

# Evaluating Capstone Courses: Employing the Five R's Model to Analyze an Agricultural Communications Magazine Class

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## Abstract

The purpose of this study was to assess students' perceptions regarding the value of an agricultural communications magazine capstone course at the University of Arkansas in an effort to describe the characteristics leading to the course's success and to pilot a clear method of evaluating capstone courses. The course evaluators used the Model for the Integration of Experiential Learning into Capstone Courses (MIELCC) as a framework for the evaluation. Students reported receiving a valuable experience on all accounts. Based on the examination of students' perceptions through the lens of the model (MIELCC), the course fulfilled students' needs for experiential learning and prepared students for their careers. Students reported having improved their levels of confidence in their communications skills and having improved important skills to prepare them for the workforce. For new and developing agricultural communications programs, the findings of this evaluation help solidify the need for a similar capstone course in the curriculum and provide a model that can guide capstone curriculum development and evaluation. The results also lead to the recommendation of modifications to the MIELCC to emphasize the importance of internal communications in the capstone experience and to introduce the concept of noise—situations when the system is hindered—in the capstone environment. This addition adds an element of realism to the model and helps account for difficulties encountered throughout capstone courses. Future studies should employ the MIELCC to examine successful magazine capstone courses in agricultural communications programs across the country in order to create guidelines for developing and improving such courses.

## Introduction

As communicating with the public about issues related to agriculture, food, and the environment becomes more and more important, so does academe's ability to provide society-ready graduates who possess advanced communications skills (Andelt et al., 1997; Graham, 2001; Klein, 1990). For decades, building students' communication skills has been a priority in colleges of agriculture across the United States. Degree programs in agricultural communications exist in dozens of colleges across the country, most with a focus of providing the agriculture industry with graduates who are skilled in communications and who also have a strong knowledge and passion for issues and topics related to agriculture, food, and the environment.

Demand for work-ready graduates with strong communication skills continues to increase. According to the United States Department of Agriculture-National Institute of Food and Agriculture (2010), prospective demand for several communications-related occupations will continue to rise for the next five years. Demand for public relations specialists will increase by 24%, technical writers by 18.2%, market research analysts by 28.1%, and sales managers by 14.9%. There are more than 6,200 annual job openings available in education, communication, and government operations related to agriculture. According to the NIFA research, potential employers "have expressed a preference for graduates from colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine who tend to have relatively stronger interests and more extensive work experiences for careers in food, renewable

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energy, and the environment that those from allied fields of study” (USDA-NIFA, 2010, p. 2).

Experts in agricultural education and communications identified “build[ing] competitive societal knowledge and intellectual capabilities” as an area of focus in the academic discipline of agricultural communications (Osborne, 2007, p. 6). Undergraduate and graduate degrees in agricultural communications are awarded by dozens of Land Grant universities and other institutions with agricultural academic programs across the country. Such programs typically include experiential learning opportunities because experiential learning has for decades been the cornerstone of the Land Grant institution and agricultural education (Kerr et al., 1931; Parr and Trexler, 2011). Agriculture graduates generally have more extensive work experiences than students from other fields of study (Klein, 1990; USDA-NIFA, 2010). This fact is likely due to the pragmatic approach taken by agricultural educators at all levels.

Capstone courses are essential for fulfilling students’ experiential learning needs in an agricultural communications program (Edgar et al., 2011; Sitton, 2001). By definition, a successful capstone course provides a simulated or real-life experience facilitated to students allowing them to synthesize knowledge that was previously learned, to a higher level of understanding (Crunkilton et al., 1997). Durel (1993) noted that a capstone class is a crowning experience coming at the end of a sequence of courses with the specific objective of integrating a body of fragmented knowledge into a unified whole. As a rite of passage, this course provides an experience that allows students to build life skills. Sitton (2001) noted that these courses give students the opportunity to hone in on previously gained knowledge and skills and move to a higher schema. Additionally, Andreasen (2004) stated that such courses “provide an opportunity to incorporate previously learned, often disjointed information into an interconnected contextual frame of reference from which to transition into a career or further study” (p. 52) and allow students the opportunity to “demonstrate mastery of the area’s complexity” (Troyer, 1993, p. 246).

