

A MODEL OF PERSONAL EPISTEMOLOGY, SELF-EFFICACY AND LEARNING STYLES

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ABSTRACT

Many students entering hospitality undergraduate program have a wide range of academic, epistemological beliefs learning styles and motivation. This poses an additional challenge to teaching staff as to how best to address students' learning behavior and cognitive processes in relation to appropriate instruction. Students' learning styles are dictated by how students perceived knowledge, particularly the meta-cognitive components (Personal epistemology) to perform in college. Nevertheless, studies have shown that students' self-efficacy (perceived ability) has a mediating effects in this relationship. Hence, the purpose of this study was to explore the relationship between personal epistemology and learning styles mediated by self-efficacy. Data collection was carried out at the Faculty of Hotel and Tourism Management, UiTM. The instruments were administered during regular scheduled courses. Structural equation modeling (SEM) technique was employed to assess relationships among manifest (i.e., observed) and latent variables. Data were analyzed at the $p < .05$ level of significance.

INTRODUCTION

Increasing complexity in all facets of work and life coupled with persistent calls for educational relevancy present numerous challenges to educational institutions, particularly higher vocational programs (hospitality management). For instance, the complex business world has provided a new dimension toward the importance of higher vocational education. The traditional belief that has plagued vocational education currently is replaced by the renewed understanding that mental processes (learning theory) can never be separated from doing and practice. The need to revise or eliminate outdated curriculum and develop new contents to meet emerging work requirements is a seemingly endless discourse and occurrence – not to mention the ineffectiveness of the delivery system.

There has been considerable debate and some disquiet among industry professionals regarding the issue of degree standards. However, the call for improvement and innovation in the educational process has been plagued by our own educational

culture of learning. The main actor in this process has been undermined – students' learning experiences.

One of the typical indicators of academic standards is measured through the number of first and upper-second-class degree awarded. While the relevance of this performance indicator to today's graduates might be questioned, they raise interesting points worthy of further consideration. The issues of variability among schools and situational demand, such as examinations format, assessment, will influence how students respond to situational tasks and academic performance alone could not provide the best indicators for students learning experiences. Sometimes, the examination formats do not engage the types of abilities that are meaningful in real life contexts or emotionally charged (e.g. thinking skills) (Keeley, 1992; Yeh, 2001). Hence, it is imperative for educational institutions to understand this predicament if hospitality management education is to continue its relevancy and preparing future workforce that is capable of facing global challenges.

In our efforts to understand the ways students learn, their motivation for learning, and the factors which can affect learning, we must recognize the concept of multidimensionality. In any individual learner's experience, there are many factors which can affect learning.

Students need to understand that the way they see things depend on their epistemological beliefs. The more they have been exposed to relevant knowledge the more they tend to see things from a dualistic approach to a more relativistic approach (Schommer, 1990). It is believed that, students' epistemological beliefs and perceived ability dictate their learning behaviors. At the same time, understanding individual's epistemological beliefs enables educators to define the learning environment and deploy effective instructional approaches (Anders and Evan, 1994).

The study developed a structured questionnaire for the survey. As this study is the first of its kind to be carried out amongst hospitality students, a thorough knowledge of the subject matter and figuring out the way respondents react to the questions are vital. The sample frame is drawn from the Faculty's student registration database.

Relationships between the constructs need to be studied and understood well. The preliminary findings from this study would be able to inform hospitality schools of its existence (epistemological beliefs and self-efficacy) and how their beliefs influence learning style.

Problem Statement

Apparently, there is a growing concern and criticism about the quality of today's hospitality management graduates. The industry has lamented that today's graduates lack certain critical abilities to perform effectively in the workplace. Despite the criticism, there has also been no initiative or concerted efforts taken by hospitality schools to understand the multidimensionality of the issue. Much of the initiatives taken to correct or respond to this allegation have concentrated on the curriculum itself and neglecting the students' role in the learning process. Within the curriculum context issues such as curriculum structure, course contents, credit hours have been given great consideration.

To date no attempt has been made (within the hospitality domain) to analyze the interrelationships between epistemological beliefs, self-efficacy and the approach to learning in order to explain students' learning process. Lord and Emrich (2001) say "changes in *learning* behavior require changes in meta-cognitive processes (emphasis added)". Student's epistemological beliefs influence their conception about learning and goals (mastery and performance).

