



TPACK to GPACK? The examination of the technological pedagogical content knowledge framework as a model for global integration into college of agriculture classrooms

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HIGHLIGHTS

- Exploring the TPACK framework for global integration, or internationalization.
- Global knowledge alone does not lead to effective internationalization of curriculum.
- Determining the suitability of the GPACK model for faculty development programs.
- International travel component was integral for interlinking knowledge groups of GPACK.

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ABSTRACT

Faculty in U.S. colleges of agriculture are encouraged to internationalize their classroom curricula, but further research is needed to determine how to best prepare faculty. This study explores the transferability of the technological pedagogical content knowledge model (TPACK), originally used for technology integration, to our proposed model, the global pedagogical content knowledge model (GPACK), for the effective integration of global concepts into content-specific courses. Interviews from eight program participants of a yearlong faculty development program imply combined faculty training in global issues, pedagogy, and content, rather than in an exclusive knowledge area, may more adequately prepare faculty for classroom internationalization.

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1. Introduction

Throughout the literature, there are strong arguments for increased internationalization of curriculum in colleges of agriculture (CoA) across the United States (Acker & Scanes, 2000; Navarro & Edwards, 2008; Moriba & Edwards, 2015). In an increasing global society, the overall aims of internationalization are to create awareness of the world's interconnectedness as well as complexity, enabling students to appreciate differences among nations and

cultures, thus preparing them for cross-cultural communication as they function in the world both personally and professionally (Hobbs & Chernotsky, 2007). Internationalization has slight variations in definition, but is commonly defined as, 'the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of postsecondary education' (Knight, 2003, p. 2). There is a growing need for CoA graduates to possess not only specific content knowledge in their given area of expertise, but also have the ability to link this knowledge with its greater implications in our globalized world and marketplace (Acker & Scanes, 2000). Acker and Scanes (2000) explained, '... departments will need to assist their students in understanding a globally interdependent agricultural system' (p. 53). To facilitate this acquisition, internationalization has become an initiative within the university at varying levels (Hudzik, 2015).

The integration of international curriculum into on-campus,

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subject-specific courses, such as animal science or plant pathology, serves as a method to allow all students to gain a more globalized understanding, despite not being able to travel themselves (Green, Luu, & Burris, 2008). While various methods can be taken to promote internationalization, the responsibility rests with individual faculty to integrate internationalization in their curricula and classroom (Ertmer, 2005). Schuerholz-Lehr (2007) found that faculty who have international experience do not always translate these experiences into their curriculum and explained a need for faculty workshops in this area, suggesting that faculty trainings may play an important role in translating these global experiences and knowledge into the development and delivery of curriculum. Many argue faculty development is key for internationalization (Hamrick, 1999) and needs to address international knowledge, pedagogical knowledge, and the linkage between the two (Navarro, 2004; Carter, 1992; Shetty & Rudell, 2000).

Despite the critical need to integrate global concepts into CoA teaching, limited research exists in the cognitive preparation of faculty to do so. In this article, we explore the similarities of knowledge areas between technology integration and global integration into content courses. The plethora of research related to technology integration can provide valuable insight to the methods in which global integration can be best promoted in the classroom. The technological pedagogical content knowledge model (TPACK) presented by Mishra and Koehler (2007) has served as a valuable technology integration framework, and now we aim to explore its value in faculty training for the integration of global content into curriculum.

2. Literature review

From the CoA perspective, internationalizing curriculum has been a highly regarded method to foster connections between global content and subject content for students. In one study, international program directors and committee members (N = 31) from land-grant universities across the country all reported study abroad was the most effective method of teaching students about international agriculture, with 68% agreeing that the second best method was through internationalizing the curriculum/course content (Brooks, Frick, & Bruening, 2006). Because of limitations, such as finances and time, not all university students are able to participate in study abroad experiences (Alsup & Egginton, 2001). According to the Institute of International Education Open Doors data, 1.9% of students in the field of agriculture studied abroad in 2013/2014, a 0.6% rise from the previous academic year. However, the highest represented group of students participating in study abroad were business and management students at 19.6% — demonstrating a significant difference from agricultural majors (Institute of International Education, 2015). Given this, the internationalization of the program curricula takes a primary role in preparing students for the multifaceted, global field of agriculture. One study found that 28 out of 31 total faculty respondents (90%) claim their institutions encourage the integration of international themes into undergraduate curricula, but of the total respondents, 67% claimed no training had been completed to help faculty incorporate international themes into their courses (Brooks et al., 2006).

Carter (1992) highlighted the role of faculty in augmenting the international competencies of students, stating that ‘faculty have a pivotal role to play in the integration of international modules and components in their course material. Yet many faculty remain unmotivated or unprepared to incorporate an international perspective in their syllabi’ (p. 42). Navarro and Edwards (2008) claimed that if internationalization is not presented to faculty as a multifaceted process of embedding these concepts into all forms of

instructional activity, it is often viewed as an independent addition. In this study, we support the assumption that providing faculty training, through knowledge acquisition, will better motivate and prepare faculty to internationalize the curriculum of their content courses, ultimately stimulating student growth. Supporting knowledge acquisition related to internationalization is essential, but *what* areas of knowledge and *how* these knowledge areas are acquired need to be identified. Explicit arguments of *what types of knowledge* are needed to support faculty in internationalization is not well developed in the literature. This leads us to explore the TPACK framework as a model for faculty training in programs for internationalization.

2.1. Overview of the TPACK framework

The TPACK framework places acquisition of knowledge central to curriculum change and explores the relationship between and among three bodies of knowledge: content, pedagogy, and technology (Mishra & Koehler, 2007). Shulman (1986) developed the concept of pedagogical content knowledge (PCK) as a way to conceptualize the knowledge bases needed for effective teaching. He supported the idea that pedagogical content knowledge:

Represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction. Pedagogical content knowledge is the category most likely to distinguish the understanding of the content specialist from that of the pedagogue. (Shulman, 1987, p. 8, p. 8)

Content knowledge includes the amount and organization of an educator's knowledge concerning their subject matter, not only accepting facts as presented, but also knowing why they are so. The knowledge of processes and methods of teaching and learning represents *pedagogical knowledge*, which also includes an overarching understanding of educational values and aims (Shulman, 1987). *Technology knowledge* has been added to Shulman's PCK framework as both a knowledge area and a series of tools (Mishra & Koehler, 2007).

The TPACK model has brought forth a valuable framework for further investigation into the integration of technology into the classroom, as Thompson and Mishra (2007) noted, ‘What is clear now is that we need to go beyond simplistic technocentric approaches because knowledge of technology does not necessarily lead to effective teaching with technology’ (p. 38). Thus, we make the connection with global knowledge. Knowledge of global issues alone does not lead to effective internationalization of the curriculum.

3. TPACK to GPACK

The shift of the TPACK framework for technology integration to global integration, or internationalization, is possible given the similarities of the two knowledge areas, technological knowledge and global knowledge. The proposed GPACK model allows us to support conversations and further research regarding the knowledge areas faculty need to internationalize the curriculum (Fig. 1). The following points outline the similarities between global integration and technology integration:

- a) Since Boyer (1990) published his transformative report on higher education, numerous teaching and learning scholars have supported the notion that higher education faculty are prepared as subject matter experts, not as educators

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