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The Study of Learning Style Preferences of Undergraduate Students for Teaching Adaption

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Abstract

Knowing students preferences regarding learning style enables teachers to use more effective method of providing information and to choose better educational tools for a particular students. The purpose of this research is to address the use of David Kolb learning style to investigate the learning style preferences of undergraduate students whether there are significant differences across four dimensions of David Kolb Experiential Learning Theory due to gender, year of study, and faculty. This is to be a guideline for improving teaching method according to learning style preferences find out. Questionnaires were distributed to a sample of 398 undergraduate students at Rajamangala University of Technology Thanyaburi on Academic year of 2016. Descriptive statistics were used to present the main characteristics of correspondents and the results of the study. The results of study illustrated that gender has no impact on learning styles preference, but most of undergraduate students have the difference of learning style due to year of study, and faculty which mostly are Accommodator regarding David Kolb's learning style which their strength is 'doing' and 'risk-taking', and good at adapting one-self to new situation.. The teaching adaptation to this research's result is the educator should focus on involving interpersonal experience of students to the real world situations. This study has some limitations. First, the findings of the study are based on the data collected from only one university. Second, the sample is limited to Undergraduate students, therefore, there might be different learning style preferences from Graduate students. On the other hand, it has a number of implications for educator and students. The students will benefit from knowing their own learning style. Educator will also benefit from the result of this study in the sense that they need to adopt teaching style and strategies that match the learning styles of the majority of students.

Keywords *– Learning style, Undergraduates, Teaching Adaptations*

Introduction

In the development of a country, that is in its cultural, social and economic improvement, its modernization and for the peace and comfort of its people, the most important factors are the human being and the education provided to him (Jermsittiparsert, 2020; Jermsittiparsert & Sriyakul, 2020a, 2020b). Education is all the studies in individual's behaviors in order to make him acquire behaviors important for knowledge, skill, understanding, interest, attitude in an appropriate way, which is intentional and through his own experiences. With these studies education is to achieve learning which is the main purpose. Learning is the behavioral change in the individual as a result of his interaction with the environment (Kazu, 2009)

The effectiveness of professional development depends on how carefully educators conceive, plan and implement it. (Mizell, 2010). The quality of undergraduate education is vitally important whether students are preparing for a career or transitioning to graduate school. Employers and educators presume that graduates have a certain set of knowledge and skills that will serve them well in their chosen career or in postgraduate education (Carroll, 2005). In addition, during undergraduate training, instructors of higher-level courses presume that students have learned material in prerequisite courses and will carry this information with them into future courses. Therefore, there is a strong need to improve learning and retention during

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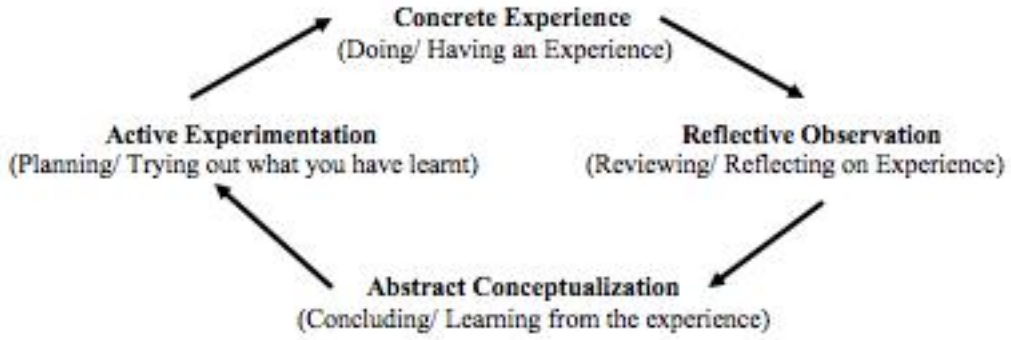
undergraduate education to ensure that students are prepared to handle the challenges that they will face both in future courses and after graduation. As instructors, we need to find ways to improve instruction at all levels of education to improve student learning, retention, and motivation.

