

CASE 4 Learning Model

Curriculum for Agricultural Science Education (CASE 4 Learning) is a system of instructional support for the classroom teacher like no other resource in agricultural education. The CASE 4 Learning model provides four major support areas to promote solid classroom instruction using rigorous and relevant lessons to enhance student learning.

The four areas of teacher support are curriculum, professional development, assessment, and certification. Each area contributes to the validity of CASE instructional materials by ensuring that teachers are properly equipped and trained and that student learning is accountable. This document will explain the components that define the CASE 4 Learning model.

Background

The call from Perkin's reform stresses that Career and Technology Education (CTE) should promote services and activities that integrate rigorous and challenging academic and career and technical instruction. Educational research suggests that student-learning opportunities are enhanced when instruction is rigorous enough to challenge student thinking and relevant enough to engage active participation. Considering these aspects of CTE reform, agricultural education is positioned well to prosper in our current educational system and provide students with valuable learning opportunities in agricultural subject matter.

The National Council for Agricultural Education (NCAE) established a long-range goal to increase the growth and quality of agricultural education programs. To facilitate the development of quality programs, the NCAE identified eight initiatives. The third of eight initiatives called for creating a curriculum model to establish a sequence of agricultural education courses that enhance the delivery of agricultural education.

CASE 4 Learning was established to provide a structured sequence of courses. Still, CASE also serves as a model for elevating the rigor and relevance expected for the new vision of agricultural education. The rigor of CASE is validated by the alignment of lessons with national education standards for agriculture, science, math, and English language arts. Industry, post-secondary, and secondary experts serve on curriculum development committees to ensure the relevance of the content. During the development stage, committee members identify key concepts of understanding a student should have along with a performance objective for students to demonstrate competency.

To connect relevance with student learners, CASE curriculum highlights the strengths of experiential learning, the heart and soul of agricultural education, by utilizing activity-, project-, and problem-based instructional strategies. The NCAE sought a partnership with Project Lead the Way, Inc. (PLTW®) to provide technical guidance in curriculum development using this approach. A nationally recognized curriculum development organization, PLTW® has successfully designed and implemented courses based on the rigor and relevance philosophy.

Of the many strengths of agricultural education, leadership, experiential learning, and character education are three pillars. CASE recognizes the three-circle model of agricultural education that represents the efforts of over 80 years of practice. Classroom instruction is enhanced to meet the needs of today's agriculture students without sacrificing FFA and SAE instruction. Both FFA and SAE for All are integral components of the curricular model.

CASE started with a framework of 10 courses that fit into one or more curricular areas, formally known as Pathways; Animal Science, Plant Science, Agricultural Engineering and Mechanics, and Natural Resources. These courses are broken down into four levels: Introductory, Foundation, Specialization, and Capstone. Each level has increased expectations of the learner to use inquiry-based skills to work

independently on advanced projects. Therefore, students should experience an Introductory or Foundation course before enrolling in a Specialization or Capstone course.

CASE developed shorter and technical skill-based courses as the demand for more flexibility in curricular and professional development offerings grew. Appendix A lists all year-long and modular-based curricular offerings. Schools should choose from the menu of CASE courses to best fit their local student and industry needs. CASE recommends choosing courses from two or more levels to build a student's inquiry-based and independent learning skills. The sequence may be exclusively CASE course offerings or a combination of CASE and local curricular offerings. In addition, the courses chosen by a school could come from multiple CASE curricular areas.

It is important to note that CASE is flexible and designed to supplement traditional agricultural education programs. CASE aims to improve the retention of professional agriculture teachers and student learning by providing pedagogically sound lessons for any agricultural education program. The Council also developed CASE to generate interest in districts seeking an alternative model for agricultural education instruction.

The CASE 4 Learning Model

The four components comprise the system of the CASE model. This model has been used to develop and implement the successful PLTW® curriculum for secondary engineering and biomedical subject areas. With CASE 4 Learning, agricultural education represents a complete model for curriculum delivery.

Curriculum

Curriculum Features

CASE courses consist of a comprehensive package of teaching resources required to instruct lessons (with the exception of physical aides and equipment). Each lesson plan contains teacher notes, PowerPoints®, student activity instructions, and assessments. Lessons are designed to provide everything the teacher needs at the click of the mouse. The philosophy behind a CASE lesson is to empower the student by providing students an active role in their learning rather than learning being a product of teacher-led instruction.

Activity, Project, and Problem (APP) modalities refined by PLTW® are the primary instructional strategies used to enhance content rigor and experience relevance. APP modalities use activities, projects, and problems to guide students through the learning experiences. Student-directed learning and inquiry-based instruction are established using the APP modalities of learning.

