Student and Faculty Learning Styles Within Academic Units in the University of Florida's College of Agriculture

Rick Rudd[1], Matt Baker[1], and Tracy Hoover[1]
Department of Agricultural Education and Communication, University of Florida

Abstract

This study identified student and faculty learning styles with the Group Embedded Figures Test, and made comparisons based upon the learning style assessments within the College of Agriculture at the University of Florida. As a group, both students and faculty were field independent learners. Marked differences existed between majors. Students in Agronomy, Entomology and Nematology, Dairy and Poultry Science, and Agricultural Education and Communication were identified as field dependent learners while students in Forest Resources and Conservation, Microbiology, Plant Pathology, Soil and Water Science, and Food Science and Human Nutrition were predominantly field independent learners. Faculty in Animal Science, Horticulture, and Agronomy were field dependent learners, while most of the other departmental faculty were field independent learners. No gender differences in learning style were identified among students or faculty.

Introduction

Universities continue to emphasize good teaching. The professorial role is being widened to include an increased capacity for teaching. Unfortunately, most faculty members in the agricultural sciences have had very little, if any professional preparation for teaching.

Many differences among students can be observed and easily identified, such as race, age, and academic ability. Others, such as the students preferred learning style are not as evident. Since we tend to teach the way we were taught and often have a narrow definition of the learning process (defined usually by the way we learn) understanding and coping with different learning styles is often a challenge for faculty members.

The success of education hinges on the adaptation of teaching to the learning differences among the students (Snow and Yallow, 1982). Learning styles of students are often studied at four levels: (1) personality, (2) information processing, (3) social interaction, and (4) instructional methods (Claxton and Murrell, 1987). Kirby (1979) speculates that several models have correlates that describe two basic orientations to learning: Asplitters@ who tend to be analytical and logical, breaking complex issues into manageable parts, and Alumpers@ who learn through identifying relationships and patterns between parts.

Dunn and Dunn (1993) placed learners into analytical and global categories. Analytical learners preferred formal situations with few distractions, while global learners preferred a less formal environment and could work on several tasks at once.

Witkin (1976) identifies learners by their ability to deal with "fields" either independently or as a whole. The fields Witkin used were simple figures embedded in complex figures. By ascertaining an individual's ability to locate a simple figure within an organized, complex figure, Witkin claims that learning style can be classified as either field dependent or field independent. Witkin's (1976), field dependent learners appear to be aligned with Kirby's (1979) Alumpers@ and the global thinkers identified by Dunn and Dunn (1993), while the field independent learners seem to be identified with splitters (Kirby, 1979) and analytical learners (Dunn and Dunn, 1993).

Field dependent learners tend to be more social, have a more global perspective and learn more effectively in a non-formal environment than field independent learners. Field independent learners are better able to discern individual components and learn well in formalized settings. Learning style goes beyond cognition into the psychological realm of learning (Witkin, 1976). Witkin also noted in a review of literature that there seemed to be a relationship between careers selected by individuals and their learning style. He found that field independent learners tended to be attracted to careers that required the use of their analytical skills (mathematics, engineering, biological sciences) whereas field dependent learners preferred careers that required interpersonal skills (social sciences, elementary school teaching, management).

Professors that are field dependent learners tend to teach in ways that facilitate field dependent learners and teachers who are field independent learners tend to teach in ways that facilitate field dependent learners (Jacobson, 1992; Garger and Guild, 1984; Smith, 1982; Dunn and Dunn, 1979). Unfortunately, few teachers consider that the students have preferred learning modes (learning styles) that may or may not be that same as theirs! We can be certain that in any

[1] Assistant Professor

given college course some student's learning styles will be aligned with the teacher's teaching style and some will not. Garger and Guild (1984) offer an assessment of learning behavior, teacher characteristics, and student motivation techniques associated with learning styles (Table 1).

Several instruments have been developed and used to assess individual learning styles (Cox, et al., 1988; Claxton and Murrell, 1987). The Group Embedded Figures Test (GEFT) has been widely utilized in agricultural education to measure learning style (Baker, et al., 1996; Raven, et al., 1995; Torres and Cano, 1995; Cano and Metzger, 1995; Cano et al., 1992a; Cano et al., 1992b; Cano, et al., 1991). The GEFT is an instrument designed to determine learning style by assessing the ability of a person to locate simple figures within complex figures. The ability to locate such figures is one characteristic of field independent learners.

The national average for the GEFT is 11.4 (Witkin, et al., 1971) out of a possible 18. For the purpose of this study, individuals and groups scoring the national average and above were classified as field independent while those scoring below the national average were classified as field dependent.

