

Computer Mediated Communication: A Motivational Strategy Toward Diverse Learning Style

RUSNANI ABDUL KADIR
ROSSENI DIN

ABSTRAK

Gaya belajar ialah cara setiap pelajar mula memberi tumpuan, memproses dan menyimpan maklumat baru dan sukar. Kajian ini menggunakan Learning-Style Inventory (LSI) yang dibina oleh Kolb (1985) untuk mengukur gaya belajar 241 pelajar daripada dua buah sekolah menengah di kawasan bandar di Malaysia. Dapatan menunjukkan pelajar sekolah menengah di Malaysia cenderung untuk mencerap secara reflektif. Ini bermaksud, mereka memproses maklumat secara reflektif dan memahami situasi baru melalui persepsi yang konkrit. Pembelajaran di Malaysia lebih cenderung ke arah pemusatan guru. Guru tidak menaruh jangkaan agar pelajar mencari maklumat secara aktif. Sebaliknya, mereka disediakan dengan bahan-bahan dan diberi sedikit sahaja ruang untuk berkembang apa lagi untuk mencabar guru atau pentadbir. Pelajar sebegini, yang dikenal pasti sebagai divergers, belajar melalui pemerhatian dan refleksi. Sehubungan itu, kajian ini mencadangkan agar komunikasi berperantaraan komputer dilaksanakan untuk memberi ruang untuk perkembangan minda bukan sahaja untuk pelajar-pelajar divergers ini, tetapi juga untuk pelajar-pelajar yang mempunyai lain-lain gaya belajar.

ABSTRACT

This study define learning style as the way in which each learner begins to concentrate, process, and retain new and difficult information. It uses the Kolb's Learning-Style Inventory (LSI) (1985), to assess the learning style of 241 students from two urban secondary schools in Malaysia. The finding of this study shows that secondary school children in Malaysia tend to use reflective observation in their learning mode orientation. This means that they are reflective information processors and they understand new situations through concrete perceptions. Teaching and learning in Malaysian secondary schools tend to be traditional and teacher centered. Students are not expected to be active information-seekers. Instead, they are presented with materials and given very limited space to deviate, what more to challenge the teachers and other people of authority. The learner with this orientation does a lot of watching and reflecting. Consequently, the learning styles of these students are of Diverges. Hence, the study suggested that computer mediated

communication be used not only to motivate these divergers but also to suit the need of their counterparts.

INTRODUCTION

The aim of all teachers should be to help their students learn. To help his students learn effectively a teacher needs to know how children learn. To know how children learn teachers need to understand what is learning and the nature of the learning process. Barrow and Milburn (1990), defined to learn as to acquire understanding of something that one did not have before. While Desforges (1995) described learning as a process which brings about a relatively permanent change of behavior which is not attributable to the maturational process or to state-altering chemicals such as drugs. When we are learning, we are in the act or process of acquiring knowledge or skill. In the field of education, learning is the result of education. When teachers teach, they expect students to learn.

Students have different learning style. Studies shows that approximately 30% of people are visual learners who prefer learning with the help of images and pictures. Approximately 30% are auditory learners; they prefer learning by talking and listening. Approximately 40% are physical learners who likes to do things through hands-on experience or exercises. The more our senses are involved, the more we learn and remember. This study suggests the use of computer mediated communication as a tool for providing multisensory lessons to enable students to use 3 memories, visual, auditory, and practical so that recall will be faster and better.

Various models of the learning process have been developed over the years; the four that have been most influential is Gagne's 1956 Hierarchy of Learning, Piaget's 1969 Model of Cognitive Development, Kolb's 1984 Experiential Cycle, and Race's 1993 Ripples of Learning (Ellington & Earl 1999). These models either present levels of learning, or explain the process of learning. Understanding these models helps teachers get the overall idea of the learning process. However these models do not explain how individuals differ in the learning process. As all teachers are aware of, each of the students are unique, with different learning needs and different learning preferences. In short, each child learns in different ways. The process of learning is different for each individual. Thus it is not enough to understand model, but teachers need to be aware of various learning styles.

