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Pre-University Form Six Teachers' Pedagogical Practices In Enhancing Students' Intellectual Quality in Malaysian Secondary School

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ABSTRACT

Background: In line with the rebranding of pre-university form six program, teachers job are to equip students with high intellectual ability through the practice of critical and creative thinking. The practice of critical and creative thinking possessed by students enable them to solve problems in a logical and rational way in order to practice lifelong learning. **Objective:** This study identify the pedagogical practices of pre-university teachers in enhancing the students' intellectual quality. **Results:** The results showed that the most sub dimension of pedagogical practices shown by the pre-university teachers in enhancing students' intellectual quality was teaching strategy. Results from independent t-test showed that there were significant gender differences in every construct of pedagogical practices among teachers in enhancing students' intellectual quality. However, the mean score showed that female teachers have higher mean in employing better pedagogical practices in enhancing students intellectual quality compared to male teachers. Analysis of one way ANNOVA also showed significance difference in means of pedagogical practice according to teachers teaching experience**. Conclusion:** This study indicate that the pre-university teachers in the state of Penang do enhance the students intellectual quality through their pedagogical practices with biggest concern on implementing it through their teaching strategy in the classroom.

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INTRODUCTION

The success of national development objectives is highly dependent on the quality of human capital in terms of intellectual aspects. The intellectual and ability to think critically and creatively among students has long been a goal of formal education. Intellectual level should be increased in producing human capital that are critical, creative,analytical and innovative. According to Lim Poh Yoke and Muhamed Awang (1986), the higher the level of education of a person, the higher the level of his intellectual development. Before entering the university, the students first receive formal education, whether at the Malaysian Higher School Certificate (pre-university sixth form), Matriculation or Foundation.

Intellectual is a potential possessed by all students. However, not all students can achieve high intellectual level. Intellectual improvement among pre-university students need to be developed during the process of teaching and learning because the education at the pre university level is an important fundamental part of creating quality human capital in terms of mind development. This support the educational goals of the country which is to develop pre-university students' intellectual and spiritual ability to the maximum level. Characteristics of intellectual thinking is clearly given attention in the curriculum of pre-university education in Malaysia that emphasizes the students to love asking questions and look up for answers , look at the relationship, predict events to occur, speculate on possibilities, explore ideas, think literally, and always reflect critically on ideas, actions and outcomes (Curriculum Development Centre, Ministry of Education, 2011).

Problem Statement:

In line with the rebranding of the sixth form pre-university program, teachers job are to equip students with high intellectual ability through the practice of critical and creative thinking. The practice of critical and creative thinking possessed by students enable them to solve problems in a logical and rational way in order to practice lifelong learning. Effectiveness of teachers teaching depends on the pedagogical

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practices used in the classroom. Research by Aminah Ayob, Hazri Jamil, Halim Ahmad, Maznah Ismail and Farouk Abdul Majid (2004), showed that the pedagogical practices of teachers is a significant factor in influencing the increase in the level of students' intellectual. Selection and use of pedagogy is aimed to change the behavior of students from passive to active and can increase high cognitive thinking that can lead to change and the construction of student's knowledge.

However, the main challenge faced by teachers is to what extent the teachers can prepare themselves, not only with the knowledge related to their field of teaching, but also with the skills and attitudes that enable teachers to make a positive change towards students of different backgrounds (Aveling & Hatchell, 2007). This is clearly stated by Lingard (2005) which states that teachers and pedagogy being practiced is a schooling factor that mainly contributes to the formation of better learning. However, this matter is actually lacking in teachers' teaching. Many teachers are more concerned with academic matters, and are less focused on pedagogical practices to increase students' intellectual quality. The teacher should be more sensitive and creative in applying their pedagogical knowledge in their teaching so that it is more appropriate with the students' learning environment and finally can achieve teaching objectives. Thus, knowledge and proficiency in all aspects of pedagogy among teachers will surely able to assist in the success of teaching and learning and furthermore achieve the learning objectives that have been outlined.

