Learning Styles of Leisure Science Majors Compared to Management, Psychology, and Sociology Majors

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Abstract

The purpose of this study was to investigate the learning differences among 216 sophomore to graduate students in the Sport Management, and Travel & Tourism Management specialties of the Department of Parks, Recreation & Tourism Management (PRTM), and in the Psychology, Sociology, and Management departments at Clemson University, using the four learning/transforming modes and the two combination scores of Kolb's Learning Style Inventory (1985 revised). One-way ANOVA and GLM Univariate analysis of learning/transforming modes and combination scores revealed that students of the PRTM specialties favored empirical learning, while Psychology, Sociology, and Management students used more rational learning. Samples in all five academic units extensively used the active experimentation (doing) transformation of knowledge. Female students used the empirical learning method more than males. This study concludes that Kolb's model may be a useful teaching tool in Leisure Science to strengthen the majors' rational learning abilities, in which the sample is found to be comparatively weak.

Keywords: Experiential Learning Theory, Leisure Science majors, related disciplines.

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Introduction

Throughout human history different philosophical underpinnings have been used to explain the learning process. According to Christian (1987), the main sources of knowledge are the senses (empirical), authority, reason (rational), and intuition. It was Kant in the 19th century, who first tried to integrate the rational and empiricist views into an interactionist epistemology (Dare, Welton, & Coe, 1987). In the 20th century several social scientists elaborated on Kant's approach (Dewey, 1938; Lewin, 1951; Piaget, 1970; Kolb, 1976). Kolb developed the Experiential Learning Theory (1976), which he defined as "the empiricist's concrete experience, ...and the rationalists' abstract conceptualization..." (Kolb, 1984, p. 6).

Kolb's philosophical foundation on learning can be traced back to the works of Dewey, Lewin, and Piaget (Hickcox, 1991). Kolb's learning model uses two axes, which represent two pairs of dialectic concepts. There are two ways in Kolb's Experiential Learning Theory (ELT) to acquire knowledge: concrete experience (CE) and abstract conceptualization (AC). Kolb's theory also suggested two dichotomous ways to transform learned information. These are reflective observation (RO) and active experimentation (AE). In practical terms, CE has to do with "feeling" (in the sense of sensory acquisition of knowledge), AC with "thinking", RO with "watching-listening", and AE with "doing". The ELT assumes that CE and AC, as well as RO and AE are opposite abilities resulting in two bipolar dimensions in the learning/transforming process. Kolb (1976) constructed the Learning Style Inventory (LSI) in order to measure the learning/transforming modes (L/TM), and identify learning style types (LST). In the model, dominant learning style types can be identified by two algebraic operations, AC minus CE, and AE minus RO, followed by plotting the two combination scores on the two axes, and identifying the point of interception. The combination of the two ways to acquire experience with the two ways of transforming knowledge results in four quadrants representing learning style types, which are named: 1) Converger, the combination of thinking and doing; 2) Diverger, the combination of feeling and watching-listening; 3) Assimilator, the combination of thinking and watching-listening; and 4) Accommodator, the combination of feeling and doing (Kolb, 1985).

Figure 1 shows the learning cycle after Kolb (1985). Learning styles (LS) are "the typical ways a person behaves, feels, and processes information in learning situations" (S. J. Sims & R. R. Sims, 1995, p. 194), and are developed as a consequence of hereditary factors, the influence of the environment, and previous learning experiences (Kolb, 1984).

There are a number of learning style instruments that have been developed, in addition to Kolb's LSI. These include Biggs' Study Process Questionnaire (1979), Dunn, Dunn, and Price's Learning Style Inventory (1987), Entwiste and Ramsden's Approaches to Studying (1983), Friedman and Stritter's Instructional Preference Questionnaire (1976), Grasha and Riechmann's Learning Styles Questionnaire (1974), Gregorc's Style Delin-

eator (1982), Honey and Mumford's Learning Styles Questionnaire (1986), Kagan's Matching Familiar Figures Test (1964), Knight, Elfenbein, and Messina's Knowing Styles Inventory (1994), Krause's Cognitive Profile Inventory (1998), Marshall and Merritt's Alternate Learning Style Inventory (1985), McKenney and Keen's Learning Style Inventory for Business (1974), Myers-Briggs Type Indicator (Myers, & McCaulley, 1958), and Schmeck, Ribich, and Ramanaih's Inventory of Learning Process, (1977).

