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Disparity of Learning Styles and Higher Order Thinking Skills among Technical Students

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Abstract

Learning styles and higher order thinking skills are an important aspect in teaching and learning especially at higher education institutions. The purpose of this research was to analysis the disparity in learning styles on the level of higher order thinking skills (HOTS) among technical students. A total of 375 technical students from four technical universities in Malaysia were randomly selected as samples. The Kolb Learning Styles Inventory and a set of questionnaires adapted from Marzano Rubrics for Specific Task or Situations were used as research instruments. This is a quantitative research and the gathered data was analyzed using SPSS software. The findings indicated that the most dominant learning style among technical students is Doer. The findings also depict none of the students perceived their thinking skills' levels to be high. Only four Marzano HOTS, namely comparing, inductive reasoning, deductive reasoning and investigation are rated at the moderate level. On contrary, nine Marzano HOTS are rated as low. The Cramer V analysis showed that there is a very low relationship between Kolb Learning Styles and the level of 13 Marzano HOTS. Besides that, the findings revealed that there is statistically significant difference in Kolb Learning Styles on the level of 13 Marzano HOTS. However, only two Marzano HOTS are significant difference in Kolb Learning Styles. Therefore, the identification of learner's learning styles could serve as initial guide in developing more effective and conducive teaching-learning environment for learning HOTS.

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Keywords: Learning styles; higher order thinking skills; technical students; relationship; difference

1. Introduction

Thinking skills is the sense of competence to carry out the thought process (Sulaiman, Aziz & Mok, 2011) which

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essential in our daily lives. Thinking skills is an intellectual process that involves the formation of concepts, analysis, application, syntax, and evaluate the information collected or generated by observation, experience or reflection (Ball & Garton, 2005). Thinking skills closely related to the human person's ability to use both cognitive and affective domains in order to obtain or provide information, solve problems or make decisions for the various active activities Mohd. & Hassan, 2005; Hashim, & Yaakub, 2004). Therefore, thinking skills is a combination of cognitive processes and the ability to complete a given task (Milvain, 2008).

HOTS is the highest level in the hierarchy of cognitive processes. HOTS enable students to overcome the challenges that too much information in this information age, but the time for processing is limited Phillips, 2004). HOTS happens when someone gets new information, keep in memory and compile, link to existing knowledge and generate this information to achieve a goal or solve a complicated situation. Consequently, Onosko, & Newmann, (1994) defined HOTS as the potential use of the mind to deal with new challenges because HOTS can challenge individual to interpret, analyse or manipulate information (Mohamed, 2006; Ea, Chang, & Tan, 2005).

Thinking skills are fundamental in educational process. A person thought can affect the ability of learning, speed and effectiveness of learning. Therefore, thinking skills is associated with learning process because there was a close relationship between thinking skills and learning (Resnick, 1987). Students who are trained to think demonstrate a positive impact on the development of their education. Perception and processing are the two main processes in learning thinking skills (Mohd. & Hassan, 2005). The ability and tendency of a person in perceiving and processing information is different (Abd. Razak, & Azman, 2012; Joseph, 2000). This tendency of the learning environment is defined as learning styles (Rogers, 2009; Rassool, & Rawaf, 2007).

Learning style is the way individuals interact with information (Church, 2004; Gremli, 1996), began to concentrate on process Alias, 2005; Kolb, 1976) and maintains new and difficult information (McDonough, & Osterbrink, 2005; Dunn & Dunn, 1995), perceiving, thinking, remembering back and solve the problem (Renti, 2007; Narayanasamy, 2000). However, the learning style is a consistent pattern of behaviour, but each individual has their own way, in contrast to his peers (Pashler, McDaniel, Rohrer, & Bjork, 2009). According to Rassool & Rawaf. (2007) and Rayner & Riding (1998), learning styles explain a person's behaviour in a learning task. The behaviour consists of two aspects which are cognitive learning style that shows the way of thinking and learning strategies that demonstrate the process used to respond the needs of learning activities.

In other words, learning style is an individual strategy that is used in facing learning environment and materials. By such, learning style is related to the tendency of students to think and communicate with others, classroom environment and learning activities (Rogers, 2009; Grasha, 1996). In conclusion, learning styles not only highlight elements of cognitive processing thinking style, but also observing and organizing information.

Many researchers study the uniqueness of individual's learning style to generate alternatives for learner to foster their learning habits and increase their achievements in study (Ning & Downing, 2010; Prashning, 2004; Vincent & Ross, 2001). One will be more successful in any area if he knows his own strength and lowness Tan & Samyudia, 2009; Zulfa, 2006; Dunn & Griggs, 1993). Hence, students should expose themselves to learning styles and thinking skills, so that they will enhance a better and more effective learning environment (Tapsir *et al*, 2010; Emamipour & Shams Esfandabad, 2010).

2. Problem background

The role of Institute of Higher Education is to constantly improve the quality of students in order to provide students in training and education for the job market (Bridgstock, 2009; Rasimah *et al*., 2008). One of method to produce future employees is to educate students how to think rather than what to look for thought (Ea; Chang & Tan, 2005; Thompson & Evans, 2005; Chalupa, 1992). In fact, education acts as an agent of development thinking skills that needed to produce a productive and meaningful life (Zain, 2007; Osman, 2004; Abd. Rashid, 1999).

However, education in the 21st century still emphasizes on rote learning of facts without understanding (Mustaffa, 2007; Richmond, 2007; Karim, 1994). Most of the students are mastering in memorizing but not thinking skills (Syed Mohd Yamin, 2007). Pedagogy of HOTS cannot be developed in the exam-oriented education system (Jones, 2010; Mustaffa, 2007). Educators prefer teacher-centred teaching methods which is focus on

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