Most research related to pedagogy focused more on the importance of linking the relationships between teaching and student's achievement, effective teaching tool (ABM) and information technology and effectiveness. The scope of the pedagogical issues discussed are still focused on students' academic achievement and teaching effectiveness that are correlated with the increase of achievements in tests. Previous studies also relate performance improvements to their interests and attitudes towards approaches or methods that are being researched or recommended (Shahril @ Charil, 1994). In addition, research on pedagogical mastery is done more on prospective teachers in higher education institutions (Johari Hassan & Aslinda Mohd Aris, 2008) and very little done in the pre-university level, especially in STPM level.

Therefore, in this study, identifying the pedagogical practices of pre-university teachers is conducted to see whether the pedagogical practices of teachers bring changes in enhancing the students' intellectual quality. This is due to many pre-university students are said to be narrow minded (A. Naim Kassan (1983); Khoo Yin Yin & Kassim Zakaria (2005)). Students are more preferred to just receive all the knowledge given by teachers without 'digesting' the given knowledge. This matter is also due to the students are too exposed with learning method that focuses on the examination (Abdul Aziz Abdul Shukor & Hairul Nizam Ismail, 2005). So, there were doubts about the ability of pre-university students and university graduates who are said to have less general knowledge and less reasoning ability and critical thinking.

Study by Hazri, Nordin, Zohir, Fadhilah and Mohd Nor Isman (2009) found that students were less involved in higher-order thinking because most teachers do not encourage students to think deeply and actively involved in the classroom. Students only receive and listen to all the information given by the teacher in a passive state. Nor Asniza Ishak findings (2010) showed the teachers least practice intellectual quality dimension. However, teachers applied the intellectual quality among students by encouraging students to think at higher levels by challenging student thinking ability during the process of teaching and learning through the process of high level questioning, analogy construction and relate teaching with students' experience.

Researching the pedagogical practices of teachers at STPM level in Malaysia is very relevant because the study related to pedagogy in Malaysia only sees the teaching of teachers who taught form one, two and four only (Hazri et al (2009), Nordin Abd. Razak, Hazri Jamil, Bob Lingard & Mohamaz Zohir Ahmad (2010) and Nor Asniza Ishak (2010) and less conducted on teachers, especially in the sixth form. Teachers' pedagogy practice in raising the students' intellectual level can give real scenarios of sixth form teaching and learning (T&L). This studies is considered important because of its contribution to the advancement of knowledge about best pedagogical practices used by the teachers who taught in sixth form in raising the intellectual level among pre-university students, especially in the sixth form stage. Findings of this study are expected to assist in the teachers and STPM pre-university level curriculum planners planning. It could be said that most teachers do not have knowledge of the extent of the intellectual level of their students and how to raise the intellectual level. Thus, this study is expected to give the teachers a bit of information about the appropriate pedagogy to enhance students' intellectual level that covers every aspect emphasized in pedagogy.

Literature Review:

Concept of Intellectual Quality Based On Productive Pedagogy Framework:

Intellectual qualities is the ability needed by the students to be more successful and excellent as practitioners in academic, work and life (Falk & Millar 2002; Hambur, Rowe & Luc, 2002 in Lublin, 2003). Intellectual capabilities can be applied or integrated into teaching and learning in the context of study subject (Kearns, 2001). Preliminary studies related to self-fulfilling predictions (Rist, 1970) and

studies on streaming and tracking (Oakes, Gamoran & Page, 1992), indicate that one of the main causes some students do not get high academic achievement is due to the school or educational institution that do not always insist or ask students to show good outcomes in terms of intellectual level. Lim Yoke Poh and Muhamed Awang (1996), states that students who enter IPT have less ability to reason and think critically and are not able to compete at international level together with students from other universities and this matter will prolong after the students graduate from university and move into the the work life. (Morshidi Sirat, Rosni Grill, Lim Hock Wam & Nasser Mohammed Katib, 2004).

