AN ASSESSMENT OF LEARNING STYLES AMONG FRESHMAN STUDENTS IN THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES AT OKLAHOMA STATE UNIVERSITY

By

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CHAPTER I

INTRODUCTION

There is a heated debate over whether or not the education system in the United States is keeping up with the rest of the world. The educational standards and goals vary from state to state and from learning institution to learning institution. For many years now the educational system has focused on the curriculum and keeping up with the "norms" (Torres and Cano, 1994). After the system has determined what the student needs to know, then that information is passed along to the teachers. It is then their place to pass it on to the students and make sure they learn it.

The student is the center of this whole circle. But far too often the student is not taken into account in the design of the curriculum or in the teaching style that the material is presented. A lot of the time the teaching process ends at the simple presentation of the material. Many times, the teachers do not see it as their place to make sure the students learn the material. They simply present the information (Jenkins, et al, 1990).

If we, as a nation, are going to stay competitive, we must have a highly educated and skilled population. To do this we might need to look at education from a different point of view. Maybe we should concentrate less on curriculum design and where we rank among the world-wide norms and turn our thoughts to the needs of the students.

For several years now some educators have been working to determine how students learn. They have also been looking at the different learning styles that make it easier for different students to learn new information. Numerous studies have been done on the audio and visual aspects of the learning process. More recently, educators have started to focus on the dependent versus independent learning styles (Jenkins, et al, 1990). These styles help to determine whether the students learns better by instruction or by an independent, hands-on, problem solving method. When it is determined how students learn, then the curriculum and teaching methods can be planned around the learning styles. This insures that the students gain the most from the time and money spent on their education. Also, when learning is easier and comes more naturally, students are more likely to go further with their education and seek to learn more (Jenkins, et al, 1990).

Statement of the Problem

Many educators today do not realize the varying ways that students process and understand information. Therefore, there is a need to understand the preferred learning styles of students. This will enable educators to better prepare and present information in a manner which will assist the student in assimilating and using the knowledge he/she has attained.

Purpose of the Study

The purpose of this study was to determine the preferred learning styles of freshman students enrolled in the College of Agricultural Sciences and Natural Resources at Oklahoma State University during the 1996 Fall semester.

Research Questions

To achieve the purpose, the following research questions needed to be answered:

1. What was the preferred learning style of the freshman students enrolled in the College of Agricultural and Natural Resource Sciences by gender.

2. What was the preferred learning style of the freshman students enrolled in the College of Agricultural and Natural Resource Sciences by major

3. What was the overall preferred learning style of freshman students enrolled in the College of Agricultural and Natural Resource Sciences.

Scope of the Study

The scope of this study included freshman students enrolled in the College of Agricultural Sciences and Natural Resources at Oklahoma State University during the 1996 Fall semester.

Assumptions of the Study

The following assumptions were made concerning the validity of the data presented in this study:

1. The students fully understood why they were being tested and what was expected of them.

2. The students completed the test to the best of their abilities.

3. Although the validity of the testing device was already established, it was assumed that the test was still up-to-date and an accurate measure of the students learning styles.

Terms and Definitions

The following terms and definitions were relevant and added clarity and understanding to this study:

Analytic Skill- To identify simple figures hidden in a complex field: to use the critical element of a problem in a different way. Field dependent people find it difficult to overcome the influence of the surrounding field or to separate an element from its context. Field independent people do not. They can attend to the familiar object without reliance on the prevailing field (Jenkins, et al, 1990).

Field Dependent Learning Style- Perception is strongly dominated by the surrounding field; perceive globally; more difficulty solving problems (Cano, et al, 1992).

Field Independent Learning Style- Perceives items separately from the surrounding field; perceive analytically; promote problem-solving, critical thinking, and the inquiry approach to learning (Cano et al, 1992).

Group Embedded Figures Test (GEFT)- a standardized test that was designed to provide an adaptation of the original individually administered EFT test which would make it practical to test large numbers of subjects to determine learning styles (Witkin et al, 1971).

Kinesthetic- Refers to the use of the body; use of hands, gestures, body movement, and eye contact. Movements may be conscious or unconscious but the listener still elicits meaning from them (Shute and Moore, 1982).

Learning- The change in ability, skill, information or motivation which takes place in the learner; it is what is left after a specific educational event or experience is concluded (Shute and Moore, 1982).

Modality- Is any of the sensory channels through which an individual receives and retains information. These are composed of three elements: sensation, perception, and memory (Barbe, et al, 1979).

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter was to present a summary of material directly and indirectly related to factors that influenced this study. The review was divided into six major areas. Those areas were: (1) Introduction; (2) Learning Styles; (3) Teaching Styles; (4) Agricultural Teaching Methods; (5) Gender Related Learning Differences; and a (6) Summary.

Introduction

The topic of learning styles has been heavily scrutinized. Research has shown that different students learn better under different circumstances. This research effort involved freshman students enrolled in the college of Agricultural Sciences and Natural Resources at Oklahoma State University to, in part, benefit the students by determining their learning style as a class so that professors preparing to teach this class will understand the learning preference of the class as a whole and what teaching styles will most benefit the students.

Learning Styles

Keefe states that cognitive styles tell how information is being processed. He described field independence versus field dependence as the part of the brain that is in

control. Analytical (left-hemisphere dominated) and global (right-hemisphere dominated) were the two categories he classified. Independent learners perceive things that are discrete from a complex background. Dependent learners are influenced more by the background and are not able to pick the patterns out of the background (Keefe, 1979).