Although student learning styles have been identified in a variety of studies, the relationship between learning style and college major for agriculture students, and the relationship between faculty learning styles and fields of study have not been adequately addressed. Are there relationships between a student's learning style and the major they choose? Is there a relationship between a faculty member's academic unit and his/her learning style? Are students with a particular learning style drawn to academic units where faculty members possess similar learning styles?

Table 1. Field Dependent and Field Independent Characteristics.

Field Dependent		Field Independent
	Learning Styles	
perceives globally		perceives analytically
makes broad general distinctions among concepts, sees relationships		makes specific concept distinctions, little overlap
social orientation		impersonal orientation
attends best to material relevant to own experience		interested in new concepts for their own sake
requires well defined goals and reinforcements		has self-defined goals and reinforcements
needs organization provided		can self-structure situations
more affected by criticism		less affected by criticism
uses spectator approach for concepts		uses hypothesis-testing approach to attain concepts
	Teaching Styles	
Prefer teaching situations that allow discussion		prefers impersonal teaching situations like lecture
		emphasizes cognitive aspects
uses questions to introduce topics and probe for student answers		uses questions to check student learning
uses student-centered activities		uses teacher-organized learning situation
viewed by students as teaching facts		viewed by students as applying principles
provides less feedback, avoids negative evaluation		gives corrective feedback, uses negative evaluation
strong in establishing a warm, personal learning environment		strong in organizing and guiding student learning
	How to Motivate Students	
verbal praise		through grades
through helping the teacher		through competition
external rewards		personal goal chart, choice of activities
showing the tasks value to others		showing the task is useful to them
providing outlines and structure		freedom to design their own structure

Garger and Guild, 1984

Purpose and Objectives

The purpose of this study was to identify student and faculty learning styles in the College of Agriculture at the University of Florida. The following objectives guided this study:

1. determine student learning styles by college major,
2. determine faculty learning styles by academic unit,
3. compare student learning styles by college major to faculty learning styles by academic unit, and
4. determine if gender differences in learning style exist within the student and faculty samples.

Methods

The target populations for this descriptive study consisted of 3500 College of Agriculture students enrolled in courses at the University of Florida in the spring, summer, and fall semesters of 1996, and 345 College of Agriculture teaching faculty members at the University of Florida.

Data were collected from a purposeful sample of 450 students enrolled in several College of Agriculture courses. Courses were surveyed in spring, summer, and fall of 1996. Courses were selected for the data collection that would provide the researchers with a wide variety of student-majors in the College of Agriculture at the University of Florida. The selected courses included; Introduction to Animal Science; Reproductive Physiology and Endocrinology in Animal Science; Animal Nutrition; Environment, Food and Safety; Field Crop Science; Quantitative Methods in Food and Resource Economics; Principles of Food and Resource Economics; Strategic Selling; and Effective Oral Communication. A purposeful sample of 97 College of Agriculture teaching faculty members was utilized in this study (n=97). The findings of this study are limited to the purposeful samples.

Learning styles of the students and faculty participating in this study were measured with the Group Embedded Figures Test (GEFT). The validity and reliability of the Group Embedded Figures Test were established during the instrument's development. The researchers also identified the participants' gender to complete objective four. Data were analyzed using the SPSS/PC+ statistical software package. The researchers utilized descriptive statistics to interpret the data.

Results

The first research objective was to determine student learning styles by College of Agriculture major. Students from 13 majors within the College of Agriculture were surveyed (n = 450). See Table 2. The overall GEFT score for students in the College of Agriculture was 11.7). Animal science majors had a mean GEFT score of 11.8 and accounted for over one-third of the students surveyed. Agronomy and Entomology / Nematology students had the lowest mean scores (9.9 and 10.0 respectively) while Forestry and Natural Resources students posted the highest mean scores at 14.7.

Table 2. GEFT Scores by Student Major (n = 450).

Major	n		GEFT Mean Score	
Food Science and Human Nutrition	17	3.8[Z]	12.6	5.4[Y]
Animal Science	166	37.0	11.8	4.9
Ag. Education and Communication	24	5.3	10.2	5.2
Horticulture[X]	9	2.0	11.7	5.6
Dairy and Poultry Science	11	2.5	10.4	6.6
Food and Resource Economics	57	12.6	11.8	5.0
Soil and Water Science	2	.4	14.0	0.0
Agricultural Engineering / Agricultural Operations Management	27	6.0	11.8	4.5
Agronomy	9	2.0	9.9	3.6
Plant Pathology	2	.4	13.0	4.2
Microbiology	26	5.8	12.5	4.2
Forest Resources and Conservation	15	3.2	14.7	2.3
Entomology / Nematology	6	1.3	10.0	5.1
Other (Dual majors / undeclared)	79	17.6	11.5	4.9
Statistics	---	---	---	---
Total	450	100.0	11.7	4.9

[X] - Includes Horticultural Sciences and Environmental Horticulture
[Y] - Standard Deviation
[Z] - Percentage of Total

Social science majors within the College of Agriculture include Agricultural Education and Communication, and Food and Resource Economics. Students majoring in Agricultural Education and Communication had a mean GEFT score of 10.2. Food and Resource Economics students posted a mean score of 11.8.