Curriculum Development

CASE curriculum is grounded in the most current acceptable curriculum design and development practices. Each new course begins by assembling a curriculum development committee of secondary and post-secondary agricultural educators along with industry representatives for a respective subject. These individuals, whom their state supervisors of agricultural education have nominated, determine the concepts students should understand and the performance objectives a student should be able to do to demonstrate understanding.

This first stage of the curriculum development process uses this panel of experts to define essential concepts taught in the course. CASE curriculum writers then craft the lessons using CASE design principles, including logical instruction sequence, spiraling design, and other pedagogical considerations (refer to *CASE Lesson Development Philosophy* publication).

Once an initial draft is written, a CASE course is subjected to several validation steps. Pilot testing is done with a team of teachers (usually from the course development group) to try out lessons, find improvement points, and assess the rigor and relevance of the lessons and activities. Pilot testing provides the

curriculum writer valuable feedback to adjust the curriculum for length of instructional time, clarity of instructions, and correction of errors.

Before a new CASE course is released, the complete course is field-tested by a select group of secondary agricultural educators. The field test teachers will use the curriculum as designed. Feedback from the field test allows for further adjustment to the course and provides critical information about the timing and flow of lessons.

A CASE course is never in a “final draft.” CASE teachers can use an online form to submit suggestions or changes to the curriculum. Curriculum coordinators periodically review the suggestions and update CASE courses with any minor changes. Based on industry and educator feedback, major revisions are made to stay current with education standards and science and technology. Minor changes and revisions are ongoing, and updated revision dates are recorded in the document footer. The edition of each course is listed in Appendix A.

Teacher Services

CASE courses have several unique features to assist teachers with preparation and instruction. The teacher resources section includes every resource the teacher needs to implement lessons and activities. Each lesson has teacher notes with detailed instructions about how to teach each activity, project, or problem. The teacher notes include an overview of each activity, project, or problem, along with instructions on how to prepare, an explanation of what the student will do, and a guide on how to assess the student.

CASE provides a list of materials for teachers to acquire to teach the course. CASE has agreements with vendors to offer discounts or packaged kits to ease purchasing.

PowerPoint® slides have suggested teacher comments provided to help the teacher explain the slide's content or enrich the examples the teacher will use to help students understand the concepts. Assessment help is provided to the teacher as well. Included in each CASE lesson are single-point rubrics to assess projects and problems. Besides rubrics, answer keys are provided for various activities and end-of-lesson assessments.

A central CASE team is available to help answer questions for teachers as they implement the curriculum. The team consists of content experts for specific curricula and professional development. Lead and Master Teachers are an extension of that team that can provide new CASE teachers with guidance and advice.

Professional Development

CASE Institutes and BriefCASEs

CASE Institutes and BriefCASEs are professional development sessions that provide teachers with training for instruction related to a specific CASE course or module. Once a teacher has successfully completed the required hours of professional development, the teacher is certified to teach that specific CASE course or module.

CASE professional development sessions provide teachers with critical background related to the pedagogy used in CASE curricula, along with technical skills and knowledge needed for classroom instruction. Teachers are required to attend the entire multiple-day workshop. CASE Institute facilitators, called Lead Teachers, lead the sessions and certify that each teacher is adequately prepared to provide instruction using CASE curricula. Peer teaching and developing a professional learning community during the CASE professional development sessions provide experiences for teachers.

Professional development sessions are offered in multiple lengths and formats depending on the type and amount of curricular content.

- BriefCASEs are 6-24 hours long and offered year-round, often in conjunction with professional development conferences and conventions.
- CASE Institutes are 40 or more hours long and are offered in the summertime. Post-secondary institutions often host these events.
- Pre-Service CASE Institutes are held in conjunction with a university teacher education program for agricultural education for those who have not yet entered the teaching profession.

Lead Teacher Orientations

CASE has two levels of facilitators: Master Teachers and Lead Teachers. Lead Teachers are teacher trainers who have attended a CASE Institute for a specific course, provided instruction to secondary students in that course for at least one year, and participated in a Lead Teacher Orientation Session prior to teaching their first CASE Institute. Master Teachers are teacher trainers who meet set qualifications for CASE Certifications, Lead Teaching experience, and curriculum implementation.

Lead Teacher Orientations provide prospective Lead Teacher candidates with training related to delivering a CASE Institute. Because CASE Institute sessions reduce an entire year's worth of instruction into the required hours, CASE Institute trainers must analyze and evaluate each component of the curricula to create a well-balanced and effective professional development experience. Lead Teachers understand how to make a scope and sequence and refine delivery skills for teaching to an adult audience.