### **Context: The University of Arkansas Magazine Capstone Course**

Faculty at the University of Arkansas, in an effort to continue building their relatively new agricultural communications undergraduate and graduate curricula, developed and offered a magazine capstone course for the first time in the spring semester of 2010. Modeling existing courses in well-established

agricultural communications programs across the country, the faculty offered students in the course an opportunity to serve on the staff of a new agricultural magazine called AR Culture. This first capstone class included 11 agricultural communications students. Three graduate students served as publication managers, supervising the undergraduate students’ editorial assignments, layout and design assignments, writing one feature story, and advertising sales responsibilities. Eight undergraduate students were responsible for writing two feature stories highlighting and promoting people and programs associated with the Dale Bumpers College of Agricultural, Food and Life Sciences. All students were responsible for their own photography and feature story layouts and for selling advertising and creating advertisement copy and layouts. Two thousand copies of the 52-page publication were printed professionally and used by college and university faculty and staff for recruiting, development, and public relations purposes.

At the conclusion of the course, the instructors conceived and conducted a unique evaluation of the course, which was based on pedagogical theory related to experiential learning through capstone courses. The study, originally intended to be a simple course evaluation, evolved into a project with a larger purpose: to develop a method of evaluating capstone courses that could be widely used in agricultural communications academic programs across the country.

### **Theoretical Framework**

The underlying theories for this study included a long-standing precept about pragmatic teaching and one relatively new theory explaining how to successfully integrate experiential learning into capstone courses. Dewey’s (1938) concept of experiential learning is universally known in agricultural education. Andreason’s (2004) Five R’s model has been cited frequently in literature related specifically to capstone courses (see Clark et al., 2010 and VanDerZanden, 2005).

Traditionally, agricultural education at both the secondary and higher education levels has continued its mode of experiential learning initially propagated by the father of American education, John Dewey (Boone, 2011). “Simply stated, experiential learning is learning through experience” (Andreasen, 2004, p. 53). Dewey (1938) observed that “there is an intimate and necessary relation between the processes of actual experience and education” (p. 7). In addition to his promotion of hands-on learning, Dewey also espoused the concept of collateral learning – the incidental learning that occurs in conjunction with experiential

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learning activities. “Perhaps the greatest of all pedagogical fallacies is the notion that a person learns only the particular thing he[*/she*] is studying at the time” (p. 29). According to Dewey, collateral learning may be the most important aspect of experiential learning activities.

Experiential learning has been used in secondary and postsecondary classrooms for decades (Roberts, 2006). Kolb (1984) expanded experiential learning through the development of a four-stage cyclical model intended to further explain the hands-on learning process. Besides Dewey, Kolb’s model was guided by Lewin (1951) and Piaget (1952). Kolb’s (1984) experiential learning cyclic model involves four principal stages: concrete experiences (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE).

Andreasen (2004) proposed that successful capstone courses should incorporate the Five R’s – receive, relate, reflect, refine, and reconstruct. The Five R’s “are designed to spiral and funnel the required capstone components into a synthesis and lead to an integration of the subject matter content” (Andreasen, 2004, p. 56). The parallels between Andreasen’s Five R’s and Kolb’s Learning Cycle (1984) model and its four principal stages are obvious, demonstrating how the Five R’s capstone model, also called the Model for the Integration of Experiential Learning into Capstone Courses (MIELCC), is supported by long-standing academic theory about the nature of experiential learning.

Following the MIELCC, from an educational evaluation perspective, in order for a capstone course to be considered successful, each of the five components must be achieved. Students enrolled in the capstone course must receive an activity or experience which

either is contrived by the instructor or spontaneously occurs. Learners must be able to relate previously fragmented knowledge to the received activity or experience. Students will then be able to reflect upon what has been received and related in the experience for further understanding. Andreasen (2004) noted, “without structured and active reflection, the lessons available to the learner will not become as apparent and meaningful as otherwise possible” (p. 56). Learners should then be able to refine the knowledge received and move towards a higher expertise. Lastly, a new knowledge base or schema should be reconstructed by the learner. “Once synthesis and integration have resulted, the spiral of the five R’s can be recycled or reused and additional knowledge processed, feedback provided, and evaluations made that will improve knowledge acquisition, retention, and learning” (Andreasen, 2004, p.56) (Figure 1).

