Relationships between the Learning-style Preferences and the Characteristics and Academic Performance of Taiwanese College Hospitality Students

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ABSTRACT

The purpose of the current study was to explore the relationships between the learning styles preferences of students at a Taiwanese hospitality college and their characteristics and academic performance. This study involved a convenience sample of 360 students in a hospitality management program at a university in Taiwan. We used the Solomon–Felder Index of Learning Styles, which has four dimensions comprising 44 discrete-choice questions. Results indicated that hospitality college students were more likely to be reflective, sensate, visual, and global and that female students were significantly more sensate than were their male counterparts, whereas both male and female students were more sensate than intuitive. Male students were significantly more visual than were their female counterparts, whereas both male and female students were more visual than verbal. Results revealed significant differences in two of the four learning styles between students who were enrolled by examination and students who were enrolled by application. Analysis of variance revealed no significant differences between the classes on any of the four learning styles. Correlation analyses also revealed no significant differences between graduates of high schools and of vocational schools in any of the constructs measuring learning style. A significant difference between sequential and global learners emerged with respect to academic performance. Sequential learners performed better academically than did global learners. Limitations and future research implications are discussed.

Keywords: hospitality college students; leaning styles; active/reflective; visual/verbal; sensing/intuitive; sequential/global

INTRODUCTION

The learning revolution in higher education has resulted in a shift of paradigms from instructional-focused to learner-centered pedagogical approaches. Thus, different methods (e.g., case studies, student-led discussions, and web-based modules that allow students to learn at their own pace) have been incorporated into classrooms to enhance student learning and replace teacher-led lectures as the predominant means of conveying information. To facilitate learning, instructors should assist students in processing and analyzing information and making better decisions rather than merely transmit knowledge. Therefore, greater understanding of learning styles can enhance teaching and learning effectiveness by identifying students’ preferences for comprehending and utilizing information presented in classes. Although the learning styles of hospitality students have been extensively studied, most of this research has involved learning environments in the West. Thus far, no study examining the learning styles of Taiwanese hospitality students has been conducted. Assessment of the learning styles of Taiwanese hospitality students can help educators recognize and respond to diverse learning styles.
Purposes of the study

Although learning styles have been studied extensively, many educators still do not recognize that students process information differently and thus, they do not attempt to meet the needs of diverse learners (Sims & Sims, 1995; Hsu & Wolfe, 2003). Effective teaching occurs when educators recognize that students have diverse learning styles and use pedagogical techniques appropriate for this diversity. The purpose of the current study was to identify the learning styles of students and examine how differences among learning styles affect the academic performance of students in a hospitality management program at a university in Taiwan. Specifically, this study (1) uses the Solomon–Felder Index of Learning Styles to assess the learning-style preferences of students, (2) compares the learning styles of students by sex, grades, type of enrollment, and background, (3) examines any significant differences in the academic performance of students across learning styles, (4) determines the applicability of the Solomon–Felder Index of Learning Styles to the Taiwanese–Chinese context, and (5) offers recommendations on instructional strategies.

Learning-style preferences of hospitality and tourism management students

Several studies have recently investigated the learning styles of students of hospitality, tourism, and travel management and have reported varied findings. Berger (1983) indicated that hospitality students were more likely to be divergers (33%) or accommodators (29%) compared with assimilators (20%) and converging learners (18%). Paulson (1993) also found that hospitality students enrolled in various food production classes tended to fall into the diverger category (49%). However, Bagdan and Boger (2000) reported that hospitality students at four Midwestern universities were more likely to be assimilators compared with the other three types of learners in Kolb's Experiential Learning Model.

Hsu (1997/1998) indicated that a plurality (38%) of new hospitality students were convergers, but that their learning styles changed as they progressed in their program. By the time they completed their hospitality education, 55% were convergers (Hsu, 1999). Hsu & Wolfe (2003) conducted a study at a hospitality and tourism management program at a university in Hong Kong to identify the learning styles of students and faculty members. Results indicated that the percentage of convergers was higher than that of any other learning style represented, and that the scores tended to increase toward the abstract conceptualization (AC) and active experimentation (AE) ends of the spectra as students advanced in their studies.