One way to improve student motivation and performance is to adapt teaching approaches to meet the different learning style preferences of our students (Miller, 2001)_ Learning style preferences are the manner in which, and the conditions under which, learners most efficiently and effectively perceive, process, store, and recall what they are attempting to learn (James & Gardner, 1995). Although it is known that students have a variety of learning style preferences (Lujan & DiCarlo , 2006), knowing the students' learning style preferences will aide in the development of the most effective teaching approaches (Tanner & Allen, 2004).

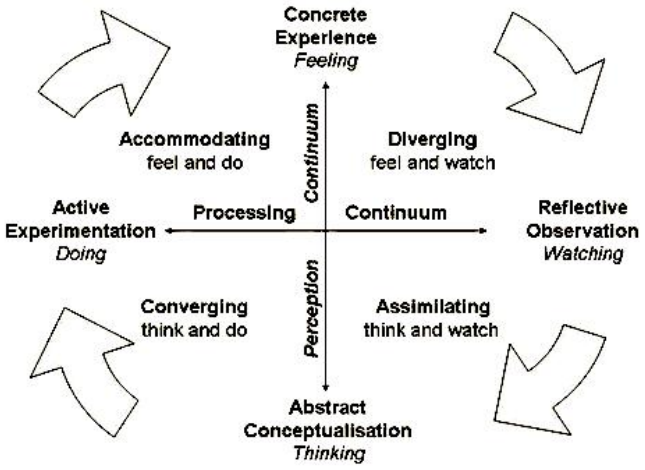
There are many methods available for assessing learning styles, with each method offering a distinctly different view of learning style preferences. The method used in this study defines the preference in learning style based on transformation of experience. Experiential learning theory is a dynamic view of learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction. It is a holistic approach to human adaptation through the transformation of experience into knowledge. ELT draws on the work of prominent 20th century scholars who gave experience a central role in their theories of human learning and development (Passarelli & Kolb, 2012) Kolb's experiential learning theory works on two levels: a four-stage cycle of learning and four separate learning styles. Much of Kolb's theory is concerned with the learner's internal cognitive processes. Kolb states that learning involves the acquisition of abstract concepts that can be applied flexibly in a range of situations. In Kolb's theory, the impetus for the development of new concepts is provided by new experiences (Kolb, Rubin & Mclntyre , 1984). Kolb and Fry (1974) views learning as an integrated process with each stage being mutually supportive of and feeding into the next. It is possible to enter the cycle at any stage and follow it through its logical sequence. However, effective learning only occurs when a learner can execute all four stages of the model. Therefore, no one stage of the cycle is effective as a learning procedure on its own.

Figure – 1: Kolb's Learning Cycle



Kolb's learning theory (Kolb & Fry,1974) sets out four distinct learning styles, which are based on a four-stage learning cycle (as above). These four stages derive from the two major ways by which individuals learn: (1) perceiving or grasping new information or experience, and (2) integrating or transforming what is perceived (Smith & Kolb,1986) into concepts. Kolb explains that different people naturally prefer a certain single different learning style. Various factors influence a person's preferred style. For example, social environment, educational experiences, or the basic cognitive structure of the individual. Whatever influences the choice of style, the learning style preference itself is actually the product of two pairs of variables, or two separate 'choices' that we make, which Kolb presented as lines of an axis, each with 'conflicting' modes at either end. (McLeod, 2017).

Figure – 2: Kolb's Learning Styles



There are 4 learning styles: Diverging, Assimilating, Converging and Accommodating (Kolb ,2014):

Diverging (feeling and watching): These people are Looking at issues from various perspectives, characterized as sensitive, with a preference to watch rather than do something. Those with this learning style have a better ability to generate ideas and engage in brainstorming, enjoy gathering information, are often interested in people, imaginative and emotional, arts-oriented, have excellent group-work skills, and are open to concrete feedback.

