How do university students come to know about food systems?

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Introduction

Ongoing food safety and scarcity challenges individuals to be more conscious and informed about food production and consumption. The agricultural literacy of the K-12 student population has been widely studied (Frick, Birkenholz, Gardner, & Machtmes, 1995). While school-based education is an important contributor to the agriculture literacy movement, it excludes a large portion of the population, namely those who are not enrolled in K-12 education (e.g., adult learners, post-secondary students) (Kovar & Ball, 2013).

Conceptual Framework

The current study examined ways in which college students acquire food production and consumption knowledge. Mars and Ball's (2016) four epistemological categories (scope and scale, structure, nature of knowledge, outcomes); formal, non-formal, and informal learning settings (Etling, 1993); and the five primary sources of knowledge as defined by Kramer and Sias (2014) (family, education, peers, organizational affiliations, media) conceptually framed and guided the research. Our understanding of food systems was shaped by the following components identified by Chase and Grubinger (2014): (1) production, (2) processing, (3) packaging, (4) distribution, (5) marketing, (6) consumption, and (7) disposal of food.

Purpose and Objectives

The purpose of this study was to quantitatively describe how college students who attend a campus farmers' market come "to know what they know" about food production and consumption. The following objectives were established: (1) describe the demographic characteristics of the students who attend a campus farmers' market, (2) describe students perceived knowledge of food systems, and (3) describe which sources are most influential in contributing to university student knowledge on food systems. This study aligns with priority seven of the AAAE National Research Agenda, addressing complex problems, specifically within the context of non-formal and informal settings (Roberts, Harder & Brashears, 2016).

Methodology

This study was descriptive survey research. The target population was undergraduate students who participate at the weekly campus farmers' market at The University of Arizona. This population was identified based on the understanding that their participation in the farmers' market is an indication of some conscious awareness of food systems. Student participants (n = 50) were selected using a convenience sampling method (Farrokhi & Mahmoudi-Hamidabad, 2012) and therefore, the findings are not generalizable beyond the sample. Content and face validity were established using a panel of five experts who were selected because of their expertise within various disciplines of agriculture (e.g., agricultural education, agricultural economics, rural sociology). Reliability was established using a test-retest model on various groups of students throughout The University of Arizona. Acceptable reliability estimates were determined a priori to be .70 or higher. The pilot test reliability estimates, co-efficient of stability, for items were found to be .75 to 1.0.

The 40-item questionnaire presented participants with multiple descriptions of each of the seven food system components (Chase & Grubinger, 2014). Participants were asked to indicate using a Likert scale how much each of the three learning settings and five sources of knowledge contributed to their recognition and understanding of the food system component that corresponded with each description. The Likert scale was ranked with 1 being 'contributed nothing' and 5 being 'contributed significantly'. Data was analyzed using IBM™ SPSS® Version 24 to calculate means and standard deviations.

Results

Objective 1: Of the respondents, 28% *(n=14)* identified themselves as male, 68% *(n=34)* identified themselves as female, 2% *(n=1)* identified themselves as non-binary/third gender, and the remaining 2% *(n=1)* preferred to self describe. The distribution of race was as follows: Caucasian 54% *(n=27)*, Hispanic or Latino 26% *(n=13)*, African American 8% *(n=4)*, Native American or American Indian 2% (n=1), Asian/Pacific Islander 6% *(n=3)*, and other 4% *(n=2)*. Of the respondents, 10% *(n=5)* were freshmen, 18% *(n=9)* were sophomores, 24% *(n=12)* were juniors, and 48% *(n=24)* were seniors. The final demographic variable that was identified was the college that each student was enrolled in, the College of Agriculture and Life Sciences 12% *(n=6)*, the College of Architecture, Planning & Landscape Architecture 6% *(n=3)*, the College of Education 12% *(n=6)*, the College of Engineering 10% *(n=5)*, the College of Fine Arts 2% *(n=1)*, the College of Medicine 10% *(n=5)*, the College of Science 12% *(n=6)*, the College of Social and Behavioral Sciences 14% *(n=7)*, and the College of Public Health 22% *(n=11)*.

Objective 2: The perceived knowledge of the seven food system components are represented by the following results: consumption ($\mu = 3.25$, SD = .64), production ($\mu = 3.10$, SD = .68), processing ($\mu = 2.94$, SD = .71), marketing ($\mu = 2.93$, SD = .75), disposal of food ($\mu = 2.89$, SD = .70), distribution ($\mu = 2.66$, SD = .66), and packaging ($\mu = 2.66$, SD = .85).

Objective 3: The most influential source of knowledge for production was education (formal learning), ($\mu = 3.40$, SD =. 99). The most influential source of knowledge for processing was education (formal learning), ($\mu = 3.54$, SD =1.03). The most influential source of knowledge for packaging was education (formal learning), ($\mu = 3.10$, SD = 1.09). The most influential source of knowledge for distribution was media (informal learning), ($\mu = 3.12$, SD = 1.10). The most influential source of knowledge for marketing was media (informal learning), ($\mu = 3.56$, SD = 1.05). The most influential source of knowledge for consumption was education (formal learning), ($\mu = 3.64$, SD = .90). The most influential source of knowledge for disposal of food was education (formal learning), ($\mu = 3.08$, SD = 1.14). Descriptive statistics were also used to describe the amount that each source has contributed across all seven aspects of the food system. The results are as follows: family (informal learning) ($\mu = 2.79$, SD = .89), education (formal learning) ($\mu = 3.31$, SD = .74), peers (informal learning) ($\mu = 2.57$, SD = .73), previous organizational affiliations (informal and non-formal learning) ($\mu = 2.69$, SD = .72), and media (informal) ($\mu = 3.24$, SD = .76).

Conclusions, Implications, and Recommendations

The results suggest that education (formal learning) and media (informal learning) are the primary avenues through which college students develop their individual understandings of food production and consumption. Conversely, the participants indicated organization affiliations (informal and non-formal learning) were overall the least influential source of food systems knowledge. The results also show that the participants are most proficient in knowledge concerning food production and consumption, and least proficient in knowledge concerning processing and packaging. These results contribute to the agriculture literacy narrative with respect to populations outside of K-12 education (Kovar & Ball, 2013).

Recommendations for practice include developing and enhancing strategies for increasing college student awareness and understanding of food systems. Specifically, the development of formal and non-formal food systems curricula to align with discipline specific patterns is encouraged. Recommendations for research include a deeper examination of disciplinary based perspectives and experiential backgrounds of college students specific to food systems.

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