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## Final Report

Curriculum Re-design to Meet Needs of Learning Disabled Students in Illinois  
Agricultural Education Programs

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# Curriculum Re-design to Meet Needs of Learning Disabled Students in Illinois Agricultural Education Programs

## Abstract

The target population for this pilot project included agricultural education students with Specific Learning Disabilities (SLD) and teachers in five high schools in the federally designated economically distressed area, the Illinois Delta Region. A unit of instruction taken from the existing 165 units of *The Illinois Core Curriculum* for agriculture was re-designed in a manner appropriate to SLD students. Students from the five selected programs were randomly assigned to treatment and control groups. Pre-posttests and focus groups were conducted in this mixed methods quasi-experimental pilot study to assess the effectiveness of the redesigned curriculum. Data analysis will be completed by June 30, 2008.

## Introduction

Students with learning disabilities in the United States have increased dramatically in recent years, from 0.75 million in 1976 to 2.41 million in 2002 (Biddle, 2006; Swanson, 1999). This trend indicates a growing need for innovative approaches to improving teaching and learning for secondary learning disabled students.

Given the high percentage of learning disabled students aspiring to post-secondary vocational training and/or a college education (U.S. Department of Education, 2004), it is imperative that curriculum re-design for the learning disabled student in agricultural education and other CTE programs be completed. These students are not mentally retarded and not normally low in their Intelligence Quotient (IQ). For students with Specific Learning Disabilities (SLD), messages to the brain often become jumbled and they may have difficulty with one or more academic areas. With nearly one fourth of our agricultural education students possessing special needs (Pense, 2007), we risk losing that amount of our future workforce in the agriculture industry.

## Theoretical Framework

The theoretical framework for this study was based on the concept of inclusion. Bloom, Perlmutter and Burrell (1999), describe inclusion as a philosophy that draws students, families, educators and schools together to foster an environment that incorporates acceptance, belonging and community. Elbert and Baggett (2003) quote Salend (2001, p. 5) in describing inclusion as seeking to “establish collaborative, supportive and nurturing communities of learners that are based on giving all students the services and accommodations they need to learn, as well as respecting and learning from each other’s individual differences.”

To provide the accommodations needed by students with specific learning disabilities (SLD), assistive technology (Forgrave, 2002) will not only help deliver the information but will also enable students to complete tasks more efficiently and independently. This leads to improved performance and greater academic success.

### **Purpose/Objectives**

The target population for this pilot project was agricultural education students enrolled in Introduction to Agriculture courses (N = 209) in five high schools in the federally designated economically distressed area, the Illinois Delta Region (Pinckneyville Community H.S., Anna-Jonesboro H.S., Marion H.S., Carmi-White County H.S. and Shawnee H.S.).

The Illinois State Board of Education (2004) has produced *The Illinois Core Curriculum* to meet state learning standards for five cluster areas in agriculture; the Core includes 746 lessons in 165 units. One unit of instruction was re-designed in a manner appropriate to the SLD student, and gain scores were determined for both a treatment and a control group. The specific objectives were:

1. To re-design an existing unit in the Horticulture Cluster of *The Illinois Core Curriculum* (ISBE, 2004).
2. To compare/contrast the gain scores of students taught using the re-designed curriculum with those of students taught using the existing state curriculum.
3. To disseminate findings from the research of this pilot project through a presentation at the 2008 Connections Conference and to agricultural education teachers in the Illinois Delta Region.

### **Methods/Procedures**

Students from agricultural education programs in the five selected schools in the Illinois Delta Region were randomly assigned to treatment and control groups. Pre-posttests were conducted in this quasi-experimental study to assess the effectiveness of the redesigned curriculum.

Prior to initiating the study, both the instruments and consent forms were approved by the university Institutional Review Board for research with human subjects (Assurance # 00005334).

In redesigning the three existing horticulture lessons in the Illinois Core Curriculum for Agriculture, technology choices were examined. King-Sears and Evmenova emphasize using technology that is “efficient, cost effective and gets the job done” (2007, p. 9). Therefore, power point software was selected as the medium. To help integrate the technology into instruction, and accommodate varied disabilities, the lessons employed a self-paced format, included illustrations with text, used basic English phrases where possible, and included a voice over application with the recording speakers employing

the Special English technique advocated for second language learners (Celce-Murcia & McIntosh, 1979).

Six major principles of effective instructional design (Ramond, 2007) were employed to guide curriculum re-design; including big ideas, conspicuous strategies, mediated scaffolding, strategic integration, judicious review, and explicit instruction. These six principles were also used in a rubric for validation of the re-designed self-paced lessons by peers in both agriculture education and special education. According to Wiersmas and Jurs (1990), such a validation process helps to ensure appropriate language and content.

The pre- posttests (parallel forms) went through a similar process of construction and validation. Content validity was also addressed by adhering to the original lesson plans in the Illinois Core Curriculum. The re-designed curriculum and pre- posttests were pilot tested the week of February 4-8, 2008 with students enrolled in the Introduction to Agriculture courses at Eldorado High School in Eldorado, Illinois. The pilot of the pre-test yielded an initial KR-20 reliability coefficient of .68.