WHAT IS LEARNING STYLE

Dunn and Dunn (1993: 2) defines learning style as the way in which *each* learner begins to concentrate, process, and retain new and difficult information. Learning

style refers to how individuals learn in terms of their perceptions, processes and preferences. There are a variety of learning styles such as surface learning, deep learning; strategic learning; serialist approach, and holistic approach (Ellington & Earl 1999). Learning style has been extensively studied and was found to vary with gender (Clump & Skogsberg 2003; Honigfeld & Dunn 2003; Keri 2002), academic major (Clump & Skogsberg 2003), and academic achievement (Gadzella & Baloglu 2003; Jone 2003). According to Kolb (1985), understanding one's personal learning style helps one to know his strengths and weaknesses as a learner. Thus a teacher who wants his student to learn more effectively can help by first identifying the personal learning style of the student, and then teach the student how to improve his learning style when face with new experiences. Similarly, teachers may cater students with different learning style by using various media and strategies in their teaching delivery.

There are a number of theories on identifying learning style, one of which was proposed by Kolb (1985), based on experiential learning theory. According to this theory, an individual learns through perception and processing the information. Kolb (1985) described four learning mode orientations as follows:

1. **Concrete Experience (CE):** A learner with this orientation involves himself fully and openly in new experiences. The learner relies on feelings, being intuitive, rather than systematic and scientific approach to problems. They are good intuitive decision-makers. Being open-minded, people with this orientation are good at relating to others. They value relating to people, and they function well in unstructured situations.
2. **Reflective Observation (RO):** A learner with this orientation will carefully observe in order to understand the meaning of ideas and situations. They emphasize on understanding and concern with what is true. They focus on reflection but not action. The observation and reflection of the new experience are based on multiple perspectives. They are not concern with practical application of the idea. As learners, they rely on watching, and forming their opinions based on their own thoughts and feelings. They value patience, impartiality, and considered, thoughtful judgement.
3. **Abstract Conceptualization (AC):** A learner with this orientation relies on thinking and not feeling. They tend to create concepts that integrate their observations into logically sound theories. They are good at systematic planning, manipulation of abstract symbols, and quantitative analysis. They value precision, the rigor and discipline of analyzing ideas, and the aesthetic quality of a neat, conceptual system.
4. **Active Experimentation (AE):** A learner with this orientation is concerned with the practical application and not just reflective understanding. They emphasize on doing and being active instead of just observing. They want to influence people and change situations. They are good at getting things done and are willing to take the risk to achieve their goals. They

value producing results, and having an impact and influence on the environment.

Based on these learning modes, Kolb (1985) formulated four learning styles. These learning styles reflect on whether learners are active or reflective information processors and whether their understanding are based on concrete or abstract perceptions. The four styles are divergers, accomodators, assimilators, and convergers. Divergers prefer to learn through concrete experience and reflective observation. They may be particularly adept at viewing a situation or problem from multiple perspectives and developing imaginative solutions, in other words “brainstorming.”

Accomodators tend to be risk takers who thrive on action and new experiences. They may be comfortably relying on information from others than are individuals with other learning preferences. These “doers” often excel in situations that require adaptation to immediate circumstances. If a plan they are using does not fit the facts, they will discard it rather than reexamine the facts. The dominant learning preferences of accomodators are concrete experience and active experimentation.

Assimilators favor abstract conceptualization and reflective observation. These individuals are often able to pull together very different observations into an explanation or theoretical model. They tend to enjoy abstract assignments, such as creating action plans to solve problems, but less interested in actually implementing the plan devised.

Convergers learn best through abstract conceptualization and active experimentation. Their strength lies in practical application of ideas. They tend to prefer concrete answers to gray areas or open possibilities and will organize their thinking to use hypothetical-deductive reasoning to focus on specific problems.

The idea that every student has the potential to succeed and to achieve in school has always been the underlying philosophy behind formal education. Many of our students do get to realize their potential. Yet there are those who fail to do so. Finding the answer to this puzzle has prompted numerous studies aim at determining the factors of academic success and the relationships of various factors to academic achievement. One of the factors is learning style. Learning style research has indicated that students succeed academically in learning environments that match their learning style. However in Malaysia, learning style has not received much attention. Traditionally, teachers have never taken into account the learning style of their students when delivering their lessons, and educational researchers also have not shown much interest in learning style. The aim of the study is to explore the various learning styles of Malaysian secondary students. The first objective is to find out if the learning styles of academically good students differ from academically weak students. Then the study will look into gender differences. In the discussion section, the study suggests the potential of computer mediated communication as a motivational strategy for the various learning style of student.