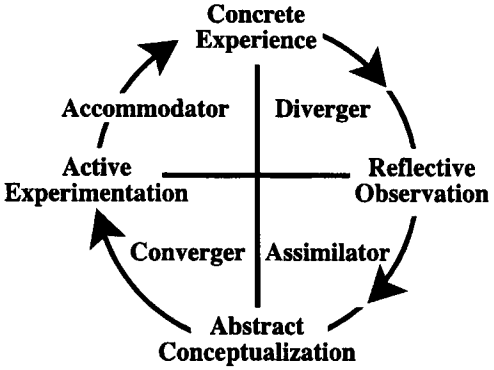

Figure 1. Kolb's experiential learning model.

The basic prerequisites for the use of any learning style instrument are a sound theory and demonstration of acceptable levels of psychometric properties, i.e. validity and reliability (Sims & Sims, 1995). There have been a number of theories proposed in an attempt to explain how individuals learn (Stuart, 1992), including the Whole Brain Theory (Sperry, 1973), the Neurolinguistic Programming Theory (Helm, 2000), and the Seven Intelligences Theory - verbal, musical, visual spatial, kinesthetic, sequential linear, interpersonal, intrapersonal (Gardner, 1983). Kolb's Experiential Learning Theory proposes that learning is a circular process, and people go through four learning/transforming stages that require the abilities of concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984).

Both collective and individual studies have been conducted on the psychometric properties of the various learning style instruments. Curry (1987) classified these into instructional and environmental, information processing, and personality-related preferences. Kolb's ELT and the LSI instrument belong to the information processing (cognitive) category. Curry (1987) also analyzed the psychometric properties of 21 instruments and rated them as strong, good, fair, poor. She found that Schmeck, et al.'s (1977) was strong both in terms of validity and reliability. Kolb's (1985) LSI received a strong and fair rating in reliability and validity respectively. Table 1 lists Curry's (1987) ratings for psychometric properties of selected learning style instruments.

TABLE 1

Psychometric Property Ratings of Selected Learning Style Instruments
(after Curry, 1987)

Topology	Author(s)	Inventory Title	Reliability/Validity
Environmental	Dunn, Dunn, & Price	Learning Style Inventory	G, G
	Friedmann & Stritter	Instructional Preference	F, F
	Grasha & Riechmann	Student Learning Interest	F, F
Cognitive	Biggs	Study Process Questionnaire	G, F
	Entwistle & Ramsden	Approaches to Studying	G, G
	Kolb	Learning Style Inventory	S, F
	Schmeck , Ribich, & Ramanaih	Inventory of Learning Process	S, S
Personality	Kagan	Matching Familiar Figures	F, F
	Myers	Myers-Briggs Type Indicator	G, S

Note: S = strong; G = good; F = fair; P = poor.

Kolb's theory is considered by most researchers useful for establishing the existence of individual differences in learning styles, but has been strongly criticized by some on his method of measuring learning styles, i.e. the psychometric properties of the LSI instrument (Pickworth & Schoeman, 2000). Specifically, content validity and internal reliability were questioned.

Kolb's original (1976) LSI was criticized for having low internal consistency, and poor test-retest reliability (Freedman & Stump, 1978; Merritt & Marshall, 1984). For this reason, Kolb revised the LSI to overcome these problems (Kolb, 1985). Although the internal consistency of the LSI-1985 improved, some researchers suggested that this was due to its ipsative measure, i.e. rank ordering of items (Atkinson, 1988; Loo, 1996; Ruble & Stout, 1990; Sims, Veres, Watson, & Buckner, 1986). Furthermore, in the same-item same-column format, a respondent may recognize a pattern during the completion of the questionnaire and might be influenced by it in answering subsequent questions (response-set bias). This led to proposing a scrambled version of the LSI-1985 instrument. Indeed, Ruble and Stout (1990) showed that there was a lowering of the alpha coefficients (.73) in their scrambled version compared to the original (.82). On the other hand, Veres, Sims, and Locklear (1991) found with their scrambled version of LSI-1985 high test-retest correlations ranging from .92 to .99. They concluded, that "contrary to the findings of previous research ... the LSI II (1985) may have considerable utility." (p. 149). However, the ipsative format still raises questions since it produces spurious negative correlations among items (Hicks, 1970). Geiger, Boyle, and Pinto (1993) compared the results of Kolb's LSI-1985 ipsative version to an alternate normative version consisting of 48 items. The results of the normative instrument provided strong support for the existence of four separate learning/transforming modes according to Kolb's ELT.