Other areas of cognitive styles consist of perceptual modality preferences where learners have a preference for kinesthetic, visual, or auditory modes of perception. Scanning is where the learner has a broad attention versus a more focused attention. Constricted control is easily distracted where flexible control tends to focus more on the task at hand. Highly tolerant individuals tend to accept unorthodox or unrealistic experiences with ease. Less tolerant learners hold tightly to more conventional ideas. People with strong automatization style can easily perform repetitive and simple tasks. People with a weak automatization style have strong restructuring abilities. The last cognitive learning style according to Keefe is the conceptual versus the perceptual dominance. Conceptual learners perform easily in conceptual areas, whereas perceptual learners perform perceptual-motor behaviors easier (Keefe, 1979).

Along with the cognitive styles, Keefe stated that affective styles and physiological styles also worked to determine a persons learning styles.

Affective styles are those that relate to attention, emotion, and values. Therefore, a wide variety of influences such as culture, peers, personality, family and values are intimately involved in the motivational processes of the learner. Physiological styles are based on the functioning of the human body. Physiological styles are types of responses influenced by sex-related differences, health, personal nutrition, and reaction to the physical environment (Keefe, 1979). Witkin described field dependent and field

independent learning styles as two of the most studied learning styles. He found that field dependent learners perceive globally and, therefore, find it harder to do problem solving. Field independent learners are more analytical and find problem solving easier. They take a critical thinking and inquiry approach to learning. Witkin (1971) also found that most agricultural education instructors are field independent learners and therefore teach more problem solving techniques.

Teaching Styles

Ramsden (1988) stated that teaching was a practice that assumed the teacher had an understanding of learning. Teachers must present material in such a way that it encourages a change in the students perceptions. He went on to claim that teachers themselves should become scholars on their students so they can understand how the students learn.

Silvernail (1979) reported that there are numerous ways to categorize teaching styles. He stated that teaching styles can be globally defined as direct or indirect and traditional versus progressive.

The direct method consisted of the teacher using their authority over the student. They could also state their own opinion, criticize the students behavior, and direct the students attention. Indirect methods were those in which the teacher asked the students for their opinions, praised and encouraged the students, and applied or helped to clarify the students ideas.

The terms traditional and progressive can be related to the formal and informal teaching styles. The formal style consists of a controlled classroom. Teachers present

each subject separately by class or individual teachings. Most of the time students have assigned seating. Teachers assess students based on an averaging system. Usually an extrinsic motivation system predominates.

Informal styles, on the other hand, are nearly the opposite of formal. Teachers favor an integration of the subjects taught. Most of the time students have a free choice of seating. The student has a choice of group or individual presentation of material. Assessment in all forms of grading, homework, and testing is usually avoided. Intrinsic motivation is usually preferred (Silvernail, 1979).

Agricultural Teaching Methods

Agricultural teaching methods have almost always been centered around a hands-on type of problem solving. The Cooperative Extension Service's main goal is to educate. Most of their programs center around adult education on agricultural related topics. Historically, their educational programs have been a demonstration type of teaching. This is the problem solving learning method that field independent learners prefer (Cano, et al, 1992).

Teachers of Agricultural classes seldom use only one teaching method. They usually try to develop a variety of methods to relate to the different learning needs of the students. Numerous methods such as conferences, personal contact, supervised farm programs, teaching machines, problem solving, lecture, panel discussion, symposiums, tours, demonstrations, films, and resource personnel are all used in agricultural programs. Each teacher must decide which methods will work best for their audience and evaluate the situation and the objectives to be accomplished (Bender, et al, 1972).

Lammel (1966) stated that the methods used by a teacher depend, in part, on the teacher's values, conception of individuals, learning concerns, and knowledge of the material to be presented.

Gender Related Learning Differences

Gender refers to the roles of men and women that are socially or culturally based. Sex, on the other hand, refers to the biological differences of men and women. Therefore, most people agree that learning differences are gender based and are related to the individuals socialization and culturalization rather than based on biological differences (Feldstien and Jiggins, 1994).

Gender differences can be seen in the classroom. When students and teachers enter a classroom, they bring with them their own values, attitudes, and socially influenced beliefs about what behaviors are appropriate for men and women (Gappa and Pearce, 1982). These differences can affect the students learning style.

Eisler used the term "dominator society" to describe those who wield power as functionally objective and independent and mostly male. Those who power was held over were those who function subjectively and interdependently (usually women), (Eisler 1987). Based on Eisler's theories, we would assume that more males would prefer independent learning styles. In the study completed by Torres and Cano found that more males preferred independent learning styles. They found that, of the individuals in their study, 71.2 percent of the males preferred an independent learning style, while only 47.7 percent of females preferred the independent learning style (Torres and Cano, 1994).

Most research on gender differences present gender differences as dichotomies, assuming one view would dominate. This view usually sees women as having less ability for abstraction and rationality than men, and more concern for care than justice (Fried, 1994).

Summary

There is a wide variety of terms used to describe learning and teaching styles. They all basically get around to using the same terminology. However, several areas need to be considered when determining students learning styles. Most students do not know how they learn best and even fewer teachers know how their students learn. Learning styles should be determined so teachers can match teaching and learning styles. The best thing for teachers to do if they do not know their students' learning styles is to simply vary their teaching styles so that all students regardless of learning style can benefit.