In this paper, the concept of intellectual quality discussed is based on the dimensions of quality intellectual contained in the concept of productive pedagogies that combine a variety of approaches, methods, techniques and strategies used by teachers in the teaching and learning process (Lingard, 2007). The study found that the intellectual quality element can be used in the teaching to help students master the concepts and content of the lesson. Intellectual qualities build a relationship between pedagogy and knowledge (Luke & Hogan, 2006). Anyhow, the description of the intellectual quality dimensions in the productive pedagogical framework is given priority in this paper as one of the dimensions that enhance students' thinking skills at pre-university level. Information for intellectual quality subdimension is based on productive pedagogical framework described in Table 1. The concept of intellectual quality give consideration to the increase in the interest of students to master the subjects taught in a more meaningful way. This means that the teacher is productively able to select and build teaching strategies related to subjects taught by using various teaching styles and approaches based on the student's background. The strategy that focuses on the intellectual quality in teacher's teaching can enhance student's development and achievement (Chalmers, 2000). Lingard et al. (2001) believes, through practice and emphasis on intellectual quality, teachers can produce high intellectual students. Teachers should know the learning style favoured by their students, identify the techniques and strategies of teaching and thus master the techniques to evaluate the effectiveness of teaching strategies implemented in order to provide reflections towards teacher's teaching.

Table 1: Description on Intellectual Quality subdimension based on productive pedagogy framework.

Subdimension	Subdimension Description
Higher Order Thinking	Involve modification of information and ideas. This modification occurs when students combine facts and ideas and are able to synthesize, generalize, elaborate, hypotesize or draw conclusions and translation.
Deep Knowledge	Deep knowledge emphasizes on the idea based on the topics and content that is considered important.
Deep Understanding	Deep understanding will be formed when students are able to understand the complex relationship between important concepts in a topic. Students can construct or produce new information to find relationships, solve problems, form explanations and draw conclusions.
Subtantive Conversation	There is a good interaction between teachers and students on the topics discussed. Interactions that exist are in reciprocity pattern and create partnership's understanding.
Knowledge As Problematic	Involves understanding knowledge that is not fixed as the information but more to the building and also involving subjects such as political, social and cultural influences and implications. Students are able to solve problems related to the teaching topic given.
Metalanguage	Involves instruction that incorporates frequent discussion about talking about how the ongoing conversation and writing are conducted. Also involve vocabulary and specific technical words about how a word can be used or not (syntax and grammar).

Pre-University Level Intellectual Quality Related Research Perspective:

Intellectual quality is the capabilities required by the pre-university students to become more successful and excellent as practitioners in academic field, work and life (Falk & Millar 2002; Hambur, Rowe & Luc, 2002 in Lublin, 2003). Intellectual capabilities can be applied or integrated into teaching and learning in the context of the studies subject (Kenan, 2010). Preliminary studies related to self-fulfilling predictions (Rist, 1970) and studies on streaming and tracking (Oakes, Gamoran & Page, 1992), indicates that one of the main causes some students do not have high academic achievement is due to the school or educational institution that do not focus on the development of the intellectual level. This is no exception for students in pre-university level.

In Malaysia, a study by Morshidi Sirat, Rosni Grill, Lim Hock Wam & Nasser Mohammed Katib (2004); and Lim Poh Yoke and Muhamed Awang (1996) found that, the pre-university leavers entering Higher Education Institutions (IPT) have less ability to reason and think critically and not able to be competitive at the international level together with students from other universities . It is feared that this will continue when students graduate in IPT and go into the work life. The same matter is also supported by reports of the Ministry of Human Resources (2005) and the Ministry of Higher Education Malaysia (2006) that found that the major factor of unemployed graduates is the lack of thoughtful discussion skills involving verbal skills and critical thinking skills especially in reasoning, relating to problem solving. Factors mentioned are some of the important factors contained in the intellectual aspects. Focus on improving intellectual skills

particularly in communication and critical thinking skills and problem solving not only become the focus of the educational institutions in Malaysia but also for educational institutions abroad. Both of these skills are skills across the curriculum. (Rodiah Idris, Siti Rohayah Ariffin & Noriah Mohd Ishak, 2009).