An item analysis was then conducted which yielded a difficulty index score and a mean discrimination index for each multiple choice question. The results helped the researchers to determine whether to retain, reword or remove each test item. The pre-posttests were also scrutinized to ensure that each item was written according to rules laid down for multiple choice items by Gronlund & Waugh (2009). A second pilot of the pretest at Eldorado High School yielded a KR-20 reliability coefficient of .90.

Researchers on the project went to each of the five school sites during the first two weeks of May, 2008 and administered the pretests to students in enrolled in Introduction to Agriculture courses (n = 209). Students were randomly divided into two groups, one group to be given the self-paced redesigned lessons in Horticulture, and the other group to receive traditional classroom instruction on the same topics from the teacher using the lesson plans and power point presentations taken from the Illinois Core Curriculum for Agriculture. After a week or more, when the three lessons in Horticulture were completed, the teacher was instructed to administer the posttests and return them to the researchers. The pre- and posttests contained 24 multiple-choice items. Students were instructed to record their answers on a Mark Reflex<sup>®</sup> answer sheet by NCS.

### **Results/Outcomes**

The deliverable products included a unit of instruction of three lessons redesigned by a subject matter specialist. Each lesson included objectives, learning activities, and evaluation instruments and activities. These lessons were produced on CDs and employed interactive components to increase student learning and retention for the SLD student. The lessons addressed the following subjects:

Lesson 1 – Understanding horticulture

Lesson 2 – Determining the importance of the horticulture industry

Lesson 3 – Exploring career opportunities in horticulture

Two pre-service teachers, an agricultural education major and a special education major, received training in delivery of the re-designed curriculum and testing. By assisting in the curriculum redesign, making visits to the research sites to administer curriculum, and collecting data, these students gained invaluable information and experience that will enhance their future teaching careers.

Illinois Agricultural Education, as a subset of CTE, has maintained and updated a Strategic Plan since 1985 to improve education in and about agriculture (ISBE, 2007). Two of the sixteen quality indicators call for:

- a) Validating competencies needed by students for entry and advancement in employment objectives as put forth in the Illinois Learning and Skill Standards.
- b) The agriculture teacher is to give input into the CTE component of the Individualized Education Plan (IEP) for each student.

The skills acquired through agricultural education courses which are re-designed for the SLD student will both address the Illinois Learning and Skill Standards and enhance the effectiveness of each SLD student's IEP. By so doing, the SLD students in this study were helped to complete their CTE programs in agricultural education and obtain skills for successful future employment. This curriculum redesign also helped to ensure that the SLD students who make up 23% of Illinois' agricultural education classrooms (Pense, 2008) become an important part of the Illinois workforce in agriculture.

Findings related to lesson development and curriculum redesign for SLD students were disseminated to Illinois teachers and teacher educators through presentations at the Connections Conference in Saint Charles, Illinois on March 6, 2008, and at the National Agricultural Education Research Conference in Reno, Nevada on May 22, 2008.

Statistical analysis of student gain scores in the study are still underway and will be submitted as a research article to the Journal of Agricultural Education when analysis has been completed.

### **Implications/Recommendations**

The findings of this study should not be generalized beyond the population of this pre- posttest quasi-experimental study. However, whether generalizing to all Illinois agricultural education programs or not, the amount of data generated does carry implications for the whole state.

Given a large majority of learning disabled students planning on vocational school or college after high school (U.S. Department of Education, 2004), and given agricultural education students in this study benefited from the redesigned lessons, the remaining 743 lessons and units in the Illinois Core Curriculum for Agriculture should be considered for

both updating the information and redesigning each lesson for the benefit of SLD students.

Further research is recommended to:

1. Identify additional ways to increase or improve current teaching/learning resources for SLD students in the various specializations of agricultural education.
2. Identify avenues for channeling additional funding to rural schools to meet special needs of SLD students through curriculum redesign.
3. Investigate ways to modify and further develop the state curriculum in agricultural education in order to better educate and train our SLD student population.
4. Identify potential in-service training which will help agricultural education teachers understand how to best employ redesigned curriculum for SLD students in their programs.
5. Describe the challenges agricultural education teachers may experience by including SLD students in their programs.
6. Explore other methods of curriculum redesign for the SLD student in agricultural education.

### **Conclusions**

With nearly one fourth of our agricultural education students possessing special needs, we not only risk losing that amount of our future workforce in the agriculture industry, but safety and political ramifications loom in the future as well. If the curriculum does not meet the needs of our SLD students, and if classrooms are not set up properly with equipment and facilities for SLD students, lawsuits may very well lie ahead for many of our institutions. With a renewed focus on our SLD student population, funding opportunities may also exist through special grants and governmental programs. The entire curriculum may be specially redesigned, facilities may be upgraded and equipment purchased which will aid all students in agricultural education programs.

In keeping with the concept of “inclusion,” a synergy may exist through the interactions of our SLD students and non-disabled students. When the non-disabled serve as teacher aides, and as service learning projects become better developed, all students in the agricultural education classroom may find benefit from newly redesigned curriculum. Other aspects of peer interaction may include the development of leadership and citizenship skills. SLD students may also find academic and job skill benefits through full participation in Supervised Agricultural Experience Programs and Career Development Events if SLD needs are met through redesigned curriculum.

Perhaps the greatest implication in this study for Illinois agricultural education is the opportunity to further develop the Illinois Core Curriculum. Modifications can be made to the Core which include those elements needed to assist agricultural educators and their SLD students.

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