CHAPTER III

DESIGN AND METHODOLOGY

Introduction

The purpose of this chapter is to explain how this study was designed and what methodology was used in the conduct of this study. Once the problem to be addressed was determined, the purpose and objectives were developed so that data could be collected and analyzed. An instrument to test the students was selected and a decision was made to determine a population. As a result, procedures were established to determine how the data would be collected and analyzed.

The Institutional Review Board (IRB)

Federal regulations and Oklahoma State University policy require review and approval of all research studies that involve human subjects before investigators can begin their research. The Oklahoma State University Research Services and the IRB conduct this review to protect the rights and welfare of human subjects involved in biomedical and behavioral research. In compliance with the aforementioned policy, this study received the proper surveillance, was granted permission to continue, and was assigned the following number: AG-97-004 (Appendix B).

Population of the Study

The population used in this study was composed of freshman students enrolled in the College of Agricultural Sciences and Natural Resources at Oklahoma State University during the 1996 Fall semester. A cluster sample method was used so all freshman students, in attendance, in either of the three classes of Agriculture Orientation 1011 on September 10, 1996 were tested. Missing elements in the study included those freshman students who did not attend class on the day the test was given and those freshman students who were not enrolled in the entry level class, Agriculture 1101. Of the 284 eligible freshman students enrolled in the class, 248 of them completed the test by the end of the testing period. To have a 95 percent level of confidence, I had to have at least 165 in my population. This was adequately met with the 248 students tested. Therefore, a make-up test was not offered to the students that were absent from class that day. The students that took the test comprised 87.32 percent of the total freshman population enrolled in Agriculture Orientation 1011 in the College of Agricultural Sciences and Natural Resources.

Selection of the Instrument

The Group Embedded Figures Test was selected because of its reputation and highly established validity in determining learning styles. A similar study was conducted at The Ohio State University by Robert Torres and Jamie Cano (1994). They also chose to use the Group Embedded Figures Test (GEFT). This study was replicated in the same manner as their study was conducted except The Ohio State study examined at the

preferred learning styles of senior students. The Oklahoma State study used the same research questions and utilized the GEFT to acquire data indication the learning styles of freshman students enrolled in the College of Agricultural Sciences and Natural Resources.

GEFT norms and test reliability was established using test information from male and female college students from eastern liberal arts colleges. The norms determined that men performed slightly better than women on this test. The norms are strictly applicable to individuals coming from populations similar to the group from which the norms were obtained (Witkin, et al, 1971).

The GEFT is a timed survey instrument, therefore, an appropriate method of estimating reliability was the correlation between parallel forms with identical time limits. Correlations between the First Section nine item scores and the Second Section scores were computed and corrected by the Spearman-Brown prophecy formula, producing a reliability estimate of .82 for both males and females.

Since the GEFT is intended as a group form of the Embedded Figures Test (EFT), then the validity of the test was determined using it's "parent" form of the test. In one study, subjects were given the Second Section in a group format and the Third Section on an individual basis. The correlations were then corrected and for reduced test length and combined for the two groups. The second measure to determine the GEFT's reliability was the rod-and-frame test (RFT). The RFT is a criterion measure of field-dependence/independence. The test subjects that were given the GEFT were also given the RFT. Then each subject's score on the latter test was the absolute size of errors summed over eight trials.

The correlation between the GEFT and the EFT were reasonably high producing a reliability estimate of .82 for both males and females. Correlations between the GEFT and RFT fall toward the lower end of the range of correlations typically found between the EFT and the RFT. The combined evidence suggests that the GEFT may be a useful substitute for the EFT when it is more practical to test a whole group (Witkin, et al, 1971).

The GEFT was easy for the students to complete and was given in a short time period. This was a necessity since the tests were given during the students class periods and the instructor did not want to allow additional class time. Along with the questionnaire, a cover sheet was attached to acquire demographic information from the students. This was necessary so that the information on gender and major related learning styles could be determined. It was also a control measure to make sure that all of the students were actually freshman students and not transfer students who decided to take the class. It was also a measure to track the students who did not take the test. The test was administered in the Agriculture Orientation 1011 class due to the nature of the course being oriented toward freshman and AG 1011 being a college requirement. The rationale for this was that a larger number of responses would be attained and it would also benefit the students to determine their individual learning styles.

Conduct of the Study

The test was personally administered by the researcher to the freshman Agriculture 1011 class during the class periods on October 10, 1996. This procedure was supervised by Dr. Wes Holley, Assistant Dean of the College of Agricultural Sciences and Natural

Natural Resources. Anonymity was not offered but confidentiality was guaranteed. This was due to the fact that names would not be used in the final research report. Only the compiled results of the test would be reported. Names were taken and used with the test to report back to individual students who wanted to know their personal learning style. This was done because the instructor who taught the Agriculture 1011 classes thought that information would be beneficial to the students and they deserved the information for the time they spent taking the test.

Analysis of Data

The design of the test was set up so that all responses were graded on a simple right or wrong basis. This allowed for easy grading of the exams. Therefore, all the data obtained from the test was strictly quantitative. There were no perceptions, judgments, or theories which would require qualitative analysis. Descriptive statistics was applied to the data obtained from using Minitab statistical computer program. Frequency distributions, mean scores, percentages, standard deviations, and ranges were used to present the data.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this chapter is to report the findings of the study. The intent of the study was to determine the learning style of freshman students in the College of Agricultural Sciences and Natural Resources at Oklahoma State University.

