An Assessment of Visual Communications Pilot Curriculum in Arkansas Secondary Agricultural Science Programs

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Abstract

Visual communications curriculum was developed and piloted in Arkansas secondary agricultural science courses. Perceptions of the curriculum and an associated experiential learning activity were assessed. Teachers were provided electronic access to all lessons, instructional PowerPoints, worksheets and handouts. Lessons in the curriculum covered basic photography, writing and videography competencies and skills. Upon completion of instruction, the University of Arkansas visited identified schools with a mobile classroom equipped with computers, digital SLR cameras and video cameras. Students spent a full day collaboratively taking photos and capturing video, which supported their agricultural news or feature storyboards for video development. Student (N = 72) perceptions were assessed using a 20 question instrument. Teacher (N = 7) participates were also surveyed. At the time of publication, eight Arkansas high school agricultural programs had completed the program, with one school repeating participation with a different group of students. Students noted the curriculum was enjoyable, interesting and practical for their future. Overall, teachers agreed that students gained knowledge about visual communications and were engaged and interested in the topic. Also, 87.5% of the teachers noted they would include the curriculum without the experiential (mobile classroom) portion of the program.

Introduction

Technology use and integration is growing rapidly in today's society. Technology can also aid in advancements in many everyday tasks, including education. Additionally, as the general public becomes further removed from the farm, communication becomes ever-critical to the promotion of agriculture (Bailey-Evans, 1994). By the 1900s, agricultural communications had evolved into a highly competitive industry requiring knowledge of business practices and editorial skills as well as farming (Burnett and Tucker, 2001). Agricultural communicators now use digital technologies to disseminate messages throughout media outlets and both secondary and postsecondary courses have shifted to reflect this change (Edgar et al., 2012).

"*Visual images are very powerful in their occupation of the publics' time and the shaping of how we process our surrounding environments*" (Sadler-Trainor, 2005, p. 9). Visual images play an important role in society due to the messages images portray, both positive and negative, regarding social class and culture (Edgar and Rutherford, 2012; Rhoades and Irani, 2008;). Secondary students have an inclination to learn digitally; therefore visual communications is an important area to study (Van Scoter, 2004). Consequently, many of the competencies outlined in the agricultural communications career development event (CDE) focus on visual communications. Thousands of secondary students compete in CDEs annually, nationally.

Agricultural education courses are built on a foundation of constructivism and experiential learning, which fosters and enhances understanding and knowledge about agriculture (Newcomb et al., 2004). Many secondary courses today integrate technology use to enhance student readiness of postsecondary education or the workforce (Mazurkewicz et al., 2012). In 2011, Hess and Trexler noted that "constructivist-based approaches for teaching agricultur[e] require experiential learning elements" (p. 159) in order to expand student learning and competencies in agricultural literacy. Agriculture continues to diversify and change, aiming to meet the needs of producer and commodity groups. This change and diversification has brought about the need to more effectively communicate and promote agriculture to an audience who is often uneducated about agriculture and its practices. "*As agricultural education enters the twenty first century, it [education and agriculture] must change with emerging trends in society and the agricultural industry*" (Talbert et al., 2005, p. 61). Currently, there is no curriculum area or educational frameworks outlined for agricultural communications to be taught in Arkansas

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secondary agricultural science courses, making it difficult to provide career relevant experiences for students.

Today, agricultural education provides training for all students, including those who will not be involved with farming or entering the agricultural industry (Talbert et al., 2005). With change and agricultural diversification ever-present, agricultural education teachers, specifically those in secondary education, struggle to keep abreast of changes with emerging trends in society and the agricultural industry. However, agricultural education teachers are critical links between secondary students and agriculture. Additionally, a student's desire to achieve higher levels of learning stems from students' perceptions of great teaching (Wilson et al., 2010). "A teacher who achieves high levels of learning is no doubt a great teacher, but we assert that instructors should go one step further and also seek the label of greatness from the students" (Wilson et al, 2010, p. 64). It is important that new curriculum initiatives integrate innovative, excellent teachers to ensure diffusion of the content (Rogers, 2003).

