

Annual Conference² on Teacher Education⁰⁶

**Education for the
Underprivileged**



**School of Education and
Social Development
Universiti Malaysia Sabah**



**Jawatankuasa Penyelarasan
Pendidikan Guru**

**6-8 September 2006
Hotel Le Maridian
Kota Kinabalu
Sabah**

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Selamat Datang

Annual Conference **2016** on Teacher Education **06**

Education for the Underpriveled

6-8 September • Hotel Le Meridian Kota Kinabalu

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Kata-kata Aluan

Naib Canselor
Universiti Malaysia Sabah
Prof. Datuk Dr. Mohd. Noh Dalimin



Assalamualaikum warahmatullahi wabarakatuh dan salam sejahtera.

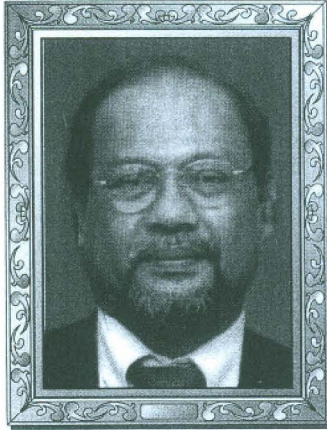
Saya ucapkan syabas dan tahniah kepada panel penyunting atas kejayaan menghasilkan prosiding Seminar Kebangsaan Jawatankuasa Penyelarasan Pendidikan Guru (JPPG) 2006. Kertas kerja yang dikumpulkan dalam prosiding ini merangkumi berbagai tema dan aspek pendidikan guru. Saya yakin interaksi para pembaca dengan penulisan-penulisan dalam terbitan ini akan mencetuskan banyak lagi perbincangan yang akan menyumbang kepada dunia penyelidikan dan amalan pendidikan guru. Ucapan tahniah juga saya tujukan kepada Pusat Pendidikan Luar Bandar (PPLB) di bawah Sekolah Pendidikan dan Pembangunan Sosial (SPPS) yang turut dilancarkan semasa aktiviti seminar JPPG ini. Seperti yang kita sedia maklum, Rancangan Malaysia Ke Sembilan telah menfokus kepada pendidikan di kawasan luar Bandar. Oleh itu adalah wajar Pusat Pendidikan Luar Bandar (PPLB) memainkan peranan dalam melahirkan golongan guru, murid, ibu bapa dan komuniti luar bandar secara amnya yang berpendidikan tinggi, proaktif, berdedikasi dan bertanggungjawab. Usaha-usaha yang sedang dan bakal dilaksanakan diharap mampu membina kehidupan yang lengkap kepada mereka yang berada di luar bandar. Pelancaran pusat penyelidikan PPLB ini amat bersesuaian dengan tema seminar "Education for the Underprivileged".

Saya berharap segala usaha murni ini akan menghasilkan buah yang baik dan memberi manfaat pada semua pihak. Terima Kasih.

'Bertekad Cemerlang'

Prof. Datuk Dr. Mohd. Noh Dalimin

Naib Canselor
Universiti Malaysia Sabah



Kata-kata Aluan

Pengerusi
Seminar Pendidikan JPPG 2006
Prof. Madya Dr. Zulkifli Mohamed

Assalamualaikum warahmatullahi wabarakatuh dan salam sejahtera.

Saya merakamkan ucapan setinggi-tinggi terima kasih serta syabas kepada Jawatankuasa Penyelarasan Pendidikan Guru 2006 dan Jawatankuasa Seminar Kebangsaan Penyelarasan Pendidikan Guru yang telah berjaya menganjurkan Seminar Jawatankuasa Penyelarasan Pendidikan Guru 2006 yang bertemakan "Education for the Underprivileged" pada 6hb. September hingga 8 hb. September 2006 bertempat di Hotel Le Meridian, Kota Kinabalu, Sabah.

