

Assessing Agricultural Communications Students' Learning Styles

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Abstract

The agricultural communications program at Oklahoma State University has had a 625-percent increase in students enrolled during the past 12 years. However, little research has been done to evaluate the types of students enrolling in the program. Specifically, no studies assessing what learning styles and demographic profiles are prevalent among the student population in this degree program have been analyzed.

This research project used the Gregorc Style Delineator (1982) to determine what styles could be found within the student population. The test was administered to 136 students. Demographic information was collected to determine what impact, if any, these characteristics had on learning style. The dominant learning style among the group tested was Concrete Sequential. According to Gregorc, individuals with this learning style tend to be more fact-oriented and methodical in their thought process (Gregorc, 1982). Demographically, several values were studied, including gender, classification, composite ACT score, cumulative grade point average, and residency. Recommendations included conducting future research to assess the possibility of variables affecting learning styles and student success. If information could be gathered from additional agricultural communications programs across the country, a more accurate and well-rounded assessment of the learning styles and demographics of agricultural communications students could be made.

Introduction/Theoretical Framework

Considerable research has been reported regarding learning styles and their effects on academic performance (Torres, 1993; Torres & Cano, 1994; Cano & Porter, 1997; Honeyman & Miller, 1998; Cano, 1999). Learning styles are described by Gregorc (1979) as a learning environment adaptation, indicated by a set of particular behaviors used when gathering information. Similar to this is cognitive style, which is defined as the way people organize information and arrive at judgments or conclusions based on their observations (Hunt, Krzystofiak, Meindl and Yousry, 1989). 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, Scholl & Lowalski, 1999).

Research has been completed to determine the learning styles of students enrolled in agriculture, and overall, they are generally portrayed as concrete learners (Dyer & Osborne, 1996). Numerous studies in agricultural education have used the Group Embedded Figures Test (GEFT) to measure learning styles. However, except for a few, most of the learning-style research conducted in agricultural education has been explorative and has not considered the impact of students' learning styles on teaching and learning (Day, Raven & Newman, 1998). The focus also has been more on agricultural education students, not agricultural communications students.

It is important for a department to understand the learning styles of its students, as it can be beneficial for the student, instructor, and adviser. Torres and Cano (1995) maintain "learning style affects the learning success of students in specific kinds of situations, instructors need to be sensitive to learning style differences" (p.7). Advising duties can be enhanced through an

understanding of learning styles and students' preferences for teaching methods or curriculum materials (Torres & Cano, 1995). Murano & Knight (1999) reported "study skills and the ability to remain attentive in class were different between learning styles" (p.52). Therefore, the assessment of learning styles can be used for building strategies to enhance the learning transfer between instructor and student. However, there is research where the relationship between course achievement and a student's learning style is positive, but low (Garton, Spain, Lamberson & Spiers, 1999).

The agricultural communications program at Oklahoma State University has had a 625-percent increase in students enrolled during the past 12 years (Table 1). However, little research Table 1

Increase in student enrollment in agricultural communications at the Oklahoma State University

<i>Majors available to students</i>	Fall 1991	Fall 1993	Fall 1995	Fall 1997	Fall 1999	Fall 2001	Fall 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.

has been done to evaluate what types of students are enrolling in the program. Specifically, what learning styles and demographics are prevalent among the student population in this degree program?

While there has been research to determine the importance of learning styles, 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.

The purpose of the agricultural communications degree program at OSU is to provide students with a broad knowledge base in both communications and agriculture. The first agricultural journalism classes were offered at the university in 1927.

Students are required to complete coursework focusing on practical application. These courses include broadcasting, photography, Web design, writing and public speaking. The demands of the coursework require students to not only learn material, but also to focus on the application of the learned material.

Purpose/Research Questions

Because of the small amount of research available, the primary purpose of this study was to provide literature about predominant learning styles among agricultural communications students at Oklahoma State University and the demographic profile of those students. 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 did the learning style of agricultural communications students at OSU differ based on demographic characteristics?

Methods/Procedures

To determine the learning styles present within the program, researchers determined the Gregorc Style Delineator instrument 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, 1982). The system views the

human mind as an instrument of thought that determines the ways realization and actualization will be achieved. 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, 1979). The Style Delineator works with two abilities, perception and ordering, to determine an individual's learning style.

Perception is the way people grasp information. People perceive information in either an abstract or concrete way. Individuals with an abstract perception are able to understand information and visualize it without using their physical senses (Gregorc, 1982). Gregorc (1982) further maintains 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). The Style Delineator model uses these different methods to create four combinations of learning styles: Concrete/Sequential, Abstract/Sequential, Concrete/Random, and Abstract/Random.

The Style Delineator was administered to 136 students enrolled in agricultural communications courses during the fall 2003 semester. The test includes 10 sets of four words. Students were asked to rank the words according to the best and most powerful descriptor of themselves. It was based on first impressions and took an average of less than five minutes to complete. The results of the test, as well as gender, classification, composite ACT score,

cumulative grade point average, and state of permanent residency were recorded and processed to determine what if any trends existed within the data.

