

# A Survey on Learning Style Indicator between Genders and Game-based Learning in UiTM Seremban

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**Abstract**— Traditional or conventional learning process is found insignificant for the new generation of students nowadays. The learning process has become very challenging as students are more exposed to technological devices. A conventional teaching method is no longer suitable for them since they have different styles of learning in different circumstances. It is hypothesized that students are inclined to be visual learners due to the significant enhancement in technology and gaming. Therefore, the objective of the study was to identify the learning style indicators among students in Universiti Teknologi MARA, Seremban, Malaysia. A survey on students' perception about game-based learning was also conducted. The results show that 47.3 percent of the students were visual learners compared to kinaesthetic (30 percent) and audio (22.7 percent) learners. Pearson Chi-square shows there was no significant difference in learning style preference between male and female students. Students also agreed that game-based learning was an effective learning approach that helped them understanding their lesson better. Hence, it is suggested that the learning process should be in interactive manner to motivate student and helps them to score in the subject.

**Keywords**— Game-Based Learning, Learning Style, Visual, Kinaesthetic and Audio

## I. INTRODUCTION

Conventional teaching method focusses on the teacher as a key role and based on oral recitation. Students usually listen to the statement recited by the teacher or friends in learning. It is known as passive learning approach where students study and memorize the fact. This method is inefficient and gives problems to them especially those with visual and kinaesthetic dominance. Every student has a different learning style whether he or she prefers visual, audio or kinaesthetic learning style. It is common to have mix learning styles in class. However, there is only one most dominant learning style that they are comfortable with. The different approaches among students include the aspect of individual thoughts, reactions, interests, preferences, achievements and understanding.

Recognising student's learning approach is important because it is a key factor in the formation of an individual (Abedin et al, 2012). Uninteresting learning process will

easily get students bored in class and face difficulties to focus. They tend not to being engaged and are not enthusiastic in class. As a result, it will definitely decrease their academic achievement.

There are several methods to make a learning process interesting. The best practice is by adding tools and equipment that are close to their real world, for example, the use of technology. Nowadays, students are more exposed to computers, smart phones, the Internet and also video games. The exposure of too many devices at homes makes them bored in the passive learning environment because they are not seeing all these technological devices while learning. In order to keep students engaged, they need to be interested. If the technology changes every aspect of students' life and can make them doing something enjoyable, convenient and time saving, it can also change the way how they communicate and learn.

Learning process can become lively and enjoyable with the help of various tools and equipment in the classroom, especially game based learning. Past studies showed that the shift from passive to active learning or from a teacher-centred to a student-centred approach is probably the most positive consequence of technology (Struyven, Dochy, Janssens, & Gielen, 2006; Wilson & Fowler, 2005 ; Brown & Kathy 2003).

Therefore, this paper is interested in determining the learning style indicator among students of Universiti Teknologi MARA Negeri Sembilan in Seremban Campus. The survey was also conducted to investigate students' perspective about game-based learning.

## II. LITERATURE REVIEW

### 1. Learning Styles

Learning style has been defined by Keefe (1979) as a characteristic of the cognitive, affective and physiological behaviours perceived by the learners that serves as relatively stable indicators. Understanding students' individual learning styles can play a very important role in the learning process. Over the past decade, more than 60 universities

have been conducting research on students' learning styles. From these research investigations, some useful results regarding the effects of environmental, physiological and cognitive development on the students' achievement have been discovered.

There are numerous learning style models. McAdams and Pals (2006) offer five principal models of person including dispositional traits, characteristics adaptations, culture contexts and others. According to Thomas and Amit (2007), a use of a variety of teaching and learning approaches has the potential to enhance performance of adult students. The advocates of learning style models (Claxton & Murrell, 1987; Coffield, 2004) mention that students have different learning styles. By taking that as a basic premise, the higher education should not assume all adult students learn in the same way. According to Fleming (2001), a widely-used model of learning style is the Visual Auditory Kinesthetic (VAK) model. Most people possess a dominant or preferred learning style; however some people have a mixed and evenly balanced blend of the three styles.

Zapalska and Dabb (2002) note that the teaching strategies best suited to students' learning improve the way students learn as their learning style is being recognized. According to Dunn (1982, 1986), individual learning style uniqueness could be thought of as a fingerprint. She further explains that as a result of maturation, over the time an individual's learning style changes.

According to Dunn, Beaudry and Klavas (1989), students' achievement increases when the methods of teaching match their learning styles. Reich (1991) adds that, the diversity of students learning style should be taught sufficiently by the faculty to promote innovation in their fields.

## 2. Game-based Learning

Games have been recognized as being a good tool to promote learners to actively participate in learning activities (Baid & Lambert, 2010; Huizenga et al 2009). Game-based learning broadly refers to the use of video games to support teaching and learning. Current scenario shows that digital technologies and various digital tools such as games and social media have impacted in how students learn, play and socialise. Since the introduction of mobile devices, digital games as a form of entertainment are becoming popular as a tool for people to spend their time. Educators and teachers are therefore increasingly interested in focusing more on using digital games as a tool to facilitate learning. If these new digital technologies are ignored, the opportunities to maximize students' potentials and addressing digital literacy of today's youth is hard being achieved (Judson, 2010).