Saya juga ingin merakamkan ucapan setinggi-tinggi terima kasih serta syabas kepada sidang editor yang berjaya mendokumentasikan beberapa kertas penyelidikan yang telah dibentangkan. Kertas-kertas kerja tersebut diterima daripada universiti-universiti, IPTA, Kementerian Pendidikan, Institut Pendidikan Guru, Jabatan Pelajaran dan sekolah serta disusun mengikut tema-tema tertentu. Ini memberi peluang kepada peserta seminar dan pembaca meneroka bidang pendidikan serta memperluaskan jangkauan sehingga kawasan luar bandar sebagai mana agenda pendidikan yang dirancang dalam Rancangan Malaysia Ke Sembilan supaya tidak wujud jurang antara miskin dan kaya, bandar dan luar bandar serta jurang digital yang membataskan pencapaian pelajar. Semoga seminar ini membantu ahli-ahli akademik, pengurus pendidikan, pendidik dan masyarakat membincangkan dan menghayati persoalan-persoalan yang berkaitan dengan pendidikan guru.

Seperti yang kita sedia maklum, pendidikan dan pembangunan sumber manusia adalah kunci kepada peningkatan daya saing negara. Ia bertujuan melahirkan generasi masa hadapan yang berkualiti, berketrampilan, berilmu dan beretika mulia. Bersesuaian sekali dengan tema seminar ini maka Pusat Pendidikan Luar Bandar (PPLB) di bawah kendalian Sekolah Pendidikan Dan Pembangunan Sosial turut dilancarkan. PPLB mempunyai empat objektif utama iaitu menjana pemikiran komuniti ke arah kepentingan pendidikan, melatih sukarelawan yang akan bertindak sebagai agen perubahan, meningkatkan tahap literasi komuniti luar Bandar dan menjalankan penyelidikan bagi tujuan pembangunan komuniti. Semoga segala usaha murni ini diberkati Allah Yang Maha Kuasa.

Prof. Madya Dr. Zulkifli Mohamed

Dekan Sekolah Pendidikan dan Pembangunan Sosial
Universiti Malaysia Sabah

Aturcara Program

Seminar Pendidikan JPPG 2006

Hari Rabu (6 September 2006)

- 1400-1700 Pendaftaran
1600-1730 Lawatan ke SK Pulau Sepanggar

Hari Khamis (7 September 2006)

- 0730-0800 Pendaftaran
0800-0805 Bacaan doa
0805-0820 Ucapan alu-aluan YBhg. Prof. Madya Dr. Zulkifli Mohamed
Pengerusi Seminar Pendidikan JPPG 2006 & Dekan Sekolah
Pendidikan dan Pembangunan Sosial
0820-0850 Ucapan dan Perasmian YBhg Prof. Datuk Dr. Mohd. Noh Dalimin
Naib Canselor Universiti Malaysia Sabah
0900-1000 Ucap Utama I
YBhg. Prof. Datuk Dr. Mohd. Noh Dalimin
Naib Canselor Universiti Malaysia Sabah
1000-1030 Kudapan
1030-1130 Kertas Kerja Institusi 1 (Universiti Kebangsaan Malaysia)
Kertas Kerja Institusi 2 (Universiti Putra Malaysia)
Sesi Selari 1
1130-1230 Kertas Kerja Institusi 3 (Universiti Malaysia Sarawak)
Kertas Kerja Institusi 4 (Universiti Teknologi Malaysia)
Sesi Selari 2
1230-1400 Makan Tengah Hari dan Pameran Buku
1400-1500 Ucap Utama II
YBhg. Pn. Normah Gagoh
Pengaroh Pelajaran Sabah
1500-1630 Kertas Kerja Institusi 5 (Universiti Utara Malaysia)
Kertas Kerja Institusi 6 (Universiti Sains Malaysia)
Sesi Selari 3
1620-1700 Minum Petang
1900-2200 Majlis Makan Malam dan Pelancaran
Pusat Pembangunan Pendidikan Luar Bandar
YB Datuk Hj. Masidi Manjun
Menteri Belia dan Sukan Merangkap Exco Pelajaran Negeri Sabah

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Aturcara Program Seminar Pendidikan JPPG 2006

Hari Jumaat (8 September 2006)