Accordingly, Epistemological beliefs have a direct influence or act as 'stimulant' on the individuals' behavior (Russell, 2001). Hence, educators should be aware of their learning preference in terms of approaches and classroom management. Therefore, a fuller understanding of epistemological beliefs held by students would be of much value to educators in developing better classroom learning experience. Research has shown that epistemological beliefs influence comprehension and cognition for academic tasks, particularly in classroom learning (Schommer, 1990; 1994). The beliefs students hold (epistemology and self-efficacy) will eventually influence their professional practices (Russell, 2001).

Objective of the study

The objective of this study was to explore the effects of epistemological beliefs and self-efficacy on learning behavior amongst hospitality management students. Nevertheless, in this study, learning style is assessed as a trait rather than looking at the situational demand that may influence learning styles (situation-based).

LITERATURE REVIEW

Epistemological Beliefs

According to Schommer (1990), epistemology is a '*system of belief constructs, comprised of multiple dimensions rather than as a general construct.*'

Epistemological beliefs refer to individuals' beliefs about the nature and structure of knowledge (Schommer, 1998; Buehl, Alexander and Murphy, 2002). Throughout the philosophical literature, studies on Epistemological beliefs have been well documented. However, within the educational context this philosophical construct is a recent phenomenon.

Recent educational research has begun to focus on the importance of linking students' epistemological beliefs and achievement motivation constructs (Buehl, Alexander and Murphy, 2002). According to Ryan (1984), students' beliefs about knowledge are based on either dualistic or relativistic. Ryan also found that those with relativistic epistemological beliefs said they achieved understanding when they could apply the information to new situations (transferability) and when they could see connections between ideas. On the other hand, those with dualistic beliefs tend to focus only on facts finding and develop concept loosely.

Perry (1970) was known to be the pioneer in investigating how college students relate knowledge, learning and the environment. Using an interactionist model, he attempts to interpret students' epistemological responses to the college learning environment. Perry observes that students would start their studies thinking in a dualistic ('Yes' or

‘No’, ‘True’ or ‘false’) manner and gradually shift to a more relativistic approach (absolutes are no longer the norm, but the exception) to understand the world. Starting from Perry's research on beliefs, several authors have adopted the model and developed further from different lines of thought. However, the meta-cognitive perspectives has received much attention over the past decades. The meta-cognitive perspective originated in the USA is said to focus on the analysis of students' beliefs about knowledge and learning (Ryan, 1984; Schommer, 1993a).

Activities such as planning how to approach a given learning task, comprehension, and progress toward the completion of a task are meta-cognitive in nature. It is argued that meta-cognitive activities play a critical role in determining how well learners apply their cognitive resources (Borkowski, Carr and Pressely, 1987). Nevertheless, both perspectives view that all learners have their own subjective preference for learning depending on the situational demand. One criticism of Perry's scheme of epistemological beliefs is its uni-dimensionality. Schommer (1990) realizes that an individual's epistemological worldview is best explained as a “system of more or less independent beliefs”. This leads to the development of five distinct dimensions (simple knowledge, certainty of knowledge, omniscient authority, learning is innate and learning is quick or not at all) that can be measured independently.

Schommer (1993a) also postulates that epistemological beliefs predict academic achievement. Later, she advances this initial hypothesis to include the epistemological beliefs effects on learning strategies and comprehension. According to Schommer (1993b) gender plays an important role in conceptualizing knowledge. Female students believe to a greater extent than boys that learning takes place gradually, which may give them a slight epistemological advantage in their efforts at comprehension and this would enable girls to perform better in examinations. This aspect is related to different ways of studying, or approaches to learning. Hence, a person holding naïve epistemology generally believes that knowledge is simple and clear, knowledge resides in authorities, concepts are learned quickly or not at all, and learning is innate - a transmissive approach. On the other hand, if a person holds a mature (relativistic) epistemological belief, he or she tends to view knowledge as complex, knowledge can be learned, and knowledge can be developed accordingly by the learner – a constructivist approach (Schommer 1990; Brownlee, 2001).

