. Tesis Doktor Falsafah. University of Adelaide.
- Hair, J. Black, W. Babin, B. Anderson, R and Tatham, R (2006). *Multivariate Data Analysis* (Sixth Edition). New Jersey: Pearson Educational International.
- Kamaruddin Haji Kachar (1989). *Pendidikan Dan Masyarakat*. Kuala Lumpur: Teks Publishing Sdn. Bhd.
- Kamaruddin Md Tahir. (2010).Penilaian Pembangunan kemahiran Generik Dalam Kalangan Pelajar Tahun Akhir Kolej Komoniti Kementerian Pengajian Tinggi. Tesis Doktor Falsafah tidak diterbitkan. Universiti Kebangsaan Malaysia.
- Karagiannopoulou E. Dan Christodoulides P. 2005. The impact of Greek University students perceptions of their learning environment on approaches to studying and academic outcomes. *International Journal of Educational research* 43, ms 329-350.
- Kember, D. and Leung, D.Y.P. 1998, "Influences upon students' perceptions of workload", *Educational Psychology*, Vol. 18 No. 3, pp. 293-307.
- Kember, D., & Leung, D. Y. P. (2005a). The influence of active learning experiences on the development of graduate capabilities. *Studies in Higher Education*, 30, 157–172.
- Kim. D ( 2002). *The Relationships Between Teachers' Approaches To Teaching, Students' Perceptions Of Course Experiences, And Students' Approaches To Studying In Electronic Distance Learning Environments*. Tesis Phd , University of Georgia.
- Lewin, K. (1936). *Principals of topological psychology*. New York: McGraw.
- Lizzio A, Wilson K dan Simons R. 2002. University students perception of the learning environment and academic outcomes: implication for theory and practice. *Studies in Higher education*. Vol 27, No. 1.
- McInnis C, Griffin P, James R, dan Coates H . 2001. Development of the Course Experience Questionnaire (CEQ). Centre for the Study of Higher Education and Assessment Research Centre. Faculty of Education ,The University of Melbourne
- Mohd Najib Abd. Ghafar (1999). *Penyelidikan Pendidikan*. Johor: Penerbit UniversitiTeknologi Malaysia
- Mohd Noh Bahar (1994). *Faktor-faktor Yang Mendorong Minat Pelajar-pelajar Di Sekolah Menengah Vokasional*. Universiti Teknologi Malaysia. Laporan PSM. Tidak diterbitkan
- Mok Soon Sang. 2009. *Falsafah dan Pendidikan di Malaysia*. Puchong: Penerbitan multimedia Sdn Bhd.
- Moos, R. H. (1974). *The social climate scales: An overview*. Palo Alto: Consulting Psychologists.
- Moos, R. H., & Trickett, E. J. (1974). *Classroom environment scale manual*. Palo Alto: Consulting Psychologists.
- Murray, H. A. (1938). *Explorations in personality*. New York: Oxford University Press.
- Nijhuis J. F. H, Segers M. S. R dan Gijsselaers W. H. 2005. Influence of redesigning a learning environment on student perceptions and learning strategies. *Learning Environment Research*. 8: ms 67-93.
- Nijhuis J. F. H, Segers M. S. R dan Gijsselaers W. H. 2008. The extent of variability in learnig strategies and student perception of the learning environment. *Learning and Instruction*. 18: ms 121-134.
- Norlia A. A, T. Subahan. M, Lilia H dan Kamisah O. 2006. Hubungan antara motivasi, gaya pembelajaran dengan pencapaian matematik tambahan pelajar tingkatan 4. *Jurnal Pendidikan* 31, ms 123-141.

- Ramsden, P. 1991. 'A Performance Indicator of Teaching Quality in Higher Education: the Course Experience Questionnaire', *Studies in Higher Education*, Vol. 16, pp. 129–149.
- Ramsden, P. 1991a. 'Report on the CEQ Trial', in R. Linke *Performance Indicators in Higher Education*, Vol 2, Australian Government Publishing Service, Canberra.
- Ramsden, P. 1991b. 'A Performance Indicator of Teaching Quality in Higher Education: the Course Experience Questionnaire', *Studies in Higher Education*, Vol. 16, No. 2, pp. 129–150.
- Ramsden, P. 1992, *Learning to Teach in Higher Education*, Routledge, London.
- Sekaran, U. (2003). *Research Methods for Business: A Skill Building Approach* (2<sup>nd</sup> Edition). New York: John Wiley & Sons, Inc.
- Sharifah Alwiah Alsagoff (1987). *Psikologi Pendidikan II*. Kuala Lumpur: Longman Malaysia Sdn. Bhd.
- Smith, C dan Bath , D.2006. The role of learning community in the development of discipline knowledge and generic graduate outcomes. *Australia.Higher Education* 51:259-286. Springer.
- Widad Othman (1998). *Kaedah Mengajar Lukisan Kejuruteraan*. Nota Kuliah. Tidak Diterbitkan.
- Wilson K. dan Fowler J. 2005. Assessing the impact of learning environment on students approaches to learning: comparing conventional and action learning designs. *Assessment & Evaluation in Higher Education*. Vol. 30, No. 1, ms 87-101.
- Wilson, K. L., Lizzio, A. & Ramsden, P. (1997) The development, validation and application of the Course Experience Questionnaire, *Studies in Higher Education*, 22(1), 33–53.