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Food for Thought: The Impact of Integrated Student Experiences on Learning

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May 31, 2013

Selected Poster prepared for presentation at the Agricultural & Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting, Washington, DC, August 4-6, 2013

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BACKGROUND

Introduction

To study food issues meaningfully, one must understand food production, consumption, culture, policy and health among other issues, thus suggesting the necessity of a set of multidisciplinary tools. However, most of our teaching is still conducted through a disciplinary lens in part because it is often difficult for faculty to facilitate truly meaningful interdisciplinary interactions among faculty and students. We describe and evaluate a method for teaching undergraduate students about food from multiple disciplinary perspectives that augments the traditional disciplinary course with integrative experiences designed to encourage multidisciplinary understanding of food issues.

Food for Thought Integrative Learning Experiences

- In a cluster of courses called Food for Thought, 7 faculty members from 6 departments teach students about food information, food culture, food consumerism, nutrition and health.
- The classes all have shared learning outcomes focused “on developing the student as an informed consumer of food.”

Table 1. Food for Thought Cluster Projects and Activities AY 2011-2012

Term	Cross-Course Cluster Projects	Classes Involved
Fall 2011	Nutrient Sources: Truth in Labeling Project	Food of Chemistry Nutrition
	Latino Contributions to the Food System Project	Food Politics Elementary Spanish II
	Gendered Health: Sugars and Artificial Sweeteners	Sociology of Gender Pathophysiology
Spring 2012	Understanding the Economic, Botanic and Environmental Costs and Benefits of Urban Gardening	Plants and Humans Economics of Food Gardening

- Previous research demonstrated that the multidisciplinary cluster approach using cross-course interactions leads to student perceptions of learning gains (1). In this research we move beyond perceptions to assess directly how student learning about food is affected by experiences designed to integrate student learning across disciplines.
- We hypothesize that the various interactions of the students in the cluster have a positive impact on integrative student learning in the areas of food and research literacy, critical thinking about and understanding of food systems, and becoming an informed consumer of food.



OBJECTIVES

- The purpose of this research is to determine whether participation in the Food for Thought cluster enhances integrative student learning in the areas of food and research literacy, critical thinking about and understanding of food systems, and becoming an informed consumer of food.
- We test whether the student exposure to a focused, integrative learning environment can result in superior achievement in comparison to a control group.

METHODS

Design

•Students in both Food for Thought cluster classes and control classes:

- Read a news article, “Quinoa’s Global Success Creates Quandary at Home” by S. Romero and S. Shahriari (The New York Times, March 20, 2011). The article explores the relationship between the rising popularity of the high-protein grain quinoa in the American diet and the problems and opportunities this creates for the production, market economy, and culture of Bolivian growers of quinoa.
- Completed a short assignment (see Instrument Prompt, below).



Participants

Table 1. Demographic information about students responding to the questionnaire

	n	% of survey responses
College Level		
Freshman	64	18.9
Sophomore	91	26.9
Junior	77	22.8
Senior	96	28.4
Other	10	3.0
Cluster Course vs. Control		
Cluster course	161	47.6
Control course	177	52.4
Number of Cluster courses		
None	177	52.3
One	98	29.0
Two	31	9.2
Three or more	32	9.5
Intentional Cluster Declaration		
Food for Thought Cluster	33	9.8
Other Cluster	137	40.5
No Cluster Declared	168	49.7
Total	338	100

Instrument Prompt

From your perspective, discuss the issue addressed in the article by answering the following questions.

- In one sentence, state the main issue addressed in the article.
- List two sources utilized in the article and evaluate the usefulness of each source to the reader for understanding the issue.
- In one paragraph, discuss the interconnectedness of the issue identified in (1) with three of the following fields:
 - culture
 - health
 - environment
 - chemistry and/or biology
 - agriculture, food and/or nutrition policy
 - gender/social inequality
 - marketing/economics
- How are your choices as a consumer influenced by this issue? Using material from the article and learned in your courses, explain the tradeoffs (pros and cons) that you face in making the decision. Limit your response to one paragraph.

Scoring

A score was assigned to responses for each question on a scale of 1 to 4 where 1 is the benchmark response, 2 and 3 are different degrees of milestone responses and a score of 4 was for a capstone response. The scores were compared based on individual questions and on a composite score (sum of the score of Questions 1 to 4).

Student responses were scored by four faculty and results were tabulated by numerical code. The Kappa level for interrater reliability for the four reviewers was 0.79, indicating substantial agreement.



RESULTS

- Students exposed to the Food for Thought cluster performed better on our measures (Figure 1), and their performance increased with increasing exposure via additional courses (Figure 2).

