

Assessing Agricultural Communications Students' Learning Styles: A Baseline Study



**D. Dwayne Cartmell II¹, Melissa Majors²,
Marcus A. Ashlock³ and Shelly Peper Sitton⁴**
Oklahoma State University
Stillwater, OK 74078

Abstract

This Oklahoma State University research project determined students' learning styles using the Gregorc Style Delineator to determine the learning styles found within the agricultural communications student population. The typical agricultural communications student can be described as a female junior or senior with a permanent residence in Oklahoma, an ACT score between 25 and 29, and a grade point average above 3.00 on a 4-point scale. The largest group of students was Concrete/Sequential (42.2%). The Abstract/Sequential and Concrete/Random groups were similar in size, 23.0% and 20.7% respectively. Males who preferred concrete information perception preferred a random gathering process, while females who preferred concrete information perception preferred a sequential ordering process. Recommendations include future research to assess the possibility of variables affecting learning styles and student success and to expand the study to additional agricultural communications programs across the country to provide a national assessment of the learning styles and demographics of agricultural communications students.

Introduction

Considerable research has focused on learning styles and their effects on academic performance in undergraduate education (Cano and Porter, 1997; Cano, 1999; Fidanza et al., 2004; Honeyman and Miller, 1998; Torres, 1993; Torres and Cano, 1994). Gregorc (1979) described learning styles as adaptations within the learning environment, which are indicated by specific behaviors individuals use as they gather information. Similar to this is cognitive style, which is defined as the way people organize or categorize information and render judgments or conclusions based upon their observations (Hunt et al., 1989). "Information processing style, often termed cognitive style, has gained prominence in the organizational behavior literature as researchers use it as a basis for studying decision-making behavior, conflict, strategy development, and group processes" (Leonard et al., 1999, p. 407).

Research to identify the learning styles of students enrolled in agriculture generally has portrayed these students as concrete learners (Dyer and Osborne, 1996). Within agricultural education, researchers often have used the Group Embedded Figures Test (GEFT) to measure learning styles (Garton et al., 1999; Garton et al., 2000; Garton et al., 2002; Marrison and Frick, 1994; and Torres and Cano, 1994). However, except for a few studies, the learning-style research in agricultural education has been explorative and has not considered the impact of students' learning styles on teaching and learning (Day et al., 1998). In addition, this research focused specifically on agricultural education students, rather than on agricultural communications students.

Torres and Cano (1995) said students' learning success in certain situations is affected by learning styles and recommended teachers "be sensitive to learning style differences" (p. 7). Grasha (1996) maintains students learning styles are affected by experiences, thus, teaching styles will influence a student's learning style. Zapalska and Dabb (2002) maintain absorption and retention of information can largely depend upon whether the information was received through a person's preferred learning modality or style.

An understanding of learning styles and students' preferences for teaching methods or curriculum materials can enhance advising duties (Torres and Cano, 1995). Murano and Knight (1999) reported "study skills and the ability to remain attentive in class were different between learning styles" (p. 52). Although research shows the relationship between course achievement and a student's learning style is positive, but low (Garton et al., 1999), faculty can use learning styles assessments to build strategies to enhance the learning transfer between instructor and student. However, Krätzig and Arbuthnott (2006) maintain educators should be wary of the conclusions made about student learning improvement and its influence by the efforts in course design using learning styles.

The purpose of the agricultural communications degree program at Oklahoma State University is to

¹Assistant Professor; Email: dwayne.cartmell@okstate.edu

²Coordinator of Communications, Oklahoma State University Alumni Association, Email: melissa.majors@okstate.edu

³Research Associate; Email: marcus.ashlock@okstate.edu

⁴Associate Professor; Email: shelly.sitton@okstate.edu

provide students with a broad communications and agriculture knowledge base. Students are required to complete coursework focusing on practical application, as well as courses in agricultural leadership, agricultural economics, plant science and animal science to increase their agricultural knowledge base. The communications courses include broadcasting, photography, Web design, publication design, writing and public speaking. The demands of the coursework require students to not only learn material, but to also focus on the application of the learned material. Application opportunities culminate in a supervised internship and in the required capstone course where students produce the Cowboy Journal magazine.