In a study investigating the learning styles of hospitality management students in the UK, Lashley (1999) found that students displayed preferences for active learning styles. Barron and Arcodia (2002) found that Australian hospitality and tourism students were also predominantly active learners. Similarly, Lashley and Barron (2006) conducted a study of the learning-style preferences of new entrants into hospitality and tourism programs in Australia and the UK. Results showed that students preferred concrete rather than abstract and active rather than reflective learning styles.

In contrast, in Australia, students with Confucian backgrounds preferred learning in abstract and reflective styles (Lashley and Barron, 2006). These students were more likely than their peers in Australia and the UK to agree or strongly agree with statements that suggested a more considered and cautious approach to studying. These data supported the finding of previous studies showing that students with Chinese cultural backgrounds tended to prefer reflective learning styles (Chan, 1999; Wong, Pine, & Tsang, 2000). These students preferred to learn through observation and benefited from the opportunity to think before acting. They appreciated the opportunity to conduct research before an activity and to think about what they had learned. These findings appear connected to cultural issues deriving either from the
nature of the general culture or from educational experiences within the culture (Chan, 1999; Barron, 2004).

Research on sex differences in learning styles

Many studies have shown differences between the learning styles of male and female college students. Dwyer (1998) reported a significant relationship between trait/context-communication apprehension and learning-style preferences in women. Dwyer’s study recommended removing the hierarchical barriers from classroom organization or eliminating the sorts of threats that potentially invalidate the learning efficacy of women, irrespective of course content. Lundeberg et al. (1994) reported significant differences in confidence between undergraduate men and women in their responses to test items and argued that these differences were contingent both on learning context and on the domain tested.

Picou et al. (1998) examined the learning styles of 187 Hispanic students and concluded that the men emphasized more abstract/sequential styles, whereas the women stressed more concrete/random styles. Simpson (1995), in a related vein, raised an important point in his study, which found that men tended to be more field-independent than women. Lo (1994) investigated learning-style differences among Taiwanese students and found significant main effects for sex, grade, and academic group. Female students were more persistent, responsible, and self-motivated than male students. Males were more likely than females to prefer learning in the late morning.

Relationship of learning style and academic performance

A number of studies have examined the relationship between learning style and academic performance in various disciplines. Whereas some studies have reported relationships between performance scores and a converging learning style (Mainemelis et al., 2002; Rutz, 2003), others explained the ostensible relationship between differences in learning style and student performances as a function of the chosen assessment technique.

Holley and Jenkins (1993) examined the relationship between learning style and four different formats for accounting exam questions (multiple-choice theory, multiple-choice quantitative, open-ended theory, and open-ended quantitative). Their results reflected a significant difference in learning styles for all but the multiple-choice quantitative format. They claimed that students with different learning styles perform differently depending on the examination format. Therefore, different assessment strategies are required for measuring the overall performance of students. Demirbas and Demirkan (2007) explored the effects of learning styles and sex on the performance scores of freshman design students during three successive academic years. Findings indicated that design students tended to prefer assimilating and converging learning styles over diverging and accommodating learning styles and that the performance scores of converging and diverging students differed significantly in favor of converging students in design courses only.

METHODS

Samples

A convenience sample of 360 students in a hospitality management program at a university in Taiwan participated in this study. Of the total sample, 81.9% were women and 18.1% were men. The average age of the students was 21 years.
Instruments

Researchers have developed various instruments to measure students’ learning styles; of these, three have received the most academic attention: the Grasha–Reichmann Learning Style Scale (Reichmann and Grasha, 1974), the Kolb Learning Style Inventory (Kolb, 1996), and the Solomon–Felder Index of Learning Styles (Felder 1993; Solomon and Felder, 2002). Because we needed to employ the same assessment tool used in previous studies to gain a better understanding of whether hospitality students in Taiwan differed from those in Western hospitality programs, we used the Solomon–Felder Index as the instrument in this study. The initial English questionnaire was translated into Mandarin for the Taiwanese participants following Usunier’s (2000) recommendation regarding equivalence in cross-cultural research.