Academic self-efficacy

According to Bandura (1997) academic self-efficacy is students' belief in their ability to activate and regulate motivation and cognitive resources needed to attain a desired educational goal. Self-efficacy has been shown as an effective predictor of students' choice of academic activities (Pajares and Schunk 2002; Zimmerman, 1995).

When self-efficacy is low, students will underestimate their performance abilities. Students will select tasks that do not challenge them, thus not receiving corrective feedbacks regarding their performance, which could counter their negative self-efficacy perception (Bandura, 1997). These students often allow their doubts to undermine their concentration in turn causing them to give up easily during difficult tasks (Bandura and Locke, 2003). When self-efficacy is high, students will challenge themselves to

engage in tasks successfully. Students with high efficacy will feel confident in their performance and ability to succeed which in turn promotes competency for further tasks (Locke and Latham, 1990). Perceived ability (Self-efficacy) is said to play a role in mediating the relationship between epistemology and learning behavior (Ames and Achjer, 1988; Schunk, 1995). According to Schunk (1995) students with the right level of epistemology belief about knowledge will see ability to learn through the adaptation of the appropriate learning styles will affect their performance.

Learning behavior

This study assumes that learning styles is a trait that surfaces as an attitude towards learning. Entwistle (1988) proposes that learning style consist of three levels: deep, surface and disorganization. Weinstein and Mayer (1986) call the deep approach as 'critical thinking'. Students using the deep approach tend to validate any information and attempt to connect them with their prior knowledge. Individuals who used this approach to learn is able to challenge the authenticity of the knowledge or information. Prior knowledge is said to provide the basis of this challenge. On the other hand, students with a surface learning style will never challenge the validity of the information and deploy the rote memorization strategy. Disorganization learning style refers to an individual who is unable to organize and structure information in an orderly manner for better comprehension. Nevertheless, Biggs (1993) unveils that there is nothing wrong with the rote learning strategy and this does not equate the strategy with the surface learning styles.

Biggs further explain that situational demands (tests and exam formats) may influence the adoption of the learning styles. According to Schoenfeld (1983) novice learners (normally 1st year students) tend to select the first strategy that comes to mind and stick to it regardless of the nature of the knowledge and the outcomes. On the other hand, students who are keen about learning tend to understand the task, select a learning strategy and evaluate the outcomes, which resemble the deep learning approach. Students who adopt this approach tend to make sense and integrate the information (Biggs, 1993).

In certain circumstances, learning styles have been conceptualized as cognitive and metacognitive study strategies (Qian and Alvermann, 1995). However, the concept of cognitive and metacognitive involves more than just applying the specific approach to achieve result. Metacognitive concept includes the understanding of how and when to use different strategies to meet goals and greatly depends on the situational demands to select the best strategies to achieve better performance (Sinkavich, 1994). Metacognitive experiences usually precede or follow a cognitive activity. For example, if a person has failed to comprehend (cognitive) what he or she has just read and attempts to rectify (meta-cognitive is activated) the situation (Roberts and Erdos, 1993). Hence, a student may apply the concept (strategies) to determine which learning styles to adopt when confronting a particular task or assignment. Thus, is it believed that those with greater meta-cognitive abilities tend to be more successful in their cognitive endeavors (Flavell, 1979).

METHODOLOGY

The purpose of this study was to explore the effects of epistemological beliefs and self-efficacy on learning behavior amongst hospitality management students enrolled in the Faculty of Hotel and Tourism Management, UiTM. Accordingly, it is also important to recognize the fact that data and methods of capturing data are inextricably interdependent (Leedy 1980, p. 75). In order to understand the scope of the study, a thorough knowledge of the subject matter and figuring out the way respondents react to the questions are vital. Not wanting to reinvent the wheel, the initial construct list was adapted from Schommer (1998), Owen and Froman (1988) and Entwistle (1988). The study sample was derived from one university offering hotel and tourism management (final year students). In order to secure responses, the questionnaire was administered during class sessions (from several courses). The context of this study, a large public university, limits the extent to which the findings can be generalized to other types of institutions.