The population of the study included freshman students enrolled in Agricultural Orientation 1011. Of the 284 students enrolled in the class, 248 (87.32%) were identified as Freshmen and completed the test.

The test also included an attachment to determine student demographics such as classification, gender, and major. Student classifications were determined because sophomores and transfer students were also enrolled in the orientation class.

Gender Related Learning Styles

There were a total of 248 students in the test population that completed the test. Of that 248, 128 were female and 120 were male.

Of the females in the population, 54 (21.77%) tested field-independent, whereas field-dependent learning was the preferred learning style of 74 (58.47%)female students. Of the 120 males tested in this study, 49 (19.76%) were determined to be field-

independent learners, while 71 (28.63%) were identified as being field-dependent (Table I).

Major Related Learning Styles

Learning styles were also determined to see if there was a preference between field-dependency and field-independency among students relative to their major field of study. In some majors, one learning style was primarily dominant. However, in most majors, there was a relatively even distribution of learning styles among their students (Table II).

Among Agricultural Communications' (AGCOM) freshman majors 10 (4.03%) were identified as being field-dependent learners, while six (2.42%) indicated a preference toward being field-independent learners. Data concerning Agricultural Economics (AGEC) freshmen students, however, revealed that 28 (11.29%) students were field-dependent learners, whereas 15 (6.05%) expressed a field-independent learning preference. Eighty percent of the Agricultural Education (AGED) students were identified as being field-dependent learners, while considering the total freshmen students in the College, eight (3.23%) AGED majors indicated a field-dependent learning preference and two (0.81%) were classified as being field-independent learners. Freshman majors in Agronomy (AGRON) were somewhat similar with eight (3.23%) indicating a field-dependent learning preference, although four (1.61%) exhibited a preference toward being field-independent learners. Animal Science (ANSI) on the other hand had the largest number of freshmen with 49 (19.76%) enrolled in the College and 30 (12.10%)

TABLE I

A DISTRIBUTION OF LEARNING STYLE PREFERENCES AMONG FRESHMEN MAJORING IN AGRICULTURE AT OKLAHOMA STATE UNIVERSITY BY GENDER

	Learning Style Preference (GEFT)					
	Field-Dependent		Field-Independent		Total	
Gender	N	%	N	%	N=248	%
Female	74	29.84	54	21.77	128	51.61
Male	71	28.63	49	19.76	120	48.39
Total	144	58.47	104	41.53	248	100.00

TABLE II

A DISTRIBUTION OF LEARNING STYLE PREFERENCE AMONG FRESHMEN MAJORING IN AGRICULTURE AT OKLAHOMA STATE UNIVERSITY BY ACADEMIC MAJOR

	Learning Style Preference (GEFT)					
	Field-Dependent		Field-Independent		Total	
Major	N	%	N	%	N=248	%
AGCOM	10	4.03	6	2.42	16	6.45
AGEC	28	11.29	15	6.05	43	17.34
AGED	8	3.23	2	0.81	10	4.03
AGRON	8	3.23	4	1.61	12	4.84
ANSI	30	12.10	19	7.66	49	19.76
BIOCH	5	2.02	14	5.65	19	7.66
ENTO	2	0.81	2	0.81	4	1.61
ENVIR	4	1.61	3	1.21	7	2.82
FOR	1	0.40	3	1.21	4	1.61
HORT	1	0.40	3	1.21	4	1.61
LA	3	1.21	3	1.21	6	2.42
PRE-VET	32	12.90	26	10.48	58	23.39
UND	13	5.24	3	1.21	16	6.45
Total	145	58.47	103	41.53	248	100.00

were disclosed as having a field-dependent learning preference. Although, the ANSI freshman were the largest group of independent learners identified by departmental major, 19 (7.66%) of the total freshman enrolled demonstrated a preference toward being field-independent learners. Biochemistry and Molecular Biology (BIOCH) majors were rather unique when compared to the other majors in the College of Agricultural Sciences and Natural Resources with almost 74 percent of their majors manifesting a field-independent learning style. Fourteen (5.65%) BIOCH students out of the 248 total freshman enrollment in AG 1011 were found to express a preference as field-independent learners. However, five (2.02%) BIOCH freshman were more similar to their peers, exhibiting a field-dependent learning style. Entomology, Environmental Science, Forestry, Horticulture and Landscape Architecture together had a total of 25 freshmen majors, which was slightly over ten percent of the total freshman enrollment (248). Entomology (ENTO) majors were evenly split with two (0.81%) being identified as preferring a field-dependent learning style and two (0.81%) indicating a field-independent preference. Environmental Science (ENVIR) freshmen in agriculture expressed a 75 to 25 percent split within their chosen major, with four (9.61%) expressing a learning preference toward being field-dependent learners and three (1.21%) revealing a field-independent learning style. One (0.40%) Forestry (FOR) freshmen major was classified as being a field-dependent learners, while three (1.21%) demonstrated a learning style preference as field-independent learners. Horticulture (HORT) also had only one (0.40%) freshman major classified as a dependent learners, whereas it was evident three (1.21%) students had a field-independent learning preference. Landscape Architecture (LA) freshman majors were evenly split concerning learning preferences with three (1.21%) expressing a field-

dependent learning preference and three (1.21%) expressing a field-independent learning style. The Pre-Veterinary Medicine (PRE-VET) majors were the largest total group enrolled in AG 1011 with 58 (23.39%) freshmen students. Thirty-two (12.9%) Pre-Vet majors displayed a learning style preference toward being field-dependent , while 26 (10.48%) seemed to prefer a field-independent learning style. The Undecided (UND) majors were also rather unique in that over 81 percent of their group (16) preferred a field-dependent learning style; although three (1.21%) demonstrated a field-independent learning preference.