Several factor analytical studies have examined the construct validity of Kolb's LSI with mixed results. Some researchers found evidence for the bipolar structure (Loo,

1999; Pickworth & Schoeman, 2000; Sadler-Smith, 2001), while others noted that bipolar dimensions existed but not from thinking to feeling and from watching to doing as required by ELT, but from feeling to watching and from thinking to doing (Geiger, Boyle, & Pinto, 1993). Cornwell and Manfredo (1994) tested Kolb's model for its learning/transforming modes, and for the learning style types. They found evidence, using the LSI, the Wonderlic Personnel Test, (Wonderlic, 1983) and origami folding task, for the four learning/transforming modes, but not for the four learning style types. On the other hand, the results of Ruble and Stout's (1990) factor analysis suggested that AC, RO, and AE may represent distinct learning/transforming abilities, but CE is poorly defined. Ruble and Stout (1994) conducted a comprehensive literature review and critique on psychometric properties of Kolb's LSI-s. Their conclusion is that both the LSI-1976 and the LSI-1985 are deficient in reliability and construct validity due to their ipsative scale, and "should not be used for purposes of interindividual comparisons." (p. 10), i.e. learning style classification.

Kolb (1984) identified five forces that shape learning styles: psychological personality, educational specialization, professional career, current job, and adaptive competencies. Well over 300 published studies were conducted on these factors using Kolb's LSI-s, as well as on the psychometric properties of the instrument (Geiger & Pinto, 1991).

Methodology

The objective of this study was to compare Kolb's learning/transforming modes of students in five different specialties within the Department of Parks, Recreation & Tourism Management (PRTM) with those in the Department of Sociology, Department of Psychology, and Department of Management (Organizations/Businesses) at Clemson University. The five specialties in the Department of PRTM were: Sport Management, Community Leisure Services, Recreation Resource Management, Travel & Tourism Management, and Therapeutic Recreation. The reason for selecting Sociology, Psychology, and Management for comparison was that PRTM is an applied social science relying on psychological and sociological principles, and also uses management techniques. Sophomore, Junior, Senior, and Graduate students in various available classes participated in the study. Freshmen were excluded since many had not selected their major discipline. The questionnaires were administered to consenting students in selected upper level undergraduate and graduate level classes (convenience sampling).

The instrument selected for this comparative learning style study was Kolb's revised (1985) Learning Style Inventory. In spite of the many critiques of this instrument, it generated well over 300 published studies (Geiger & Pinto, 1991), four other learning style models are based on it (Curry, 1987), and the ELT's learning-teaching utility is high (Sims & Sims, 1995). We are not aware of any published research on PRTM specialties using Kolb's LSI. Because this is a comparative study of learning/transforming modes of students in five majors/disciplines, the ipsative nature of the instrument is not

expected to have a negative effect on the results. As Hicks (1970) noted the ipsative measures may be useful for studying intraindividual preferences. However, in order to avoid the response-set bias, the revised LSI answers were scrambled, and 22 original and 22 scrambled questionnaires were mixed and administered to 44 Social Science students. The data were analyzed using the SPSS reliability test, including post-hoc analysis for 196 scrambled cases (Table 2). The alphas were generally lower, although acceptable for the scrambled instrument. Therefore, the scrambled questionnaires were used for the remainder of this study.

