

# The VARK Learning Style of the University Student in Computer Course

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**Abstract**—The achievement of teaching and learning process doesn't come solely from the teacher or supporting material. It requires the coordination and motivation of the learner as well. If the teacher realizes the ability of the learner and provide appropriate learning environment, the learner will be able learn in accordance with their skills and learning style. The VARK learning style process can categorize the learner's abilities in to 4 groups: 1) Visual (V), 2) Aural (A), 3) Read/Write (R) and 4) Kinesthetic (K). The learner will be able to learn from direct practice. When the learner has many learning options according to their potential, this will lead to motivation of learning.

**Index Terms**—VARK, learning style, computer education, higher education, computer course

## I. INTRODUCTION

It's essential for university students to develop their self-learning potential in order to apply for learning process of career. For learning management, the teacher has to develop teaching style that helps enhance the maximum potential of the learner and support the self-improvement of the learner in order to achieve the determined objectives. There are many factors affecting the learning organization such as knowledge and ability of teaching and teaching technique. The successful learning process also depends on the learner. The learner must have prominent learning goals that can be applied with their career [1]. The researcher also teaches a computer course. It's found that the computer learners are really different. This is normal for university students that are mostly experienced adults with high individuality. The teaching for university is therefore required good preparation that is suitable to the ability of individual difference [2]. Therefore if the teacher realizes the abilities, existing knowledge, readiness, interests and diligence of each learner, it will be beneficial to proper teaching and potential enhancement organization for the learner. This method can stimulate and enhance the learner's learning.

## II. RESEARCH OBJECTIVE

The objective of this study was to the VARK learning style of students at Sripatum University-Chonburi Campus and Burapha University in computer course.

## III. RELATED THEORY

The learning style means the physical characteristic, thought and feeling that an individual uses for stably acknowledging, reacting and interacting with the environment. It is important and affects the learning motivation and efficiency of the learner [3]. There are many scholars who study the learning style in order to build learning motivation in many forms [4].

### A. Learning Style of Kolb

This learning style is applied from the Experiential Learning Theory that was obtained from the human development and learning theory of the leading scholars from 20<sup>th</sup> century including John Dewey, Kurt Lewin, Jean Piaget, William James, Carl Jung, Paulo Freire, Carl Rogers and others. The learning style of Kolb divides the learning style by enquiring the learners into 4 forms: diverging, assimilating, converging and accommodating. It's found that many people do not know their learning style.

### B. Learning Style of Peter Honey and Alan Mumford

The concept of this learning style uses the learning style and cycle of Kolb to create a survey to categorize the learners into 4 groups: reflectors, theorists, pragmatists and activists.

### C. Learning Style of Fleming

The concept of Fleming learning style categorizes the learning style according to the learner's perception into 4 types called VARK:

1) Visual (V): The learner is interested in the visual material. Therefore the teacher must present the communicating text.

2) Aural (A): The learner who is good at listening such as lecture, group discussion, conversation and website chat.

3) Read/Write (R): The learner is good at reading documents, books, and material by his/her own then summary what has been read.

4) Kinesthetic (K): The learner is good at using his/her experience and directly practices it.

It can be concluded that the learning cycle of Kolb focuses on the learner to diverge, assimilate, converge and accommodate their knowledge and transfer their experience. However, the learning cycle of Peter Honey

and Alan Mumford focuses on behavior trend and make the learner to learn in process in order for them to gain experience then review and conclude the obtained experience which leads to learning planning [5]. The categorization of learner type of VARK focuses on the learner's abilities, promoting the motivation of the learner through the contents and activities. The VARK method of learning categorization uses a downloadable survey from [www.vark-learn.com](http://www.vark-learn.com). The results can be concluded in a short period. Therefore, this method is widely used in many countries by university students [6].

For this reason, the research selected the VARK learning style to categorize the learners. It is an appropriate approach for development of teaching material, activities and environment to suit the ability of university computer students and build their motivation.