Observation of the data in Table III indicate a somewhat lower mean correct score for female freshman students in agriculture than males. Test scores ranged from zero missed to 17 missed out of a total of 18 questions. The mean number of correct questions was 10.69 or 7.31 missed. Males and females were evaluated on different scales to determine learning style preferences as indicated by the GEFT scoring guide. Males could miss only five questions and still be field-independent, while females could miss up to six and be field-independent. This is because a t-test was conducted on the gender different raw mean scores on the GEFT and was found to be significant ($t=2.71; p<.005$), (Witkin, et al, 1971). Due to the results of the t-test, a different scale was used. The mean score for the females was 10.48 questions correct or 7.52 missed. The mean score for the male population was 10.9 correct or 7.1 missed. Therefore, according to the different scales used, both groups of freshman students majoring in the College of Agricultural Sciences and Natural Resources at Oklahoma State University were field-dependent.

TABLE III

A SUMMARY OF PREFERRED LEARNING STYLE MEAN SCORES REVEALED AMONG FRESHMEN MAJORING IN AGRICULTURE AT OKLAHOMA STATE UNIVERSITY BY GENDER

Gender	N=248	Mean	SD	Range*
Female	128	10.48	4.48	1 - 18
Male	120	10.90	4.52	1 - 18

*Raw score based on maximum possible score of 18.

The number missed was very close for both groups. Four female students and six male students scored a perfect score with 18 correct. However, both groups had one student each who missed 17 questions.

The data in Table IV revealed overall that 145 of the 248 students or over 58 percent of the freshmen enrolled in AG 1011 expressed a field-dependent learning preference. Furthermore, the data showed that this particular group of 145 freshmen had a mean correct score of 7.52 with a standard deviation of 2.90 and a range in correct items from one to 12. In addition, the data indicated 103 (41.53%) of the 248 freshmen students preferred a field-independent learning style, while showing evidence that this particular group of freshmen students had a mean correct score of 15.15 with a 1.67 standard deviation and completing 12 to 18 question items correctly. As a whole the freshman students declaring Agriculture as a major during the 1996 fall semester were predominantly field-dependent learners.

TABLE IV

A DISTRIBUTION OF MEAN SCORES AMONG FRESHMEN MAJORING IN AGRICULTURE AT OKLAHOMA STATE UNIVERSITY BY LEARNING STYLE PREFERENCE

Learning Style Preference	Frequency (N=248	Percent (%)	Mean	SD	Range
Field-Dependent	145	58.47	7.52	2.90	1-12
Field-Independent	103	41.53	41.53	1.67	12-18
Total	248	100.00			

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of this chapter is to present a summary of the test that was conducted to determine the learning styles of freshman students enrolled in the College of Agricultural Sciences and Natural Resources during the 1996 fall semester.

Purpose of Study

The purpose of this study was to determine the preferred learning styles of freshman students enrolled in the College of Agricultural Sciences and Natural Resources at Oklahoma State University during the 1996 fall semester.

Research Questions

To achieve the purpose, the following research questions needed to be answered:

1. What was the preferred learning style of the freshman students enrolled in the College of Agricultural Sciences and Natural Resources by gender?

2. What was the preferred learning style of the freshman students enrolled in the College of Agricultural Sciences and Natural Resources by major?

3. What was the over-all preferred learning style of the freshman students enrolled in the College of Agricultural Sciences and Natural Resources?

Design and Conduct of the Study

This study replicated a study that was conducted at The Ohio State University by Robert M. Torres. The Group Embedded Figures Test (GEFT) was administered to freshman students enrolled in the Agricultural Orientation (AG 1011) class at Oklahoma State University during the 1996 fall semester. It was conducted in a similar manner except it was given to freshman students instead of seniors. This was done to allow the students to benefit from this study during their college careers.

Major Findings of the Study

The major findings in his study were grouped into three sections.

1. Gender related learning styles.
2. Major related learning styles.
3. Overall preferred learning style.

Gender Related Learning Styles

In both the males and the females, field dependence was the preferred learning style. Over 57 percent of the female students preferred the field-dependent learning style leaving slightly over 42 percent that preferred the field-independent learning style. Furthermore, over 59 percent of the males students in this test also preferred the field-

dependent learning style, while slightly more than 40 percent indicated a field-independent learning preference.

Major Related Learning Styles

Most of the departmental majors looked at in this study were slightly field-dependent overall. There were some variation observed among the male and female students regarding learning styles in some of the majors.

Freshman students in the Undecided category and Agricultural Education majors both had strong tendencies toward the dependent learning style. More than eighty percent of both Undecided freshman and AGED majors indicated a filed dependent learning preference. Further testing might determine if this holds true for Agricultural Education major, but the Undecided category will evolve into other majors as the students progress in their college career.

The Biochemistry/Molecular Biology majors ranked very high on the field-independent side with over 73 percent indicating an independent learning preference. If the major was tested at all levels and this remained to be high, then the faculty might want to use a teaching style that would make it easier for those students to learn. In the same respect, it might also indicate that students with a dependent learning style might have more difficulty if they selected BIOCHEM as a major than a student that was an independent learner.