## Purpose of Study

The purpose of this study was to assess students’ perceptions regarding the value of an agricultural communications magazine capstone course in an effort to describe the characteristics leading to the course’s success and to pilot a clear method of evaluating capstone courses. To accomplish this purpose, the research was guided by the following questions:

- 1) Did the magazine capstone course meet student’s needs for experiential learning?
- 2) According to student feedback, did the magazine capstone course contain the characteristics of a quality capstone experience as described by Andreasen’s MIELCC (Five R’s) model?

This study was used to pilot an evaluation instrument in preparation for a larger study of similar courses across the nation.

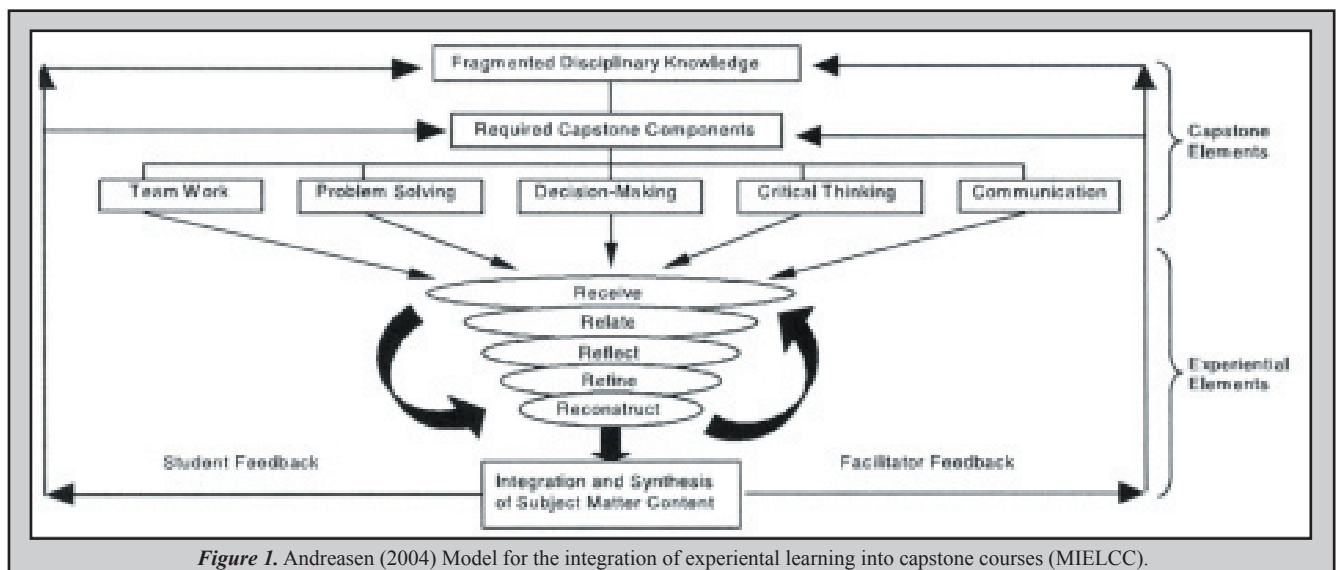


Figure 1. Andreasen (2004) Model for the integration of experiential learning into capstone courses (MIELCC).

## Methods

This summative evaluation, conducted after the conclusion of the capstone course, was descriptive and followed the qualitative paradigm of investigation. Naturalistic inquiry—a research approach that allows investigators to study subjects and situations from a non-quantitative, inductive perspective—guided this study of 11 human subjects who were selected purposively because they were students in the course. The 11 subjects were undergraduate and graduate students enrolled in the spring 2010 Agricultural Publications course at the University of Arkansas. Three of the subjects were graduate students who served as magazine staff managers. Eight undergraduates were enrolled in the course and served as writers, editors, photographers, designers, and advertising sales representatives. The subjects, selected by virtue of their participation in the course represented a “typical” selection of subjects as defined by Merriam (1998) and Patton (1990). That is, they reflected the average instance of agricultural communications students participating in a magazine capstone course. Participants completed a 16-week capstone course focused on developing the University’s first student-produced agricultural magazine.