In addition, the study by Hazri, Nordin, Zohir, Fadhilah and Mohd Nor Isman (2009) found that students were less involved in higher-order thinking because most teachers do not encourage students to think deeply and actively involved in the classroom. Students only receive and hear all the information given by the teacher in a passive state. Nor Asniza Ishak findings (2010) and Nor Asniza Ishak, Azman Mohd Noh, Saliza Kadir and Siti Noor Daud @ Othman (2012) on productive pedagogical practices among teachers in schools and lecturers in matriculation colleges showed that teachers and lecturers least practice the intellectual quality dimension. However, teachers and lecturers applied the intellectual quality among students by encouraging students to think at higher levels by challenging students' thinking ability during the process of teaching and learning through the process of high level questioning, analogy construction and relate the teaching with students' experience.

The above explanation shows that the implementation of and emphasis on the intellectual aspects of quality need to be prioritized by teachers and lecturers in pre-university level in order to produce students who have the dynamic thinking ability that is able to think critically and creatively, capable to communicate intellectually and then the ability to solve problems related to their field of study.

Research Objective and Research Question:

This study aims to identify the pedagogical practices of sixth form teachers in improving the students intellectual quality.

In particular, this study aims to:

1. Identify the pedagogical practices in pre-university form six teachers in improving the students intellectual quality.
2. Identify the differences in pre-university form six teachers' pedagogical practices based on teaching experience in improving the students' intellectual quality.
3. Identify the differences in pre-university form six teachers' pedagogical practices based on gender in improving the of students' intellectual quality.

Based on the study objectives, a number of research questions are presented:

1. What are the pedagogical practices of pre-university form six teachers in improving the of students' intellectual quality?
2. Are there any difference in the pedagogical practices of pre-university form six teachers in improving the students' intellectual quality based on teaching experience?
3. Are there any difference in the pedagogical practices of pre-university form six teachers in improving the students' intellectual quality based on gender?

Methodology:

In this study, a quantitative research approach was used in order to investigate the pedagogical practice among teachers in enhancing the quality intellectual among pre-university students. Quantitative research refers to the collection of numerical data in order to explain, predict and/or control phenomena of interest (Gay & Airasian, 2010). Cohen dan Manion (1994) listed three advantages of using quantitative method: (a) this method may imployed by the researcher when the number of respondent is big; (b) findings from the research enabling the researcher to do a correlation study and comparative study towards bigger sample and population; and (c) able to produce measurement facts and informations by using multiple statistical method in explaining the phenomenon studied. In this study, a survey method was utilized involving the usage of questionnaires.

The teachers population consist of all teachers from pre-university form six level in the state of Penang.There are 38 schools in Penang which offered a pre-university programme for the year of 2014. From this total numbers of schools, the population of form six teachers are 1235. (Jabatan Pelajaran Negeri Pulau Pinang, 2013). However considering the limitation of collecting data from all schools, reasercher decided to collect data from teachers among schools in Seberang Prai Utara (SPU) only. There are nine shools in SPU offering the pre-university programme with the total of 264 teachers. According to the sampling table by Krejcie and Morgan (1970), among the population of teacher in SPU, a total of 155 teachers will be used as a sample for this quantitative research. A random sampling technique was employed in gaining sample from the total number of 264 pre-university teachers in SPU.

This study involve the utilization of questionnaire in order to investigate the pedagogical practice among pre-university teachers in enhancing the intellectual quality among pre-university students in secondary schools. The instrument was developed by adapting questionnaires by Lingard *et al.* (2001), Fields (2002), Esah Sulaiman (2004), Mills & Goos (2007), Rodiah Ahmad (2008) dan Halizah Awang (2010) regarding pedagogical practice among pre-university teachers in enhancing the students intellectual quality. The questionnaires were divided into six construct which are; lesson plan teaching strategy, usage of teaching aid, classroom management, teaching evaluation and enrichment and remedial lessons. The questionnaires consist of two sections, Section A: A demographic questions and Section B: Questions/ items regarding self

assessment of the teachers' pedagogical practice in enhancing the students intellectual quality. The questionnaire consist of 76 items using Likert scale (1 to 5).

A pilot study was carried out in gaining the reliability and the validity of the instrument. Three experts were chosen for content validation, face validation and language validation. A pilot study is useful to ensure that the respondent thoroughly understand the questions and to identify the appropriate timing for the respondent to answer the questions (Gay, Mills & Airasian, 2010). The pilot study was implemented towards 30 pre-university teachers and the findings were not use in the real study. Data from the findings were analysed using Statistical Package for Social Science (SPSS) version 20.0 by finding the value of Cronbach Alpha. A reliability test was carried out to determine the internal consistency of the items and can be shown in Table 2.