METHODOLOGY

A sample of 241 students from two urban secondary schools in Malaysia participated in the study. Two classes of students who had performed well and two classes of students who performed poorly in the public examination the year before were selected from each school. Of the 241 students, 75.1% were female and 24.9%, males. 51% were Malay, 33.6% Chinese, 13.7% Indian, and 1.7% other. The average age of the students was 16. In each school, the school counselor trainee administered the inventory to students during their regular class time.

Learning-Style Inventory (LSI), Kolb (1985) was used. The inventory consists of a set of statements aimed at determining students' learning style preferences. Participants complete, in rank order, four sentence endings that correspond to four learning mode orientations: (1) concrete experience - CE, (2) abstract conceptualization - AC, (3) active experimentation - AE, or (4) reflective observation - RO. Two combinations of ranking scores are plotted on a grid to identify the intersection of the scores and thus indicate the learner's preferred learning styles quadrant: diverger, assimilator, converger, or accomodator.

RESULTS

LEARNING MODE ORIENTATION

The mean score for all four learning modes indicate that students have equal tendency towards all modes of learning orientation (Table 1). Table 2 presents the means and standard deviations for learning mode orientation by gender and achievement level. T-test analyses for the achievement group did not find any significant difference between the high achievement level group and the low achievement level group for all learning mode orientations (Table 3). In comparing the male and female group, t-test analyses also did not find any significant difference between them, for all learning mode orientations (Table 4).

TABLE 1. Overall means and standard deviations for learning mode orientation

| Variable | N | Mean | SD |
|-------------------------------|-----|-------|------|
| 1. Abstract conceptualization | 241 | 29.39 | 5.55 |
| 2. Active experimentation | 241 | 29.92 | 5.18 |
| 3. Concrete experience | 241 | 28.33 | 5.75 |
| 4. Reflective observation | 241 | 32.55 | 5.84 |

TABLE 2. Means and standard deviations for learning mode orientation by gender and achievement level

| Variable | Male Mean (SD) | Female Mean (SD) | High Achiever Mean (SD) | Low Achiver Mean (SD) |
|-------------------------------|----------------|------------------|-------------------------|-----------------------|
| 1. Abstract conceptualization | 31.20 (5.70) | 28.79 (5.38) | 30.37 (5.79) | 28.37 (5.11) |
| 2. Active experimentation | 30.23 (5.29) | 29.82 (5.16) | 29.87 (5.49) | 29.97 (4.86) |
| 3. Concrete experience | 28.07 (5.05) | 28.41 (5.97) | 27.95 (6.02) | 28.72 (5.45) |
| 4. Reflective observation | 30.57 (5.32) | 33.21 (5.87) | 32.07 (6.01) | 33.05 (5.64) |

TABLE 3. Results of t-test analysis for learning mode orientation by achievement level

| Variable | Achievement group (N) | Mean | t-test | Sig. |
|-------------------------------|-----------------------|-------|--------|------|
| 1. Abstract conceptualization | High (123) | 30.37 | -2.827 | ns |
| | Low (118) | 28.37 | | |
| 2. Active experimentation | High (123) | 29.87 | .156 | ns |
| | Low (118) | 29.97 | | |
| 3. Concrete experience | High (123) | 27.95 | 1.038 | ns |
| | Low (118) | 28.72 | | |
| 4. Reflective observation | High (123) | 32.07 | 1.301 | ns |
| | Low (118) | 33.05 | | |

TABLE 4. Results of t-test analysis for learning mode orientation by gender

| Variable | Group (N) | Mean | t-test | Sig. |
|-------------------------------|--------------|-------|--------|------|
| 1. Abstract conceptualization | Male (60) | 31.20 | 2.9620 | ns |
| | Female (181) | 28.79 | | |
| 2. Active experimentation | Male (60) | 30.23 | 0.5830 | ns |
| | Female (181) | 29.82 | | |
| 3. Concrete experience | Male (60) | 28.07 | -0.405 | ns |
| | Female (181) | 28.41 | | |
| 4. Reflective observation | Male (60) | 30.57 | -3.091 | ns |
| | Female (181) | 33.21 | | |

LEARNING STYLE

To determine which of the four learning style quadrants the respondents fall into (Table 5), the AC-CE score and AE-RO score were calculated. When the scores were put on the grid it was found that overall, the students are divergers (1.06,

-2.63), high achievers are divergers (2.41, -2.20), low achievers are divergers (-.35, -3.08), male are divergers (3.13, -.33), and female are divergers (-.38, -3.39).

