

# The Consequences of Mismatching Learning Styles with an Innate Learning Style among High School Students in Songkhla, Thailand: Academic Performance and Strain

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**Abstract:** *The aim of this research is to find out how learning styles affect their academic performance and strain. Learning styles were slightly different in each theory. This research employed theories of VARK, which categorized learning styles into visual, auditory, reading/writing, and kinesthetic. The study analyzed the consequences of matching and mismatching learning styles among 410 high school students in Songkhla, Thailand. According to the research's hypothesis, a person's learning style affects the degree of stress and academic performance. The study's statistics show that the majority of high school students are mismatching learners. Most of them appear to be a visual - dominant learner, but seem to absorb and retain information by reading/writing. In terms of academic accomplishment, the matching learners, who employ a learning style that matches with their innate style, achieve higher GPA in comparison with the incongruent ones. The level of stress, however, does not appear to be impacted by learning styles; the gap of the strain level between matching and mismatching learners is narrow. Therefore, other variables outside of learning style may have an influence on stress levels more strongly. After analyzing all the data, a student's innate learning style has the most influence on academic achievement.*

**Keywords:** Learning styles, Academic performance, Strain, VARK theory, High school students

## 1. Introduction

The term "learning style" is used to describe the way each person employs to learn. Each student learns differently; some learn through actions, and others may learn by oral litany. Aristotle, who first recognized the word "learning style", believed that, "each child processed specific talents and skills". Ever since Aristotles began to observe the different learning styles of each student, the concept of learning styles has expanded. Lev Vygotsky (1978), an eminent Russian researcher, believed that social learning anticipates a child's development and a child's exact surroundings will influence how the child thinks. Vygotsky considered that an individual's community shows a dramatic role in the abilities to make meaning from things. Learning styles are also relevant by the behavior, the attitude, and the people the learners interact with.

Neil Fleming (1987) developed a way to help students learn more about their learning preferences called the VARK model. VARK models categorize learning styles into visual, auditory, reading/writing, and kinesthetic. Visual learners may prefer to use a lot of connectors or diagrams, create graphic organizers. Auditory learners listen carefully to lectures and focus on the tone of speech. Read/write learners regularly prefer to have the text in some format or create diagrams then convert them back into statements. Kinesthetic learners learn best by doing. According to Kolb's learning styles (1984), each person is naturally drawn to a single learning style and one's environment, educational experiences, or individual cognitive structure are the factors that grant a person's single learning style. Kolb's theory is that, "learning is the process whereby knowledge is created through the transformation of experiences" (Kolb, 1984).

Numerous research shows that the children in one classroom have a variety of distinct learning profiles. As mentioned by Dunn and Dunn (1978), only 20 - 30% of students appear to be auditory learners, 40% are visual learners, and 30 - 40% are kinesthetic or visual learners. Barbe and Milone (1981) stated that for school children the most frequent modality strengths are visual (30%) or mixed (30%), followed by auditory (25%), and then by kinesthetic (15%). Price, Dunn, and Sanders (1980) discovered that nursery schoolers are mostly kinesthetic, and there is a steady development of visual learning through the elementary grades. Only in the fifth or sixth grade can most students learn information through auditory learning. Carbo (1983) found that good readers favor learning through their visual and auditory senses, while poor readers have a stronger preference for kinesthetic learning by exploring the reader's perceptual styles. Due to these different learning styles, teachers must include activities that cater to each one in their curriculum so that all students can learn in their innate style in their classes.

This study, researchers used Neil Fleming's VARK Learning Style to count the number of high school students whose current learning style is mismatched with their innate learning style. The research investigated the correlation between students' academic achievement and the effect of mismatching learning styles the students currently employed. Moreover, the relationship between students' actual learning preferences and their level of stress. The sample of 410 students, 156 male and 254 female, in grades 10 through 12 in Songkhla, Thailand, was chosen for this study.

**Objectives:** The research's aims were as follows.

- To discover the innate learning styles among high school students.
- To discover the proportion of students who apply matching and mismatching learning styles.
- To analyze the relation between students' matching learning styles and academic achievement by considering from their grade point average.
- To assess the level of stress among the students who apply matching and mismatching learning styles.

**Hypothesis:** The following are the study's formulated hypotheses:

Most students, especially those who prefer auditory learning, use matched learning methods.

Learning styles are significantly impacting academic achievements and the level of stress.

Students who have been using a learning style that matches with their innate learning style will have a lower level of stress and better academic performance.

## 2. Method

The researcher planned to keep the school size of the population's sample in a random process. The researcher ran

a survey via a Google Form questionnaire in order to collect the data.