Table 2: Reliability test for each of the construct in the questionnaire.

Construct on Pedagogy	Reliability	Conclusion
1. Lesson Plan	Cronbach Alpha = 0.74	This items shows a medium reliabilty
2. Teaching Strategy	Cronbach Alpha = 0.80	This items shows a high reliabilty
3. Usage of Teaching Aid	Cronbach Alpha = 0.81	This items shows a high reliabilty
4. Classroom Management	Cronbach Alpha = 0.90	This items shows a high reliabilty
5.Teaching Evaluation	Cronbach Alpha = 0.86	This items shows a high reliabilty
6. Enrichment and Remedial lessons	Cronbach Alpha = 0.83	This items shows a high reliabilty

Data Analysis and Research Findings:

Demographic Findings:

This section will discuss the demographic findings which include teachers gender, ethnic, teaching experience and pre-university teachingexperience. The summary of the findings can be shown in Table 3.

Table 3: Summary on the demographic findings.

Demographic Details		Number (people)	Percentage (%)
Gender	Male	35	22.6
	Female	120	77.4
Ethnic	Malay	93	60.0
	Chinese	51	32.9
	Indian	9	5.8
	Other	2	1.3
Teaching Experience	1-5 Years	2	1.3
	6-10 years	16	10.3
	11-15 years	30	19.4
	16-20 years	43	27.7
	20 Years and above	31	20.0
Pre-university Teaching Experience	1-5 Years	21	13.5
	6-10 years	42	27.1
	11-15 years	64	41.3
	16-20 years	12	7.7
	21-25 Years	7	4.5
	25 Years and above	9	5.8

Descriptive and Inferential Statistic:

Table 4 shows the descriptive statistic for each of the construct in the questionnaire which refferred to lesson plan, teaching strategy, usage of teaching aid, classroom management, teaching evaluation and enrichment and remedial lessons. This findings is to answer research question number one. Summary of the findings can be shown in Table 4.

Table 4: Discriptive statistic on each of the construct.

Construct on Pedagogy	Mean Score	Standard Deviation (sd)
Lesson Plan	39.30	3.38
Teaching Strategy	105.22	10.26
Usage of Teaching Aid	40.86	6.13
Classroom Management	50.10	4.62
Teaching Evaluation	34.67	3.14
Enrichment and Remedial Lessons	29.13	3.15

From Table 4, it shows that teaching strategy carry the highest mean score (mean = 105.22, sd = 10.26) follow by classroom management (mean = 50.10, sd = 4.62), usage of teaching aid (mean = 40.86, sd = 6.13), Lesson Plan (mean = 39.30, sd = 3.38), teaching evaluation (mean = 34.67, sd = 3.14) and lastly enrichment and remedial lessons (mean = 29.13, sd = 3.15). From the result, it shows that pre-university teachers focus on enhancing students intellectual quality through teaching strategy and less concern on using enrichment and remedial lessons to enhance students intellectual quality. Teachers will

make use of the time in the classroom to enhance the students intellectual quality through activities, discussion and problem solving.

Inferential statistic were carried out to answer research question number two and three. An independent t-test was used to examine if there are any significance difference between the mean of teachers gender towards teachers pedagogical practice in enhancing intellectual quality among pre-university students. The findings can be shown in Table 5. From the findings, it shows that there were significance different between teachers gender towards teachers pedagogical practice in enhancing intellectual quality among pre-university students in term of lesson plan (t (153)= -2.57, p=.01) and enrichment and remedial lessons (t (153)=-2.84, p=.00). However there were no significance difference in term of teaching strategy (t (153)=-2.57, p=.01), usage of teaching aid (t (153)=-2.57, p=.01), classroom management (t (153)=-2.57, p=.01) and teaching evaluation (t (153)=-2.57, p=.01). Results also showed that female teachers practice peadgogical in enhancing students' intellectual quality in every construct of intellectual quality with the highest concern on the construct of teaching strategy (mean = 105.68, sd = 10.58) compare to the male teachers. However from the table it shows that both male and female teachers less concern in enhancing students' intellectual quality by practicing the enrichment and remmedial lesson in the classroom.

