

**AUTHORS:**

Minah Ak. Japang (1), Rochin Demong (2), Ainnecia Yoag (3), Carolyn Salimun (4)

**AFFILIATIONS:**

(1) *Labuan School of International Business and Finance (SIBF)*  
*Universiti Malaysia Sabah*  
*Labuan International Campus*  
*87000 FT Labuan, Malaysia.*  
[mina1511@mailkal.ums.edu.my](mailto:mina1511@mailkal.ums.edu.my)

(2) *Faculty of Office Management and Technology (FOMT)*  
*Universiti Teknologi MARA*  
*Shah Alam Campus*  
*40450 Shah Alam*  
*Malaysia*  
[rochin@salam.uitm.edu.my](mailto:rochin@salam.uitm.edu.my)

(3), (4) *Labuan School of Informatics Science (SSIL)*  
*Universiti Malaysia Sabah*  
*Labuan International Campus*  
*87000 FT Labuan, Malaysia.*  
[ainnecia@mailkal.ums.edu.my](mailto:ainnecia@mailkal.ums.edu.my), [carolyn@mailkal.ums.edu.my](mailto:carolyn@mailkal.ums.edu.my),

**KEYWORDS:**

Multimedia presentation graphics, students learning preferences, impact of computer-mediated technology.

**SUB-THEME:**

The impact of Information, Communication & Technology (ICT) in Education.

**ABSTRACT**

As our country is moving into a knowledge-based economy, the challenge today for educators is how to create and utilize computer-mediated technologies for enhanced learning process. However, there is still little evidence that supports computer-mediated technologies in Malaysian education. Thus, this study intended to examine the relationship between students learning preferences and the use of multimedia presentation graphics in the classroom atmosphere. There are number of studies that have been carried out on the use of multimedia elements in teaching but only a few studies have explored the link between students learning preferences and computer-mediate technology. The study was done based on Students Learning Preferences (VAK Inventory/Visual-Auditory-Kinetics Inventory) and Multimedia Presentation Graphics Scale (MPG). The participants of this study were students from two major courses namely Fundamental Multimedia taken by students majoring in multimedia and e-commerce, and World Wide Web (WWW) Technology courses taken as a minor subject for finance students. These participants consist of 286 students from 1<sup>st</sup> year students to 4<sup>th</sup> year students. The findings show that in some cases, that our participants indeed enjoyed the use of computer-mediated graphics in their class, whereas in other cases found that it was the use of computer-mediated graphics in business courses taught with computers, draws little participation from the students. In

computer-mediated presentation graphic has inadvertently created well as enhancing students understanding on the subject being taught. Thus, the study aimed to provide the basic understanding of harmonizing computer-mediated graphic into business courses in general.

## INTRODUCTION

Integrating computer-mediated technology in education is a critical part as our country is progressing into a knowledge-based economy. Thus, this raises the challenge for educators to create and utilize the computer-mediated technologies in the enhancing learning process. Parallel with the emergence use of information and communication technologies (ICT) in global education system, the use of computer mediated technology in our business courses has doubtlessly given distinctive impact especially when comes to tertiary education. However, the issue is to what extent our education system has accessed to computer-based learning environment remains less known as there is still little evidence that supports computer-mediate technologies in the Malaysian education literature.

Therefore, the main objective of this paper is to gain fundamental insights on the relationship between students learning preference with computer-mediated technologies used in two majors business courses. Learning preference has been defined as the cognitive, affective, and psychological traits that serve as relatively stable indicators of how learners perceive, interact with and respond to the learning environment (Keefe, 1979). Thus, based on this definition of learning preference, this paper attempts to relate the students learning preference within computer-mediated learning classroom atmosphere.

## LITERATURE REVIEW

Nowadays, there are many articles and publications which discuss about the innovative ways of using computer-mediated technologies in global education. For example, early work done by Steen (1991) provides some fundamental insight of using a computer in mathematics education. The study shows on how computers enable students to observe and create patterns or hidden knowledge from which mathematical connections grow as well as helps educators in stimulating mathematical reasoning. However in Malaysia, our journey into knowledge-based society has been one of the main motivations in integrating computer into our educational delivery system. Nowadays, computer-mediated technologies have played more extensive used in teaching and learning processes especially at Malaysian higher learning institutions.