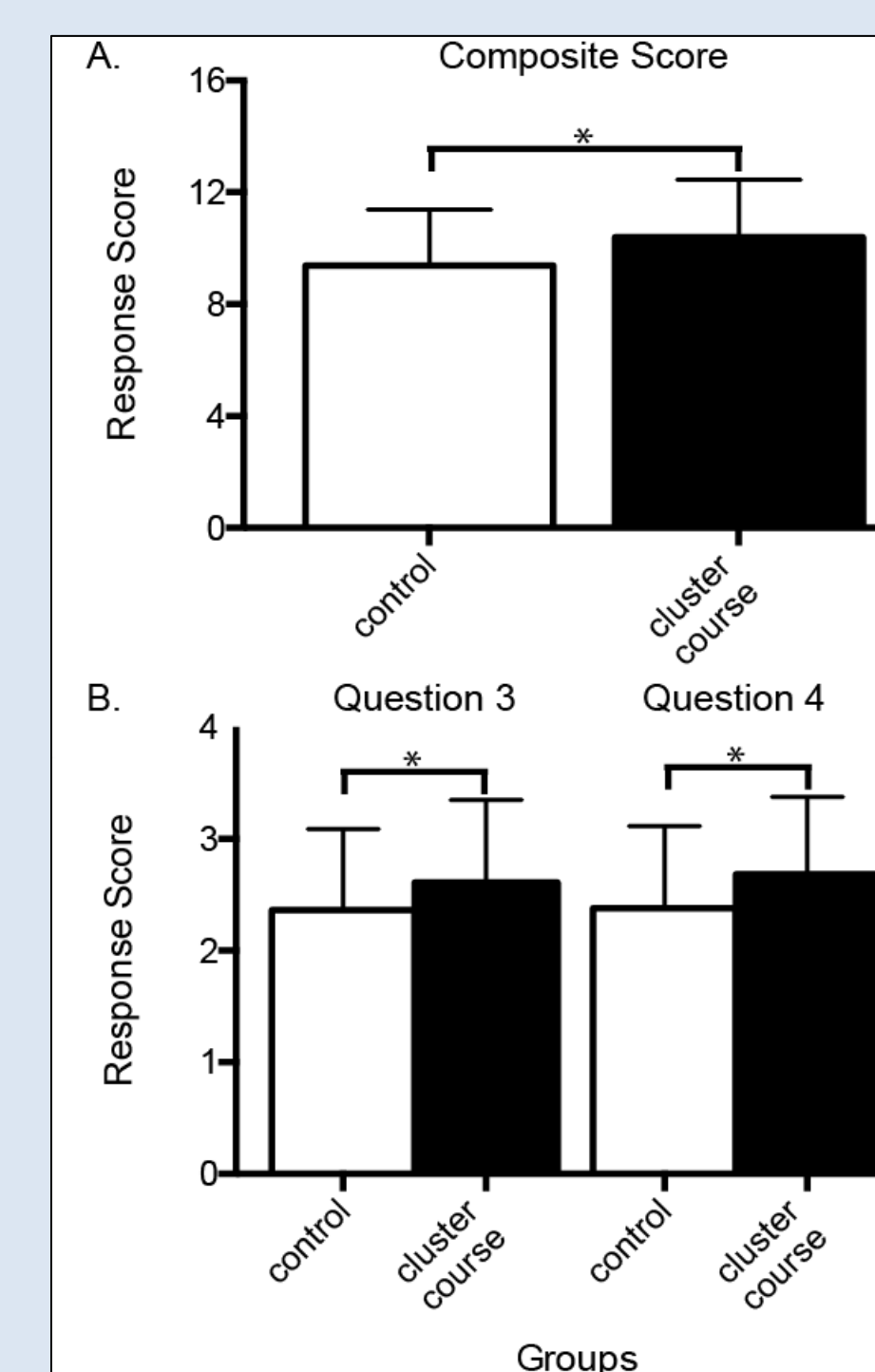