- 0800-0900 Ucap Utama III
Associate Profesor Peter Kell
University of Wollongong, Australia
- 0900-1000 Kertas Kerja Institusi 7 (Universiti Pendidikan Sultan Idris)
Kertas Kerja Institusi 8 (Universiti Teknologi MARA)
Sesi Selari 4
- 1000-1030 Kudapan dan Pameran Buku
- 1030-1130 Kertas Kerja Institusi 9 (Universiti Malaysia Sabah)
Kertas Kerja Institusi 10 (Kolej Universiti Teknologi Tun Hussein Onn)
Sesi Selari 5
- 1130-1400 Makan Tengah Hari dan Pameran Buku
- 1400-1500 Kertas Kerja Institusi 11 (Universiti Malaya)
Kertas Kerja Institusi 12 (Universiti Islam Antarabangsa Malaysia)
Sesi Selari 6
- 1500-1600 Sesi Selari 7
- 1600-1630 Majlis Penutup YBhg. Lt Kol Prof. Datuk Dr. Hj. Kamaruzaman Ampon
Timbalan Naib Canselor Universiti Malaysia Sabah (Penyelidikan dan
Inovasi)

Abstrak

Seminar Pendidikan JPPG 2006

PEMBANGUNAN PENDIDIKAN PELAJAR MELALUI PEMBELAJARAN ANIMASI GRAFIK

Ahmad Rizal Bin Madar, Jailani bin Md. Yunos, Nin Hayati Binti Mohd Yusoff & Hashima Binti Hamid
Kolej Universiti Teknologi Tun Hussein Onn

Tujuan kajian ini adalah untuk mengkaji berkaitan pembangunan pendidikan pelajar melalui perisian animasi grafik bagi mata pelajaran Sistem Elektronik dan mengkaji tiga aspek rekabentuk perisian iaitu rekabentuk pembelajaran konstruktivisme, rekabentuk antaramuka dan rekabentuk interaksi yang diinginkan oleh pelajar yang terlibat. Responden kajian ini adalah pelajar semester dua kursus Diploma Kejuruteraan Elektrik & Elektronik iaitu seramai 172 orang. Sebanyak tiga buah politeknik yang terlibat dalam kajian ini iaitu Politeknik Kota Bharu, Politeknik Sultan Hj Ahmad Shah dan Politeknik Johor Bahru. Kajian ini merupakan suatu kajian deskriptif yang melibatkan kajian kuantitatif. Instrumen kajian ini adalah soal selidik. Data-data yang dikumpul, dianalisis menggunakan SPSS version 11.5 yang melibatkan skor min dan sisihan piawai. Dapatan kajian menunjukkan perisian animasi grafik bagi mata pelajaran Sistem Elektronik perlu dibangunkan sebagai alat bahan bantu mengajar dan bahan rujukan kepada pelajar (purata skor min = 4.00). Pelajar bersetuju menggunakan perisian yang mempunyai aktiviti-aktiviti yang melibatkan aplikasi teori pembelajaran konstruktivisme. Selain itu, pelajar inginkan rekabentuk antaramuka yang dapat memberi ketenangan kepada mereka untuk belajar serta mempunyai unsur-unsur interaktiviti dan memberi kebebasan untuk mereka menggunakan perisian tersebut. Kesimpulannya pembangunan pendidikan pelajar menjadi lebih bermakna melalui perisian animasi grafik.

KEPIMPINAN PENGAJARAN, IKLIM SEKOLAH, EFIKASI DAN KOMITMEN GURU-GURU DI SEKOLAH-SEKOLAH RENDAH YANG BERKESAN DAN TIDAK BERKESAN DI LUAR BANDAR