TABLE 2

Reliability Analysis Results (Cronbach's alpha)

Mode	Original n = 22	Scrambled n = 22	Scrambled n = 196
Feeling	.8976	.7126	.6872
Observation	.8251	.8427	.7931
Thinking	.8739	.7463	.7525
Doing	.8777	.7726	.7277

An attempt was made to acquire the same number of usable questionnaires in each of the eight disciplines/specialties. Due to the fewer number of majors in Therapeutic Recreation, Recreation Resource Management, and Community Leisure Services, these three PRTM specialties were excluded from the selected statistical analyses. The total number of usable responses was thus 44 for Sociology, and 43 for each of the remaining disciplines/specialties. In addition to Kolb's LSI, the questionnaire collected the following demographic data: the sample students' major, educational level, age, gender and ethnicity.

The research hypothesis was that there are differences in learning/transforming mode levels among samples of the five majors/specialties, since educational specialization is a major force shaping learning styles (Kolb, 1984). Possible influences of the demographic variables on the dependent variables were also examined. In this study we used the SPSS package (2000) to analyze preliminary frequencies, One-way ANOVA, and GLM Univariate statistics.

Results

The socio-demographic characteristics of the sample are shown in Table 3. Seniors, students between 21 and 23 years of age, females, and Caucasian race represent the majority of the sample.

TABLE 3

Socio-demographic Characteristics of the Sample

Variables	%
Education Level	
Sophomore	21.8
Junior	29.2
Senior	46.8
Graduate	2.3
Age Range	
18 – 20 years	36.6
21 – 23 years	54.6
24 years and older	8.8
Gender	
Female	53.7
Male	46.3
Race	
Caucasian	93.5
African American	3.7
Asian	2.3
American Indian	.5

To test if learning/transforming modes differed by majors, One-way ANOVA was conducted on sums of the twelve responses for each of the four learning/transforming modes ("feeling", "observation", "thinking", "doing"), and on the two combination scores ("thinking minus feeling" and "doing minus observation"). The sum means of the four learning modes and the two combination scores are reported in Table 4. For the four learning/transforming modes, the possible minimum score sum is 12 and the maximum is 48. The possible combination scores range between –36 and + 36.

TABLE 4

One-Way ANOVA Mean Sums of Learning/Transforming Modes, and Mean Sum Differences of Thinking-Feeling and Doing-Observation Combinations

Majors	Feel. Sum	Obs. Sum	Think Sum	Do Sum	Think – Feel	Do – Obs.
Psych.	25.42	29.93	30.26	34.35	4.84	4.42
Manage	21.91	31.19	30.74	36.16	8.84	4.98
Soc.	25.89	29.34	29.86	34.91	3.98	4.89
Sport	27.95	30.35	27.21	34.47	-.63	4.12
Travel	26.33	29.79	28.49	35.40	2.16	5.60

TABLE 5

GLM Univariate ANOVA Results on Variable Sums

Variable by Majors	E	Sig.
Feeling sum	5.308	.000
Observation sum	.405	.803
Thinking sum	1.981	.099
Doing sum	.531	.713
Thinking minus Feeling sum	4.370	.002
Doing minus Observation sum	.097	.983

Table 5 shows the results of the ANOVA analysis. "Feeling sum" ($p < .0005$), and "thinking minus feeling sum" ($p < .005$) are the significant variables. Schaffe's post hoc tests were conducted for each variable. The results are reported in Table 6. Significant differences exist between Management, and the PRTM specialties Sport Management and Travel and Tourism Management, for the "feeling sum" and the "thinking minus feeling sum" variables. The "thinking minus feeling" means by majors are shown on Figure 2.

TABLE 6

Significant Variables of Schaffe's Post Hoc Tests

Variables	F	Sig.
Feeling sum	5.308	.000
Management – Sport Management		.005
Management – Travel & Tourism		.036
Management – Sociology		.076
Observation sum	.405	.805
Thinking sum	1.981	.099
Doing sum	.531	.713
Thinking minus Feeling sum	4.370	.002
Management – Sport Management		.004
Management – Travel & Tourism		.096
Doing minus Observation sum	.097	.983