Sampling ,Data Collection and Analysis

The sample frame/or population and the size were drawn from the Faculty's students registration database (random sampling among the final year). Participation is voluntarily. Self-administered questionnaire was employed in this study. All final year (500 students) are informed of the study and distributed the questionnaire through their respective class representatives. The respond rate was 42 percent. A total of 210 students (consisted of 66 male and 144 female) responded. This proportion generally represents the distribution of student population of the Faculty.

Students were asked to respond to the adapted questionnaire that contained Schommer's (1998) Epistemological Questionnaire and Entwistle's Learning strategies (1988) and their demographic. A 5-point Likert scale was used to test the degree to which each student rates the importance of each question in the EQ (63 items) and learning strategies (15 items) scales. Academic self-efficacy questionnaire (33 items) was adapted from Owen and Froman (1988). Students who did not respond in the first occasion were reminded through their class representatives. Composite scores for the two constructs (epistemological beliefs and Academic self-efficacy) were carried out by aggregating each subscale for each of the two categories. The mean scores and standard deviations (SDs) were performed on the data. We employed two levels of analysis. First, data was treated using exploratory and confirmatory analyses. To validate the scales, items in each dimension were summated and tested using structural equation modeling (Amos 6). Reliability test was also performed on the data.

FINDINGS

A normal distribution is a critical assumption in Structural Equation Modelling (SEM). Assessment of normality was carried out to determine data distribution. Result from the test indicates that the joint multivariate kurtosis value and associated critical ratio there is a moderate degree of non-normality (4.68, 2.68); therefore, transformation was needed in order to rectify the situation (data influencing the results). Following transformation, a Bollen-Stine bootstrap procedure (1000

iterations) was employed. This analysis was not significant (The p value was $< .05$ (.361) indicating that the model fit was not inflated. The KMO measure of sampling adequacy is .646.

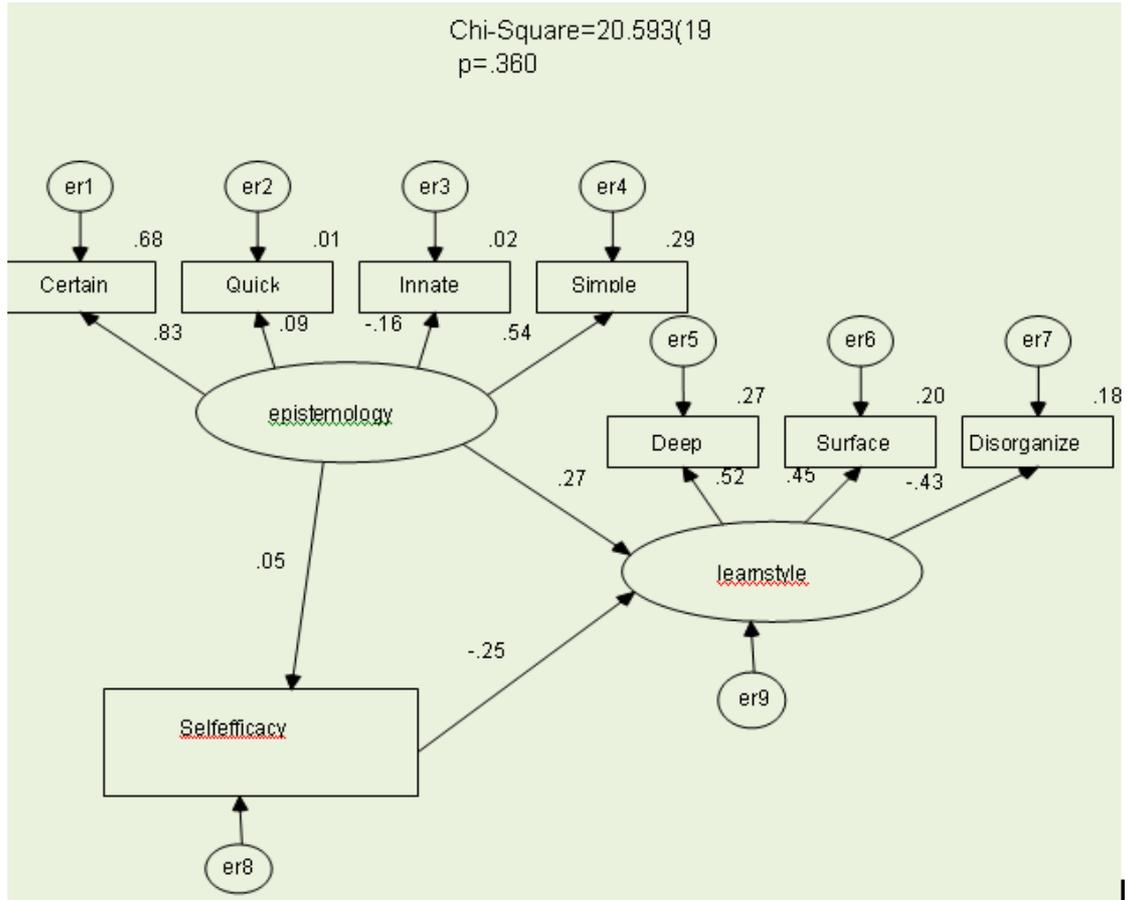
Based on these results, it was decided and following Gerbing and Anderson's (1989) recommendation that the maximum likelihood (ML) method of estimation should be used (ML procedures requires that the observed variables to be continuous and normally distributed)