The second research objective that guided this study was to determine the learning styles of the teaching faculty in the College of Agriculture. A total of 97 faculty members completed the GEFT. The mean score for the faculty was 12 (Table 3). Ten of the academic units in the College of Agriculture had five or more faculty members participate in the study. Of those 10 units, three posted mean scores greater than 15 (Agricultural Engineering / Agricultural Operations Management, Forestry and Natural Resources, and Entomology / Nematology). Horticulture, (mean score = 8.7), and Animal Science, (mean score = 9.1) had the lowest mean scores. Scores for faculty members representing the social sciences in the College of Agriculture were; Agricultural Education and Communication (mean score = 11.3) and Food and Resource Economics (mean score = 12.1).

Table 3 GEFT Scores of Faculty Members by Academic Unit (n = 97)

Academic Unit	Z	GEFT Mean Score		Y
Food Science and Human Nutrition	6	6.1	11.0	7.4
Animal Science	8	8.2	9.1	4.3
Ag. Education and Communication	10	10.3	11.3	4.1
Horticulture[X]	21	21.4	8.7	5.3
Dairy and Poultry Science	3	3.1	13.0	2.0
Food and Resource Economics	9	9.2	12.1	4.6
Soil and Water Science	5	5.1	13.2	6.7
Agricultural Engineering / Agricultural Operations Management	11	11.2	15.4	3.9
Agronomy	6	6.1	10.7	4.8
Plant Pathology	2	2.1	8.0	2.8
Microbiology	1	1.0	10.0	0.0
Forest Resources and Conservation	7	7.1	15.1	3.0
Entomology / Nematology	6	6.1	15.5	2.1
Statistics	1	1.0	9.0	0.0
Family, Youth and Community	1	1.0	2.0	0.0
Total	97	100.0	12.0	5.0

[X] - Includes Horticultural Sciences and Environmental Horticulture
[Y] - Standard Deviation
[Z] - Percentage of Total

The third objective was to compare learning styles of students majoring within academic units to the faculty members teaching in those academic units. Of the 10 academic areas where five or more faculty were surveyed, learning style scores were strikingly similar (Table 4). Agricultural Engineering / Agricultural Operations Management (Faculty = 15.4, Student = 11.8) and Entomology / Nematology (Faculty = 15.5, Student = 10.0) posted the greatest differences in student and faculty GEFT mean scores.

Overall means for students and faculty members in the College of Agriculture were similar. The grand mean for students was 11.7 which indicated a field independent learning style. Faculty in the College of Agriculture had a grand mean score of 12.0, also denoting a field independent learning style.

Table 4. Comparison of Faculty and Student GEFT Scores by Academic Area.

Academic Area	Student Mean Score	Faculty Mean Score
Food Science and Human Nutrition	12.6	11.0
Animal Science	11.8	9.1
Ag. Education and Communication	10.2	11.3
Horticulture′	11.7	8.7
Food and Resource Economics	11.8	12.1
Soil and Water Science	14.0	13.2
Agricultural Engineering	11.8	15.4
Agricultural Operations Management		
Agronomy	9.9	10.7
Forest Resources and Conservation	14.7	15.1
Entomology / Nematology	10.0	15.5
Grand Mean	11.7	12.0

′ Includes Horticultural Sciences and Environmental Horticulture

The fourth objective was to determine if there were learning style differences between genders (Table 5). In the student sample both males and females were field independent learners (59.2% of the males and 55.3% of the females). The split between field dependent and field independent learners was nearly equal in the faculty sample with 51% of the males and 50% of the females classified as field independent (Table 6). A Chi Square value was calculated for both faculty and student learning style classification by gender. There were no significant differences in learning style for males and females in either group.

Table 5. Student Preferred Learning Style by Gender (N=450).

Gender	GEFT Learning Style Category			
	Field Dependent		Field Independent	
	n	%	n	%
Male	85	40.0	127	60.0
Female	105	44.1	133	55.9
Total	190	42.2	260	57.8

Table 6. Faculty Preferred Learning Style by Gender (n=97).