Ishak Bin Sin
Universiti Utara Malaysia

Setiap tahun ada beberapa sekolah rendah luar bandar yang menerima Anugerah Kualiti Menteri Pelajaran dan Anugerah Sekolah Harapan Negara semasa pelancaran Perayaan Hari Guru di peringkat kebangsaan. Antara kriteria penilaian bagi kedua-dua anugerah berprestij ini ialah kepimpinan guru besar, iklim sekolah dan prestasi akademik murid. Sekolah-sekolah yang berjaya ini dikatakan mempunyai kepimpinan yang berwibawa dengan iklim sekolahnya yang kondusif untuk belajar dan mengajar serta mempunyai guru-guru yang komited kepada tugasnya. Sekolah-sekolah ini dikatakan berprestasi tinggi dalam pencapaian akademik murid-muridnya. Mengikut kajian-kajian, kepimpinan pengajaran (*instructional leadership*) guru besar, iklim sekolah, efikasi dan komitmen guru-guru, sama ada komitmen kepada sekolah atau komitmen kepada pengajaran dan pembelajaran telah sekian lama dikenalpasti sebagai pembolehubah-pembolehubah yang berpengaruh ke atas keberkesanan sekolah. Kepimpinan pengajaran dikatakan mempunyai kesan secara langsung ke atas efikasi guru, komitmen guru terhadap sekolah, komitmen guru terhadap pengajaran dan iklim pengajaran dan pembelajaran. Kepimpinan pengajaran juga dikatakan mempunyai kesan secara tidak langsung ke atas pencapaian akademik murid. Manakala faktor iklim sekolah pula dikatakan mempunyai kesan secara langsung ke atas proses pengajaran dan pembelajaran dan seterusnya memberi kesan ke atas pencapaian akademik murid. Begitu juga komitmen guru terhadap sekolah dan komitmen guru terhadap pengajaran dikatakan mempunyai kesan secara langsung ke atas pencapaian akademik murid. Walaupun begitu, sejak akhir-akhir ini terdapat penulisan-penulisan menggambarkan bahawa terdapat sebilangan guru besar yang lemah dalam kepimpinan pengajaran, iklim sekolah yang tidak kondusif untuk pengajaran dan pembelajaran, guru yang tiada efikasi dan tidak komited terhadap tugasnya. Di samping itu terdapat juga penulisan-penulisan yang menggambarkan terdapat sekolah-sekolah yang sangat rendah prestasi akademiknya. Keadaan yang sangat berbeza daripada segi prestasi akademik ini telah menimbulkan satu persoalan baru, iaitu adakah guru besar di sekolah yang tidak menerima anugerah-anugerah tersebut tidak mengamalkan kepimpinan pengajaran? Atau adakah guru-guru di sekolah-sekolah yang tidak menerima anugerah-anugerah tersebut tiada efikasi dan tidak komited? Atau adakah iklim sekolah-sekolah yang tidak menerima anugerah-anugerah tersebut mengalami iklim yang tidak sihat? Permasalahan ini mendorong penyelidik untuk

**ANIMATION GRAPHIC IN TECHNICAL SUBJECTS ACHIEVEMENT AT
POLYTEHNIC OF MALAYSIA HIGHER EDUCATION MINISTRY**

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Somchai Enoi,
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ABSTRACT

The aim of this research is to examine the effect of animation graphic courseware usage on student achievement in Electronic System at polytechnic, Ministry of Higher Education Malaysia. This research compared the student achievement between the control group which following the conventional method in teaching and learning with the treatment group used animation graphic courseware in teaching and learning method. The moderator variable of this research was spatial visualization ability. This research used quasi-experiment pretest and posttest design for not equivalent group using the inferential statistic to analyze data. The respondents of this research were semester one students taking Diploma in Electronic Engineering at Polytechnic Johor Bahru and Polytechnic Merlimau. 40 respondents were not randomly selected in this research. Posttest and pretest score were compared to get the gain score student achievement in the topic Sine Wave Amplifier Circuit. Non-parametric tests Mann-Whitney U test and Spearman correlation coefficient were employed by using *Statistical Package for Social Sciences* (SPSS) version 13.0 software. The results show there was statistically significant difference in student achievement between treatment and control group. There also was statistically significant difference in student achievement among high spatial visualization ability between treatment and control group. It was concluded animation graphic courseware overall increased the student achievement where more to high spatial visualization ability students.