#### D. Example of VARK Questionnaire

The VARK questionnaire categorizes the learning questionnaire in accordance with the perception of the learners. The Fleming survey contains 16 questions with 4 multiple choices. The example of questions and answers of VARK survey is shown in Table I:

TABLE I. EXAMPLE OF VARK QUESTIONNAIRE

Question	You are going to choose food at a restaurant or cafe. You would:		
Answer	V	Look at what others are eating or look at pictures of each dish.	
	A	Ask the waiter or friends to recommend choices.	
	R	Choose from the descriptions in the menu.	
	K	Choose something that you have had there before.	

#### E. Interpretation of VARK Learning Style

The interpretation of VARK learning style questionnaire is done by collecting the answers from an individual learner and interpreted into ability point of VARK learning style [7]:

Calculating the total scores of VARK:

$$\boxed{V} + \boxed{A} + \boxed{R} + \boxed{K}$$

Use the total scores to find the stepping distance from the Table II:

Table II Use scores of stepping distance to calculate the score level of learning style.

TABLE II. USE SCORES OF STEPPING DISTANCE TO CALCULATE THE SCORE LEVEL OF LEARNING STYLE.

The total of my four VARK scores is	My stepping distance is
14-21	1
22-27	2
28-32	3
32+	4

Steps of learning style calculation:

1) Calculate the total scores of VARK to find the stepping distance from Table II. S is used for stepping distance.

2) Sort the VARK points in order from the maximum to minimum. Use  $n_1$ ,  $n_2$ ,  $n_3$ ,  $n_4$  respectively.

3) If  $n_1 - n_2 > s$  meaning the learner has single preference of learning style. If the result is less, follow step 4.

4) If  $n_2 - n_3 > s$  meaning the learner has bi-modal preference. If the result is less, follow step 5.

5) If  $n_3 - n_4 > s$  meaning the learner has tri-modal preference. If the result is less, it means the learner has four-modal preference.

#### F. Single Preference of Learning Style

Use the total scores of VARK of the learner to compare with Table III.

TABLE III. THE STRENGTH OF SINGLE PREFERENCE

Total Scores	The strength of single preference			
	Very Strong Preference	Strong Preference	Mild Preference	Multimodal No single preference
16-21	6+	4-5	2-3	0-1
22-27	7+	5-6	3-4	<3
28-32	8+	6-7	4-5	<4
33+	9+	7-8	5-6	<5

Use the highest VARK scores of each learner to interpret as shown in the examples 1-4:

Example 1: Mr.A has VARK scores = 17.

$$\boxed{10} + \boxed{3} + \boxed{2} + \boxed{2}$$

V                      A                      R                      K

1) Calculate value of stepping distance =1

2) Calculate the learning style:

V (10) – A (3) = 7 whereas 7>1

3) Mr.A has V learning style. He has a very strong visual preference.

Example 2: Mr.B has VARK scores = 27.

$$\boxed{12} + \boxed{6} + \boxed{5} + \boxed{4}$$

K                      R                      V                      A

1) Calculate value of stepping distance =2

2) Calculate the learning style:

K (12) – R (6) = 6 whereas 6>2

3) Mr.B has K learning style. He has a strong kinesthetic preference.

#### G. Bi-modal Preference of Learning Style

Example 3: Mr.C has VARK scores = 16.

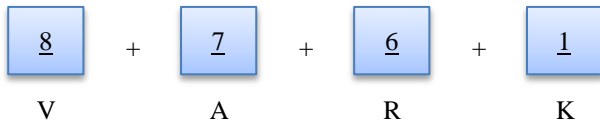
$$\boxed{5} + \boxed{5} + \boxed{3} + \boxed{3}$$

R                      K                      V                      A

Mr.C has bi-modal preference of learning style: R and K.

#### H. Tri-modal Preference of Learning Style

Example 4: Mr.D has VARK scores = 22.



Mr.D has tri-modal preference of learning style: V, A and K.

### I. Four-modal Preference of Learning Style

The learner has 4 styles of learning: V, A, R and K

### J. Learning Design

The design of learning material in accordance with the learning style of the learners is done by making the learners to do the questionnaire in order to categorize the group of learners into 4 styles shown on Fig. 1.