Theoretical Framework

The Vocational Education Act of 1963 defined vocational education as courses used for the preparation of students for paid or unpaid employment (Hayward, 1993). Additionally, this act recognizes agricultural education courses as preparing individuals for college studies (Newcomb et al., 2004). This preparation for the workforce can be achieved through modified teaching methods that include reflective learning and hands-on engagement (Kolb, 1984; Leggette et al., 2012; Mazurkewicz et al., 2012; Palfrey and Gasser, 2008).

Constructivism has been used to represent a collection of theories, including generative learning (Wittrock, 1990), discovery learning (Bruner, 1961) and situated learning (Brown et al., 1991). Learning is an active process where the learner uses sensory input and construct meaning with the content based on previous learning and experiences (Mazurkewicz et al., 2012). Kolb (1984) proposed the theory of experiential learning that involved four principal stages: concrete experiences, reflective observation, abstract conceptualization and active experimentation. These teaching methods allow students to reach application, analysis, synthesis and evaluation, the higher tiers in Bloom's Taxonomy of learning (Bloom and Krathwohl, 1956). "Learners are expected to understand the applications they are learning" (Edgar, 2012, p. 5) and should be able to do more than simply act on memorization.

"*Communications in agriculture are designed to introduce students to topics related to promoting agriculture through a variety of media sources*" (Oklahoma Instructional Media Center, 2010, p. 5). However, since the incorporation of the agricultural communications CDE and the development of *The Guidebook for Agricultural Communications in the Classroom*, Arkansas has yet to develop an educational framework in agricultural communications to teach secondary students about technologies and careers associated with the field. Yet, recent research priority areas in the field note the importance of visual communications curriculum and training in secondary education programs, including: (a) sufficient scientific and professional workforce that addresses the challenges of the 21st century; (b) meaningful, engaged learning in all environments; and (c) efficient and effective agricultural education programs (Doerfert, 2011).

The diffusion of innovations can be, and usually is, a long intricate process. Rogers (2003) developed a widely used model for following a new product through the diffusion process. Rogers (2003) defined diffusion as "*the process in which an innovation is communicated through certain channels over time among the members of a social system*" (p. 5). There is a need for agricultural communications curriculum to be incorporated in Arkansas secondary agricultural education programs to help meet the needs of the industry. As new curriculum is developed, it must go through the same processes new technology and other innovations go through to be accepted by teachers. "*The early adopter is respected by his or her peers and is the embodiment of successful, discrete use of new ideas*" (Rogers, 2003, p. 283). This study targeted Arkansas secondary agricultural science teachers who were identified as early adopters.

As agricultural communications becomes a more prominent area of the industry, it is important for secondary agricultural education programs to build student interest in this area (Fraze et al., 2013). Prior to this study, University of Arkansas faculty secured funding to develop agricultural (visual) communications curriculum and activities. The curriculum was used to prepare students to create promotional videos about agriculture. Upon completion of the developed program (curriculum and a mobile classroom project), Arkansas teachers and state educational staff were provided the opportunity to decide if the curriculum implementation into the educational frameworks for secondary agricultural courses would meet their needs. In order for the program to progress in the innovation decision process and for agricultural communications curriculum to be expanded, perceptions of the students and teachers who participated in the Visual Communications program must be assessed. The purpose of this study was to assess participants' (students' and teachers') perceptions of the Visual Communications program. The following research questions guided the study:

- How do students perceive the curriculum associated with the Visual Communications program?
- How do students perceive the hands-on, experiential video production activity (mobile classroom) associated with the program?
- How do teachers perceive the Visual Communications program (curriculum and mobile classroom experience)?