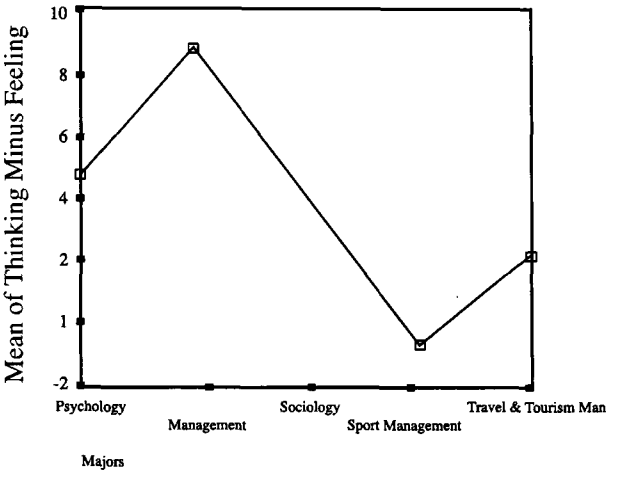

Figure 2. Means of thinking minus feeling by majors.

To improve on the results of the One-way ANOVA, exploratory GLM Univariate ANOVA tests were run for each of "thinking sum", "feeling sum", "observation sum", "doing sum", "thinking minus feeling sum", and "doing minus observation sum" as dependent variables, using only gender, age, and major categories as fixed factors. Table 7 summarizes the significant factors under the learning/transforming dependent variables.

TABLE 7

Significant Fixed Factors of Dependent Variables

Variables	F	Sig.
Thinking sum		
Gender	6.365	.012
Age category	5.334	.006
Major	2.530	.042
Feeling sum		
Major	4.785	.001
Doing sum		
Age	5.151	.007
Thinking minus Feeling sum		
Gender	2.887	.091
Major	4.209	.005

For the "thinking sum", all fixed factors were significant, and the model accounted for 10% of the variance ($R^2 = .100$). For the "feeling sum" learning mode, the parameter

estimate revealed that significant difference exists between Management students ($t_{(4)}$ = -2.797; $p < .01$) and the rest, whereby the former use empirical learning less than the other majors/specialties. According to the result of the "doing sum" mode, there seems to be an increasing use of "doing" knowledge transformation with age. The "thinking minus feeling" combination score suggests that females used "thinking" less than "feeling" ($t_{(1)} = -1.699$; $p < .1$). The parameter estimate also shows that Management and Psychology majors used rational learning more than empirical learning ($t_{(4)} = 2.282$; $p < .05$). Any probability levels less than .1 in this paper will require future study.

To refine the previous results, a GLM Univariate test was conducted on "thinking sum" as the dependent variable and gender, age category, major category, and sex-major category, as fixed factors. The test results of between-subjects effects are displayed in Table 8.

TABLE 8

Thinking Sum GLM Univariate ANOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1424.460	20	129.496	3109.000	.001
Gender	336.327	1	336.327	8.074	.005
Age	18.542	2	209.271	5.024	.007
Major	397.586	4	99.396	2.386	.052
Gender* Major	429.530	4	107.382	2.578	.039
Error	8498.132	204	41.658		

All independent variables in the model are significant, and they explain 14.4% of the overall variance in the dependent variable. Parameter estimates show that females use the rational learning mode less than males ($t_{(1)} = -1.54$; $p < .0001$), with the exception of Sport Management students. The younger age category (18-20 yrs.) is different from the rest of the age groups in its greater use of rational learning ($t_{(2)} = 2.726$; $p < .05$). Psychology students rely on rational learning more than the other majors/specialties ($t_{(5)} = 2.178$; $p < .05$). The means of this analysis are shown in Table 9.

TABLE 9

Estimated Marginal Means for Thinking Sum

Variables	Categories	Mean
Gender	Female	27.720
	Male	30.623
Age	18-20 yrs.	31.509
	21-23 yrs.	29.114
	24 and older	26.891
Majors/Spec.	Psychology	31.555
	Sociology	29.933
	Management	29.275
	Travel & Tourism	27.994
	Sport Management	27.100

Figure 3 illustrates the significant interaction between gender and majors by displaying the estimated marginal means of the "thinking sum" for gender by majors. As depicted in Figure 3, males scored higher on "thinking sum" than females in every major except Sport Management.