The sampling group, included 410 high school students selected through random sampling techniques from various schools of Hat - Yai District in Songkhla Province of south in Thailand. The respondents were divided by gender: 156 males (38.04%) and 254 females (64.6%). Neil Fleming's VARK Learning Style was used to identify students' innate learning styles. The questionnaire began by inquiring about the respondent's personal information, before moving on to their study habits and lifestyle. Then some questions are employed to find out the respondent's current learning style - (See, Table 2.1 for details), as well as their innate learning style (See, Table 2.2). After that, some questions are employed to access their level of stress (See, Table 2.3). Afterward, the survey participants were asked to provide a grade point average (GPA) which is an average overall score for all the subjects, representing the academic achievement from - 10th to 12th - or Mathayom 4 to 6 in Thailand's education system. After the data screening, the researchers categorized information by grouping learning styles of students due to the matching and mismatching learning method.

**Table 2.1:** The Using Learning Style Question Template

	(1) auditory	(2) visual	(3) kinesthetic	(4) reading/writing
What will you do the night before the exam?	Listen to the YouTube summary clip.	See mind map summary or content table diagram.	Do the exercise.	Rewrite the summary.
What will you do if you don't understand the subject matter?	Ask your friends to explain it to you.	Reread the content.	Find more exercise to do.	Do the summary.
How do you remember the new vocabulary?	Spell it out.	Use color pens to write the vocabulary.	Use a finger to write the word in the air.	Write the word repeatedly.
What would you do if you were tasked with assembling a chair?	Ask your friends.	Watch the assembly method on the internet.	Let's actually do it.	Read the manual.
How do you prepare yourself before doing the presentation?	Listen to your recording again.	Remember the content by looking at the presentation.	Do it without preparing.	Write the script.
What type of presentation do you like?	Oral speaking or debating	Pie chart, map, diagram or table	Demonstrate practical methods.	Write the report.
Which action helps you remember best?	Listen to that story again.	See with eyes.	Take action.	Read or write over and over again.
How do you learn a new language?	Listen to the conversation in that language.	Make flash cards.	Speak and use in real life.	Read language books.

**Table 2.2:** The Innate Learning Style Question Template

	(1) auditory	(2) visual	(3) kinesthetic	(4) reading/writing
In lectures, you:	Listen without taking notes and engage in discussion	Watch the professor's presentation and identify patterns	Think about how the topic would play out in a real - life situation	Follow along in the textbook and take notes vigorously
If you went to a concert, what would you remember most?	How the music sounded	How the venue looked and the faces that you saw	How you acted — like if you danced or sang along	The song lyrics
You want to save money for a down payment on a house. You:	Meet with a financial advisor to discuss your goals	Create a pie chart as you save to visualize your progress	save money in the piggy bank everyday	Write down your monthly budget in a planner
What is your preferred method of receiving feedback on a project?	A one - on - one meeting with an instructor or manager to talk through the errors	Errors highlighted as a visual representation of what to correct	Demonstration of how to correct the errors	A descriptive email detailing the errors
If someone says the word "lion," what comes to mind first?	An ear - piercing roar	A fluffy brown mane	A time when you saw a lion at the zoo	The word "lion" spelled out

You are moving to a new place. How do you plan where you will put things in your kitchen?	Listen to a home organization podcast	Find interior design inspiration on Pinterest	Use sticky notes labeling cabinets and drawers as you go	Flip through home decor magazines
You are traveling to a new city. How would you plan out your visit?	Ask a friend for recommendations	check out the city's map online to find top attractions	Read a city guide	Figure it out when you get there
You receive a medical diagnosis. How would you like the doctor to discuss it with you?	Describe what the condition is	Show a diagram of how the condition affects the body	Use a model of the body part affected by the condition	Provide medical brochures about the condition
What do you do in your free time?	Listen to the music	Watch TV series/movies	Exercise	Read a book
What are you most likely to remember about new people you meet?	What you talked about with them	Their face but not their name	Their handshake feeling	Their name but not their face
When learning from the Internet I like:	Audio channels where I can listen to podcasts or interviews.	Interesting design and visual features.	videos showing how to do or make things.	interesting written descriptions, lists and explanations.

Table 2.3: PSS (Perceived Stress Scale)

	(0) almost never	(1) sometimes	(2) often	(3) always
You have insomnia or trouble sleeping.	0	1	2	3
You are unable to concentrate.	0	1	2	3
You feel bored.	0	1	2	3
You have no desire to meet people.	0	1	2	3
You have emotional instability.	0	1	2	3

To draw a conclusion and investigate the effects of various learning style - related elements, the survey data was examined using a variety of computation methods.

learning style compared to others. This indicates that most students are currently using mismatched learning styles.