Attention to the summary data in Table V illustrates the findings reported. Several majors show a small number of majors ranigng from four to 19. Further noticed was the five majors with the smallest enrollments. However, even more noticeable are the mean

TABLE V

A SUMMARY OF PREFERRED LEARNING STYLE MEAN SCORES REVEALED AMONG FRESHMEN MAJORING IN AGRICULTURE AT OKLAHOMA STATE UNIVERSITY BY ACADEMIC MAJOR

Major	N=248	Mean	SD	Range
AGCOM	16	10.31	3.99	2-18
AGEC	43	9.49	4.68	2-18
AGED	10	8.80	3.77	4-15
AGRON	12	11.0	4.53	4-18
ANSI	49	10.43	4.38	1-18
BIOCH	19	13.49	3.60	3-18
ENTO	4	12.75	4.11	8-18
ENVIR	7	6.67	2.08	5-9
FOR	4	14.0	4.08	8-17
HORT	4	15.0	3.37	10-17
LA	6	11.67	5.39	4-17
PRE-VET	58	10.83	4.67	2-18
UND	16	8.94	3.73	3-16

TABLE V

A SUMMARY OF PREFERRED LEARNING STYLE MEAN SCORES REVEALED AMONG FRESHMEN MAJORING IN AGRICULTURE AT OKLAHOMA STATE UNIVERSITY BY ACADEMIC MAJOR

Major	N=248	Mean	SD	Range
AGCOM	16	10.31	3.99	2-18
AGEC	43	9.49	4.68	2-18
AGED	10	8.80	3.77	4-15
AGRON	12	11.0	4.53	4-18
ANSI	49	10.43	4.38	1-18
BIOCH	19	13.49	3.60	3-18
ENTO	4	12.75	4.11	8-18
ENVIR	7	6.67	2.08	5-9
FOR	4	14.0	4.08	8-17
HORT	4	15.0	3.37	10-17
LA	6	11.67	5.39	4-17
PRE-VET	58	10.83	4.67	2-18
UND	16	8.94	3.73	3-16

correct scores dipicted, ranging from 6.67 to 15.0. The majors in four of the five majors show more of a tendency toward a field-independent learning style. An exception to this was the number of majors in BIOCH where 19 students are reported and 14 of the 19 are predominently field-independent learners. Further, revealing was the heavy concentration of field-dependent learners representing academic majors in AGED, UND, AGEC, AGCOM, and ANSI.

Overall Preferred Learning Style

The overall preferred learning style, as indicated from the results of this test, is a field-dependent style. Of the total population, field-dependent learning styles accounted for over 58 percent of the freshman enrolled in AG 1011, while over 41 percent were students that had field-independent learning preferences.

Conclusions

Based on an analysis of the data and subsequent major findings, the following conclusions were drawn:

1. Based on the findings, it was evident that both male and female freshman students majoring in the college of Agricultural Sciences and Natural Resources at Oklahoma State University indicated rather strong preferences toward the field-dependent learning style. However, concerning gender differences, it was observable that the male students seemed to be somewhat more persistent in their preference as field-dependent learners.

2. It was readily apparent that freshman students majoring in Biochemistry and Molecular Biology had rather strong learning style preferences as being field-independent learners. However, it was just as noticeable that freshman in Agricultural Communications and Agricultural Education were predominantly field-dependent learners. With regard to gender differences within majors, it would seem important to recognize rather striking differences between female majors in Pre-Veterinary Medicine and Agricultural Economics and their male counter parts. Female students majoring in Pre-Veterinary Medicine seem to have a slight tendency toward field-independent learning, while male students revealed a predominant inclination toward the field-dependent learning style. On the other hand, female freshman students majoring in Agricultural Economics seem to have a stronger preference toward a dependent learning style, whereas male students were more evenly split between being identified as field-dependent and independent learners.

3. Based on the results of this study, it was fairly evident that freshman students majoring in Agriculture at Oklahoma State University have indicated a field-dependent preferred learning style.

4. To acknowledge learning style differences among freshman students in Agriculture, it becomes readily apparent that some students may have difficulty in particular academic majors based on their specific learning style.

Recommendations

As a result of interpretations of the data, major findings of the study, and conclusions drawn, the following recommendations were outlined:

1. Based on the conclusions that the overall preferred learning style among freshman student in Agriculture was field-dependent, it was recommended that faculty observe differences in learning styles evident in their classes and demonstrate a willingness to adjust teaching styles to assist the majority of students to learn in an efficient manner.

2. Advisement coordinators within each academic department in the college should be informed concerning the performance of their students on the Group Embedded figures Test (GEFT). Advisement coordinators making faculty aware of differences in learning style preferences among their students will allow teaching faculty the opportunity to prepare presentations and present information in a more understandable and student friendly manner.

3. Because learning style preference impacts the academic success of students, teaching faculty should be sensitive to the learning style differences which they observe in their classes. As a result, the College of Agricultural Sciences and Natural Resources should involve the college teaching committee in conducting teaching and learning styles workshops to assist faculty in planning and delivering information to the student groups with different learning styles.

Recommendation for Additional Research

Several studies could be replicated from any individual or all of the academic departments within the College of Agricultural Sciences and Natural Resources. Awareness of their students learning styles should eventually lead to the improvement of the students academic performance. Knowing the students learning styles would benefit

faculty in both teaching as well as student advisement. Enhancing academic performance has the possibility of providing both tangible and intangible benefits for students and faculty.