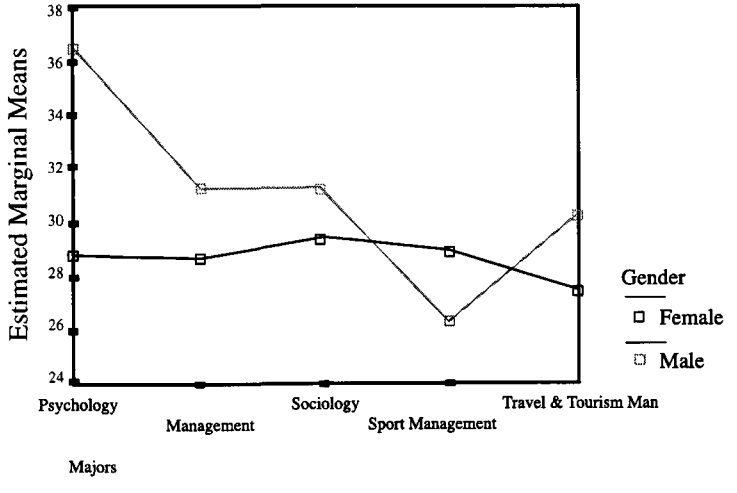

Figure 3. Estimated marginal means of thinking sum for gender by majors.

In conclusion, the GLM Univariate ANOVA results support the findings of the One-way ANOVA analysis and provide more detailed information. They suggest that students' major is an important factor in learning style even when controlling for other factors.

Discussion

The One-way ANOVA test results indicate that the main difference among the learning modes of majors in the five disciplines/specialties is in the scores on the concrete experience (empirical feeling) and the abstract conceptualization (rational thinking) axis.

In examining the One-way ANOVA means of the majors' learning/transforming modes (rows) shown in Table 3, PRTM Sport Management students had high mean scores in "doing", which means that they transform knowledge by active experimentation. Their low scores in "thinking" and "feeling" were nearly identical. PRTM Travel & Tourism Management majors also use active experimentation most, and their score is low in empirical knowledge acquisition. Management majors have high scores in "doing", "observation", and "thinking". Indeed managers rely on planning (observation), rationalization, and execution. Psychology and Sociology majors scored high on "doing" and "thinking" and low on "feeling". Their "doing" scores were lower and the "feeling" scores higher than those for Management majors.

Looking at the comparisons of learning/transforming modes by majors/specialties (columns), in the "feeling" column Sport Management outscored the other disciplines/specialties, and Management had the lowest score. Within the "doing" column, Management shows the highest scores, and Psychology the lowest. Management surpassed the other disciplines/specialties in abstract ("thinking") learning, followed by Psychology. In the "observation" column Management received the highest score and Sociology the lowest.

The "thinking minus feeling" column shows that Sport Management students use slightly more empirical than abstract learning (-.63). The main difference between active experimentation and reflective observation is for Travel & Tourism Management (5.60). Psychology and Sociology majors have nearly identical positive scores in this column. Management students use abstract learning more and empirical learning less.

The GLM Univariate tests confirmed generally the findings of the One-way ANOVA analysis and provided more detailed results. The most significant difference among majors/specialties exists in the "thinking sum" knowledge acquisition mode. Gender, major, and age all contribute to the model, the gender effect being the most significant. Table 10 displays the percent frequency of gender by majors/specialties in the sample.

TABLE 10

Frequency of Gender by Majors/Specialties (%)

Gender	Psychology	Management	Sociology	Sport	Travel
Female	79.1	18.6	71.7	34.9	62.8
Male	20.9	81.4	27.3	65.1	37.2
Ratio	3.78	.23	2.66	.54	1.69

As discussed earlier, females generally favor the empirical learning style as opposed to rational learning. This is in accordance with findings of Knight, Elfenbein, & Martin (1997), Magolda (1989), Matthews & Hamby (1995), Philbin, Meier, Huffmann, & Boverie (1995), and Severiens & Tendam (1994). This study did not address the possible social reasons for this (see Samdahl & Jakubovich, 1997). However, the high percentage of females in Psychology, Sociology, and Travel & Tourism Management is expected to lower the overall estimated marginal means of "thinking sum" in these disciplines. It is therefore, necessary to control for gender when attempting to discern any pattern of learning style by major. This is confirmed when the One-way ANOVA and GLM results are compared. In the One-way ANOVA, Management had the highest mean. However, Management also has the lowest female to male ratio (.23). Once gender is held constant in the GLM analysis, Management's overall estimated mean (29.769) dropped below that of Psychology and Sociology, while in the One-way ANOVA it had the highest mean (30.740). Sport Management has the second lowest female to male ratio (.54). Here the estimated marginal mean for males is lower than for females. Sport Management seems to attract females with higher rational learning mode than their male counterparts. Overall, the preferred learning mode for the PRTM specialties is empirical knowledge acquisition.