An instrument was created to guide the assessment of the students experience in the capstone course following Dillman’s (2007) Total Tailored Design method. Instrumentation questions were modeled after Andreassen’s (2004) Five R’s (receive, relate, reflect, refine and reconstruct), which represent the characteristics necessary for successful capstone courses. Faculty members who taught the course developed survey questions with the goal of determining the extent to which the course adhered to the five R’s model, as perceived by the students. Therefore, content validity of the instrument was established, as the survey questions corresponded directly to the five R’s of quality capstone courses. Furthermore, the survey was reviewed by a team of agricultural communications faculty at the University of Arkansas to establish face validity.

The instrument was administered to students after the completion of the course, and it consisted of six open-ended, in-depth questions prompting the students to reflect on the capstone course. Reflection is the process by which an experience is being considered, during the experience or after the experience. It is also the creation of meaning and conceptualization from experience. Reflection allows the ability to analyze and create perceptions about experiences differently than one might have done without reflection (Brockbank and McGill, 1998). Zhao (2003) defined reflective

practice as “an ability to reflect on experiences, to employ conceptual frameworks, and to relate these to similar and dissimilar contexts to inform and improve future practice” (p. 2). The open-ended questions allowed for “more freedom of response because certain feelings or information may be revealed that would not be forthcoming with selected response items” (Wiersma, 1995, p. 181).

The instrument was administered electronically through Survey Monkey, a web-based survey tool. A preliminary email message was sent to the students informing them of the purpose of and need for the study. Four rounds of email reminders were sent to the students in an effort to increase response rates (Dillman, 2007). The survey structure protected student confidentiality to enhance the reliability of the responses. There was a 63.6% response rate to the survey.

The qualitative analysis was thematic in nature, employing open and axial coding techniques (Strauss and Corbin, 1998) as well as the constant comparative method (Lincoln and Guba, 1985) in an effort to develop a clear description of student perceptions regarding the capstone course. The textual analysis consisted of “breaking down, examining, comparing, conceptualizing, and categorizing data” (Strauss and Corbin, 1990, p. 61). Using the constant comparative method the researchers took one piece of data (i.e. one student statement) and compared it to other pieces of data. During this process, the researchers began to look at what made each piece of data different and/or similar to other pieces of data. This method of analysis is inductive because the researcher begins to examine data critically and draw new meaning from the data. The analysis of the respondent’s content was a systematic technique that employed the compression of many words of text into fewer content categories based on explicit rules of coding (Berelson, 1952; Krippendorff, 1980; Weber, 1990).

The validity of the results was enhanced in several ways, all of which are in line with Merriam’s (1998) strategies for ensuring internal validity. First, triangulation occurred, as multiple investigators examined the data and confirmed the results. Also, peer examination strengthened the results, as the data were reviewed by a group of faculty and graduate students involved in the evaluation. Thirdly, researcher biases were clarified; the fact that the primary investigators were also the course instructors is noted and must be taken into consideration by consumers of this research.

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### Results

Several important themes were evident among the students' responses. The first emergent theme was the perception that the pressures of editorial critiques and deadlines were realistic in the class. All survey participants also reported improved practical skills as a result of their experiential exercises. In particular, they reported feeling more confident in their abilities with layout and design software as well as with the interpersonal skills required to be successful in a publication project. Another theme—possibly the most important in terms of showing evidence of a successful capstone course—was that students reported employing these skills in subsequent internships and jobs in which they were employed during the summer following the course. Students' responses to the open-ended survey validated the worth of this course and typified each of the Five R's in Andreasen's (2004) model – receive, relate, reflect, refine, and reconstruct.

### Receive

Students reported receiving an unparalleled, realistic experience. For this course, the students served on a publication staff. Their responsibilities were the same as those of a professional publications staff. The responses led to the conclusion that students in the course successfully received a real-life experience achieving the first (receive) of Andreasen's (2004) Five R's.

*I feel that this course was one of the most realistic and useful learning experiences I have had in my collegiate and graduate school experience. I was able to learn to work on real deadlines, work with clients, sponsors, other staff members and more. I believe this was a very true example of what it would be like to execute a project or publication like this in the real industry world.*

Another student reported...