Assimilating (watching and thinking): These assimilating learning preference are Less focused on people, and more driven to ideas and abstract conceptualization. This learning style is more common in information and science careers, with preference on readings, following logical approaches, being concise, and with the ability to explore and manipulate analytical models.

Converging (doing and thinking): People with converging learning style have an ability to solve problems, with a preference for technical engagements that do not require social interaction. Individuals with this learning style are often good at using technology, are interested in experimentation of new ideas and in practical application of theory.

Accommodating (doing and feeling): The accommodating learning style is a hands-on and relying on intuition and not much on logic. Those with this learning style often have a preference to practical, experiential approaches, with attraction to new experiences and challenging engagements while carrying out tasks. They often have a tendency to rely on others for information, and are not interested in carrying out their own analysis, acting on a 'gut' instinct.

As Kolb defines learning as a process being in harmony with the social and physical environment. He classified preferred environment and activities regarding learning style as below;

Table – 1: Kolb's Learning Style related to environment

Learning Style	Preferred Environment	Preferred Activities
Concrete Experience	• They learn from new experiences • Feedback and discussion • Personal advise • Teach is helper and guide	• Reading • Examples • Field searches • Laboratories • Problem groups • Observations • Stimulations • Reading texts • Interactive Classes ***Accomodator***

Reflective Observation	• Class notes • In the role of active observation • They try to get information with different point of view • Teachers are guides and administrators	• Logs • Excursion • Discussion • Brain-storming • Thought provoking questions • Visual supported classes • Researches ***Converger***
Abstract Conceptualization	• Theoretical readings • Individual studies • Opinion presentation that is cleared and well-constructed	• Personal projects • Students presentations • Field studies • Laboratories • Situation studies • Simulations ***Diverger***
Active Experimentation	• Learning by doing • Taking risk • Extroverion • They want to see the result of what they did	• Lecturing • Notes • Projects • Analogies • Modelling • Theoretical readings • Article • Computer aids educations ***Assimilator***

The objective of this research are; to investigate learning style of undergraduate students according to Kolb's theory; and to review preferred environment and activities mentioned in Kolb's theory according to learning style preferences to use as possible teaching adaptation technique. The methodology used for this research is *quantitative research*. Questionnaires were distributed to a sample of 398 undergraduate students at Rajamangala University of Technology Thanyaburi on the first semester of year 2016 to find out the majority of learning style of undergraduate students. And as Adler, Whiting and Wynn- Williams(2004) mentioned that the individuals who have abstract style try to comprehend the real world and especially to learn through thinking the approach to events, concrete style through feeling, reflective style through watching and active style through doing and experiencing (Adler et al., 2004).

Method

Survey method of research was used to collect data. The questionnaire based on the ideas of The Kolb Experiential Learning Style was administered in person to 398 respondents that provided a 100% response rate.

Populations and samples

The study took place in Rajachamankala Institute of Technology Thanyaburi, sample of 398 undergraduate students were randomly chosen from population of 21000 undergraduate students in academic calendar year 2016. The sample size 398

students is calculated by using Taro Yamane formula at the statistical significant of 0.05 , and Stratified random sampling method in equal ratios from 10 faculties and 1 college.

Data Collecting

For the study, questionnaires is used as a research instrument. The questionnaires were through handed randomly distributed to undergraduate students of academic calendar year 2016, Rajamankala University of Technology Thanyaburi. This university were selected because the researcher is an instructor in Major of Humanities, Faculty of Liberal Arts, in this university. The samples can represent many undergraduate students from the various faculties genders, and year of study. Data collection was conducted during in July 2016.

The questionnaires consists of 2 parts, first is close-ended questions about gender, faculty and year of study. The second part is 12 four-point rating scale questions about learning style preference based on Kolb's theory framework which allowed the individual to express how much they agree or disagree; (1) strongly disagree, (2) disagree, (3) agree, (4) strongly agree. The points were collected and analyzed in four columns according to four dimensions of David Kolb Experiential Learning Theory. Statistical method used in this research are percentile and Chi Square.