Table 5: An analysis showing comparison of pedagogical practice in enhancing students intellectual quality according to taechers' gender.

		N		Mean		SD		t-value	Df	p-value
		Male	Female	Male	Female	Male	Female			
Construct	Lesson Plan	35	120	38.03	39.67	3.58	3.24	-2.57	153	.01
	Teaching Strategy	35	120	103.65	105.68	9.07	10.58	-1.02	153	.30
	Usage of Teaching Aid	35	120	39.15	41.36	6.86	5.83	-1.90	153	.05
	Classroom Management	35	120	49.34	50.33	4.82	4.55	-1.10	153	.26
	Teaching Evaluation	35	120	34.08	34.85	1.84	3.41	-1.27	153	.76
	Enrich-ment and Remedial lessons	35	120	27.82	29.51	3.27	3.02	-2.84	153	.00

One way analysis of varience test (ANNOVA) was also carried out to identify if there is any significance difference between group of pre-university teachers according to their teaching experience towards their pedagogical practice in enhancing intellectual quality among pre-university students. Table 6 shows that there were significance different for pedagogical practice according to teachers teaching experience involving the costruct of teaching strategy (F(5,149)=2.37); p=.04), classroom management (F(5,149)=4.23; p=.00) and evaluation (F(5,149)=2.68; p=.02). However there were no significance different for the construct of lesson plan (F(5,149)=1.89; p=.09), usage of teaching aid (F(5,149)=.78; p=.56) and for the construct of enrichment and remedial lessons (F(5,149)=.42; p=.82).

Table 6: An analysis showing comparison between construct in pedagogical practice in enhancing students intellectual quality according to teachers teaching experience.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Lesson Plan	Between Groups	105.11	5	21.02	1.89	.09
	Within Groups	1649.47	149	11.07		
	Total	1754.59	154			
Teaching Strategy	Between Groups	1195.62	5	239.12	2.37	.04
	Within Groups	15023.37	149	100.82		
	Total	16218.99	154			
Usage of Teaching Aid	Between Groups	147.59	5	29.51	.78	.56
	Within Groups	5633.23	149	37.80		
	Total	5780.82	154			
Classroom Management	Between Groups	408.65	5	81.73	4.23	.00
	Within Groups	2877.42	149	19.31		
	Total	3286.07	154			
Evaluation	Between Groups	124.97	5	24.99	2.67	.02
	Within Groups	1390.58	149	9.33		
	Total	1515.56	154			
Enrichment and Remedy	Between Groups	21.61	5	4.32	.42	.82
	Within Groups	1504.76	149	10.09		
	Total	1526.37	154			

Conclusions and Discussions:

From the research analysis and findings, it can be concluded that pre-university teachers in the state of Penang does enhance the pre-university students intellectual quality through their pedagogical practice with biggest concern on implementing it through their teaching strategy in the classroom. There were also significance difference in term of gender and teaching experience among pre-university teachers in enhancing the students intellectual quality. Teachers applied the intellectual quality among students by encouraging students to think at higher levels by challenging student thinking ability during the process of teaching and learning through the process of high level questioning, analogy construction and relate teaching with students' experience. This supported Luke (2002) findings, by stating that the implementation of pedagogical practice to enhance students intellectual quality in the classroom is visualised by the diversity usage of teaching strategies among teachers. Apart from that, teachers also encourage students to sharpen their higher order thinking through critically analyse situations regarding the topic learnt. Students were also encouraged to develop new idea derived from the concept being taught by the teacher. Apart from that, teachers also practice constructivisme approach by asking students to construct their own analogy, mind map and actively discuss in the classroom. This supported findings by Lingard (2007). Through this practice, students will gain better understanding on the concept learnt and able to apply it in differenet situation.