Materials and Methods

In the summer of 2010, the University of Arkansas developed *The Visual Communication on the Road in Arkansas: Video and Photo Creative Projects to Promote Agriculture* (Visual Communications) program. The program was based on a constructivist foundation and integrated the national FFA organizations model of classroom learning, laboratory activities and FFA involvement. The educational units of instruction also included areas of importance for agricultural communicators as outlined by Akers et al. (2001).

Interested teachers were provided access to the curriculum via the University of Arkansas Department of Agricultural Education, Communications and Technology's website (http://aeed.uark.edu/mobile_classroom.php). Participating teachers voluntarily elected to incorporate the program into a course they were already teaching. Students of that course were then selected as the students participating in this study, with parental consent. Curriculum covered photography, news and feature writing and videography and was made available electronically to Arkansas secondary agricultural programs. This pilot curriculum was taught by agricultural science teachers (N = 7) in eight classrooms prior to an experiential learning activity that took place in a mobile classroom. The Visual Communications program curriculum was designed with 10 lessons of classroom instruction/ activities that included teacher lesson plans, instructional PowerPoints, worksheets, handouts and assessments. After teachers finished delivering the curriculum units, students completed either a news- or feature-style storyboard focused on an agricultural related topic that would be used to create a video.

Once the University of Arkansas approved the student storyboards, they visited the school with a mobile classroom equipped with digital, single-lens reflex (SLR) and video cameras and laptops with photo and video editing software to assist secondary students with video creation and dissemination via YouTube. The mobile classroom (a 7x14' cargo trailer converted to a small classroom) was used to assist student groups (with three to five participants in each group) shoot photos and video and then create a three to five minute video promoting an agricultural topic or story. Each participating school created two to five student videos and completed videos were rendered and posted to YouTube. During this day, students also learned about agricultural communication careers available.

The fall 2010 semester was used as a pilot (testing) period for the curriculum and a daylong experiential experience to apply knowledge gained (using the mobile classroom) through application. During the pilot, four schools participated in the program. The pilot group was strategically targeted based on school location throughout Arkansas (n = 3 schools; n = 27 students) in the fall of 2010. In the spring of 2011, participating schools were selected based on teacher willingness to incorporate the curriculum into one of their agricultural science courses (n = 5 schools; n = 45 students). There were only minor wording changes made to curriculum and assessments after the pilot group and no significant difference was found between student data from the different semesters. Therefore, all data were compressed and reported together (N = 72 students).

Throughout the program students were asked to complete questionnaires after each specific curriculum unit was taught by the collaborating agricultural science teacher. Each questionnaire referenced the topic and assessed the students' knowledge of the specific visual communications area, how/if they enjoyed learning about it, its value to their education and if they found it to be practical. Perception questions were adapted from an instrument by Silance and Remmers (1934) to fit the content of this study. The instrument contained 20 items on a seven-point Likert scale (1 = "strongly disagree" and 7 = "strongly agree") designed to determine respondent perceptions about the Visual Communications curriculum. To prevent response set, seven of these 20 items were negatively worded. Negatively worded questions were reverse coded for analysis. Students were also asked to complete an instrument regarding the mobile classroom experience. The researchers followed Dillman's (2007) Tailored Design method to reduce instrumentation bias in question wording. Cronbach's Alpha was used to test instrument (curriculum and mobile classroom) reliability. Instrument reliability ranged from Cronbach's Alpha of 0.75 to 0.88 for both student perception based instruments.

Teachers who taught the curriculum were surveyed after completion of the program. Agricultural science teachers assessed the curriculum units and the hands-on (mobile classroom) portion of the program via Survey Monkey; an electronic survey instrument. Arkansas agricultural science teachers (N = 7) participating in the Visual Communications program were assessed to determine their perceptions of the program. Upon completion of the program, project administrators sent an email to the teachers with the link to the instrument. Teacher perceptions of the usefulness of the provided instructional materials for the curriculum as well as student understanding of visual communications post-curriculum were assessed using a five-point Likert scale (1 = "strongly disagree" to 5= "strongly agree"). Teachers were also asked if they perceived the students to be interested in the curriculum, if the curriculum was useful for the students' future and if they believed their students were engaged throughout the project based on a four-point Likert scale (1 = "not at all" to 4 = "very"). Instrumentation development followed Dillman's (2007) Tailored Design method to increase participation and reduce instrumentation bias in question wording. Instrument reliability ranged from Cronbach's Alpha of .63 to .81. Data were analyzed using descriptive (means and standard deviations) analysis.