*After interning with several places and now working [in] the field, I can say the experience in the class is very similar to what will happen in the real world!*

Also, a student recognized the realistic experience the course provided:

*The deadlines we worked on could easily be compared to the professional real world. Our work was heavily critiqued just like our bosses will do one day.*

### Relate

The undergraduate students were each responsible for all aspects of two feature stories (graduate students were responsible for one story) – writing, editing, photography, and layout and design. Graduate students also assisted with managing the production staff (undergraduates) allowing them to use and build leadership and managerial skills. Each of these skills had been previously received at the university in other agricultural communications courses (i.e. agricultural communications and lab, agricultural reporting and feature writing, graphic design, etc.). Students' responses demonstrated the occurrence of relating previously fragmented knowledge to this specific culminating project – the second of Andreasen's five R's:

*I did use every skill I had ever learned, and then some. I think the positive is it reminded me of the skills I had right before finishing at the University.*

Another student commented...

*This course most certainly allowed me to combine many of my best skills and allowed me to work on some skills that are not as strong. Such skills include[d] writing, communication both interpersonal and small group, sales, deadlines, photography, layout, sending documents to a professional printer, packaging documents, developing a theme, mission, style, layout, managing team members, editing, and more.*

Most importantly, the course also allowed students to integrate several previously learned skills into one project.

*I have never combined feature writing and layout and design. I really liked this aspect because it helped me write the story better [by] envisioning how it was going to layout on the page. Also, by thinking about what photos I would use helped me develop a more clear angle for my story.*

### Reflect

To allow student reflection (the third of Andreasen's five R's) instructors provided opportunities to review key concepts and provided time to answer questions and conduct open discussions. Each student reported being able to reflect back on the process of creating an agricultural magazine as they neared completion of the course:

*Once the magazine was in-hand and I could think back on the whole process, it finally hit me what a task it is to put a magazine together!*

Another student reported...

*Toward the end of the semester reality set in that this will be in a magazine for everyone to see. I understood the magazine process more after being able to see the pages put together and designed to look more like a print magazine. I believe that the trip to the print shop really gave me a good idea of how everything is printed and exactly why we are completing the necessary details when designing our pages.*

### **Refine**

After completion of this publication, students appeared to sense that they had successfully created a real-life experience to draw upon in their future careers. This publication also served as a premier piece in the students' portfolios. All of the students in the course reported having some previous ideas about the production of a magazine; however, students felt that this course refined their previous knowledge and skills and moved their learning toward higher levels of expertise, achieving the fourth of Andreassen's (2004) Five R's. Student responses show that they were able to refine their previously learned skills and apply multiple skills more effectively. One student responded...

*I greatly developed my understanding of Photoshop, InDesign, Illustrator, basic feature writing and photography. Before this class, I had very limited skills in each of those areas. Now, I feel I have a solid grasp on those programs and skills.*

Another student noted...

*I think I definitely developed and improved many professional skills, especially on the behind the scenes business end. Working with other staff members, sponsors and the professional printing company to get the magazine completed allowed me to see and practice working with the professional business end of the magazine, not just design. I also learned to better manage files, time, design skills and [how to complete] a large project with many contributors.*

### **Reconstruct**

The students' ability to reconstruct their perceptions of the magazine production process and

to gain awareness not only of what they learned but also of how they learned it fits well in Andreassen's (2004) five R's model of successful capstone courses. This course allowed students to fill a void in their knowledge base regarding several technical skills and allowed them to be better prepared for the workforce. One student's comment typified the responses in regard to the ability to apply the skills they developed through the capstone experience:

*I worked at the (national equine breed association headquarters) this summer, and they produce three magazines. Having had this magazine experience under my belt allowed me to speak [in a] more educated [manner] and be more credible.*

Another student reported that this course helped redefine his/her perceptions of the magazine production process and develop a new knowledge base:

*I have a new appreciation for those who work for a magazine every day. It is a stressful job with several pressing deadlines. When I entered the course, I thought it would be a class with some work outside of class and the majority of the assignments could be completed during class. I am confident saying that I was wrong by assuming such things. I now understand that it takes a team effort to make a magazine that is professional and successful.*