### ***Multimedia presentation used in teaching and learning***

By definition, multimedia is any combination of text, art, sound, animation, and video delivered to the participants by computer or other electronic and digitally manipulated means (Vaughan, 2004). However in this study the definition of multimedia presentation graphic basically based on Apperson *et al* (2006), which combines the used of PowerPoint and other visual presentation media, such as pen-pad, Macromedia Dreamweaver, Adobe Photoshop, Macromedia Flash as well as the used of some conventional data analysis software such as SPSS in financial research method classes and Quantitative Method for Window software which compiling some quantitative analysis such as stimulation model, waiting line analysis, transportations model and critical paths method for project management analysis in business-based classes. While, learning preference refers to

as among learners as in this paper referred to studentsq

It is remain a fundamental optimistic value in harmonizing multimedia technologies in business education as some studies indicated that the used of multimedia elements did help students learn better, have more positive impression of the instructor, significant improvement in the studentsqattitudes towards courses taught with computer as well as enhancing learning ambience (Apperson et al, 2006; Vale and Leder, 2004). For example, a study done by Forgasz (2002) on the use of computers used in mathematics education atmosphere in Victoria schools, Australia showed that 82% of the 92 samples among the mathematics teacher used various computer-based technologies in their teaching of mathematics. However, these studies focused on the attitude and the convenience used of computer-based technologies in classroom atmosphere, and thus not taken into account studentsqlearning preferences.

### ***Relate Students' Learning Preference and Computer-mediated learning environment***

It is commonly believed that most people favor some particular method of interacting with, taking in, and processing stimuli or information. Nevertheless, when linked to the used of computer mediated technology in our education system, doubtlessly it gives distinctive physiological impact especially when it comes to tertiary education. The early study done by Shafia, Munirah and Zurida (2003), it only explored on the attitude issue and technology anxiety towards computer usage as one of the factor that had caused the changes of perceptions on how trainee teachersq viewed complex mathematical problems, and computer are perceived as an useful tools in supporting mathematics education. However, studied done by Bennet (1999) indeed provides us insight that learning how to use the technology as well as learning with the technology is a challenge for many students.

Thus, studentsqlearning preference and computer-mediated learning ambience were mainly focusing on the method of learning particular to an individual that is presumed to allow the individual to learn best. It has been proposed that instructors should assess the learning preference of their students and adapt their classroom methods to best fit each student's learning style. However, Conner (1996) referred learning preference as a composite cognitive, affective, and physiological factors serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment. The researcher included in this definition is perceptual modalities, information processing style as well as personality patterns. Thus in this paper the studentsqlearning preference basically implied the work of Rose (1987) quoted from Conner (1996) that look at the learning style perspectives from instructional and environmental preference. This approach is to categorize the learning preference from perspective that considers one's preferences in term of sensory perception namely auditory, visual and kinesthetic.

Based on online wikipedia.org (2007), visual, auditory and kinesthetic are one models emphasizes on the sensory modalities of incoming stimuli. The models in this family may use different terms to describe same or similar learning styles. For instance, visual learning is a proven teaching method in which ideas, concepts, data and other information are associated with images and represented graphically. Graphic organizers, such as webs, concept maps and idea maps, and plots, such as stack plots and Venn plots, are some of the techniques used in visual learning to enhance thinking and learning skills. Many researchers show that visual learning is most effective way to teach something to somebody due to its interactive features.

type of learning in which a person will benefit the most from lectures, and oral sessions. Auditory /verbal learners comprehend information best when the information is presented aurally, while on the other hand, kinesthetic learning is a teaching and learning style in which learning takes place by the student actually carrying out a physical activity, rather than listening to a lecture of merely watching a demonstration. Building dioramas, physical models or participating in role-playing or historical reenactment are some examples.

By way of these three learning style, studied by Kearney (1997) points out that it takes time for students to get used to learning via technology, and until they overcome the preliminary trepidations that come with using unfamiliar technologies learning is likely to be somewhat inhibited, students must embrace the idea of playing an active role in learning rather than assuming the role of a passive recipient of information. Another researcher Kirby (1979) explains that cognitive style is a natural ability over which we have no influence whereas learning style is preference, which develop and change over time. Thus, Dunn and Dunn (1981) and Fleming (1987) also advocate the usefulness of these approaches to learning style identification.