The Solomon–Felder Index of Learning Styles has four dimensions comprising 44 discrete-choice questions. First, the active/reflective dimension shows how students prefer to process information. Active learners learn best by doing things. In contrast, reflective learners think about topics first and process information through introspection. Second, the visual/verbal dimension refers to how sensory information is most effectively perceived. Visual learners are most likely to remember what they see, such as pictures, diagrams, and flow charts, whereas verbal learners are more likely to remember what they hear and read, such as written and spoken words. Third, the sensing/intuitive dimension identifies the type of information the student preferentially perceives. Sensing students prefer sights, sounds, and physical sensations and are skilled with details and memorizing facts. They also like connecting to the real world, whereas intuitive students like memories, ideas, and insights and prefer discovering possibilities and relationships. Finally, the sequential/global learning dimension shows how the student progresses toward understanding. Sequential students gain understanding in linear steps and follow logical stepwise paths in finding solutions. In contrast, global students are holistic in their approach to learning; they suddenly “get it” (Felder and Solomon, 2000).

Reliability tests were performed for each of the four learning-style dimensions to ensure that the instrument was applicable to a Taiwanese population. Cronbach’s alphas ranged from .72 to .77. Reliability scores were deemed moderately high and therefore satisfactory.

Procedure

Instructors from hospitality programs at universities were contacted to allow students enrolled in their classes to participate in the study during the last 10 minutes of their classes. Although faculty members administered the surveys to students, they also indicated that the students should feel no obligation to participate. Thus, students who did not want to participate were free to leave. To avoid duplication of student participation, however, those students who agreed to participate in one class were exempt from providing data in another class. More specifically, the Solomon–Felder Index of Learning Styles was administered during the middle of a semester to allow students sufficient exposure to varying instructional styles and to be better able to express their own needs with respect to learning style.

Data Analyses

Learning styles were measured on a continuum from -11 to +11. Data were entered into SPSS 10.1 for analysis. Descriptive statistics including means and standard deviations were calculated. Students were categorized as having a preference for specific learning styles if they obtained a value greater (or less) than zero on each of the constructs. Thus, for example, students could be classified as active learners on the active–reflective construct if their score was >0 (and as reflective learners if it was <0). Correlations were analyzed to examine differences between the two student cohorts using this approach. T-test, Chi-square, and ANOVA approaches were used to analyze data.
RESULTS

The mean scores obtained by all students for each of the learning styles were computed. The mean scores for active/reflective, sensate/intuitive, visual/verbal, and sequential/global were -.98, 3.63, 4.72, and -.49, respectively. Results showed that hospitality students were likely to be more reflective, sensate, visual, and global. Table 1 presents the means and standard deviations for each of the four learning styles.

We examined differences between male and female students in the mean values for each of the learning styles. Table 2 presents the results of the \( t \)-tests for independent samples for each of the four dimensions of the Solomon–Felder Index of Learning Styles. Learning styles were measured on a continuum from -11 to 11, and we found significant differences between male and female students with respect to two of the four learning styles. Although both male and female students were more sensate than intuitive, female students were significantly more sensate than were their male counterparts. Whereas both male and female students were more visual than verbal, male students were significantly more visual than were their female counterparts. Both male and female students were more reflective than active, and no significant difference between male and female students emerged on the active–reflective continuum. Additionally, both male and female students were more global than sequential, and no significant difference between male and female students was found in this regard.

Correlation analyses were performed to identify differences in the proportion of male versus female students with clear preferences for particular learning styles. Students were categorized as having a preference for specific learning styles when they obtained scores greater (or less) than zero on each of the constructs. For example, students could be classified as active learners on the active–reflective continuum if their scores were >0 (and as reflective learners if their scores were <0). Table 3 shows that differences in learning styles were much less apparent when this approach was used. Indeed, no significant differences between male and female students emerged from these analyses. Both forms of analysis confirmed that hospitality students are likely to be more reflective, sensate, visual, and global. The \( t \)-tests indicated that women are more sensate and visual than their male counterparts; however, the correlation analyses revealed no significant differences.

We performed an independent \( t \)-test to compare differences in the mean scores obtained by students with two different types of enrollment. As shown in Table 4, the results revealed significant differences between students who were enrolled by examination and those who were enrolled by application with respect to two of the four learning styles. Although both examination and application students were more sensate than intuitive, application students were significantly more sensate than were their examination counterparts. Mean scores obtained by students who were enrolled by examination were significantly lower than those obtained by their application counterparts. Mean scores on the sequential/global learning dimension were -.99 and .30, respectively, showing that examination students preferred sequential and application students preferred global learning.