Since the study took place in a different cultural context, exploratory factor analysis and confirmatory factor analysis were used as an attempt to identify and validate the multidimensionality of the constructs. Nevertheless, the epistemology sample items (63) did not produce a sensible result. As an alternative, factor analysis using the 12 subsets identified produce a much more parsimonious result than using each single item (Schommer, 1998). This approach is said to reduce the problem of multicollinearity between the endogenous variables (Cohen and Cohen, 1983). Subscales were considered to load on a factor if its loading was equal to or greater than .40.

Principal factoring extraction with varimax rotation was used and has produced 4 factors which accounted for 62.5 % of the variance. The adapted questionnaire yielded factors of similar beliefs and labeled as: Knowledge is certain, Knowledge as simple (discrete), Ability to learning is innate and Learning is quick. The coefficient alpha of each factor assesses the overall reliability of the scales along with the item- to-total correlation for each item. To improve the reliability, items with correlations below the .3 were deleted from the scale (Nunnally, 1978). The final reliability of the scales (coefficient alpha) ranged from .80 to .95).

The adapted questionnaire for the learning styles yielded 4 factors. Principal factoring extraction with varimax rotation was used which accounted for 69.95 % of the variance. The three (3) can be easily identified as compared to the fourth. However, the fourth factor was dropped due to very low alpha. This is in line with Nunnally's (1978) argument saying that if the scales are not reliable, there is no point in performing additional analysis. Apparently, the three (3) factors were labeled as Deep learning, Surface learning and Disorganization. The reliability of the scales (cronbach alpha) ranged from .78 to .95. Reliability of self-efficacy scale was .96. The Epistemological Beliefs Questionnaire and the Learning Styles Questionnaire have been validated by means of confirmatory factor analysis (Amos 6). The results from analyzing the measurement model indicate a good fit of the seven dimensions of *Certain, Quick, Innate, Simple, Deep, Surface, Disorganization*. The value of CMIN/DF was 1.27, below the recommended value of 3.0 (Kline, 1998). The RMSEA value also falls within the lower limit of the 95% confidence interval of RMSEA (.035, .222). Other fit indices also point to an acceptable model fit (GFI = .979, AGFI = .954, CFI = .963). The structural model also indicated a good fit with the data ($CMIN/DF = 1.09$; $GFI = .97$, $AGFI = .95$; $IFI = .95$; $CFI = .98$; $RMSEA = .020$). See Diagram 1.

FIGURE 1; STRUCTURAL MODEL AND PATH COEFFICIENT.



A two-tailed correlational analysis was conducted on epistemological beliefs and learning styles scales to see whether there is any relationship between these constructs. See Table 2. For the male students, Surface learning was found to be negatively related to Certain Knowledge ($r = -.386, p < .01$), Simple ($r = -.264, p < .05$), but positively related to Innate ability ($r = .263, p < .05$). Disorganization was found to be negatively related to Certain knowledge ($r = -.292, p < .05$), and positively related to Innate ability ($r = .334, p < .01$). For female students, only Surface learning style was found to be negatively related to simple knowledge ($r = -.170, p < .05$). However, MANOVA test did not show any significant difference between gender (Wilk's lambda = .938, $F = 2.01, df = 7, p > .05$).