However, considering several constraints such as time constraint in the classroom and constraint to carry out interesting activities to enhance students intellectual due to the fact that the syllabus must be taught completely on time and peer pressure, cause the teachers lacking of confidence level and became too rigid in delivering the topic content. This supported Lingard (2007) mentioned that the implementation of peagogical practice in enhancing students intellectual quality is hindered by teachers who are too afraid to finish the syllabus on time rather than polishing the students' intellect.

Teachers should realise that many scholars (Lim Yoke Poh & Muhamed Awang (1986); Brabeck (1983) and Allen (1981)) agreed that when there is an increase in the education levels, the level of intellectual quality among students should also be developed in accordance with the age and physical development. The pre-university students should have a deep understanding of a topic, issue or discipline of study in order to be associated with the topic, issue or other disciplines (Yadan, 1985). Yadan (1985) further contents that, the students should be more diversed in thinking to enable students to compete in the future. This seem relevant in the context of pre-university students in Malaysia for pre-university students should have high competitiveness in order to achieve the goals and objectives of the national education policy. National education policy focuses on producing quality human capital in all aspects of life through the intellectual quality in accordance with the action of a rational, high civic consciousness and act superior to the state, society and religion.

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REFERENCES

Allen, J., 2003. Productive pedagogies and the challenge of inclusion. *British Journal of Special Education, 30(4):* 175-179.

Aminah Ayob, Hazri Jamil, Halim Ahmad, Maznah Ismail and Farouk Abdul Majid, 2004. Astudy of the causes of the failure among malay students in academic achievement. Kuala Lumpur: Bahagian Penyelarasan Penyertaan Bumiputera, Prime Minister Department.

Bahagian Perancangan Kurikulum, 2011. Kementerian Pelajaran Malaysia.

Bruner, J., 1960. The process of education. New York: Vintage.

Chalmers, M., 2000. Six dogs, twenty three cats, forty five mice and one hundred sixty spider. New York: Harper Collins.

Falk, I. and P. Millar, 2002. Non/working lives: implications of 'non-standard for higher education (GESIHE). Conference of the Pacific Rim Objective.

Fosnot, C., 1996. Constructivism: Theory, perspectives and practice (2nd ed.). New York: Teachers College Press.

Gay, L.R., Mills, Airasian, 2010. Educational research competencies for analysis and applications. New Jersey: Pearson Merrill Prentice Hall.

Habibah Elias dan Rahil Mahyuddin, 1990. Psikologi pembelajaran. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Halizah Awang, 2010. Kesan pembelajaran berasaskan masalah dalam kemahiran generik di Politeknik Malaysia. Tesis Doktor Falsafah. Universiti Sains Malaysia.

Hambur, S., K. Rowe, L.T. Luc, 2002. Graduate skills assessment, commonwealth of Australia.

Hazri Jamil, Nordin Abdul Razak, Fadzilah Abd. Rahman, Mohammad Zohir Ahmad @ Saari, Mohd Nor Isman Ismail, 2009. Productive pedagogies for Malaysian education system: investigating the classroom practice of Malaysian secondary school teacher. Seminar JPPG09. School of Cognitive Science and Human Development, Universiti Pendidikan Sultan Idris.

Johari Hassan, Aslinda Mohd Aris, 2008. Tahap Penguasaan Kemahiran Pedagogi Di Kalangan Pelajar Tahun Akhir Di Fakulti Pendidikan UTM.

Skudai, Johor. Fakulti Pendidikan, Universiti Teknologi Malaysia.

Keenan, T., S. Evans, 2010. An introduction to child development. Thousand Oaks, CA: Sage.

Kementerian Pengajian Tinggi, 2006. Modul pembangunan kemahiran insaniah (soft skills)untuk institusi pengajian tinggi Malaysia. Universiti Putra Malaysia.

Kementerian Sumber Manusia, Kementerian Pengajian Tinggi, 2005. Laporan tahunan.

Khoo Yin Yin, Zakaria Kassim, 2005. Pembelajaran penyelesaian masalah secara kaedah kolaboratif dengan pemikiran kritis dan kreatif di kalangan pelajar prauniversiti tingkatan enam. Prosiding Seminar Pendidikan, Jawatankuasa Penyelaras Pendidikan Guru, 2005. Pendidikan untuk Pembangunan Lestari.