INTRODUCTION

Multimedia is variety of element such as color, animation, text, graphic, video and audio which is integrated and can be controlled in presentation to student (Abdul Hadi et al, 2005; Ismail, 2002). Therefore the teaching and learning process more interesting, enjoy and efficient (Hannafin dan Hooper, 1989). Mayer (2001) said the multimedia development uses material text and picture to design for effective learning. It is because the text and picture usage involve auditory and visual modality in human memory system.

One of the multimedia teaching and learning that always study by researcher is visual animation courseware (Safuan dan Fong, 2003). Rieber et al (1990) found graphic animation was significant factor in helping to encode and recall the information.

Students are like information processing machine need variety of method to store and recall their memory (Ahmad Rizal dan Jailani, 2005). Technical students normally having problem to imagine the theory without any medium to explain it. Therefore visual animation can increase learning when abstract concept is transformed to visual in direction movement.

Courseware animation graphic development hopefully to solve this problem in learning System Electronic subject for Electric and Electronic Engineering students at polytechnic Ministry of Higher Education Malaysia. Individuals different among the students is on at the factor that they can not receive the knowledge. System Electronic subject was selected in this study because this subject contains components and diagrams which needed the graphic orientation demonstration. By the way there have no courseware or multimedia software was used in teaching System Electronic subject at polytechnic.

In conventional teaching method normally lecturer will give lecture in the class refer to the subject syllabus and their own teaching method. However every lecturer will have their own initiative to lecture. This phenomenon happened in polytechnic Ministry of Higher Education Malaysia.

At polytechnic Ministry of Higher Education Malaysia teaching engineering subject was done in theory and practical. Students learned the theory then will have practical at laboratory or workshop to gain the engineering concept. Cockcroft (1986) report student fail to understand the concept in difficult subject. Bosco (1986) said the main factor students' week in learning because they can not remember what they had learned. Computer can help to solve this problem because it support variety of animation in study (Sahairil, 2003).

Previous study prove that animation help in learning fact information. In science subject, there are many researches done on animation effectiveness as learning aid but not many as engineering subject (Zol Bahri, 2001). Eigen and Komoski (1969) said teaching problem in Mechanical Engineering is having unsuitable teaching aids. In this subject contain many theory about moving component, therefore the explanation for this subject should attach with

demonstration or dynamic teaching aids where students can see and make connection between theory and reality (Martin and Mats, 2005).

This phenomenon also happened in System Electronic subject for Electric and Electronic Engineering at polytechnic. System Electronic also contain moving components needed suitable animation graphic explanation to students. In example electron and hole movement concept and also current flow in electronic circuit. Nin Hayati (2005) found that theory in System Electronic difficult to give explanation to student.

System Electronic is one of the Electric Engineering subjects that compulsory pass as requirement for Electric and Electronic Engineering course offered in polytechnic. This subject is taught in semester one for Diploma in Electric and Electronic Engineering. This subject contain many theories and circuit that difficult to explain using text its need visual and simulation to show to student. Therefore multimedia learning aid for System Electronic subject need to be developed for reference and teaching aids (Nin Hayati, 2005).

Eun-mi, Y. and Andre, T. (2003) in previous found students learning using computer animation in Chemistry shows better achievement than conventional learning. However in the research shows that students' achievement is better among student high spatial visualization ability. This mean spatial visualization ability influence students' achievement in using multimedia teaching aids (Mayer, 2001). Spatial visualization ability is the mind ability to see object and think in two or three dimension and imagine the configuration object change when it is manipulated (Mayer, 1994). Spatial visualization ability is important to learning and problem solving in engineering (Maizam, 2002).

This research focus on animation graphic courseware as teaching aids in learning achievement for System Electronic subject at polytechnic. This research makes comparison learning achievement between groups using animation graphic courseware and conventional in learning. Further more comparison learning achievement between students in different spatial visualization ability also done in this research. Spatial visualization ability also influenced students' achievement in learning using multimedia (Mayer, 2001).