We used analysis of variance to examine whether significant differences among classes emerged for each of the four learning styles. Results indicated no significant differences among classes on any of the four learning styles. Hospitality students are likely to be more reflective, sensate, visual, and global as freshmen, sophomores, juniors, and seniors. The correlation analyses indicated no significant difference between graduates of high schools and graduates of vocational school with respect to any of the learning styles.

We used \( t \)-tests to examine differences in academic performance according to learning style. Results showed no significant differences in the academic performance of students who were active versus
reflective, visual versus verbal, or sensing versus intuitive. However, we did find a significant difference in the academic performance of those with a sequential versus those with a global learning style. Sequential learners performed better academically than did global learners.

DISCUSSION

The results of this study showed that hospitality students are more likely to be reflective, sensate, visual, and global, which is consistent with Heffernan, Morrison, Basu, & Sweeney’s report (2010) that Chinese students are much more likely to be global learners, less active learners, and less intuitive compared to Australian students. Given that most hospitality students are sensate learners, concrete material such as lecture notes, examples, and demonstrations of how information connects to the real world should continue to serve as useful pedagogical tools. Similarly, because most hospitality students are visual, the use of visual aids (e.g., pictures, diagrams, flowcharts, films, demonstrations, etc.) should also be continued.

Given that verbal and intuitive abilities constitute common areas of potential weakness, presentations, oral and written explanations, and readings should be used to develop verbal skills, and explanations of the applications of theories or models that develop fundamental understanding should be used to facilitate intuitive thinking. Moreover, it is important to use teaching strategies that help global learners “grasp the total picture.” Felder and Silverman (1988) recommended that global learners be allowed to devise their own solutions to problems and that creativity exercises in which students generate alternative solutions to problems and try to bring in material from other courses be included in classes. In terms of differences between male and female students, we found that men were much less sensate and visual than were women, which supports previous data showing differences between male and female college students in terms of learning styles.

CONCLUSIONS AND SUGGESTIONS

As marketers, we need to understand the characteristics of our different target markets, and as educators, we need to understand how our students learn. Both of these sentiments are relevant to hospitality education. Because hospitality education is a growth market for Taiwanese universities, it is appropriate to attempt to understand hospitality students’ learning-style preferences and the relationships of these preferences to sex, student characteristics, and academic performance.

Our findings suggest significant differences in learning style by sex and type of enrollment. They also revealed a significant difference in the academic performances of sequential versus global learners in that the academic performance of sequential learners was superior to that of global learners. Hospitality programs that can help students develop a variety of skills for information acquisition and processing will turn out graduates who are better prepared and more satisfied. By sharing concepts regarding learning styles with students, perhaps during an orientation session when students first enter the program, faculty members may be able to help students to develop awareness of the different learning styles they will encounter in classrooms and group projects. It may also be beneficial to inform students of their own learning style before their internship placement. Appreciation of different learning styles as well as greater understanding of their own preferences in this regard may help students relate to their supervisors’ learning and coaching styles, enabling better adaptation and more expeditious resolution of differences in the service of getting the most out of internships. Results showed some similarities with other studies on
the learning styles of hospitality students. Similarities may suggest that interest and education in hospitality and tourism may be a stronger force than culture in determining the learning-style preferences of individuals. However, more cross-cultural studies are needed before conclusions can be drawn. Further research is also needed to assess the generalizability of these results. In the meantime, however, hospitality educators should be alert to the potential learning challenges posed by this research.

REFERENCES


Students in Grades 3 to 5 in Taiwan, Republic of China (Doctoral Dissertation, University of Missouri – Saint Louis, 1994). Dissertation Abstracts International, 55(06), 1471A.


Table 1: The means and standard deviations for each of the four learning styles. (N = 360)

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active–Reflective</td>
<td>-0.98</td>
<td>3.74</td>
</tr>
<tr>
<td>Sensate–Intuitive</td>
<td>3.63</td>
<td>3.59</td>
</tr>
<tr>
<td>Visual–Verbal</td>
<td>4.72</td>
<td>3.66</td>
</tr>
<tr>
<td>Sequential–Global</td>
<td>-0.49</td>
<td>3.82</td>
</tr>
</tbody>
</table>

Note: Means were calculated on a continuum from +11 to -11. Students were categorized as having a preference for specific learning styles if they obtained a score greater (or less) than zero on each of the four constructs. For example, students were classified as active learners on the active–reflective construct if their scores were >0 (and as reflective learners if their scores were <0).