Results/Findings

Out of 151 total agricultural communications students enrolled during the fall 2003 semester, 136 (90.1%) completed the Style Delineator. One respondent filled out the instrument incorrectly, resulting in only 135 useable responses.

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

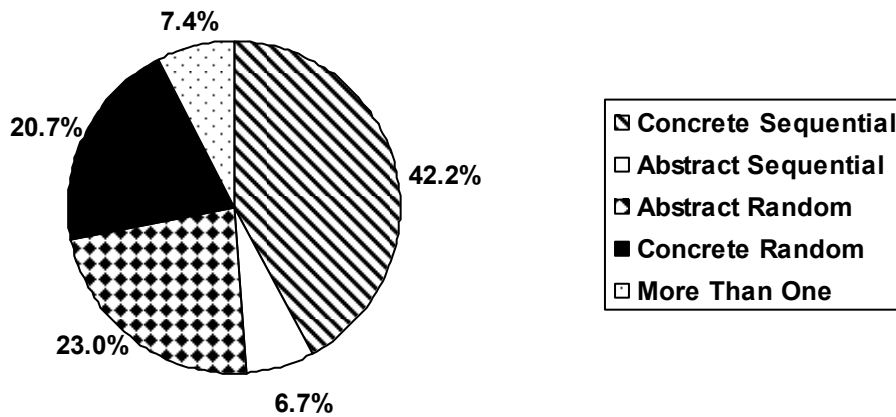


Figure 1. Learning styles of agricultural communications students at this Oklahoma State University?

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 at the end of 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, twenty-nine (21.3%) were freshmen, 19 (14%) were sophomores, 37 (27.2%) were juniors and 50 (37.5%) were seniors.

The composite ACT scores of the students ranged from 12 to 32. It is important to note scores were unavailable for 17 (12.6%) of the participants. Of the reported ACT scores, the mean score was a 23.17 (Table 2).

Table 2

Composite ACT scores received by agricultural communications students at the 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

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

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

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).

Table 4

Learning styles based on gender

	Male %	Female %
Concrete Sequential	33.3	45.1
Abstract Sequential	3.0	7.8
Abstract Random	24.3	22.6
Concrete Random	33.3	16.7
Two or More the Same	6.1	7.8

Learning styles based on classification showed the largest percentage of freshmen were Concrete/Sequential (58.6%, 17 of 29). The largest percentage of sophomores had a random learning style with 26.3% (5 of 19) Abstract/Random, and 26.3% (5 of 19) Concrete/Random. The largest percentage of juniors had a concrete learning style with 35.2% (13 of 37) Concrete/Sequential and 32.4% (12 of 37) Abstract/Random. Overall, the largest percentage of seniors (46.0%, 23) was Concrete/Sequential (Table 5).

Table 5

Learning styles based on classification (N)

	Freshman	Sophomore	Junior	Senior
Concrete Sequential	17	4	13	23
Abstract Sequential	2	3	1	3
Abstract Random	5	5	12	9
Concrete Random	4	5	7	12
Two or More	1	2	4	3

The learning styles based on composite ACT score were scattered across all score areas and learning styles. The majority of agricultural communications students (62.2%, 84) had scores between 20 and 29 and were predominantly Concrete/Sequential (45.2%, 38) (Table 6).

The differences between learning styles based on cumulative GPA are similar to those based on composite ACT score. A majority (65.9%, 89) of students had a GPA between 3.000 and 4.000. The majority of these respondents were predominantly concrete sequential (50.6%, 45) (Table 7).

Table 6

Learning styles based on composite ACT score (N)

	14 or less	15-19	20-24	25-29	30-36	Data Unavailable	Total
Concrete Sequential	1	10	17	21	2	6	57
Abstract Sequential		1	2	3	1	2	9
Abstract Random		7	11	7	2	4	31
Concrete Random	1	6	8	8	2	3	28
Two or More		1	4	3		2	10
Total	2	25	42	42	7	17	135

Table 7

Learning styles based on cumulative grade point average (N)

	1.999 or less	2.000- 2.499	2.500- 2.999	3.000- 3.499	3.500- 3.999	4.000	Total
Concrete Sequential		4	8	18	18	9	57
Abstract Sequential		1	3	2	3		9
Abstract Random	1	7	7	10	6		31
Concrete Random	2	3	7	8	8		28
Two or more		1	2	2	5		10
Total	3	16	27	40	40	9	135

The finding for the difference in learning styles based on permanent residency show that in-state and out-of-state students have a very similar makeup. In-state students were predominantly concrete sequential (41%, 41). The majority of out-of-state students were concrete sequential (45.7%, 16) or concrete random (20.0%, 7) (Table 8).