METHODOLOGY

Research question and hypotheses

The four main research questions are as follows:

1. Is there a difference in gain score achievement test among students learning using the animation graphic courseware and conventional?
2. Is there a difference in gain score achievement test among students learning using the animation graphic courseware and conventional in student low spatial visualization ability?
3. Is there a difference in gain score achievement test among students learning using the animation graphic courseware and conventional in student high spatial visualization ability?

4. Is there any relationship between students' achievement and spatial visualization ability?

RESEARCH VARIABLES

The dependent variable was the achievement score in learning that is the difference between post-test and the pre-test score. The independent variable was animation graphic courseware and the moderator variable was spatial visualization ability.

RESEARCH DESIGN AND PROCEDURE

A quasi-experimental design method were used, with pre-test and post-test, and two group was divided to control group and treatment group. Pre-test and post-test was based on Since Wave Amplifier Circuit topic. The pre-test was given before teaching and learning process started in both group. The control group will follow the conventional teaching process however treatment group was using animation graphic courseware in teaching. Pre-test was used to measure students' knowledge based on Since Wave Amplifier Circuit. Post-test was given to students after the teaching and learning finish. The purpose for post-test was to measure students' achievement after following in the class. Students' achievement was calculated by post-test score minus with pre-test.

RESEARCH POPULATION AND SAMPEL

The population of this research was semester one students in Diploma Electric and Electronic Engineering at Electrical Engineering who taking System Electronic subject. The research was done at two polytechnic, Polytechnic Johor Bahru and Polytechnic Merlimau.

Because of intake into these polytechnic was based on academic qualification and place into polytechnics in no particular order resulting in similar distribution of students. All polytechnics used same syllabus. Therefore a sample taken from Polytechnic Johor Bahru and Polytechnic Merlimau were assumed to be represented of the population.

RESEARCH INSTRUMENTS

Three research instruments were used in this study, the Spatial Visualization Ability Test (SVAT), pre-test and post-test. The SVAT was taken from Maizam (2002) to measure the level spatial visualization ability students. SVAT consists 3 parts and 29 questions. The reliability of this instrument was 0.815 alpha cronbach. Pre-test and post-test was used to evaluate the achievement after teaching and learning process. The questions were developed based on System Electronic syllabus.

RESULTS

Table 4.1: Ranking For Treatment and Control Group

	GROUP	N	Mean Rank	Sum of Ranks
GAIN SCORE	TREATMENT	20	25.38	507.50
	CONTROL	20	15.63	312.50
	Total	40		

Table 4.2: Result Mann-Whitney U Test

	GAIN SCORE
Mann-Whitney U	102.500
Wilcoxon W	312.500
Z	-2.641
Asymp. Sig. (2-tailed)	.008

Results Mann-Whitney U test shows at table 4.1 and 4.2, null hypothesis was rejected because P value less than α ($U=102.5$; $z=-2.64$; $p=0.008$). There was statistically significant difference in mean rank gain score achievement test between treatment and control group.

Table 4.3: Ranking Among Treatment and Control Group For Low Spatial Visualization Ability

	LOW SPATIAL VISUALIZATION ABILITY GROUP	N	Mean Rank	Sum of Ranks
GAIN SCORE	TREATMENT	11	13.36	147.00
	CONTROL	11	9.64	106.00
	Total	22		

Table 4.4: Result Mann-Whitney U Test

	GAIN SCORE
Mann-Whitney U	40.000
Wilcoxon W	106.00
Z	-1.348
Asymp. Sig. (2-tailed)	.178

Table 4.3 and 4.4 shows the Mann-Whitney U test results for low spatial visualization ability student between control and treatment group. Null hypothesis was accepted because P value greater than α ($U=40$; $z=-1.348$; $p=0.178$). There was no statistically significant difference in mean rank gain score achievement test in low spatial visualization ability student between treatment and control group.