Table 2: Independent Samples t-test (N = 360)

<table>
<thead>
<tr>
<th>Learning Style Constructs</th>
<th>Sex</th>
<th>N</th>
<th>Mean</th>
<th>Mean Difference</th>
<th>t</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active–Reflective</td>
<td>Male</td>
<td>65</td>
<td>-.45</td>
<td>.65</td>
<td>1.273</td>
<td>.204</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>295</td>
<td>-1.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensate–Intuitive</td>
<td>Male</td>
<td>65</td>
<td>2.75</td>
<td>-1.07</td>
<td>-2.196</td>
<td>.029*</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>295</td>
<td>3.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual–Verbal</td>
<td>Male</td>
<td>65</td>
<td>5.71</td>
<td>1.21</td>
<td>2.428</td>
<td>.016*</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>295</td>
<td>4.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sequential–Global</td>
<td>Male</td>
<td>65</td>
<td>-.88</td>
<td>-.47</td>
<td>-0.898</td>
<td>.370</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>295</td>
<td>-.41</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: means were calculated on a continuum form +11 to -11 for each of the four constructs. Students were classified as active learners on the active–reflective construct if their scores were >0 and as reflective learners if their scores were <0. *P < .05
Table 3: Learning Styles by Sex

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Male</th>
<th>Female</th>
<th>$X^2$&lt;sup&gt; &lt;/sup&gt;(P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>40.0%</td>
<td>36.3%</td>
<td>.318</td>
</tr>
<tr>
<td>Reflective</td>
<td>60.0%</td>
<td>63.7%</td>
<td>(.573)</td>
</tr>
<tr>
<td>Sensate</td>
<td>83.1%</td>
<td>87.8%</td>
<td>1.045</td>
</tr>
<tr>
<td>Intuitive</td>
<td>16.9%</td>
<td>12.2%</td>
<td>(.307)</td>
</tr>
<tr>
<td>Visual</td>
<td>92.3%</td>
<td>89.8%</td>
<td>.372</td>
</tr>
<tr>
<td>Verbal</td>
<td>7.7%</td>
<td>10.2%</td>
<td>(.542)</td>
</tr>
<tr>
<td>Sequential</td>
<td>40.0%</td>
<td>45.4%</td>
<td>.635</td>
</tr>
<tr>
<td>Global</td>
<td>60.0%</td>
<td>54.6%</td>
<td>(.426)</td>
</tr>
</tbody>
</table>

Note: Students were categorized on each of the four constructs as having a preference for specific learning styles if they obtained scores greater (or less) than zero.

Table 4: Independent Samples $t$-test ($N = 331$)

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Type of Enrollment</th>
<th>$N$</th>
<th>Mean</th>
<th>Mean Difference</th>
<th>$t$</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active–Reflective</td>
<td>Examination</td>
<td>208</td>
<td>-.77</td>
<td>.47</td>
<td>1.110</td>
<td>.268</td>
</tr>
<tr>
<td></td>
<td>Application</td>
<td>123</td>
<td>-1.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensate–Intuitive</td>
<td>Examination</td>
<td>208</td>
<td>3.23</td>
<td>-1.10</td>
<td>-2.705</td>
<td>.007**</td>
</tr>
<tr>
<td></td>
<td>Application</td>
<td>123</td>
<td>4.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual–Verbal</td>
<td>Examination</td>
<td>208</td>
<td>4.53</td>
<td>-.34</td>
<td>-826</td>
<td>.409</td>
</tr>
<tr>
<td></td>
<td>Application</td>
<td>123</td>
<td>4.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sequential–Global</td>
<td>Examination</td>
<td>208</td>
<td>-.99</td>
<td>-1.29</td>
<td>-2.996</td>
<td>.003**</td>
</tr>
<tr>
<td></td>
<td>Application</td>
<td>123</td>
<td>.30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Means were calculated on a continuum from +11 to -11. Students were categorized as having a preference for specific learning styles if they obtained scores greater (or less) than zero on each of the four constructs. For example, students were classified as active learners on the active–reflective construct if their scores were >0 (and as reflective learners if their scores were <0).

**$p < .01$**

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