Results and Findings

Students in this study were assessed during the fall 2010 and spring 2011 semesters and are presented together. Participating schools represented four regions of Arkansas. Twenty-six female students and 46 male students (N = 72) participated in the Visual Communications program and had useable/completed responses for the perceptions-based instrument. All student instruments were completed via paper and pen. Student perception data were coded and input by the researchers. Because frameworks outlining agricultural communications curriculum in Arkansas do not exist, teachers choose, at their own discretion, a class to participate. Students in the sample were mixed classes of freshman to seniors in high school and classes varied in subject area.

Student Perception Curriculum Developed for the Visual Communications Program

For the curriculum unit, students were agreeable in each category (interest, enjoyment and practicality) but not highly agreeable in any specific area (photography, writing and videography). Students indicated that they "moderately agreed" to "agreed" that the visual communications curriculum was enjoyable (M = 5.56, SD = 0.80), practical (M = 5.52, SD = 1.03) and interesting (M = 5.51, SD = 0.93). Table 1 notes students' perceptions in each area for each school. School G rated all three areas of assessment regarding the agricultural communications curriculum between "indifferent" (neither agreed nor disagreed) and "moderately agree", while all other schools "agreed" to "strongly agreed" with the enjoyment, practicality and interest statements, regarding the curriculum.

Student Perception of the Video Production Activity

Overall, students noted they "agree" with statements regarding the mobile classroom project in all assessment categories (enjoyment, practicality and interest). Using a seven-point scale (7 being strongly agree), students "moderately agreed" to "agreed" that the mobile classroom activity (video production project) was enjoyable (M = 5.69, SD = 0.85), interesting (M = 5.83, SD = 0.96) and practical (M = 5.70, SD = 1.02). Table 2 displays students' perceptions of the mobile classroom (experiential learning activity) by school. School D (located in the north central part of Arkansas) rated the mobile classroom highest with a mean greater than six in each category, noting that they "agreed" with each enjoyment, practicality and interest statement regarding the mobile classroom experience.

Teacher Perception of Visual Communications Program

Agricultural science teachers were given an instrument using Likert-type scales (4- and 5-point) to determine their perceptions of the Visual Communications program and the mobile classroom experience. Arkansas agricultural science teachers in this sample population (N

Table 1. Student Perceptions of the Agricultural Communications Curriculum (N = 72)

Assessment Area	Secondary School	*n*	*M*	*SD*
Enjoyment				
	A	10	5.83	0.81
	B	6	5.47	0.53
	C	11	5.56	0.89
	D	12	5.88	0.42
	E	9	5.76	0.85
	F	8	5.31	0.84
	G	11	4.82	0.68
	H	5	6.00	0.91
	Overall	72	5.56	0.80
Practicality				
	A	10	5.63	1.13
	B	6	5.52	0.87
	C	11	5.54	1.23
	D	12	6.12	0.41
	E	9	5.46	1.31
	F	8	5.41	0.57
	G	11	4.58	1.01
	H	5	6.14	0.52
	Overall	72	5.52	1.03
Interest				
	A	10	5.61	1.09
	B	6	5.21	0.56
	C	11	5.39	0.98
	D	12	6.17	0.44
	E	9	5.41	1.31
	F	8	5.46	0.59
	G	11	4.95	1.00
	H	5	5.86	0.83
	Overall	72	5.51	0.95

*Note. Scale of items: 1 = strongly disagree, 2 = moderately disagree, 3 = disagree, 4 = neither disagree nor agree, 5 = moderately agree, 6 = agree, 7 = strongly agree