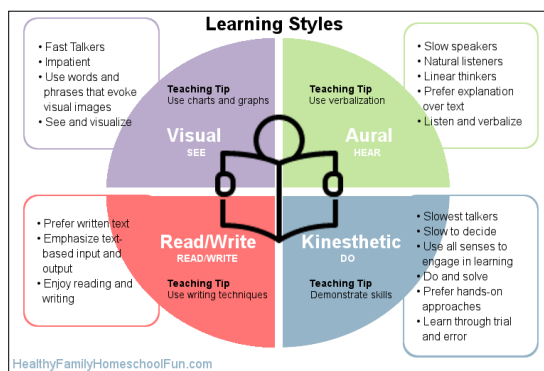


Figure 1. VARK Learning Style

The 1<sup>st</sup> style is visual. The learner is interested in visual material. Using images and colorful content shall stimulate the learners.

The 2<sup>nd</sup> style is aural. The learners of this group like to discuss and exchange ideas. The suitable learning style is lecture and group discussion.

The 3<sup>rd</sup> style is read/write. The learners of this group like to read and learn from documents, books and contents by themselves and summarize what they have read.

The 4<sup>th</sup> style is kinesthetic. The learners of this group like applying the theory into practice [8].

## IV. RESEARCH METHODOLOGY

### A. Finding of the Learning Style of the Learners

#### 1) Population and sample group

The sample group of the project consists of 145 university students who have registered for computer course. There are 81 male and 64 female students.

#### 2) Research Tools

An online questionnaire in accordance with the VARK learning style in Thai language using Google Form. The questionnaire is divided into 2 parts. Part of the questionnaire consists of 1) basic information of the responders, student ID, name-last name, gender, university, faculty and academic year; 2) questionnaire of VARK learning style consisting of 16 questions and 4 multiple choices. The VARK learning process categorizes the learner's abilities in to 4 groups: 1) Visual

(V), 2) Aural (A), 3) Read/Write (R) and 4) Kinesthetic (K) as shown on Fig. 2 and Fig. 3.

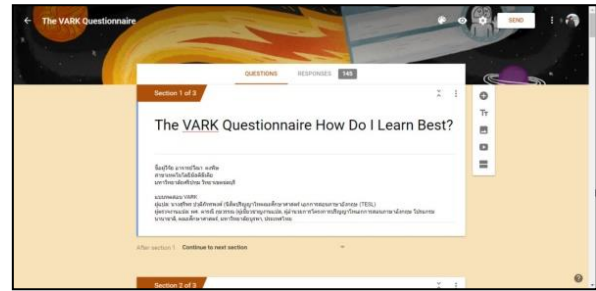


Figure 2. Online Survey of VARK



Figure 3. Example of VARK questionnaire

## V. RESEARCH RESULT

### A. Basic Information of the Learner

1) There are 145 responders with 55.9% of male and 44.1% of female as shown on Fig. 4.

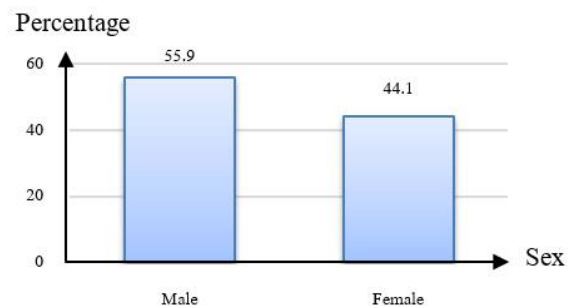


Figure 4. Learner's sex

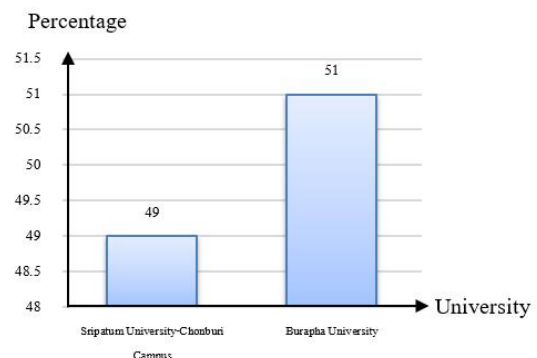


Figure 5. Learner's university

2) The learners are from Sripatum University-Chonburi Campus, Thailand (51%) and Burapha University, Thailand (49%) as shown on Fig. 5.