TABLE 5. The AC-CE and AE-RO scores for all respondents, male-female, and low-high achiever

| Group (N) | Variable | Mean | SD |
|--------------------------|----------|-------|------|
| 1. All respondents (241) | AC-CE | 1.06 | 9.35 |
| | AE-RO | -2.63 | 9.15 |
| 2. High achiever (123) | AC-CE | 2.41 | 9.62 |
| | AE-RO | -2.20 | 9.3 |
| 3. Low achiever (118) | AC-CE | -.35 | 8.87 |
| | AE-RO | -3.08 | 8.91 |
| 4. Male (60) | AC-CE | 3.13 | 8.91 |
| | AE-RO | -.33 | 8.82 |
| 5. Female (181) | AC-CE | -.38 | 9.41 |
| | AE-RO | -3.39 | 9.15 |

DISCUSSION

The mean score for all four learning modes indicate that students have equal tendency towards all modes of learning orientation (Table 1). T-test analyses for the achievement group did not find any significant difference between the high achievement level group and the low achievement level group for all learning mode orientations (Table 3). In comparing the male and female group, t-test analyses also did not find any significant difference between them, for all learning mode orientations (Table 4). When the scores were put on the grid it was found that overall, the students are divergers - High achievers, low achievers, male, female - all are divergers (Table 5). This shows that secondary school children in Malaysia tend to be reflective observers in their learning mode orientation. This means that they are reflective information processors and they understand new situations through concrete perceptions which means they prefer to learn through concrete experience and reflective observation. They may be particularly adept at viewing a situation or problem from multiple perspectives and developing imaginative solutions, in other words “brainstorming.”

According to Kolb (1985), the strengths of divergers are that they are imaginative, they understand people, can recognize problems, and able to brainstorm. However, they are not good at making decisions. Traditional parenting style and traditional teaching-learning philosophy enforce this dependence trait in the students. Good children are those who obey their parents and the elders. They should not ask too many questions. While in schools, good students are

expected to follow what the teachers say and abide to school rules impose on them. Failure to obey will result in punishment. This perhaps explains the findings of this study.

In response to the results, it is recommended that computer mediated communication or computer conferencing should be used as a teaching and learning media or teaching aid to overcome this problem and at the same time enhance learning. As such, students may feel more motivated to participate in active learning since they are not required to perform or present anything at the spur of the moment in public. According to Henri (1988), McCreary and Van Duren (1987), Harasim (1991,1992), Rekkedal and Paulsen (1989), Rekkedal (1990), Kaye (1992), Jonassen (1996), Davis et al. (1997), Somekh (1997), Davis (1997), Jonassen et al. (1999) and Newby et al. (2000), there are more than twenty effective ways to integrate computer conferencing into the classroom. They include individual and team projects, peer counseling, decision making, online games, simulation and role-playing, debate teams, formal and informal discussion, structured seminar, online lecture and education utility. These projects can be done collaboratively to get more input and to enrich the learning strategy.

Malaysian students which was found to be divergers, are often confronted with a problem when asked to speak in public. They face problems such as they do not know what to say and they do not have the right words to use. Based on the problems faced, students should be able to generate ideas and organize them coherently if given enough time for reflection before they post an idea to the whole class. With computer mediated communication (CMC), students have the ability to revise the text and edit it for appropriate grammar, sentence structure and content worth. CMC provide such an opportunity to explore and experiment ideas. This instructional tool is able to promote authentic usage of a computer mediated communication tool in real life situations and provide opportunity for students to develop their creative and critical thinking skills.