### 3. Result and Discussion

Table 3.1: Number of students categorized by the current learning style and their innate learning style

	using learning style	innate learning style
auditory	120	94
visual	71	273
kinesthetic	64	12
reading/writing	155	31



Figure 3.1: Chart comparing the number of student with their current learning style and their innate learning style categorized by VARK Learning Model

The results suggest that reading/writing is the most popular learning style employed by the students, followed by auditory style. However, the actual innate learning styles indicated different statistics. From their personal true learning style, the students are mostly visual learners. And kinesthetic learners are considerably the lowest innate

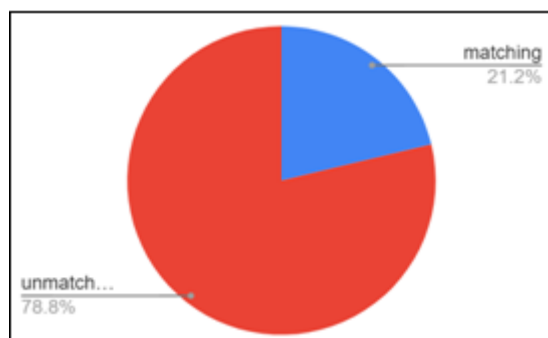
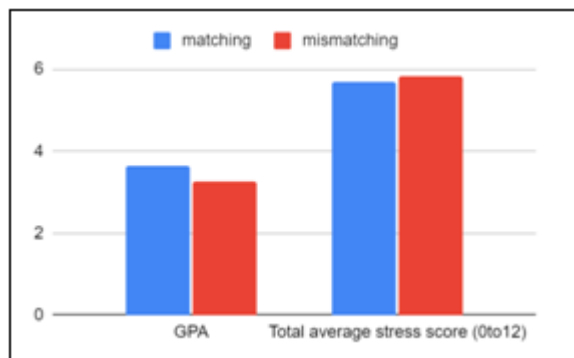


Figure 3.2: Percentage between the matching and mismatching learning style

The above pie chart provides information on the total number of 410 students; only 21.2% (87 people) are using the learning style that corresponds to their actual style of learning. It means almost one - fifth of the students, 323 people do not know what their appropriate learning methods are, which make up 78.8% of the students in Songkhla, Thailand.

Table 3.2: The results of matching and mismatching learning styles in academic achievement and level of stress

	Matching	Mismatching
GPA	3.6291954	3.2520124
Total average stress score (0 to 12)	5.6781609	5.8359133



**Figure 3.3:** Chart of the results of matching and mismatching learning styles in academic achievement and level of stress

Table 2 shows the two factors that the researchers predicted would be influenced by the usage of matching and mismatching learning styles, which are academic achievement (GPA) and level of stress. From the chart, it was suggested that the mismatching learning style may contribute to students' lower academic achievement. The matching style learners appear to have a higher GPA by 0.3771 points compared with the mismatching - style students. It means that the matching learning styles have a moderate impact on academic achievement. Nevertheless, the result was different on the level of stress. According to the Department of Mental Health in Thailand's Stress Level Test Form, there are 4 states of stress: score 0–3 is classified as a low level of stress, score 4 - 6 is a medium level of stress, score 7 - 9 is a high level of stress, and score 10–12 is the highest level of stress. From the results, the average level of stress for both matching and mismatching learning styles is in the same state, which is medium (score around 5) with only 0.1577 disparate. Taking everything into account, the matching learning style only shows an insignificant impact on the level of stress.

The findings of this study support the notion that students' learning styles have an impact on their ability to reach high academic standards. Rajshree S. Vaishnav in "Learning Style and Academic Achievement of Secondary School Students", said something similar: "The main effects of the variables are significant on academic achievement".

The research result that students who employ matched learning styles appear to have an overall 0.3771 higher GPA than those who don't, suggests that having a learning style matched with a person's innate style might help learners more succeed academically. Joanna Haswell's conclusion also support this conclusion: "Knowing how one learns best will allow students to be able to advocate for themselves to become successful, lifelong learners". Few people in Songkhla, Thailand, understand the value of learning styles. Fewer yet are students who are aware of their innate learning styles and use them to study. In short, learners with matching learning techniques have higher academic accomplishment (GPA) compared to the others.

#### 4. Conclusion

Visual learners are the most predominate innate learning styles over auditory, kinesthetic, and reading/writing

learners. 273 out of 410 respondents, or approximately 66.585% are visual learners. However, out of 410, only 87 respondents use a learning styles matched with their innate one. The significant gap of GPA among those employed matched and mismatched learning styles suggest that students who use a matching learning style have a better academic achievement. While utilizing a matched learning style can improve one's academic performance, it is remarkably important for students to recognize their innate learning style. Nevertheless, the research result indicate less impact on strain. The average level of stress in students who use matching learning styles is insignificantly different from that of the unmatched. It can be assumed that the learning style does not affect the level of stress in the student's life as the researchers initially presumed. Hence, it might be other factors that play a more importantly role on the level of stress besides the learning style.

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