Data Analysis

From 398 sample students, regarding gender, the study has shown that most of male students have learning style as ***Accommodator*** at 38.82% which is the same as most of female students (32.19%).

The result in Table 3 highlighted that; from 10 faculties and 1 college, there are 7 faculties and 1 college that have the high percentage as learning style preference as ***Accommodator***. However the research also found that Faculty of Liberal Arts, Faculty of Home Economic Technology and Faculty of Agricultural Technology has learning style at 44% as ***Converger***, 32.26% as ***Assimilator*** and 30% as ***Assimilator*** respectively.

Regarding the year of study, according to research result in Table 4 identify that third-year students has majority learning style preference as ***Diverger*** at 33.33% while the rest n first-year students, second-year students and fourth-year students have majority learning style as ***Accommodator*** at 37.40%, 30.26% and 42.31% accordingly.

Table – 2: Learning Style based on gender

Gender	Diverger		Assimilator		Converger		Accommodator	
	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount	Percentage
Male	36	26.86	26	19.40	20	14.92	52	38.82
Female	50	18.95	66	25.00	63	23.86	85	32.19

Faculty	Diverger		Assimilator		Converger		Accommodator	
	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount	Percentage
Faculty of Liberal Arts	2	8.00	5	20.00	11	44.00	7	28.00
Faculty of Engineering	24	30.38	18	22.78	12	15.19	25	31.65
Faculty of Mass Communication Technology	8	25.00	8	31.25	4	12.50	12	37.50

Faculty of Business Administration	15	17.65	14	16.47	21	24.71	35	41.18
Faculty of Architecture	5	25.00	6	30.00	1	5.00	8	40.00
Faculty of Industrial Education and Technology	1	10.00	3	30.00	2	20.00	4	40.00
Faculty of Science and Technology	11	32.35	5	14.71	4	11.76	14	41.18
Faculty of Home Economic Technology	6	19.35	10	32.26	6	19.35	9	29.03
Faculty of Fine Arts	3	11.54	7	26.92	6	23.08	10	38.46
Faculty of Agricultural Technology	7	23.33	9	30.00	8	26.67	6	20.00
Thai Traditional Medicine College	4	15.38	5	19.23	6	23.08	11	42.31

Table – 3: Learning Style based on faculty

Table – 4: – Amount of samples based on year of study

Year	Diverger		Assimilator		Converger		Accommodator	
	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount	Percentage
1	23	17.56	30	22.90	29	22.14	49	37.40
2	36	23.68	39	25.66	31	20.39	46	30.26
3	11	33.33	9	27.27	5	15.15	8	24.24
4	16	19.51	14	17.07	18	21.95	34	41.46

Result and Discussion

When look at the result of study to investigate significant differences across four dimensions of David Kolb Experiential Learning Theory due to gender, year of study, and faculty; the research found that;

After looking at the possible impact of gender on preferred learning style, most of male and female have the same learning style preference as Accommodator. This conform with the study of (Methee Pilanthananon, 1994) who study about learning style preference of Graduate students regarding gender, and (Elham Akbari & Arbin Karimnia, 2017) who study learning preference in male and female professional translator. Both genders with this learning style of Accommodator excel at accomplishing tasks by following directions, meticulously planning, and ultimately seeking new experiences (Richmond, A. S. & Cummings, R., 2005). They are characterized as being opportunistic, action driven, and risk takers. The accommodative label comes from their ability to adapt themselves to changing circumstances. The educator can tailor teaching method and design class participation to the same direction for both male and female students. According to Kolb's learning style related to environment mentioned in Table 1, the Accommodators prefer to have personal advise and feedback with discussion. The educator can combine learning activities of giving examples with field searches and interactive class to this type of Accommodator learning style.

Year of study is also a factor to take in to account as the research result show the difference learning style found in undergraduate students across four dimensions of Kolb's theory. Though most of first-year, second-year and fourth-year students have learning style preference as Accommodator, the third-year students however mostly are Divergers. The Divergers are mainly feeling and observing (Alspach, J., 1995). They like to learn via logical instruction or hands-on

exploration with conversations that lead to discovery (Fleming & Mills, 1992). The strategy for educator to design teaching method could include field study, personal project and students presentation (Kolb, 2014).