While the first agricultural journalism classes were offered at the university in 1927, the agricultural communications program had a 625% increase in students enrolled during the past 12 years (Table 1). However, little research has been done to evaluate what types of students are enrolling in the program and, more importantly, what learning styles and demographics are prevalent among the student population. While research to determine the importance of learning styles has been conducted, the effect of learning styles on agricultural communications students has yet to be studied. By assessing the learning style of students within the program at OSU, faculty can use this information along with demographic data to focus curriculum on meeting the needs of all students in the program. Specifically, this study was done to address the following research questions:

1. What is the dominant learning style of agricultural communications students at OSU?
2. What is the demographic profile of agricultural communications students at OSU?
3. How does the learning style of agricultural communications students at OSU differ based on demographic characteristics?

an instrument of thought that determines the ways to achieve realization and actualization. Gregorc developed his own style delineator as a self analysis tool. It is based on Mediation Ability Theory that states the human mind has channels through which it receives and expresses information most efficiently and effectively (Gregorc, 1979a). The GSD works with two abilities, perception and ordering, to determine an individual's learning style.

People perceive, that is they develop an understanding of, information in either an abstract or concrete way. Individuals with an abstract perception are able to visualize and understand information without using their physical senses (Gregorc, 1982). Gregorc (1982) further stated perceiving information in a concrete manner requires information that is visible in the concrete, physical world and can be understood using physical senses.

Ordering abilities are how people arrange, process, reference and dispose of information (Gregorc, 1982). In this area, people rely on either a sequence or random method. Sequential learners use a step-by-step, methodical method to process information. Randomness, on the other hand, is a characteristic that allows people to absorb information as it comes and process it without any predetermined order (Gregorc, 1982). When combined, each perception and ordering ability form the four combinations of learning styles used in the GSD model: Concrete/Sequential, Concrete/Random, Abstract/Sequential, and Abstract/Random.

The GSD was administered to 135 students enrolled in agricultural communications courses during the fall 2003 semester. The GSD includes 10 four-word sets. Students ranked each set of words according to the best and most powerful descriptor of themselves. The instrument is based on first impressions and took an average of less than five minutes to complete. The results of the GSD, as well as gender,

Table 1. Increase in student enrollment in agricultural communications at Oklahoma State University

	Fall 1991	Fall 1993	Fall 1995	Fall 1997	Fall 1999	Fall 2001	Fall 2003
Majors available to students	1991	1993	1995	1997	1999	2001	2003
Agricultural Communications	24	63	85	91	118	133	133
Agricultural Communications/ Animal Science Double					20	16	17
<i>Agricultural Communications Total</i>	24	63	85	91	138	149	150

Note. The agricultural communications/animal science double major became available to students in the fall of 1998.