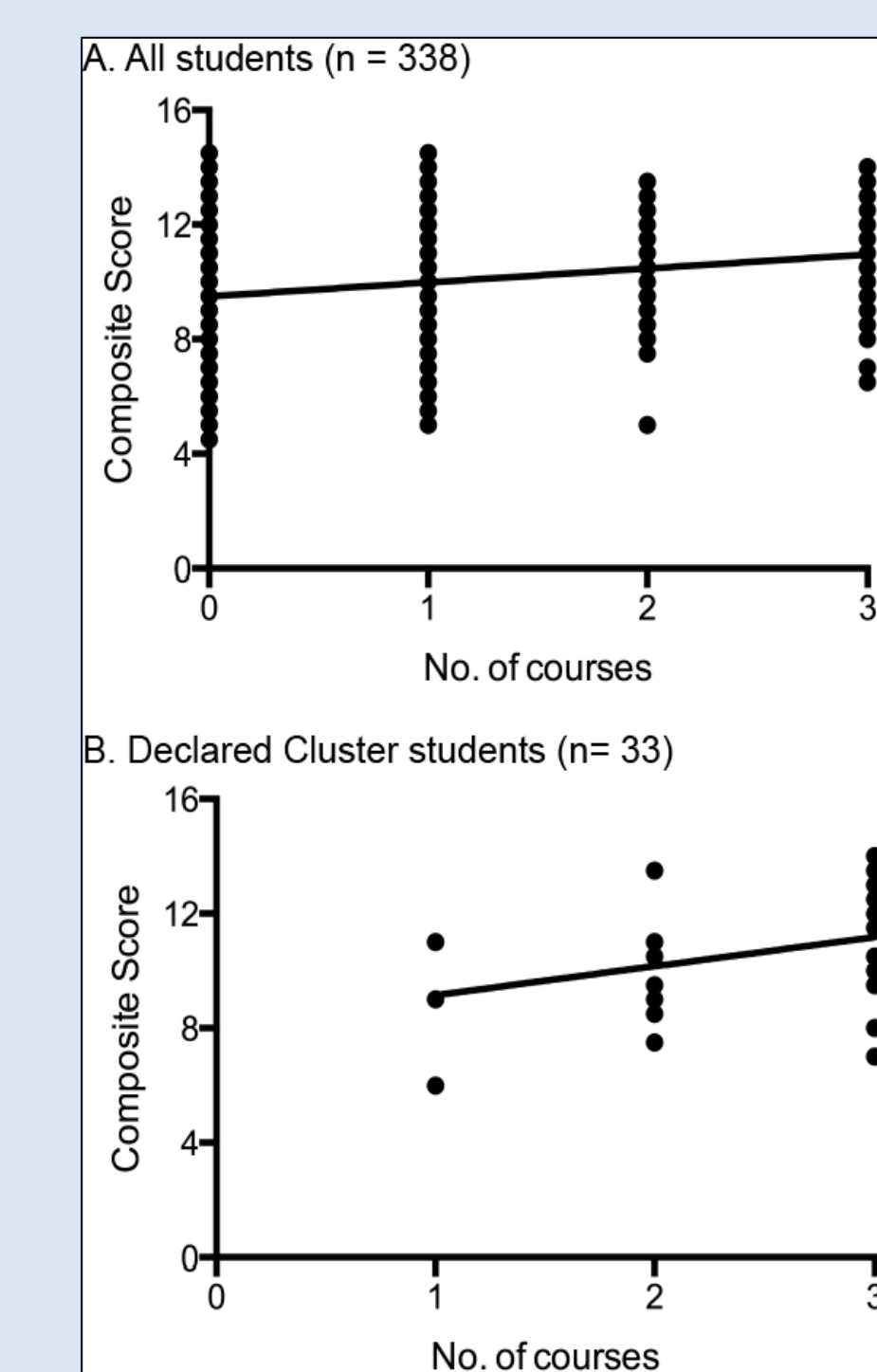