3) The learners are studying Information Technology, Business Computer and Multimedia Technology 68.3%, 25.5% and 6.2% respectively.

4) There's 54.5% of the learners from the 3rd year, 18.6% from the 4th year, 16.6% from the 1st year and 9% from the 2nd year. There are other learners as well such as from external learning scope which is account of 1.3%.

### B. VARK Learning Style

The VARK learning style questionnaire results from the sample group: The learners chose V learning style 907 points, A learning style 771 points, R learning style 757 points and K learning style 911 points. The total points are 3,346 points as shown on Fig. 6.

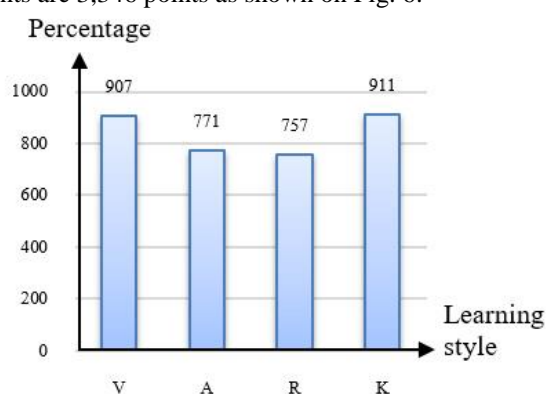


Figure 6. Total points of VARK questionnaire

Considering the learning style from the total number of 145 responders, it is found that:

1) There are 45 learners with single preference of learning style or 31.03%.

2) There are 77 learners with bi-modal preference of learning style or 53.1%.

3) There are 22 learners with tri-modal preference of learning style or 15.17%.

4) There are 1 learner with four-modal preference of learning style or 0.7% as shown on Fig. 7.

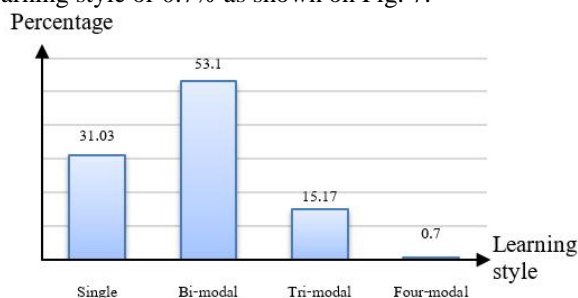


Figure 7. Learning style

The categorization of learner abilities is shown on Table IV.

TABLE IV. THE MODEL OF LEARNER

Student's preference	Learning style	Total	Percentage
Single	V	15	10.34

Student's preference	Learning style	Total	Percentage
Bi-modal	A	5	3.45
	R	8	5.52
	K	17	11.72
	VK	23	15.86
	VA	13	8.97
	VR	13	8.97
	AR	6	4.14
Tri-modal	AK	15	10.34
	RK	7	4.83
	VAR	3	2.07
	VAK	5	3.45
Four-modal	VRK	6	4.14
	ARK	8	5.52
	VAR	1	0.68

## VI. RESEARCH CONCLUSION

1) The learning style of most of the computer learners is bi-modal preference [9]. There are 53.11% of them. This means the learners are competent in 2 styles: VK, AK, VA, VR, RK and AR especially the VK styles.

2) Most of the learners are competent of VK learning style or 15.86%. The learners virtually learn from the demonstration of the teacher and practice in real on the computer.

3) The research result is found that the teaching material design should be done by creating creative activities and environment in consistent with the learning abilities of the learners in order to promote their motivation and perception. This approach will enhance the learning achievement of the learners.

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