Lim Yoke Poh, Muhammad Awang, 1986. Tahap perkembangan intelektual di kalangan pelajar universiti. Journal Akademika. Penerbit UKM.

Lingard, B., 2007. Pedagogies of indifferences. International Journal of Inclusive Education, 11(3): 245-266.

Lingard, B., J. Ladwig, 2001. School Reform Longitudinal Study: Final report, vol 1, Report prepared for Educational Queensland by the School of Education. The University of Queensland.

Lingard, B., J. Ladwig, M. Mills, M. Bahr, D. Chant, M. Warry, J. Ailwood, R. Capeness, P. Christie, J. Gore, D. Hayes and A. Luke, 2001. The Queensland school reform longitudinal study. Vols. 1 and 2. Brisbane: Education Queensland.

Lublin, J., 2003. Generic objectives and transferable skills: Centre for teaching and learning: Good Practice in teaching and learning. Engineering Science and Education Journal, 8(4): 161-168.

Luke, A., 2006. Teaching after the market: from commodity to cosmopolitan, in: L. Weis, C. Mc Carthy & G. Dimitriades (Eds) Ideaology, curriculum and the new sociology of education revisiting the work of Michael Apple (New York, NY, Routledge), 115-141.

Luke, A., D. Hogan, 2006. Redesigning what caounts as evidence in educational policy: the Singapore model, in J. Ozga, T. Seddon & T. Popkewitz (Eds) Educational Research and Policy Steering The Knowledge-Based Economy. London, Routledge, 170-184.

Morshidi Sirat, Abdul Majid Mohd, Rosni Bakar, Abdul Aziz Buang, &Mohd Mua‟ti @ Zamri Ahmad, 2001. Santun komunikasi. Kuala Lumpur. Dewan Bahasa dan Pustaka.

Nani Menon dan Rohani Abdullah, 2004. Panduan kognitif kanak-kanak pra sekolah. Kuala Lumpur: PTS Publications & Distributors Sdn, Bhd.

Newman and Associates, 1996. Authentic achievement: Restructuring schools for intellectual quality. San Francisco: Josey Bass.

Newmann, F.M., 1990. Higher order thinking in teaching social studies: A rationale for the assessment of classroom thoughtfulness. Journal of Curriculum Studies, 22(1): 41-56.

Nor Asniza Ishak, Azman Mohd Noh, Siti Noor Daud @ Othman, Saliza Kadir, 2012. Amalan pedagogi produktif dalam kalangan pensyarah-pensyarah Sains di Kolej Matrikulasi Pulau Pinang. Prosiding Seminar Penyelidikan Pendidikan Bahagian Marikulasi, Kementerian Pelajaran Malaysia Tahun 2012.

Nor Asniza Ishak, Hazri Jamil, Nordin Abd. Razak, 2013. Amalan pedagogi produktif dalam kalangan guru-guru sains di Malaysia. Malaysian Journal of Learning and Instruction (MJLI): Vol.10. Universiti Utara Malaysia.

Oaks, J., A. Gamorans, R. Page, 1992. Curriculum differentiation. Opportunities outcomes and meanings. In P.W. Jackson. (Ed.). Handbook of Research on Curriculum, 570-608. New York: Macmillan.

Piaget, J., 1954. The construction of reality in child. New York: Basic Books.

Rajendran, N.S., 2000. Kesusasteraan sebagai wahana megajar kemahiran berfikir aras tinggi. Bahagian Pendidikan Guru Kementerian Pelajaran Malaysia.

Rajendran, N.S., 2008. Teaching & acquiring: Higher order thinking skills, theory & practice. Tanjong Malim: Penerbitan Universiti Sultan Idris.

Rodiah Idris, Siti Rahayah Ariffin, Noriah Mohd Ishak, 2009. Pengaruh kemahiran generik dalam kemahiran pemikiran kritikal, penyelesaian masalah dan komunikasi pelajar Universiti Kebangsaan Malaysia. Malaysian Journal of Learning & Instruction (MJLI), 6.

Yadan, R.S., 1985. Critique on correlations among cognitive development, intelligence quotient and achievement of high school Biology students. Journal of Research In Science Teaching, 22(8): 767-768.