Table 2. Student Perceptions for the Mobile Classroom Visit (N = 72)

Assessment Area	School	n	M	SD
Enjoyment				
	A	10	5.83	0.81
	B	6	5.47	0.53
	C	11	5.56	0.89
	D	12	6.04	0.54
	E	9	5.80	1.11
	F	8	6.15	0.51
	G	11	5.41	0.65
	H	5	5.80	1.21
	Overall	72	5.69	0.85
Practicality				
	A	10	5.62	1.13
	B	6	5.52	0.88
	C	11	5.54	1.23
	D	12	6.02	0.43
	E	9	5.95	1.43
	F	8	5.96	0.64
	G	11	5.29	1.32
	H	5	5.23	1.50
	Overall	72	5.70	1.02
Interest				
	A	10	5.61	1.08
	B	6	5.21	0.56
	C	11	5.39	0.98
	D	12	6.24	0.45
	E	9	5.65	1.43
	F	8	5.84	0.68
	G	11	6.64	1.29
	H	5	5.31	1.55
	Overall	72	5.83	0.96

*Note. Scale of items: 1 = strongly disagree, 2 = moderately disagree, 3 = disagree, 4 = neither disagree nor agree, 5 = moderately agree, 6 = agree, 7 = strongly agree

= 7) participated in the visual communications program assessment. Total years of teaching experience was analyzed and resulted in 28.6% with less than one year, 14.3% with one to three years, 14.3% with six to ten years and 42.9% with more than 10 years of teaching experience. Gender of the participating teachers was 71.4% male and 28.6% female. Teachers identified their ethnicities as either white (85.7%) or other (14.3%). Level of respondents' education was identified into two levels with either a bachelor's degree (42.9%) or a master's degree (57.1%) as the highest level of education completed. Grade level presently teaching was primarily 9th through 12th grade (71.4%) with 28.6% of participating teachers teaching 7th through 12th grade.

On average, curriculum instruction took teachers 13.6 days to complete. The curriculum was taught in a variety of secondary agricultural science classes, including: agriculture business, agriculture marketing, biological animal science, leadership and communications and agriculture science and technology. Participating teachers spent on average a total of six to 10 hours preparing to teach the agricultural communications curriculum. The majority of teachers (57.1%) noted they were involved during the mobile classroom visit. All teachers indicated that the curriculum could be taught in the same class again and agreed they would teach the curriculum again. The majority (85.7%) of the teachers noted that they would continue teaching curriculum without the Visual Communications program. Teachers noted that the majority of their students had access to digital equipment needed (digital cameras and video cameras) but few had access to software (Adobe Photoshop and Premier Pro).

Teachers were asked to assess the curriculum (lesson plans, PowerPoints, handouts, etc.) based on how the provided materials met their needs for instruction (based on a five-point Likert scale 1 = strongly disagree to 5 = strongly agree). The mean rating of the provided instructional material was "neutral" (M = 3.80, SD = 1.10). However, teachers "agreed" (M = 4.29, SD = 0.76) that students had a better understanding and general knowledge of visual communications after being taught the curriculum.

When asked to rate their level of agreement on a four-point Likert scale (1 = not at all agree, 2 = somewhat agree, 3 = mostly agree and 4 = fully agree) teachers "somewhat agreed" (M = 2.00, SD = 0.58) students were interested in the topics covered in the curriculum. Teachers felt the students would "most likely" (M = 3.00; SD = 0.82) be able to apply this information in their future (based on a four-point Likert scale with 1 = not applicable, 2 = somewhat likely, 3 = most likely and 4 = very likely). Agriculture teachers noted that students were "mostly" to "very" engaged and on task during the mobile classroom visit (M = 3.57, SD = 0.79).