Table 8

Learning styles based on permanent residency (N)

	In-State	Out-of-State	Total
Concrete Sequential	41	16	57
Abstract Sequential	7	2	9
Abstract Random	25	6	31
Concrete Random	21	7	28
Two the Same	6	4	10
Total	100	35	135

Conclusions

Conclusions for this study included:

- The largest group of agricultural communications students had learning styles that exhibit concrete traits, the majority being Concrete/Sequential.
- The majority of agricultural communications graduates are females, junior or seniors, have a composite ACT score of 20-29, a cumulative GPA of 3.000 or higher, and their permanent residence in Oklahoma.
- A majority of males were concrete random (55.9%), while a majority of females were concrete sequential (61.9%) in their learning style.
- Few agricultural communications graduates exhibit an abstract sequential learning style (6.67%).
- Both in-state and out-of-state students exhibited concrete traits, particularly concrete sequential traits (42.2%).

Implications/Recommendations

It is important for the reader to not generalize the results of this study beyond this limited sample. However, the results of the study are beneficial to both the teacher and student. The diversity of the learning styles assessed by the Gregorc instrument support the need for teachers/instructors to have a broad knowledge of teaching methods to meet the learning needs of all students. This claim supports previous research conducted by Torres & Cano (1995) using the Group Embedded Figures Test.

Teaching professionals who have a clear understanding of their own learning styles can possibly create a more effective learning environment by being cognizant of their preferred teaching style. Dunn & 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 (Torres & Cano, 1995; Brandt, 1990).

Students, having knowledge of their preferred learning style, can develop more effective techniques when working with other students with diverse learning needs. Torres & Cano (1995) maintain this knowledge can also assist students to cope with and adapt to various teaching styles encountered in any university system.

Recommendations for application from this study include:

- Faculty should look at teaching methods congruent with the dominant learning styles, while continuing to meet the needs of all learning styles.
- It is important faculty become aware of and incorporate diverse teaching methods to meet the needs of the gender-different learning styles.

Recommendations for future research from this study include:

- 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 there are any differences or similarities 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.

References

- Brandt, R. (1990). On learning styles: A conversation with Pat Guild. *Educational Leadership*, 48 (2). Association for Supervision and Curriculum Development.
- Cano, J. & Porter, T. L. (1997). The relationship between learning styles, academic major, and academic performance of college of agriculture students. *Proceedings of the 24th Annual National Agriculture Education Research Conference*, 373-380. Las Vegas, NV.
- Cano, J. (1999). The relationship between learning styles, academic major, and academic performance of college students. *Journal of Agricultural Education*, 40 (1), 30-37.
- Day, T. M., Raven, M., & Newman, M. E. (1998). The effects of World Wide Web instruction and traditional instruction and learning styles on achievement and changes in student attitudes in a technical writing in an agricomunication course. *Journal of Agricultural Education*, 39(4), 65-75.
- Dyer, J.E. & Osborne, E.W. (1996). The effects of teaching approach on achievement of agricultural education students with varying learning styles. *Journal of Agricultural Education*, 37(3), 43-51.
- Dunn, R. S. & Dunn, K. J. (1979). Learning styles/teaching styles: Should they ...can they ... be matched? *Educational Leadership*, 36, 238-244.
- Garton, B. L., Spain, J. N., Lamberson, W.R. & Spiers, D.E. (1999). Learning styles, teaching performance, and student achievement: A relational study. *Journal of Agricultural Education*, 40(3), 11-20.
- Gregorc, A. F. (1979). Learning/teaching styles: Potent forces behind them. *Educational Leadership*, 36, 234-237.
- Gregorc, A. F. (1979). ORGANON: Theory Manual. Working Paper, School of Education, The University of Connecticut.
- Gregorc, A. F. (1982). *An adults guide to style*. Colombia, CT: Gregorc Associates.
- Honeyman, M. S. & Miller, G. S. (1998). The effect of teaching approaches on achievement and satisfaction of field-dependent and field-independent learners in animal science. *American Society of Animal Sciences*, 76, 1710-1715.
- Hunt, R. G., Krzystofiak, F. J., Meindl, J. R., & Yousry, A. M. (1989). Effects of cognitive style on decision making. *Organizational Behavior and Human Decision Processes*, 44, 436-453.
- Leonard, N. H., Scholl R. W., & Lowalski K. B. (1999). Information processing style and decision making. *Journal of Organizational Behavior*, 23(3), 407-420.

- Murano, P. S. & Knight, T. D. (1999). Determination of learning styles in an introductory Food science course. *NACTA Journal*, 43(4), 50-53.
- Torres, R. M. (1993). The cognitive ability and learning styles of students enrolled in the College of Agriculture at The Ohio State University. *Unpublished doctoral dissertation, The Ohio State University, Columbus.*
- Torres, R. M. & Cano, J. (1994). Learning styles of students in a college of agriculture. *Journal of Agricultural Education*, 35(4), 61-66.
- Torres, R. M. & Cano, J. (1995). Learning styles in agriculture. *NACTA Journal*, 39(2), 4-8.