## **Methodology**

Basically, the participants for this study were statistically not randomly selected as this study was done in two major courses namely Fundamental Multimedia taking by students majoring in multimedia as well as e-commerce students and WWW Technology course taking as a minor subject for finance students. These participants consist of 286 students range from first year students to fourth year students. The participants of the study were taught using several major multimedia presentation software and tool such as the used of PowerPoint and other visual presentation media such as, Macromedia Dreamweaver, Adobe Photoshop, Macromedia Flash, pen pad as well as the used of some conventional data analysis software such as SPSS in financial research method classes and Quantitative Method for Window software which compiling some quantitative analysis such as stimulation model, waiting line analysis, transportations model and critical paths method for project management analysis in business-based classes. There were approximately 286 students in these two courses taught by two instructors. 206 of the students are in WWW Technology course and 80 students from Fundamental Multimedia course. Questionnaires were set to each of the participants at the end of each course. However, there were only 243 students responded to our questionnaires.

## **Measures and analysis**

The study instruments was based on the combination of VAK Inventory (Visual-Auditory-Kinetics Inventory) adopted from Rose (1987) with the combination of Barsch Learning Style Inventory adopted from Steurer and Tracy (1994) and Multimedia Presentation Graphics Scale (MPG) adopted from Apperson *et al* (2006) and Susskind (2005) for measuring the students presentation graphic preferences as well as their classroom experience.

The students responses to the VAK Inventory and MPG Scale were analyzed by calculating the means and standard deviations on each of the items in MPG and Students Learning Preference, run a Spearman's rho correlation coefficients between the difference learning preference and attitudes towards multimedia presentations graphics used in the two courses namely general attitudes towards power point, physical properties of power point and students classroom preference.

Table 1 assesses the participants' profile based on courses, gender, and the availability of computer-mediated technology-computer ownership. Based on the table, about 33% (81) the participants were male whereas 67% (162) participants were female. A majority 77% (187) of the participants is in WWW Technology classes and another 23% (56) of the participants are from Fundamental Multimedia classes. Moreover, just 86% (208) of the 243 participants claimed to have their own personal computer or laptop. Majority of these personal computer/ laptop reported to have multimedia presentation graphic software such as Macromedia Flash, Macromedia Dreamweaver, Adobe Premier, Adobe Photoshop as well as PowerPoint where some of these software have an additional features used in their multimedia presentation-based projects.

Table 1: ParticipantsqProfile

Gender	Courses	Do You Have Your Own PC/Laptop?		TOTAL
		Have PC/Laptop	Don't have PC/Laptop	
Male	Fundamental Multimedia	25	2	27
	WWW Technology	40	14	54
<b>Total</b>		<b>65</b>	<b>16</b>	<b>81</b>
Female	Fundamental Multimedia	24	5	29
	WWW Technology	119	14	133
<b>Total</b>		<b>143</b>	<b>19</b>	<b>162</b>

Means and standard deviations were calculated for multimedia presentation graphics scale and students learning preference scale. Table 2 presents the small standard deviations relatively to means indicated that data points for Multimedia Presentation Graphics Scale and Students Learning Preference are closed. The study gives us higher level of agreement on preference of multimedia presentation graphic used in the business classes as students able to concentrated better in class (mean = 2.99), which then corresponding to the level of agreement on computers have helped students increasing their learning (mean= 3.19) and interest entertainment value in the class (mean = 3.13). The mean among these items indicated that the students have positive attitude towards multimedia presentation graphic used in the class. These means scores inline with some other findings from early studies done by Galbraith and Haines (1998), Vale and Leder (2004), and Yushau (2006) even though the studies procedure involved experimental instructional setting and different used of computer-based teaching experience and resources.

On the other hand, the finding also detected that in some cases, our participants perceived that the use of presentation graphics sometimes were less spontaneous which implied by mean scores (2.76) with the statement of "the use of power point allows people to learn with no effort or in implicit way". Mean score of 2.65 showed the level of anxiety and confidence of using computer-based learning process higher when students agreed with the statement "I find that the use of power point inhibits discussion", which showed that participants perceived that the use of multimedia presentation graphics in business courses were less spontaneous in arousing their curiosity. These suggested a study done by Barak (2007) on integration process of ICT into traditional teaching environment of the chemistry courses have promoted computer-based learning benefits for students with individual-learning style, as well as students and instructors with auditory teaching-learning style.