### **Discussion and Conclusions**

The agricultural communications magazine capstone course administered at the University of Arkansas was a valuable experience for students, according to their responses. Based on the examination of responding students' perceptions within the framework of Andreassen's (2004) model, the course fulfilled students' needs for experiential learning and prepared them for their careers. A key theme among students was that the course was valuable because it afforded them the opportunity to hone their skills and advance their previously learned knowledge through a real-life experience. This conclusion is in line with previous literature on agricultural communications capstone courses (Edgar et al., 2011; Sitton, 2001). Also, students' responses indicated the presence of each of Andreassen's Five R's (receive, relate, reflect, refine, and reconstruct). From a qualitative perspective, it could be inferred that these two observations—that students' perceived needs were met and that the course espoused Andreassen's five characteristics of a quality experiential learning capstone experience according to student responses—are linked.

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### Implications and Recommendations

For teaching practitioners in new and developing agricultural communications programs, the results of this study clarify that students who participate in capstone courses with integrated experiential learning opportunities perceive them to be an important component of an agricultural communications program, adding to the literature that already supported this notion (Crunkilton et al., 1997; Durel, 1993; Edgar et al., 2011; Sitton, 2001). For such developing programs, this study and its theoretical framework provide a model that could guide capstone curriculum development and evaluation. Students in agricultural communications programs need courses such as these not only because the courses fulfill their experiential learning needs but also because the courses help transform students into society-ready graduates (Andelt et al., 1997; Graham, 2001; Klein, 1990; Osborne, 2007).

For educational researchers, the results of this study add to the literature supporting the need for capstone experiences in agricultural communications curriculum and highlight the need to continue to develop and evaluate such courses nationwide. Based on the findings among this small group of students, it appears that a more comprehensive study is needed to evaluate similar magazine capstone courses in agricultural communications programs across the nation to help identify key characteristics that could lead to improvements in content and instructional methods associated with magazine production based capstone courses across the U.S. This broader study could significantly impact how capstone courses in agricultural communications are developed, delivered, and evaluated in the future. Plans for such a project are underway, guided by the results of this study, which served as a pilot project. Additionally, future research should focus on determining the professional skills needed in feature writing, photography, layout and design, and sales to help better prepare new professionals for the workforce. The researchers believe that a Delphi study with identified experts in photography, print media, and sales should be conducted to determine which skills most urgently need to be incorporated into agricultural communication courses, especially capstone courses in magazine production.

The results of this study have implications for pedagogical theorists as well. Dewey's (1938) philosophical observation that "there is an intimate and necessary relation between the processes of actual experience and education" (p. 7) remains accurate today, especially for agricultural communications programs focused on providing students with marketable skills.