INNOVATION IN COMMUNICATION

CMC promote real and natural communication. Through CMC, students are able to communicate with each other and others around the world that speaks the Malay language. This provides authentic contexts for communication. Besides that, CMC provides opportunities for independent learning. The usage of CMC involves a wide range of skills including knowing how to use a personal computer and becoming familiar with the special registration procedure for communication using CMC and report submission using CMC facility. Also, it gives the opportunity for users to navigate through the vast resources on the cyberspace. Mastering these skills will give students an advantage to use electronic discussion and other types of telecommunications throughout their lives. The utilization of CMC stimulates students' interest in communicating as they feel

that they have an authentic audience who will respond to their ideas. In short, CMC promotes opportunities for communication and collaboration.

Students ask more questions, generate and share more ideas when using CMC (Rosseni & Aidah 2004). They had more ideas to share with their partners. CMC permit cooperative and collaborative learning between groups, to facilitate literacy and to promote cross-cultural learning. This is because when students write to each other they share and exchange their knowledge and ideas with one another. Besides that, they cooperate with one another by giving positive responses and feedbacks to each other. CMC motivates participation in classroom activities and promote cooperative learning among students whereby they learn by sharing their knowledge through the electronic discussions activities. These activities encourages practice in conducting academic discourse as learners' try to express their ideas and opinions to real audience. Figure 1 shows a conceptual framework of a CMC implementation model in the Malaysian school setting to cater for students with various learning style.

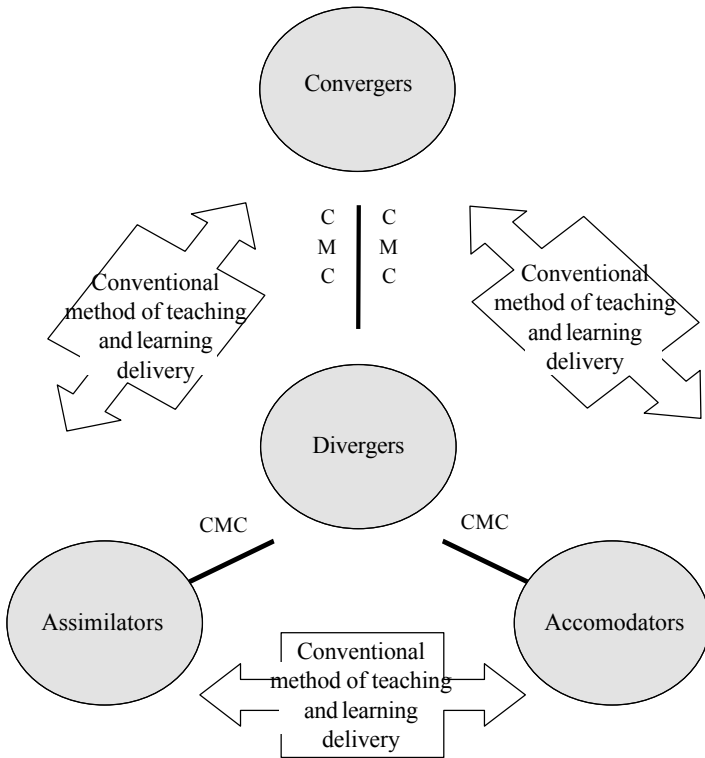


FIGURE 1. Conceptual framework of CMC Implementation Model in the Malaysian school setting for students with different learning style

CONCLUSION

This study did not find any significant difference in the learning mode orientation and learning style between low achievers and high achievers. And the learning mode orientation and learning style also are not significantly different across gender. This means that academic achievement and gender have no relation to learning style and learning mode. Perhaps there are other factors that have greater influence towards academic achievement. Failure to find any differences could also be attributed to the fact that the respondents are 16-year old secondary school students who have been exposed to a limited variety of experiences in their learning process. Regardless of gender and level of achievement, they all undergo the same process, under the same Malaysian school system. Future research with Malaysian students should perhaps focus on college students, as they may have been exposed to a wide variety of learning situations. Thus the findings may perhaps be more meaningful and provide better insight into the learning mode and learning style of Malaysian students. In the mean time, the study suggest that Malaysian schools should take advantage of the smart school infrastructure provided by the Ministry of Education to implement computer mediated communication in its effort to motivate students particularly the divergers to have a motivating and meaningful experience while learning.