Researchers also have indicated that game-based learning could be the best way to trigger students' learning motivation (Papastergiou, 2009a; Dickey, 2010; Tüzün et al 2009). According to Lepper et al (2005), game based-learning is often considered to be necessary or become the priority for learning. When motivated, students are likely to consume more time and effort in learning, eagerly complete challenging work, and take pleasure in their achievement (Malone, 1981).

In addition, it has been reported that a game-based learning approach might provide a good chance to stimulate student's abstract thinking during the process of cognitive development, and further foster their higher order thinking ability (Carbonaro et al, 2010). Terrell and Rendulic (1996) state that internal motivation and learning achievements of elementary school students can be increased through computer games. Therefore, if educators or teachers are able to apply computer games during the teaching process, students will learn happily, become more alert, creative and have better learning achievements.

## III. METHODOLOGY

A set of questionnaire was distributed randomly to 300 diploma students in Universiti Teknologi MARA, Seremban, Negeri Sembilan. The respondents were from various programmes and semesters. However, there were only 273 valid samples collected due to poor quality and unreturned questionnaire. It made the response rate of 91 percent.

The questionnaire consisted of three parts. Part A contained students' demographic background. Part B consisted of 20 statements that reflected the learning styles among students. The learning style statements were adopted from VAK Learning Styles Self-Assessment Questionnaire. Meanwhile Part C comprised five statements about student's perception on game-based learning. The statement follows the rule of Likert scale from 1 (strongly disagree) to 5 (strongly agree) in the scoring procedure.

A set of data were analysed using SPSS software. The Reliability test was conducted to determine the internal consistency of the questionnaire. The reliability test was used to measure how accurate and precise the measurement made on a certain variable by the research instrument. The overall Cronbach's alpha reliability coefficient of the questionnaire was 0.882 which is high and acceptable. Thus the questionnaire can be used to collect data in the actual study. In determining the learning style between genders, nonparametric chi-square (Pearson) was tested. There were two important concept involved; observed and expected frequency. Observed frequency is the count of observations in the group and expected frequency is the count of frequencies in the comparison group. The comparison between these two frequencies is called chi-square analysis. Lastly, Part C was analysed by using frequency distribution and percentage value.

## IV. RESULTS

The results show that there were significant difference [ $\chi^2(2, N=273) = 26, p < .05$ ] in visual and kinesthetic learning style. The residual value for visual learning style was 38, and kinesthetic was -9. It means that the most preferred learning style was visual learning style that show almost half of respondents (47.3 percent) were visual learners followed by kinesthetic learners (30 percent). Only 22.7 percent of the respondents were audio learners.

TABLE 1  
 LEARNING STYLES PREFERENCES

	Observed N	Percentage	Residual
Visual	129	47.3	38.0
Audio	62	22.7	-29.0
Kinaesthetic	82	30.0	-9.0

Meanwhile, Pearson Chi-square [ $\chi^2(2, N=273) = 2.699, p > .05$ ] shows there was no significant difference in learning style preference between male and female students. The values of standardized residuals are small which show the difference between observed and expected frequency is also small.

TABLE 2  
 CROSS TABULATION BETWEEN LEARNING STYLES & GENDER

		Male	Female	Total	
Learning Style	Visual	Count	33	96	129
		Expected Count	38.3	90.7	129
		Std. Residual	-0.9	0.6	
		Count	23	39	62
	Audio	Expected Count	18.4	43.6	62
		Std. Residual	1.1	-0.7	
		Count	25	57	82
		Expected Count	24.3	57.7	82
	Kinaesthetic	Std. Residual	0.1	-0.1	
		Count	81	192	273
		Expected Count			
		Total			

Frequency analysis was conducted on items in Part C: Learning Process through Game. For the first item, 50.5 percent of the respondents agreed that game-based learning was an effective learning approach. It was in line with the result obtained in Part B where almost half of the respondents were visual learners. Games normally involve figures and graphics that attract students in the learning process. However, 41 percent were unsure whether game-based learning could help them to score in their final grade whereas 49.5 percent students agreed that game-based learning helped them in better understanding their lesson.

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Lastly, they also agreed that game tools motivated and attracted them to study.

TABLE 3  
 STUDENT'S PERCEPTION ON GAME-BASED LEARNING

Statement		Mostly disagree	Disagree	Not sure	Agree	Mostly Agree
Game-based learning is an effective learning approach	Total	3	14	58	138	60
	%	1.1	5.1	21.2	50.5	22
I am motivate to study using game	Total	5	21	89	106	52
	%	1.8	7.7	32.6	38.8	19
I believe game-based learning helps to score in my final grade	Total	1	15	112	107	38
	%	0.4	5.5	41	39.2	13.9
Game-based learning helps in better understanding	Total	1	12	72	135	53
	%	0.4	4.4	26.4	49.5	19.4
Game and visualization attract me to learn more	Total	4	9	49	123	88
	%	1.5	3.3	17.9	45.1	32.2

## V.CONCUSION

Almost half of the respondents were visual learners, followed by kinesthetic and audio learners. The study also shows no difference between learning styles and genders. According to the frequency distribution test, the students gave positive feedback on game-based learning. Thus, it is suggested that the learning process should be in an interactive ways to engage students' interest in class. Future research may consider effective game tools for students. If it is applied in the classroom, the learning process will become lively and interesting.

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