Table 4.5: Ranking Among Treatment and Control Group For High Spatial Visualization Ability

		HIGH SPATIAL VISUALIZATION ABILITY GROUP	N	Mean Rank	Sum of Ranks
GAIN SCORE	TREATMENT		9	12.61	113.50
	CONTROL		9	6.39	57.50
	Total		18		

Table 4.6: Result Mann-Whitney U Test

		GAIN SCORE
Mann-Whitney U		12.500
Wilcoxon W		57.500
Z		-2.481
Asymp. Sig. (2-tailed)		.013

Table 4.5 and 4.6 shows the Mann-Whitney U test results for high spatial visualization ability student between control and treatment group. Null hypothesis was rejected because P value less than α ($U=12.5$; $z=-2.481$; $p=0.013$). There was statistically significant difference in mean rank gain score achievement test in high spatial visualization ability student between treatment and control group.

Table 4.7: Results Spearman Coefficient Between Gain Score Achievement Test With Spatial Visualization Ability

			GAIN SCORE	SPATIAL VISUALIZATION ABILITY
Spearman's rho	GAIN SCORE	Correlation Coefficient	1.000	.128
		Sig. (2-tailed)	.	.591
		N	20	20
	SPATIAL VISUALIZATION ABILITY	Correlation Coefficient	.128	1.000
		Sig. (2-tailed)	.591	.
		N	20	20

Table 4.7 shows the results for Spearman Coefficient Correlation between gain score achievement test and spatial visualization ability. There was very low relationship between gain score achievement test and spatial visualization ability, null hypothesis was accepted because P (0.128) value greater than α value. There was no statistically significant correlate between gain score achievement and spatial visualization ability.

DISCUSSION

Animation graphic courseware in teaching helps students to perform better in System Electronic compared with conventional teaching method. This was students learning became more effective comparison with verbal only. Image mental construction was assisted by the images shown at computer screen during the learning (Mayer, 2001). Image help students built cognitive relationship between verbal and image information (Clark and Paivio, 1991). Animation able describe complex concept simply and effectively (Sahairil, 2003).

Animation graphic courseware in teaching low spatial visualization ability students does not help to improve their achievement compared to conventional teaching method. Students with low spatial visualization ability are difficult to process and gain benefit from animation (Mayer, 1994).

However students with high spatial visualization ability got benefit from the animation graphic courseware in learning System Electronic. The achievements students in animation graphic courseware teaching group perform better than students in conventional teaching group. This result support Dual Encoding Paivio Theory state that individual have different tendency in using verbal representative and non verbal representative depend on their ability in verbal system and non verbal system (Paivio, 1986). Therefore high spatial visualization ability students will use imagination strategy more successful than students with low spatial visualization ability.

Lastly in this research found that there was no relationship between students' learning achievement with their spatial visualization ability. But in others research there was positive relationship between students spatial visualization ability and students achievement in learning science subject (Pribyl and Bodner, 1987, Dyche et al, 1993), Chemistry (Carter et al. (1987), Mathematics (Seok, H. S. dan Betty Chan, 2000).

CONCLUSION

Animation graphic courseware as teaching aids in teaching and learning process help students to perform better their performance overall in System Electronic at Polytechnic, Ministry of Higher Education Malaysia as compared to conventional teaching and learning method. Image helps students to construct cognitive relationship between verbal and image information. Spatial visualization ability able to influence students' achievement in learning using animation graphic courseware for teaching and learning process. Individual difference have to consider when design courseware and course software in education.