The study has also shown the relationship between learning preference and faculty of study that; the faculty of study has influenced in learning style preference of the undergraduate students. The Faculty of Liberal Arts has outstanding percentage of learning style preference in Converger who are highly skilled in the practical application of ideas. They tend to do best in situations where there is a single best solution or answer to a problem. Brainstorming and visual support classes are alternative teaching method to facilitate process of learning to be effective according to Kolb's (Kolb, 2014) find out on learning style related recommended environment and activities. While the Faculty of Home Economic and Technology and Faculty of Agricultural Technology are mostly Assimilator. Understanding and creating theoretical models is one of their greatest strengths in Assimilator (Kendra C., 2020). They tend to be more interested in abstract ideas than in people, but they are not greatly concerned with the practical applications of theories. To provide theoretical reading and modelling of study are the possible ways of teaching adaptation to facilitate quality of study of students. However most of undergraduate students of other faculties have majority of learning style preference as Accommodator. According to this research findings related to faculty of study in undergraduate students, the educator could design and tailor the teaching method differently in consistent with faculty of those students that enrolled the course.

Conclusion

To practice research find out on in-class teaching adaptation, the educator could engages students from difference learning style in all phases of Kolb's learning cycle and prepares them to move through subsequent learning cycles as they progress through the course and the curriculum (Lark & Amy M., 2014). For all activities in the suite, educator can have students work in small teams. These teams can be self-selected or appointed. Each activity can be completed in a single 60 to 75-minute class session and includes hands-on action activities, observation and reflection, as well as discussion. The activities are straightforward and yet they are rich analogies for the actual work involved in complex systems development. Debriefing each exercise through reflection and discussion draws out the metaphors and is key to the success in each activity. Metaphors range from resource constraints, team management, project management, interpersonal communications as well as analysis and logical design concepts alternatives, choosing among alternatives, implementing the chosen design, documenting the design and process, implementing the system, maintaining the system and/or customer support. The debriefing then focuses on what they did, how they did it, difficulties, perceptions, and reinterprets them all from perspective of real systems development. Almost uniformly, students retain the lessons from these activities.

The application of Kolb's work to the present context involves identifying class activities and assignments that engage students in each of the stages of learning – thereby ensuring that, regardless of students' learning styles and pace, class content will reach all students. Further, by constructing a variety of experiences that are explicitly aimed to foster grasping and transformation, students heighten their understanding of the material and move steadily from knowledge to comprehension to application to analysis learning levels.

As a result, there are remarkable reasons that learning styles are kept in mind in education process. Those reasons can be summarized are 1) When an individual learning style is known it means that every individual is different from each other. That is to say that the individual will create his own learning style. As perception frequencies of brain differs, individuals interpret stimuluses reaching to sensory memories. People place new information scheme in brain after relating the objects they have seen with existing schemes. When characteristics like age, gender are known, they and their differences are recognized, education that a teacher who takes the characteristics of learning styles in class has realized is the one that serves the objectives of education. 2) Recognizing the students' learning style help effectivity in learning process of students and improvement in class participation of the students. 3) Education should help raising individuals who are able to look at the world from various perspectives. Individual differences should be taken into consideration in achieving these objectives. Education should be given by taking these differences into consideration in the educational and instructional processes.

♣ When an individual's learning style is known it means that every individual is different from each otheWhen an individual learning style is known

Effective education courses should be based on instructional design decisions that will have the most impact on student learning. These may include decisions related to structure of course delivery, teacher-student communication, appropriate assignments and activities that are conducive to the course and effective use of resources. Consistent with Doherty and Maddux (2002) and Thiele (2003), suggested that it is important to design courses, which accommodate student learning

styles. Accordingly, experiential learning principles and concepts provide theoretical grounding to the practice of teaching adaptation.

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