Figure 1. Differences in (A) composite score responses and (B) Question 3 and Question 4 score responses between students who have not taken a Food for Thought Cluster course (control, open bars, n = 170) and students who have completed at least one course in the cluster (cluster course, filled bars, n = 168). Mean score and standard deviation are shown. *P < 0.05.

Figure 2. Spearman correlation between composite response score and the number of Food for Thought Cluster courses for (A) all study participants (Spearman $r = 0.23$, $p < 0.0001$), and (B) only students who had intentionally declared the Food for Thought cluster ($r = 0.32$, $p = 0.04$).



- Students who committed to completing the food cluster as part of their general education requirement also performed better, suggesting an important role in motivation for performance. (Figure 3)

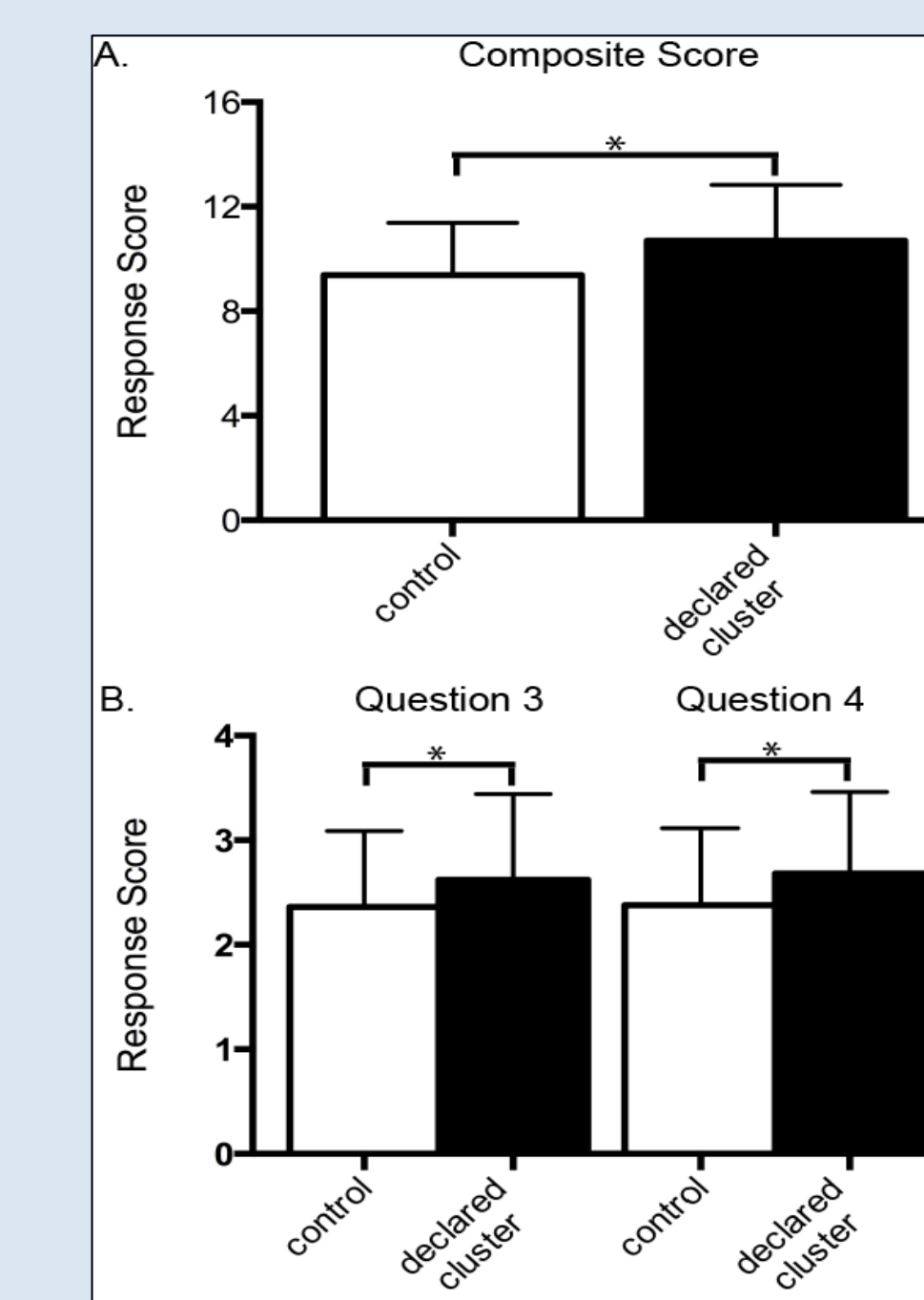


Figure 3. Differences in (A) composite score responses and (B) Question 3 and Question 4 score responses between students who have not taken a Food for Thought Cluster course (control, open bars, n = 170) and students who had intentionally declared the Food for Thought Cluster and completed at least one course in the cluster (cluster 9, filled bars, n = 33). Mean score and SD are shown. *P < 0.05.

DISCUSSION AND CONCLUSIONS

Our results suggest that the various interactions of the students in the cluster have a statistically significant positive impact on integrative student learning in the areas of food and research literacy, critical thinking about and understanding of food systems, and becoming an informed consumer of food.

Previous studies have shown similar benefits of integrative pedagogies, including the ability to transfer knowledge from one course to another, increased motivation and cognitive ability, and increased responsibility of students towards their learning (6-8). Our study contributes to this body of research by examining students’ ability to apply knowledge and skills to new material and to do so in an integrative way. Substantive, discipline-based knowledge, we contend, is mobilized by students to critically evaluate and creatively consider new problems brought to their attention.

In a world where multiple knowledge-bases need to be brought to bear on complex problems, such as those created by global food systems, integrated learning has an important role to play in the education of college students.



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