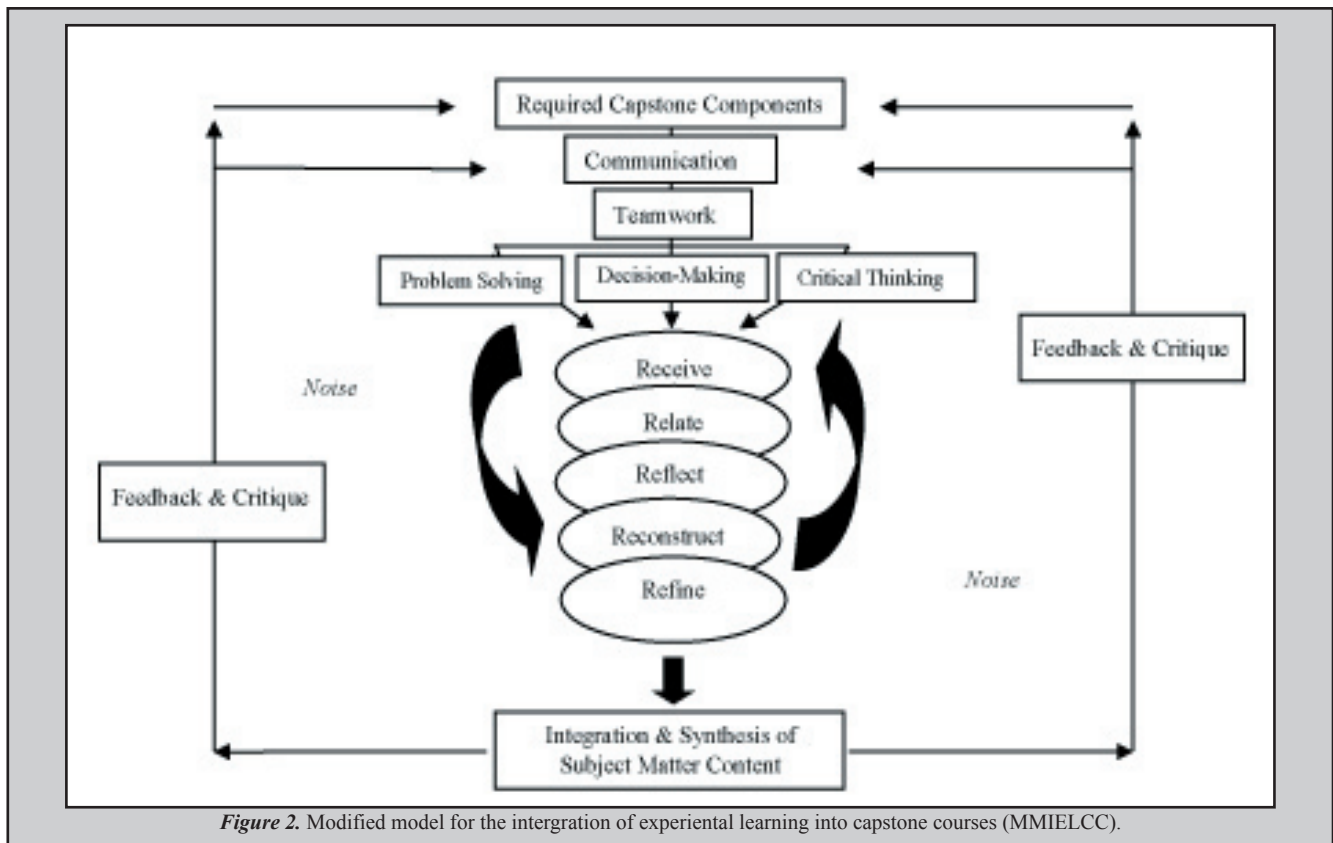
Andreasen's (2004) MIELCC (Figure 1), which contains the Five R's, aptly encompasses all of the experiential education components needed in order to provide a valid capstone experience for the students. However, the authors believe that the MIELCC model could be further refined for future expanded use among practitioners, theorists, and researchers. One finding in particular led the researchers to consider the possibility of adding the concept of professional criticism and feedback, which appears to have made the capstone course at the University of Arkansas more realistic. One student's comment (which supported the receive portion of the model) helped explain why criticism should be an integral part of the capstone course model:

*The deadlines we worked on could easily be compared to the professional real world. Our work was heavily critiqued just like our bosses will do one day.*

This sentiment led the researchers to recommend incorporating periodic feedback and critique by industry professionals and instructors into Andreasen's (2004) MIELCC model. Opportunities for feedback will vary among situations, but any feedback should enhance the students' ability to further integrate and synthesize subject matter content. Therefore, the new element of feedback and critique is indicated in the path between integration and synthesis of subject matter content and fragmented disciplinary knowledge, the characteristic is represented outside the inner-workings of the model, indicating that feedback may occur at any point in the process.

Further, the researchers believe that communication should be central in the model and noted before teamwork. Without effective communication (particularly internal communication among group members) an atmosphere of teamwork cannot exist. Teamwork is central to an environment where decision making, problem solving, and critical thinking can occur, develop, and strengthen.

Finally, the researchers were interested in accounting for the fact that part of the realism that exists in capstone courses is that the project itself does not exist in a vacuum, but instead is confounded by environmental noise. Much like the noise that exists in models of human communication, noise can be ubiquitous in the environment of a capstone course. It represents the situations when the system is hindered as a result of dilemmas such as differences of opinion, misunderstood concepts, students' and instructors' priority conflicts, unmet deadlines, distractions, and



decisions that must be made between quality and timeliness in a project.

Future research will focus on employing the modified model to determine if the suggested modifications are relevant and important to its usefulness in creating and evaluating capstone courses (Figure 2). Academic growth and improvement in agriculture-related disciplines will depend on the continued development and evolution of useful pedagogical models such as the MIELCC.

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