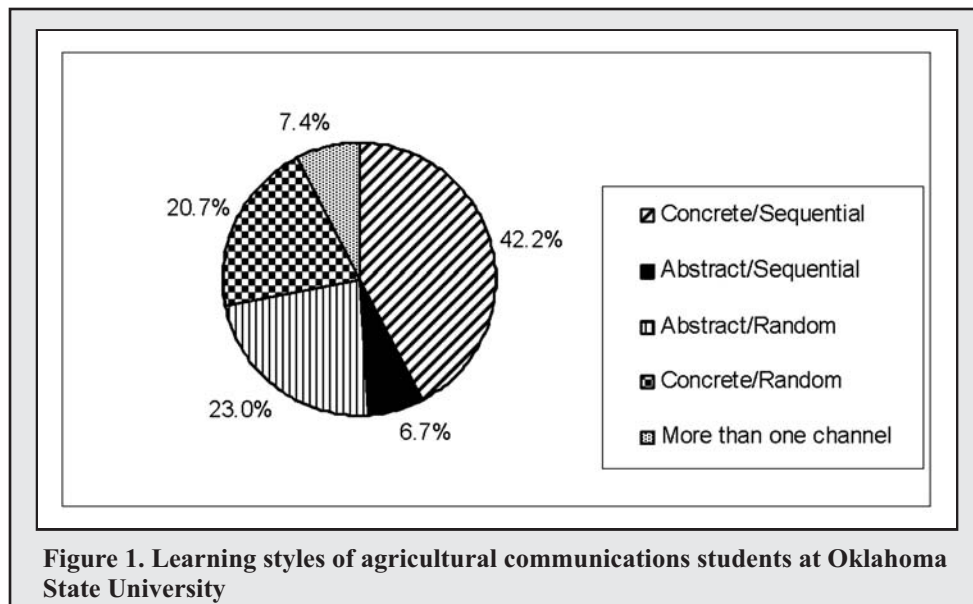
Materials and Methods

To determine the learning styles present within the program, researchers determined the Gregorc Style Delineator (GSD) instrument (1982) would be the most effective. Gregorc's instrument is based on the ORGANON System: an organized viewpoint of how and why the human mind functions and manifests itself through the human personality (Gregorc, 1979b, 1982). The system views the human mind as

classification, composite American College Testing (ACT) score, cumulative grade point average, and state of permanent residency were recorded and processed to find any trends that existed within the data.

Results and Discussion

The following results are organized by the three research questions defining this study: the learning



(20.7%) Concrete/Random (Figure 1). Ten (7.4%) respondents had the same score in more than one of the four mediation channels.

Question Two: What is the demographic profile of agricultural communications students at OSU?

Several demographic characteristics were evaluated including gender, classification, composite ACT score, cumulative grade point average, and state of permanent residency.

Of the 135 respondents, 102 (75.6%) were female and 33 (24.4%) were male.

The classification of the students was determined by hours completed through the fall 2003 semester. Students with 0-29 hours were classified as freshmen, 30-59 hours as sophomores, 60-89 hours as juniors, and 90 or more hours as seniors. Based on these categories, 29 (21.3%) were freshmen, 19 (14%) were sophomores, 37 (27.2%) were juniors and 50 (37.5%) were seniors.

style dominance, demographic profile, and the comparison of demographics and learning style.

Question One: What is the dominant learning style of agricultural communications students at OSU?

Of the 135 respondents, 57 (42.2%) were Concrete/Sequential, nine (6.7%) were Abstract/Sequential, 31 (23.0%) Abstract/Random, and 28

Table 2. Composite ACT* scores received by agricultural communications students at Oklahoma State University

Range of Composite ACT Scores	n	%
Less than 14	2	1.5
15-19	25	20.0
20-24	42	31.1
25-29	42	31.1
30-36	7	5.2
Data Unavailable	17	12.6

*Note: ACT = American College Testing

Table 3. Values for composite ACT* scores and cumulative GPA*

	Minimum	Maximum	Mean
Composite ACT Score (N=119)	12	32	23.12
Cumulative GPA (N=135)	1.667	4.000	3.188

*Note: ACT = American College Testing; GPA = Grade Point Average

Table 4. Learning styles based on gender

Learning Style	Male (%)	Female (%)	n
Concrete Sequential*	11(33.3)	46 (45.1)	57
Abstract Sequential	1 (3.0)	8 (7.8)	9
Abstract Random	8 (24.3)	23(22.6)	31
Concrete Random	11 (33.3)	17 (16.7)	28
Two or More the Same	2 (6.0)	8 (7.8)	10
Total	33 (100)	102 (100)	135

*Note: Gregorc, 1982.

The composite ACT scores of the students ranged from 12 to 32. Scores were unavailable for 17 (12.6%) of the participants; of the reported ACT scores, the mean score was a 23.17 (Table 2). The cumulative grade point average of the students ranged from a minimum of 1.667 to a maximum of 4.000 with a mean GPA of 3.188 (Table 3).