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APPENDIXES

APPENDIX A

IRB APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 10-02-96 **IRB#: AG-97-004**

Proposal Title: FIELD DEPENDENT/FIELD INDEPENDENT LEARNING STYLES OF FRESHMAN STUDENTS IN THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES

Principal Investigator(s): James D. White, Stephanie Lindon

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE APPROVAL PERIOD.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Signature: _____ Date: October 3, 1996
Chair of Institutional Review Board

APPENDIX B

STUDENT QUESTIONNAIRE

Name:_____

Gender: ____Male
____Female

Major:_____

Classification:____Freshman
____Sophomore
____Transfer
____Other_____

If you would like the results of your test please give your phone number and your campus address.

Phone_____

Address_____

Note: Your name will NOT be used with the results of this test. Your name will only be used to know who turned their test in and to report your results back to you.

DO NOT OPEN YOUR BOOKLET YET!

GROUP EMBEDDED FIGURES TEST

By Philip K. Oltman, Evelyn Raskin, & Herman A. Witkin

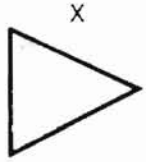
Name _____ Sex _____

Today's date _____ Birth date _____

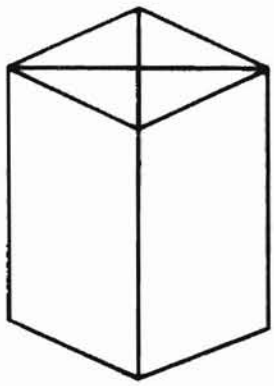
INSTRUCTIONS: This is a test of your ability to find a simple form when it is hidden within a complex pattern.

Here is a simple form which we have labeled "X":

X



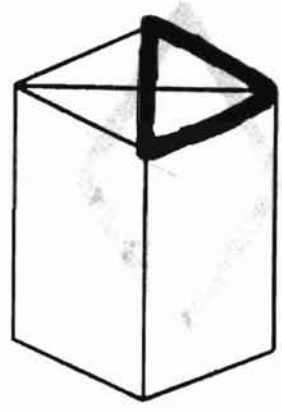
This simple form, named "X", is hidden within the more complex figure below:



Try to find the simple form in the complex figure and trace it *in pencil* directly over the lines of the complex figure. It is the SAME SIZE, in the SAME PROPORTIONS, and FACES IN THE SAME DIRECTION within the complex figure as when it appeared alone.

When you finish, turn the page to check your solution.

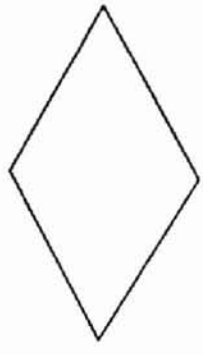
This is the correct solution, with the simple form traced over the lines of the complex figure:

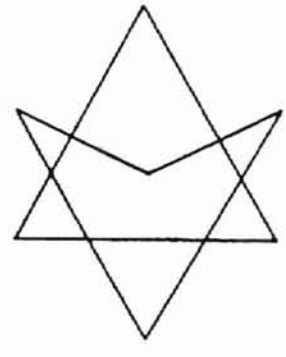


Note that the top right-hand triangle is the correct one; the top left-hand triangle is similar, but faces in the opposite direction and is therefore *not* correct.

Now try another practice problem. Find and trace the simple form named "Y" in the complex figure below it:

Y





Look at the next page to check your solution.

Solution:

In the following pages, problems like the ones above will appear. On each page you will see a complex figure, and under it will be a letter corresponding to the simple form which is hidden in it. For each problem, look at the BACK COVER of this booklet to see which simple form to find. Then try to trace it in pencil over the lines of the complex figure. Note these points:

1. Look back at the simple forms as often as necessary.

2. ERASE ALL MISTAKES.

3. Do the problems in order. Don't skip a problem unless you are absolutely "stuck" on it.

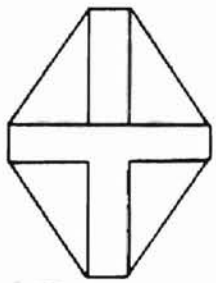
4. Trace ONLY ONE SIMPLE FORM IN EACH PROBLEM. You may see more than one, but just trace *one* of them.

5. The simple form is always present in the complex figure in the SAME SIZE, the SAME PROPORTIONS, and FACING IN THE SAME DIRECTION as it appears on the back cover of this booklet.

Do not turn the page until the signal is given

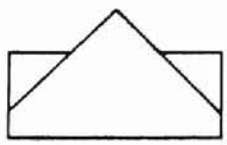
FIRST SECTION

1



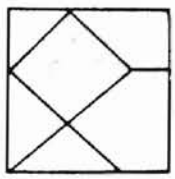
Find Simple Form "B"

2



Find Simple Form "G"

Go on to the next page

3 

Find Simple Form "D"

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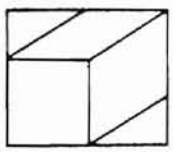
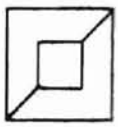
4 

Find Simple Form "E"

Go on to the next page

5 

Find Simple Form "C"

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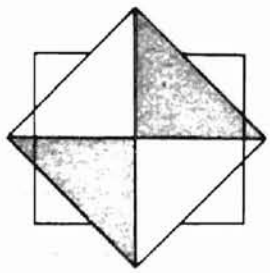
6 

Find Simple Form "F"

Go on to the next page

SECOND SECTION

1



Find Simple Form "G"