Students do not prefer classroom with the lights on full when using power point (mean = 2.43).

Table 2: Descriptive Statistics of Multimedia Presentation Graphics Measurement and Students Learning Preference

	M	SD
<b>Students Perception on instructors' preparation and organization.</b>		
In reference to the instructor's presentation style, it was easy to determine the relative importance of terms and concepts . easy to determine which covered material was more important.	2.97	.640
The instructor was able to stay focused on the lecture material . she/he did not skip around.	2.85	.664
It was easy for me personally to stay focused on the lecture material.	2.86	.700
The instructor was effective in maintaining students' interest in the lecture material.	2.88	.810
The instructor used time effectively to balance lecture and discussion.	2.91	.684
The instructor typically appears to be well prepared for class.	3.04	.676
<b>General Learning Preference.</b>		
I prefer classes where the instructor spends the majority of class time lecturing.	2.73	.722
I prefer classes where the instructor spends the majority of time facilitating discussion.	2.84	.615
I prefer classes where the instructor follows an explicit outline so that I know where we are at all times.	2.96	.602
I prefer classes where the instructor presents material in class that is not in the textbook.	2.95	.766
An instructor should not feel obligated to cover material that is in the textbook unless student express that they do not understand the material.	3.08	.735
<b>General Attitudes Towards Power Point.</b>		
The use of power point is helpful in increasing learning in the classroom.	3.19	.692
The use of power point has increased my interest (entertainment value) in the class.	3.13	.661
The use of power point can help me get a better grade in the class.	2.89	.668
The use of power point allows people to learn with no effort/in implicit way.	2.76	.741
<b>Physical Properties of Power Point.</b>		
I generally prefer a slide that provides full text of the lecture material- everything the instructor wants me to know is completely written out on the slide.	2.77	.719
I generally prefer slides that provide key phrase outlines of the lecture material.	3.07	.633
I generally find visual elements . example, pictures/charts/graphics/maps . more helpful in power point presentations.	3.23	.666
I find it helpful for instructors to read the power point slides as they are presented.	2.87	.674
I find it helpful for instructor to use the power point slides as discussion points for the lectures.	3.05	.612
I find it helpful for instructors to use decorative backgrounds on power points slides used for classroom lectures.	2.97	.632
I find it helpful for instructors to use computer-generated sounds with power points presentations.	2.96	.754
I find it helpful when each slide is revealed all at once.	2.84	.649
I find it helpful when slides are animated as the lecture progresses.	3.09	.656
I find that the use of power point inhibits discussion.	2.65	.673
I find it boring when instructor says the same things the power point slides say.	2.84	.847
<b>Students' Preference of Classroom Environment.</b>		
During lectures using power point, I prefer the lights to be dimmed, producing a sharper screen image.	3.05	2.051

I prefer the lights on full.	2.43	.833
I prefer the lights turned off, producing the sharpest screen images.	2.77	.830
I concentrated better when classes are conducted using power point.	2.99	.659
I absolutely need to take notes while in a class that conducted using power point.	3.05	.722

Note: Means higher than 2 reflected a preference for PowerPoint and Computer-based Learning Environment. \*These items were reverse-coded.

In order to get the a brief view on relationship between fives dimensions of multimedia presentation graphic scale (MPG) and Students Learning Preference (VAK Inventory), the Spearman-rho correlation coefficient reported in Table 3 below.

Table 3: Correlation between VAK Inventory and MPG Scale dimensions

Spearman's rho		Physical of Power Point	Instructor Preparation	Students Learning Preference	Attitudes Towards PowerPoint	Classroom Preference	Audio Learner	Visual Learner
Instructor Preparation	Correlation Coefficient Sig. (2-tailed)	.491** .000						
Students Learning Preference	Correlation Coefficient Sig. (2-tailed)	.425** .000	.348** .000					
Attitudes Towards PowerPoint	Correlation Coefficient Sig. (2-tailed)	.577** .000	.394** .000	.375** .000				
Classroom Preference	Correlation Coefficient Sig. (2-tailed)	.469** .000	.360** .000	.317** .000	.353** .000			
Audio Learner	Correlation Coefficient Sig. (2-tailed)	.050 .434	-.079 .221	-.058 .365	.059 .362	-.100 .120		
Visual Learner	Correlation Coefficient Sig. (2-tailed)	-.045 .486	.048 .456	-.026 .685	.005 .943	.036 .581	-.433** .000	
Kinetics Learner	Correlation Coefficient Sig. (2-tailed)	.008 .899	.046 .480	.077 .233	-.045 .490	.072 .265	-.562** .000	-.436** .000