REFERENCES

- Barrow & Milburn.1990. *Critical dictionary of educational concepts*. New York: Harvester Wheatsheaf.
- Clump, M.A. & Skogsberg, K. 2003. Differences in learning styles of college students attending similar universities in different geographic locations. *College Student Journal* 37 (4): 501-509.
- Davis, N. 1997. Do electronic communications offer a new learning opportunity in education? In. Somekh, B. & Davis, N. Eds. *Using information technology effectively in teaching and learning*. London: Routledge.
- Davis, N., Desforges, C., Jessel, J., Somekh, B., Taylor, C. & Vaughan, G. 1997. Can quality in learning be enhanced through the use of IT? In. Somekh, B. & Davis, N. Eds. *Using information technology effectively in teaching and learning*. London: Routledge.
- Desforges, C. Eds. 1995. *An introduction to teaching*. Oxford: Blackwell.
- Dunn, R., & Dunn, K. 1993. *Teaching secondary students through their individual learning styles*. Boston: Allyn & Bacon.
- Ellington, H. & Earl, S. 1999. *Facilitating student learning*. Skudai, Johor : Penerbitan Universiti Teknologi Malaysia.
- Gadzella, B.M. & Baloglu, M. 2003. High and low achieving education students on processing, retaining, and retrieval of information. *Journal of Instructional Psychology* 30 (2): 99-104.

- Harasim, L. 1991. Teaching by computer conferencing. In. Miller, A.J. Eds. Applications of computer conferencing to teacher education and human resource development. *Proceedings International Symposium on Computer Conferencing* 25-33.
- Harasim, L. 1992. Foreword. In. M.F. Paulsen. *From bulletin boards to electronic universities: distance education, computer-mediated communication, and online education*, i-iii. University Park, Pennsylvania: The American Center for the Study of Distance Education.
- Henri, F. 1988. Distance education and computer-assisted communication. *Prospects* 18 (1): 85-90.
- Honigsfeld, A. & Dunn, R. 2003. High school male and female learning-style similarities and differences in diverse nations. *The Journal of Educational Research* 96 (4): 195-207.
- Jonassen, D.H. 1996. *Computers in the classroom: Mind tools for critical thinking*. Ohio: Merrill.
- Jonassen, D.H., Peck, K.L. & Wilson B.G. 1999. *Learning with technology: A constructivist perspective*. New Jersey: Prentice Hall.
- Jone, C. 2003. Are students' learning styles discipline specific? *Community College Journal of Research and Practice* 27: 363-375.
- Kaye, A.R. 1992. Learning together apart. In. Kaye, A.R. Eds. *Collaborative learning through computer conferencing: The Najapen papers*, 1-24. Berlin: Springer—Verlag.
- Keri, G. 2002. Male and female college student's learning styles differ: An opportunity for instructional diversification. *College Student Journal*.
- Lawton, D. 1981. *An introduction to teaching and learning*. London: Hodder & Stoughton.
- McCreary, E.K. & Van Duren, J. 1987. Educational applications of computer conferencing. *Canadian Journal of Educational Communication* 16 (2): 107-115.
- Newby, T.J., Stepich, D.A., Lehman, J.D. & Russell, J.D. 2000. *Instructional technology for teaching and learning: Designing instruction, integrating computers, and using media*. 2nd Ed. New Jersey: Prentice-Hall.
- Rekkedal, T. 1990. Distance education and computer conferencing: Some international experiences. In. Carlsen, T., Rekkedal, T. & Soby, M. *Elektronisk fjaernopplaering—om undervisning og kompetanseutvikling gjennom datakommunikasjon og netver*, 1-23. Oslo: Norwegian Center for Distance Education.
- Rekkedal, T. & Paulsen, M.F. 1989. Computer conferencing in distance education: Status and trends. *European Journal of Education* 24 (1): 61-72.
- Roszeni Din & Aidah Abdul Karim. 2004. Promoting indigenous language development through computer mediated communication in an online learning environment: A hybrid approach. *Proceeding Of ED-MEDIA 2004—World Conference On Educational Multimedia, Hypermedia & Telecommunications, Lugano, Switzerland*. USA: American Association For Computing In Education (AAACE).
- Somekh, B. 1997. Classroom investigations: Exploring and evaluating how IT can support learning. In. Somekh, B. & Davis, N. Eds. *Using information technology effectively in teaching and learning*. London: Routledge.