REFERENCES

- Abdul Hadi Mat Dawi, Toh, S. C., dan Fong, S. F. (2005). "Animasi 3d Digital: Alatan Kognitif Bagi Meningkatkan Prestasi Visualisasi Mental Dalam Pendidikan Untuk Pembangunan Lestari". Seminar Pendidikan JPPG 2005. Universiti Sains Malaysia. 774-782.
- Ahmad Rizal Madar, dan Jailani Md. Yunos (2005). "Gaya Pembelajaran Visual Pelajar Teknikal Menerusi Pembangunan Koswer Berorientasikan Grafik Dan Animasi". Seminar Teknologi Pendidikan Ke 18. 385-397.
- Clark, J. M., and Paivio, A. (1991). "Dual Coding Theory And Education". Dalam Abdul Hadi Mat Dawi, Toh, S. C., dan Fong, S. F. (2005). "Animasi 3d Digital: Alatan Kognitif Bagi Meningkatkan Prestasi Visualisasi Mental Dalam Pendidikan Untuk Pembangunan Lestari". Seminar Pendidikan JPPG 2005. Universiti Sains Malaysia. 774-782.
- Eun-mi Yang and Andre, T. (2003). "Spatial Ability and the Impact of Visualization/Animation on Learning Electrochemistry". *Journal of Science Education*. **25**. 329-349.
- Hannafin, dan Hooper (1989). "Psychological Foundations of Instructional Design for Emerging Computer-based Instructional Technologies: Part". Dalam Zol Bahri Razali dan Shazmin Aniza Abdul Shukor (2005). "The Learning Aids of Mechatronics Engineering Subjects: Simulation Courseware vs Powerpoint Presentation". Konvensyen Teknologi Pendidikan Ke-18. Kuala Terengganu, Terengganu. 16-19 September.
- Ismail Zain (2002). "Aplikasi Multimedia Dalam Pengajaran". Kuala Lumpur: Utusan Publications & Distributors Sdn. Bhd.
- Maizam Alias, Black, T.R., and Gray, D.E. (2002). "Instructions On Spatial Skills And Spatial Visualisation Ability In Engineering Students". *International Education Journal*. **3(1)**. 1– 12.
- Mayer, R. E. (1994). "Visual Aids to Knowledge Construction: Building Mental Representations from Pictures and Words". In Eun-mi Yang and Andre, T. (2003). "Spatial Ability and the Impact of Visualization/Animation on Learning Electrochemistry". *Journal of Science Education*. **25**. 329-349.
- Mayer, R. E. (2001). "Multimedia Learning". UK, Cambridge University Press. dalam Abdul Hadi Mat Dawi, Toh, S. C., dan Fong, S. F. (2005). "Animasi 3d Digital: Alatan Kognitif Bagi Meningkatkan Prestasi Visualisasi Mental Dalam Pendidikan Untuk Pembangunan Lestari". Seminar Pendidikan JPPG 2005. Universiti Sains Malaysia. 774-782.

- Nin Hayati Mohd Yusoff (2005). "Keperluan Pembelajaran Berbantu Multimedia Bagi Subjek Sistem Elektronik Di Politeknik Malaysia". Kolej Universiti Teknologi Tun Husein Onn: Tesis Sarjana.
- Paivio, A. (1986). "Mental Representations: A Dual Approach" In Eun-mi Yang and Andre, T. (2003). "Spatial Ability and the Impact of Visualization/Animation on Learning Electrochemistry". *Journal of Science Education*. **25**. 329-349.
- Rieber, L.P. (1990). "Animation In Computer-Based Instruction". Dalam Safuan Haji Rabaai dan Fong, S.K. (2003). "Kesan Animasi Berasaskan Komputer Terhadap Pembelajaran Bahasa Melayu." *Malaysian Journal of Education Technology*, **3(2)**, 17-24
- Safuan Haji Rabaai dan Fong, S.K. (2003). "Kesan Animasi Berasaskan Komputer Terhadap Pembelajaran Bahasa Melayu." *Malaysian Journal of Education Technology*, **3(2)**, 17-24
- Sahairil Azlan Sahidun (2003). "Penggunaan Animasi Melalui Multimedia Interaktif Dalam Pengajaran Dan Pembelajaran Matapelajaran Elektrik Dan Elektronik". Kolej Universiti Teknologi Tun Husein Onn: Tesis Sarjana.
- Sarjit Singh P. (2005). "Kesan Kontiguiti Spatial Terhadap Pencapaian Pelajar Pelbagai Kebolehan Spatial Dalam Pembelajaran Geografi". Seminar Pendidikan JPPG 2005. Universiti Sains Malaysia. 81-89.
- Seok, H. S. dan Betty Chan (2000). "Spatial Ability And Mathematical Performance: Gender Differences In An Elementary School" ERIC
- Zol Bahri Razali (2001). "Pembelajaran Berbantu Multimedia: Implikasi Pembelajaran Subjek Kejuruteraan Mekanikal". KUKUM.