\*\* Correlation is significant at the 0.01 level (2-tailed). N=243

From the table it is obviously a significant positive relationship between students learning preference and MPG and the VAK Inventory. For instance, there was a slightly positive relationship between students perception on instructors preparation and class organization and students learning preference ( $r = .394$ ,  $p$  (2-tailed)  $< 0.01$ ) and physical attitudes towards the used of power point and other multimedia software in classroom atmosphere ( $r$

mean that the used of multimedia presentation graphic in the classroom has a significant impact on how students perceived the enjoyment of the courses taught with computer and the physical arrangement of the multimedia presentation graphics properties not the main factor that influenced students self-concept of performance in their courses, as well as students beliefs on the usefulness and worth of computer-mediated technology in their life now and in the future (Tapia and Marsh II, 2004).

Moreover, the study gives us higher level of agreement on preference of multimedia presentation graphic used in the classroom as students able to concentrated better in class ( $r = .495$ ,  $p$  (2-tailed)  $< 0.01$ ). This finding have been supported Susskind (2005) studied showed that the used of multimedia presentation graphic such as PowerPoint in the classroom setting, will liable to improve students attitudes and self-efficacy whilst students have a tendency to perceived the subjects more interesting and entertaining.

However there were no significant relationship between MPG dimensions and VAK Inventory. This finding indeed showed that either of these three multimedia presentation graphics preference significantly influenced by students learning preference when comes to auditory learner, visual learner as well as kinetics learner. Conversely, majority of kinetics learner perceived computer corresponding to the higher level of agreement on computers have helped students to do analysis data as well as increased attitudes towards their respective courses generally. Thus, indicated that the students have positive attitude towards computer and multimedia presentation graphic used regardless of students learning preferences.

In the process of understanding the attitudes towards computer-based courses among the three different groups learning preference, experimental studied done by Alldredge and Som (2002) and Samuelsson (2006) in Swedish secondary school on the impact of ICT as a change agent of instructional teaching indicated the similar result where technology used in Statistics courses captured the interest and maximize the learning potential of their students. On the other hand, Samuelsson (2006) showed that computer-based and elements multimedia presentation have acted as a motivating factor for the students to obtained rigorous forms of mathematical concepts and understanding. This is because Statistics course, like some others mathematics-based subjects, need to be taught using real world data gathered from online sources. Thus used of certain analysis software such SPSS and Quantitative Methods (QM) for window have helped to facilitate these learning activities.

## Conclusion

Although there is no significant relationship between learning preferences with computer-mediated learning process, this study indeed parallel with the work of Szabo (1998) which noted that conflicting results are common in learning preference research. Some studies shows better recall among students taught in their preferred modality, such as the used of multimedia elements within instructional setting, while on the other hand, some individuals showing no differences. As in conclusion, the purpose of this paper is to describe the basic understanding on the relationship between students learning preference and their multimedia presentation graphics preferences used specifically in two business courses namely Fundamental Multimedia and WWW Technology for e-commerce students. The definition of this presentation graphics referred to the used of PowerPoint with other major interactive form of multimedia software as well as companion analysis software and pen-pad. Both instructors of the study apparently used the stated computer-based learning activities along the instructional classroom setting. The findings showed there is a general tendency to a positive motivation towards courses taught using the multimedia presentation



comes to edutainment teaching and learning process. In computer mediated presentation graphic has inadvertently create an innovative way to communicate edutainment in business learning process, as well as enhancing studentsq attitude towards these two courses. Thus, in general, this study provides the basis understanding of harmonizing computer mediated graphic into business education. Moreover, the study also indicated that the differences in learning preferences exist in certain computer-mediated instructional setting or teaching and learning process.

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