TABLE 1: MAXIMUM LIKELYHOOD ESTIMATES (REGRESSION WEIGHTS)

			Estimate	S.E.	C.R.	P	Label
Selfefficacy	<---	epistemology	0.191	0.333	0.572	0.568	par_7
learnstyle	<---	epistemology	0.574	0.273	2.1	0.036	par_3
learnstyle	<---	Selfefficacy	-0.131	0.056	-2.326	0.02	par_4
Certain	<---	epistemology	1				
Quick	<---	epistemology	-0.219	0.201	-1.088	0.277	par_1
Innate	<---	epistemology	-0.409	0.214	-1.908	0.056	par_2
Simple	<---	epistemology	1				
Disorganize	<---	learnstyle	-0.641	0.224	-2.866	0.004	par_5
Surface	<---	learnstyle	-0.719	0.25	-2.88	0.004	par_6
Deep	<---	learnstyle	1				

TABLE 2: CORRELATIONS BETWEEN EPISTEMOLOGICAL BELIEF AND LEARNING STYLES DIMENSION

		Epistemological Dimensions			
Gender	<i>Learning Styles Dimensions</i>	<i>Certain Knowledge</i>	<i>Quick Knowledge</i>	<i>Innate Ability</i>	<i>Simple Knowledge</i>
	Male	<i>Deep</i>	.018	-.028	-.169
	<i>Surface</i>	-.386(**)	.018	.263(*)	-.264(*)
	<i>Disorganize</i>	-.292(*)	.150	.334(**)	-.164
Female	<i>Deep</i>	.112	.074	.007	.090
	<i>Surface</i>	-.027	.020	-.100	-.170(*)
	<i>Disorganize</i>	.077	-.028	.096	-.024

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Next, we test the direct, indirect effects of the estimated parameter (Epistemological belief -7 academic self-efficacy-7 learning styles). See Tables 3 and 4 for standardized direct and indirect effects. Epistemology has a direct effect on learning styles (0.27). Epistemology also has a negative indirect effect on learning styles through the mediation of Self efficacy (-.012).

To test whether gender plays an important role in determine the level of academic self-efficacy, we identified the low and high self-efficacy levels through cluster analysis. Crosstab result shows that there is a significant difference $p > .05$. Table 4 summarizes the path coefficients of the final model based on the maximum likelihood estimates regression weights.

TABLE 3: STANDARDIZED DIRECT EFFECTS (GROUP – DEFAULT MODEL)

	epistemology	Selfefficacy	learnstyle
Selfefficacy	.047	.000	.000
learnstyle	.271	-.252	.000
Disorganize	.000	.000	-.430
Surface	.000	.000	-.451
Deep	.000	.000	.522
Simple	.540	.000	.000
Innate	-.157	.000	.000
Quick	-.089	.000	.000
Certain	.826	.000	.000

TABLE 4: STANDARDIZED INDIRECT EFFECTS(GROUP-DEFAULT MODEL)

	epistemology	Selfefficacy	learnstyle
Selfefficacy	.000	.000	.000
learnstyle	-.012	.000	.000
Disorganize	-.111	.108	.000
Surface	-.117	.114	.000
Deep	.135	-.132	.000
Simple	.000	.000	.000
Innate	.000	.000	.000
Quick	.000	.000	.000
Certain	.000	.000	.000

CONCLUSIONS

This research was carried out as an early attempt to establish an explanation as to the effect of epistemological beliefs on learning styles. The findings indicated the model fits the available data, however, it did not lend a clear explanation. The model suggests that the adoption of students' learning styles can be predicted from the specific level of students' epistemological beliefs. Overall, the findings of this study are unable to support previous studies on the mediating effects of self-efficacy. Nevertheless, the findings could provide a basis to explain why some students were unable to connect or integrate knowledge. To help students develop more sophisticated (and relational) epistemological beliefs that connect self and knowledge, it is imperative for educators to consider how the facilitating conditions can help students learn better. Subsequently, to develop an effective instruction and delivery systems, educators must understand students' beliefs, perceived ability and learning motivation in relation to their learning environment.

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