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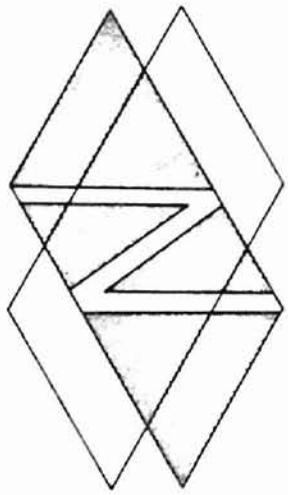

Find Simple Form "A"

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7 

Find Simple Form "A"

PLEASE STOP. *Wait for further instructions.*

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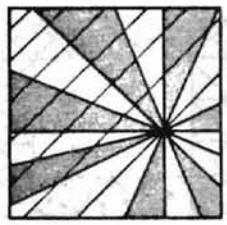

Find Simple Form "G"

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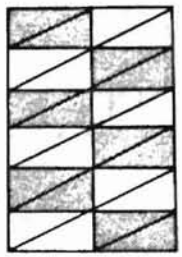

Find Simple Form "E"

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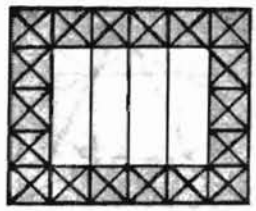

Find Simple Form "B"

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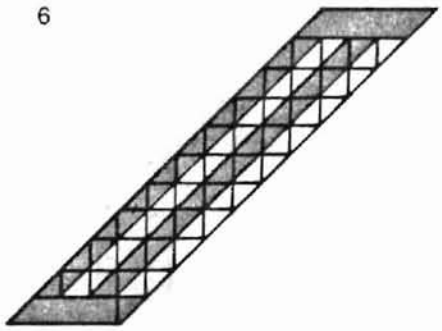

Find Simple Form "C"

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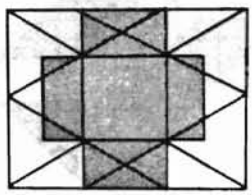
7 

Find Simple Form "E"

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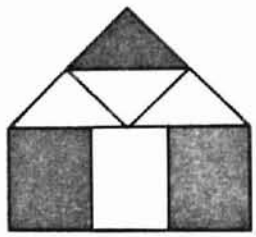
8 

Find Simple Form "D"

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9

Find Simple Form "H"

PLEASE STOP. *Wait for further instructions.*

THIRD SECTION

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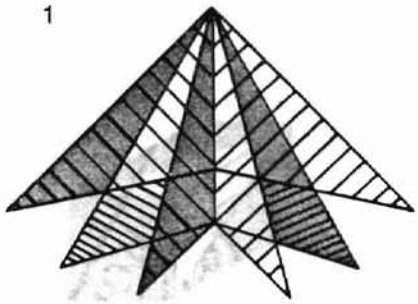

Find Simple Form "F"

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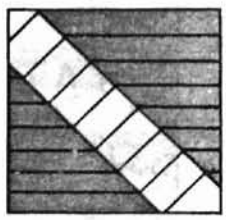

Find Simple Form "G"

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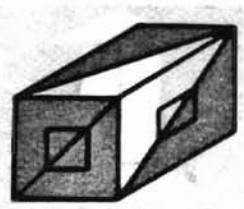

Find Simple Form "C"

4

Find Simple Form "E"

Go on to the next page

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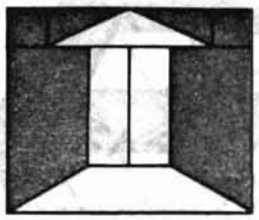

Find Simple Form "B"

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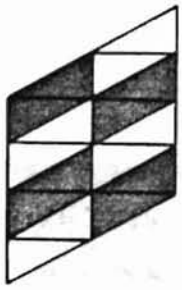

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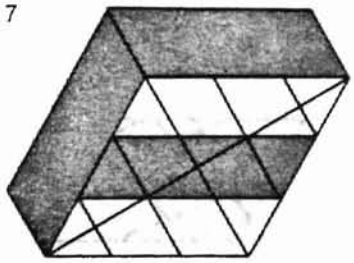

Find Simple Form "A"

8

Find Simple Form "C"

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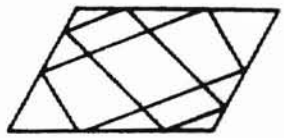
9 

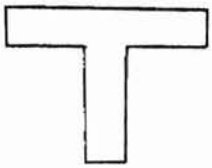
Find Simple Form "A"

PLEASE STOP. *Wait for further instructions.*

SIMPLE FORMS

A

B



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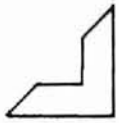
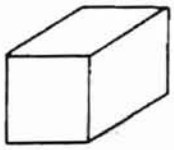


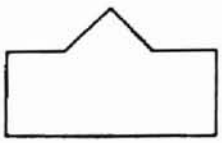
D

E

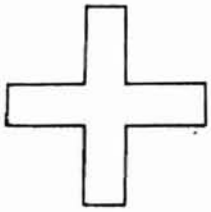


F

G



H



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VITA

Stephanie L. Lindon

Candidate for the Degree of

Master of Science

Thesis: AN ASSESSMENT OF LEARNING STYLES AMONG FRESHMAN STUDENTS IN THE COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES AT OKLAHOMA STATE UNIVERSITY

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Professional Organizations: Oklahoma Association of Extension 4-H Agents, National Association of Extension 4-H Agents.