Of the participants, three (2.2%) had a GPA of 1.999 or less, 16 (11.9%) students had a GPA of 2.000-2.499, 27 students (20.0%) had a GPA of 2.500-2.999, 40 (29.6%) students had a GPA of 3.000-3.499, 40 (29.6%) students had a GPA of 3.500-3.999, and nine (6.7%) students had a 4.000 GPA.

In-state, out-of-state, and out-of-country residency status was the final demographic characteristic to be evaluated. Of the respondents, 100 (74.1%) students were residents of Oklahoma, 33 (24.4%) students were from other states, and two (1.5%) were international students.

Question Three: How did the learning style of agricultural communications students at OSU differ based on demographic characteristics?

When comparing learning styles with gender, 46 (45.1%) of the females were Concrete/Sequential, while 11 (33.3%) males were Concrete/Sequential. Eight (7.8%) females were Abstract/Sequential and one (3.0%) male was Abstract/ Sequential. Twenty-three (22.6%) females and eight (24.3%) males had an Abstract/Random learning style. Seventeen (16.7%) females and 11 (33.3%) males were Concrete/Random. Eight (7.8%) females and two (6.1%) males received the same score in more than one of the mediation channels (Table 4).

Learning styles based on classification showed 17 of 29 freshmen were Concrete/ Sequential (58.6%). Five of 19 sophomores (26.3%) had an

Abstract/Random learning style, while another five sophomores (26.3%) were Concrete/Random. Of the 37 juniors, 15 had a concrete learning style as 13 (35.2%) were Concrete/Sequential and 12 (32.4%) were Abstract/Random. Twenty-three seniors (46.0%) were Concrete/Sequential (Table 5).

The learning styles based on composite ACT score were distributed across all score areas and learning styles. Eighty-four agricultural communications students (62.2%) had ACT scores between 20 and 29, of which 38 (45.2%) were Concrete/Sequential (Table 6).

The differences between learning styles based on cumulative GPA are similar to those based on composite ACT score. Eighty-nine (65.9%) students had a GPA between 3.000 and 4.000. Forty-five of these students were Concrete /Sequential (50.6%) (Table 7).

The difference in learning styles based on permanent residency shows 41 in-state students were Concrete/Sequential (41%). Sixteen out-of-state students were Concrete/Sequential (45.7%) and seven were Concrete/Random (20.0%) (Table 8).

Summary

The profile of an agricultural communications student at Oklahoma State University can be described as a female junior or senior with a permanent residence of Oklahoma and a preference of the Concrete/Sequential learning style. She has a composite ACT score range of 20 to 29 with the majority between 25 and 29, as well as a GPA range of 3.00 to 3.999 with an equal amount between 3.00 to 3.499 and 3.50 to 3.999.

The largest group of students was Concrete/Sequential (42.2%). The Abstract/

Table 5. Learning styles based on classification (N)

Learning Style	Freshman (%)	Sophomore (%)	Junior (%)	Senior (%)	Total n
Concrete Sequential*	17 (12.59)	4 (2.96)	13 (9.63)	23 (17.04)	57
Abstract Sequential	2 (1.48)	3 (2.22)	1 (0.74)	3 (2.22)	9
Abstract Random	5 (3.70)	5 (3.70)	12 (8.89)	9 (6.67)	31
Concrete Random	4 (2.96)	5 (3.70)	7 (5.18)	12 (8.89)	28
Two or More	1 (0.74)	2 (1.48)	4 (2.96)	3 (2.22)	10
Total n	29	19	37	50	135

* Note: Gregorc, 1982.

Table 6. Learning styles based on composite ACT score (N)

Learning Style	ACT Composite Scores					Unavailable (%)	Total n
	< 14 (%)	15-19 (%)	20-24 (%)	25-29 (%)	30-36 (%)		
Concrete Sequential*	1 (0.74)	10 (7.41)	17 (12.59)	21 (15.55)	2 (1.48)	6 (4.44)	57
Abstract Sequential		1 (0.74)	2 (1.48)	3 (2.22)	1 (0.74)	2 (1.48)	9
Abstract Random		7 (5.18)	11 (8.15)	7 (5.18)	2 (1.48)	4 (2.96)	31
Concrete Random	1 (0.74)	6 (4.44)	8 (5.92)	8 (5.92)	2 (1.48)	3 (2.22)	28
Two or More		1 (0.74)	4 (2.46)	3 (2.22)		2 (1.48)	10
Total n	2	25	42	42	7	17	135

* Note: Gregorc, 1982.