Lead Teachers facilitating BriefCASEs are engaged in professional development through virtual LTO offerings. A virtual LTO is a shorter, virtual component that repeats some of the content from the traditional LTO.

When possible, new Lead Teachers are paired with Master Teachers to co-teach a CASE Institute professional development event.

Administrator and Counselor Engagement

Administrators and counselors in many schools are the gatekeepers of students entering programs. CASE identifies the need to provide conferences to educate administrators and counselors about what CASE can do for their students and what types of students should be encouraged to enroll in CASE courses. These single-day conferences will assist teachers with student recruitment into their program and help administration understand the importance of CASE certification of programs, teachers, and students.

Affiliate Institutions

Affiliate institutions are colleges and universities that provide services to CASE teachers from their state and many neighboring states. Affiliate programs have staff that complete a CASE Institute and potentially are Master and Lead Teachers. Affiliate institutions host and manage CASE Institute/BriefCASE sessions, provide graduate credit to participants, and work with local school districts to promote and enhance CASE courses.

Assessment

Learning Reflections

Student reflection is built into every CASE lesson and activity. Essential questions are identified for each lesson to guide student thinking during instruction. Each activity, project, and problem feature conclusion questions to encourage students to reflect on the activity and to assist them in making the connections between the learning objectives of the activity and the concepts of the lesson. The teacher can also use essential questions and activity conclusion questions as formative assessment measures.

Check for Understanding

A Check for Understanding is a short assessment related to each lesson's concepts and performance objectives. Teachers can use this resource as a formative evaluation tool as students progress through the unit. Answer keys are provided to the teacher for convenience and scoring consistency.

Unit and End-of-Course Exams

CASE field tests CASE courses to determine the scope of unit and end-of-course examinations. At the present time, CASE uses NOCTI as the delivery system for end-of-course exams, and the information collected will be used to assist in course revisions.

Certification

The extended value of CASE curricula is the overall certification of students and teachers. Teacher certification is essential to ensuring the quality of a student's learning experience. Certification ensures teachers understand how to use the activity, project, and problem-based model to teach content using inquiry-based instruction.

Teachers who follow the CASE certification process provide their students with a quality education and maximum recognition. Students may be awarded college credit based upon meeting the certification requirements. CASE continues to look for industry-based certifications that students may acquire while taking a CASE course. As the program develops, it is foreseeable that CASE certifications will influence student admission and scholarship potential for higher education.

Appendix A: Curriculum

Courses and Instruction Levels

Grade Level	Animal	Plant	Natural Resources	Mechanics and Engineering
Introductory (7-9)	AgXplore			
	Introduction to Agriculture, Food, and Natural Resources			
Foundation (10-11)	Animal Science	Plant Science	Natural Resources and Ecology	Agricultural Power and Technology
	Agricultural Business Foundations			
Specialization (11-12)	Animal and Plant Biotechnology		Environmental Science Issues	Small Gas Engines
	Food Science and Safety			Ag Equipment Maintenance and Technology
	Animal Health and Veterinary Science			
Capstone (12)	Agricultural Research and Development			

Example Sequences

Grade Level	Example A	Example B	Example C	Example D
Introductory (7-9)	AgXplore	AgXplore	Local Introductory	Introduction to Agriculture, Food, and Natural Resources
	Introduction to Agriculture, Food, and Natural Resources			
Foundation (10-11)	Animal Science	Plant Science	Ag Power and Technology	Small Gas Engines
	Agricultural Business Foundations	Natural Resources and Ecology	Local Foundation	Ag Equipment Maintenance and Technology
Specialization (11-12)	Local Specialization	Local Specialization		
Capstone (12)			Agricultural Research and Development	Local Capstone

Course Editions

CASE Course	Current Version	Edition
AFNR	2010, 2014, 2017, 2023	4 th
APT	2016, 2020	2 nd
ASA	2009, 2012, 2016, 2020	4 th
ASP	2009, 2012, 2016, 2020	4 th
NRE	2014, 2016, 2021	3 rd
AEMT	2023	1 st

CASE Course	Current Version	Edition
APB	2016	2 nd
ESI	2021	2 nd
FSS	2015, 2023	2 nd
MSA	2019	1 st
ARD	2016	1 st

BriefCASE	Current Version	Edition
ABF	2019, 2023	2 nd
AgX	2021	1 st
SGE	2023	1 st
AHVS	2024	1 st