Gender	GEFT Learning Style Category			
	Field Dependent		Field Independence	
	N	%	N	%
Male	40	49	41	51
Female	8	50	8	50
Total	48	49.5	49	50.5

Discussion

Students from 13 academic majors in the College of Agriculture were represented in this study. The mean GEFT score (11.7) indicates that the students in the College of Agriculture are field independent learners. Student GEFT mean scores among majors varied greatly. Undecided and dual-major students scored close to the national mean (11.4), with a mean score of 11.5. Students in Agricultural Education and Communication, Dairy and Poultry Science, Agronomy, and Entomology / Nematology were classified as field dependent learners while all other students in the college were identified as field independent learners. There is no apparent link between field dependent learners self - selecting social science majors and field independent learners self-selecting "hard" sciences. With the exception of Agricultural Education and Communication, this finding does not support Witkin (1976) who asserted that field dependent learners would seek careers where they could best utilize their learning styles and be able to utilize their interpersonal skills.

College of Agriculture faculty were evenly split between field independent learners and field dependent learners. The faculty in Soil and Water Science, Agricultural Engineering / Agricultural Operations Management, Forestry and Natural Resources, and Entomology / Nematology were field independent with mean scores ranging from 13.2 - 15.5. Faculty members in Animal Science and Horticulture were strong field dependent learners with mean scores of 9.1 and 8.7 respectively. There were no learning style differences between male and female faculty members.

When comparing student learning styles to faculty learning styles within academic units, several differences were evident. While faculty were evenly divided between field dependent and field independent learners, only four groups of students within academic majors were identified as field dependent. All but one group of field dependent students matched with field dependent departmental faculty (Entomology and Nematology). Three departments had faculty that were field dependent learners and students who were field independent learners (Food Science and Human Nutrition, Animal Science, and Horticulture).

The percentage of males and females who were field dependent and field independent were similar for both students and faculty. A smaller percentage of the faculty members were field independent learners as compared to the students.

Implications

The authors suggest that the reader use caution in application of these results beyond the purposefully selected samples of this study.

Student and faculty learning styles matched in six of the 10 departments analyzed. Several questions arise as a result of this finding. Do students seek affiliation with departments and faculty that hold similar pre-dispositions to learning? Are departments unknowingly discouraging students from entering their programs that do not match their faculty's approach to learning (teaching)?

It is clear that there are cases where student and faculty learning styles differ. The faculty in the College of Agriculture need to be made aware of these differences and given instructional tools to better meet the needs of students with learning styles different from their own. The authors suggest utilizing the information on table six to increase faculty members familiarity with their own learning style and the learning styles of their students.

There is a need to understand how other variables effect student and faculty learning styles. Study is also needed to explore the benefits or limitations of possessing a particular learning style and entering specific college majors.

The GEFT needs to be administered to additional faculty members and students in academic units with low representation in this study. This data is needed to determine if students are indeed attracted to academic units that have faculty with learning styles similar to their own.

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Integrating Classroom and Library Instruction: A Cooperative Effort to Improve Student Term Paper Quality

Linda B. Maddux[1], Willamette University, Salem, OR 97301
James R. McKenna[2], Department of Crop and Soil Environmental Sciences, College of Agriculture and Life Sciences, Virginia Tech University, Blacksburg, VA 24061-0404

Abstract

Two sections of a service crop science class (CSES 3444-World Crops and Systems) were given extra credit to participate in a one hour workshop on library sources and databases. The librarian and classroom instructor planned the session. There was an emphasis on publication identification and retrieval of resources, as well as searching capabilities of the on-line public access catalog and CD ROM searching of agricultural and weather-related databases. The climate and weather CDs were demonstrated with emphasis on data acquisition and use. Participants completed an evaluation instrument (survey) at the end of the workshop. Statistical analysis showed no significant differences in student assessment when compared by year in college, gender, or academic major. An overall evaluation of the workshop of 4.25 on a 5 point scale was given by the students with a unanimous recommendation that this activity be continued and extra credit given for participation. This model could be used by others to encourage library literacy, introduce students to library databases, and ultimately improve the quality of student papers.

Introduction

Virginia Tech's University Libraries established anew program, the Collegiate Librarian and Information Officer (CLIO) Initiative, designed to increase usability of the library for colleges and departments within the University. This program involves a physical presence of a CLIO housed within the college, usually with office hours each week. Within the College of Agriculture and Life Sciences, the CLIO attends the monthly meetings of the Associate Dean and Director of Academic Instruction and

[1]Science Librarian
[2]Professor