Summary

Students consistently "moderately agreed" to "agreed" in the overall level of enjoyment, interest and practicality of the visual communications curriculum. Therefore, respondents perceived the curriculum to have value in their learning. Students' indicated the curriculum had practical application to their lives and they were interested in the topics. Therefore, students' collaboration (which is a method used through the curriculum's design) may have led them to have more positive perceptions; resulting in further understanding, which supports Edgar's (2012) work and constructivist approaches to learning (Hess and Trexler, 2011). It can be further postulated that positive perceptions of the visual (agricultural) communications curriculum may have occurred due to students' ability to apply new concepts and ideas (USC-CET, 2006) or engage in additional technology in the classroom (Bailey-Evans, 1994; Edgar et al., 2012).

Further it was found that participants perceived the mobile classroom (experiential) activity to be positive for enjoyment, practicality and interest. Combined with the curriculum presented, the mobile classroom activity may have elevated student perceptions through positive feelings elicited during experiential learning (Kolb, 1984). The Visual Communications program allowed students to make reflective observations and abstract conceptualizations (Kolb, 1984) taught in curriculum and applied during the mobile classroom experience. Students then applied concrete experiences along with active experimentation (Kolb, 1984) during the video production process, which may have positively impacted student perceptions.

Teachers were "neutral" on the usefulness of the prepared agricultural communications curriculum, which could be due to the pre-developed instructional material limiting their use of preferred teaching style or due to a lack of available technology at their school. Regardless of their neutral perception of the prepared curriculum, the majority of teachers noted they would continue using the instructional material even without visits from the mobile classroom.

Overall, teachers noted that curriculum improved students' understanding of visual communications and that students were interested in the topics covered. It can be concluded that the development and implementation of the program was perceived as "most likely" valuable to students' future by the instructors and that students were engaged throughout the experiential learning activity. Therefore, the research supports experiential learning activities can positively impact students at the secondary education level (Kolb, 1984). It should also be acknowledged that the impact of the program, at least through the lens of participants, was successful.

There are over 100 secondary agricultural science programs in the state, but due to end of course testing it was difficult for teachers to agree to participate in the piloted Visual Communications program. Teachers were generally concerned that the new content did not tie to curriculum frameworks which are tested through end of course examinations. Therefore, many instructors cannot afford to use valuable teaching time in order to

offer a program which is not directly linked to educational frameworks. Participating schools and instructors who agreed to participate were able to find avenues where the curriculum could be integrated into a class that was not being tested based on frameworks. Therefore, future efforts must be made to align curriculum with state educational frameworks. It is surmised that agricultural education programs outside of Arkansas could take the prescribed curriculum and also implement it into courses. The curriculum could also be used as training material for students participating in the agricultural communications CDE.

Through discussion of topics and competencies covered in this program, agricultural communications curriculum could be added to the agricultural education frameworks in Arkansas. It is unknown at this time if an entire course could be added or if curriculum will be added to an already existing course. Although opinion leaders (teachers) were targeted to teach the curriculum (Rogers, 2003). Future assessments should focus on the early adopters (teachers integrating the curriculum on their own) opinions, because their opinions will influence other teachers in the state regarding whether or not the Visual Communications curriculum adoption occurs.

Because agricultural communications is a relatively new conceptual area in secondary agricultural programs and has high levels of technology integration, established teachers may have a difficult time understanding the material. Therefore, state trainings should be initiated to assist teachers with increased comfort in teaching the curriculum and to enhance their knowledge and skills in visual and agricultural communications. Teachers should be provided with instruction on how to better incorporate visual communication technology into the classroom. Additionally, future research should focus on teachers' influence of students' perceptions regarding the curriculum due to teachers influence on student learning (Wilson et al, 2010).

The curriculum should be improved to strengthen both student and teachers perceptions of the engagement, practicality and interested of the instruction. Additional research should be conducted regarding agricultural communications knowledge, competencies, skillsets needed in industry before modifying and expanding this curriculum for incorporation into state educational frameworks. Students who participated in the Visual Communications program should be surveyed to determine if the knowledge and skills gained during the program influenced them to create videos on their own time or look further into careers related to agricultural communications.

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