Table 7. Learning styles based on cumulative grade point average (N)

Learning Style	< 1.999 (%)	2.000-2.499 (%)	2.500-2.999 (%)	3.000-3.499 (%)	3.500-3.999 (%)	4.000 (%)	Total
Concrete Sequential*		4 (2.96)	8 (5.92)	18 (13.33)	18 (13.33)	9 (6.67)	57
Abstract Sequential		1 (0.74)	3 (2.22)	2 (1.48)	3 (2.22)		9
Abstract Random	1 (0.74)	7 (5.18)	7 (5.18)	10 (7.41)	6 (4.44)		31
Concrete Random	2 (1.48)	3 (2.22)	7 (5.18)	8 (5.92)	8 (5.92)		28
Two or more		1 (0.74)	2 (1.48)	2 (1.48)	5 (3.70)		10
Total	3	16	27	40	40	9	135

* Note: Gregorc, 1982.

Table 8. Learning styles based on permanent residency (N)

Learning Style	In-State (%)	Out-of-State (%)	Total
Concrete Sequential*	41 (30.37)	16 (11.85)	57
Abstract Sequential	7 (5.18)	2 (1.48)	9
Abstract Random	25 (18.52)	6 (4.44)	31
Concrete Random	21 (15.55)	7 (5.18)	28
Two the Same	6 (4.44)	4 (2.96)	10
Total	100	35	135

* Note: Gregorc, 1982.

Sequential and Concrete/Random groups were similar in size, 23.0% and 20.7% respectively. The least reported learning style was an Abstract/Sequential learning style (6.67%).

One interesting comparison between reported learning styles and gender was both male and female reported having concreteness as their preferred way of information perception, but the genders differed when ordering the gained information with males preferring a random ordering process and females preferring a sequential ordering process.

Readers should not generalize the results of this study beyond the limited sample studied. However, the study's results are beneficial for teachers and students. The diversity of the learning styles assessed by the Gregorc instrument supports the need for teachers/instructors to have a broad knowledge of teaching methods to reach the learning needs of the students. This claim supports previous research conducted by Torres and Cano (1995) using the Group Embedded Figures Test.

Teaching professionals who have a clear understanding of their own learning styles possibly can create a more effective learning environment by being cognizant of their preferred teaching style. Dunn and Dunn (1979) maintain an instructor's learning style is reflected in the methods by which they choose to teach. With this in mind, teachers can use their knowledge of the student's learning style to direct more of the methods or curriculum to reach the diverse learning needs of the class (Brandt, 1990; Torres and Cano, 1995). Students, having knowledge of their preferred learning style, can develop more effective techniques when working with other students with diverse learning needs. Torres and Cano (1995) maintain this knowledge also can assist

students to cope with and adapt to various teaching styles encountered in any university system.

Researchers have the following recommendations for application from this study:

Faculty should look at teaching methods congruent with the dominant learning styles, while continuing to meet the needs of students of all learning styles.

Faculty should become aware of and incorporate diverse teaching methods to meet the needs of the gender-different learning styles.

Researchers have the following recommendations for future research:

Determining the relationship among demographic characteristics, learning styles, and student success.

Longitudinal studies to compare student success and learning style knowledge when compared to students who have not been educated in their learning style.

Continuing to examine learning styles and teaching methods to determine if students' needs are met through new teaching and advising techniques.

Using the same instrument to determine if any differences or similarities exist in students' learning styles based on academic program, department, college or university.

Perform a national study to see if agricultural communications students on a national level are similar to those attending Oklahoma State University.

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