ThinkSpace: An Online Platform to Help Students Solve Complicated Multi-Disciplinary Problems in Agriculture

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Introduction

The National Research Council (2009) documented in its "Transforming Agricultural Education for a Changing World" report it is essential that agricultural education be transformed to meet the challenge in providing a safe, plentiful, and sustainable food supply for earth's population. Graduates who are prepared to meet such challenges must be able to solve complex problems whose solutions draw from a number of content areas. At Iowa State University a team of educators have developed the open-source ThinkSpace tool to help students achieve this competency.

The Teaching Tool

ThinkSpace is based on a well-established problem solving teaching methods and software used to teach problem solving.

As a teaching tool it helps improve students' ability to solve complex, multi-disciplinary problems by having them work on case studies that integrate ideas and information from multiple areas in a collaborative asynchronous environment online.

Agriculture Disciplines where ThinkSpace can be used to Enhance Student Problem Solving Skills

- Agriculture Economics
- Agriculture Education
- Agronomy
- Animal Science
- Ecology
- Entomology
- Food Science
- Horticulture
- Natural Resource Management
- Plant Pathology
- Soil Science
- and many others

ThinkSpace is a dynamic platform which can be customized to fit teaching and learning needs. In addition to posting the content in a variety of layouts, multiple 'apps' can be used to further student learning. Examples include:

- Text mark up
- Video and animations
- Drag and drop functions

Horticulture Example

Pedagogical Dilemma:

In order to evaluate and diagnose problems in a landscape, horticulture professionals must combine information from multiple sources including:

- evaluation of the landscape site
- input from the homeowner
- weather data
- plant disease diagnostics
- soil tests
- etc.

Pedagogical Solution:

To give students real-world problem solving experience a case study with five different landscape scenarios was created. For each scenario students are required to complete three steps:

1a. analyze the data provided about the site and complete a 'situation summary',

1b. develop three preliminary diagnoses about the plant problem,

2. determine a final diagnosis and provide evidence to support this diagnosis,

3. make a recommendation to the homeowner on how to manage the problem.
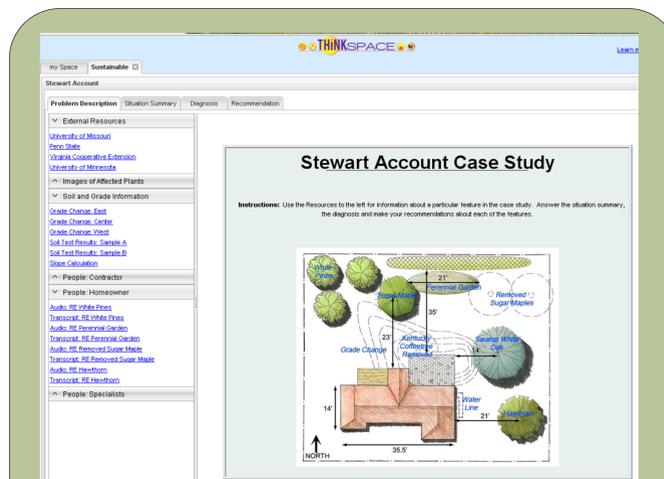


First page of the ThinkSpace interface.

From here students can: select the individual scenarios (labeled in blue on the landscape plan); see the assignment resources in the left menu; and select from the three parts to the assignment in the top menu.

Situation Summary and Preliminary Diagnosis
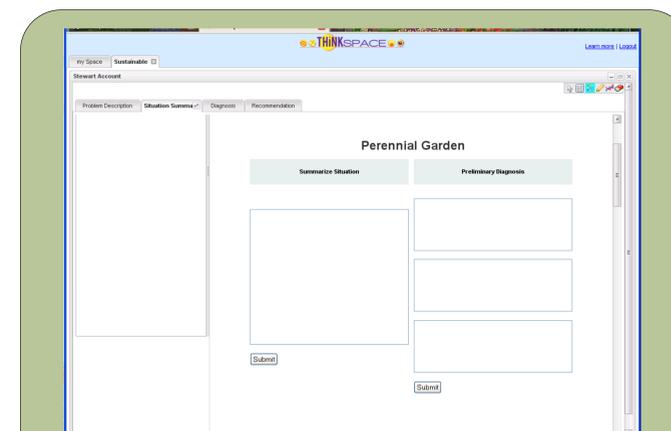
Students complete the situation summary and preliminary diagnoses and submit these to the instructor. Once approved they move on to the next step.

Final Diagnosis and Evidence
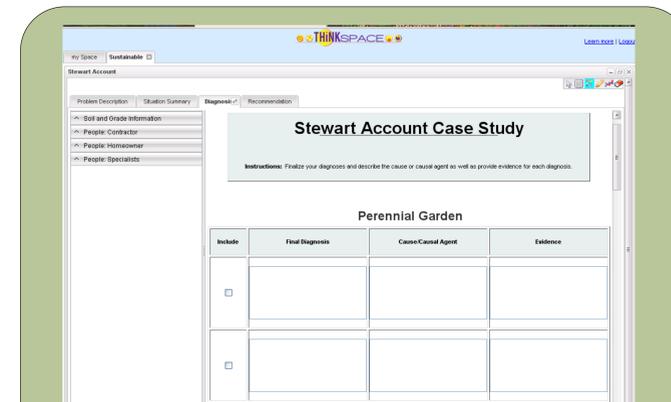
At this point, students describe the cause and provide evidence to support each preliminary diagnoses. By clicking on the 'include' button, they select which diagnosis is their final diagnosis. From here they make recommendations to the homeowner.

Future Development

In addition to helping students improve their problem solving skills, the ThinkSpace project plans to build and support a community of educators by providing effective technical support, case study content and/or case development support, and faculty development on how to use this tool. We are currently seeking faculty who are interested in partnering on this project. If you are interested please contact: Ann Marie VanDerZanden at vanderza@iastate.edu or (515) 294-5075.