Conclusion

This research examined the learning/transforming abilities of selected Sport Management, and Travel & Tourism Management students, and compared them with majors in Management, Psychology, and Sociology using Kolb's LSI. Convenience sampling of classes were used, therefore, the results cannot be generalized. The conclusions must be replicated and subjected to disproval studies on random samples.

Nevertheless, based on these findings, Leisure Science teaching could benefit from Kolb's model of learning. Several disciplines have already used Kolb's learning cycle in teaching, including Business (Dyrud, 1997), Political Science (Brock & Cameron, 1999), Physical Education (Coker, 1996), Nursing (JoyceNagata, (1996), and Chemistry (Logowski, 2000). Leisure Science is a relatively young discipline, still searching for a balance between positivist and intrepretive paradigms (Henderson, 1990). Kolb's learning cycle is ideally suited to expose students to both. Successful learning depends on both characteristics of the student (learning style, motivation, intellectual skill), and the teacher (teaching style, enthusiasm, empathy, choices of course content) (Entwistle, 1981). Consequently, both the students, and the teacher's learning style should be determined in the beginning of the course in order to identify strengths and weaknesses in the four learning/transforming abilities. The course should start with Concrete Experience to engage the student personally, emphasizing open-mindedness. Case studies, field trips, films could be used to collect data. In step two, Reflective Observation would consider the concrete experience from several prospective of why and how they occurred. Deductive lecture/discussions, and group activities may be used. Abstract Conceptualization should follow to practice problem solving, and build the observations and reflections

into a concept or theory. Since this study showed comparative weakness of PRTM majors in theory-building ability, this part of the model should be emphasized. Finally, Active Experimentation should apply the theories, and complete the synthesis of the learning cycle. While not all courses in the Leisure Science curriculum may be appropriate for inclusion of the complete learning cycle, some of the four learning/transforming modes could be proved beneficial to advance student learning.

There are two primary ways of applying learning style knowledge in the classroom. The first involves classifying class units based on the mode conducive to learning. For example, a unit on trends might be taught using reflective observation, and involve keeping a journal reflecting on the media coverage of leisure and recreation. A class unit on developmental aspects of play might focus on concrete experience, requiring storytelling and reminiscences of childhood by class members.

Kolb's learning/transforming modes could also be incorporated into the classroom by using all four stages on teaching one concept. For example, teaching about flow (Csikszentmihalyi, 1975) might involve the following processes:

1. Students are asked to observe children while playing on a playground. The observation is directed toward the actions of the children while playing. This would capture Kolb's concrete experience stage.

2. Upon the completion of the site visit students return to the classroom and the professor leads them through a discussion designed to help the students reflect on what they have observed. This reflective observation stage allows students to make sense of what they experienced in stage 1.

3. During the abstract conceptualization stage students use logic to translate their observations and reflections into a concept or theory. During this stage the professor uses probing questions, as well as readings from the textbook, to lead students to a conceptualization of flow.

4. The theory developed during the abstract conceptualization stage is then tested during the active experimentation stage. Students return to the "real world" to determine whether their theory is isomorphic with reality. This maybe accomplished by setting up a series of hurdles of varying heights at a playground, and determining by tabulation and interview why certain obstacles were avoided by children of equal abilities (boredom, anxiety).

The results of this study indicate that students in the sampled leisure science curriculum are comparatively weak in abstract conceptualization. If our students are to become effective learners they must acquire proficiency in all four learning/transforming modes. It is crucial faculty help develop deficient areas by focusing on learning mode weaknesses in the classroom. Therefore, the findings of this study indicate a need to concentrate on activities of leisure science students to strengthen concept and theory building.

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