

NATIONAL RESEARCH AGENDA

American Association *for* Agricultural Education
 2011- 2015 Research Priority Areas

Scientific & Professional Workforce

Sufficient Scientific and Professional Workforce That Addresses the Challenges of the 21st Century

Key Outcome: *A sufficient supply of well-prepared agricultural scientists and professionals drive sustainable growth, scientific discovery, and innovation in public, private, and academic settings.*

Informed Choices

Background

Recently, the National Academy of Sciences (2009) report titled *Transforming Agricultural Education for a Changing World* stated that: "Our world is changing at an increasing pace and unleashing a complicated set of problems and opportunities" (p. 1). The report further commented on the challenges this present to the human resource needs of U.S. agriculture:

Because agricultural production is embedded in social and natural systems, it is affected by changing circumstances in those systems, such as increasing international competition in agricultural products, changing consumer demands and expectations of agriculture and food, declining levels of public research support, evolving immigration and labor policy, growing demands to regulate the environmental externalities of agriculture, and emerging constraints of the natural resource base. In addition, rising rates of obesity are leading to increased incidence of preventable disease while structural and economic issues affect access to fresh fruits and vegetables in many communities. How will we respond to these challenges? Do we have a pool of individuals capable of navigating us through these changing waters? (p. 3)

The answer to their question is no. A recent report by Purdue University and the U.S. Department of Agriculture's National Institute of Food and Agriculture predicts more than 54,000 agriculture-related job openings annually between 2010 and 2015 (Goecker, Smith, Smith, & Goetz, 2010). But despite the promising employment outlook, there is a talent shortage in the applied agricultural sciences. Challenging our profession's ability to respond to this need is a changing higher education environment highlighted by universities that have dropped or consolidated programs in the agricultural sciences because of low enrollment and dwindling funds.

Addressing our societal and industry challenges will require a diverse workforce that includes scientists and professionals with knowledge and skill beyond today's standards. These individuals must be well prepared for discovery science, teaching

and learning, science, technology, engineering, and mathematics (STEM) integration, and application of innovation for public, private, and academic settings. Without a focus on the development of effective human capital as a life-long process, we will fail in addressing the societal challenges that lie before us.

Challenges

With the global population expected to increase to nine billion by 2050, food security is of paramount importance to countries everywhere. Failure to address food security concerns could cause political instability in many parts of the world. Riveria and Alex (2008) connected this global need to a need for change in the development of the agricultural workforce:

Greater commercialization of agricultural systems and increasing trade liberalization dictate the need for better capacity on the part of the agricultural workforce in the 21st century. Global changes in the roles of the public and private sectors and dramatic advances in technology have also strongly affected agricultural workforce development needs. These evolving changes have important policy, institutional, and programmatic implications. (p. 374)

The need to provide a highly educated, skilled workforce capable of providing solutions to 21st century challenges and issues has never been greater. The issues that face our society have grown increasingly complex and harder to solve, even with the products of sophisticated scientific discovery and application. In the meantime, our educational system is being challenged by cultural, economic and structural factors that threaten our nation's standing as a global leader in scientific and technological innovation. There is therefore a growing need to develop strategies to create a society of diverse, highly educated professionals and knowledge workers to address major societal challenges and develop innovations that drive the engines of economic growth.

If we are to be able to recruit and retain students to study in and prepare for careers in agriculture and natural resources related fields, we must be able to better understand the models, strategies,

Technologies, Practices & Products

Meaningful, Engaged Learning

Efficient & Effective Programs

Vibrant, Resilient Communities

and tactics needed to best prepare, promote, and retain new professionals who demonstrate the requisite content knowledge, technical competence, and cultural awareness, coupled with communication and interpersonal skills. This will require that adequate numbers of well-prepared, highly effective agricultural educators, communicators, and leaders be made available to meet current and future needs.

Opportunities to Respond

The agriculture industry represents a major driver of economic growth and development. It requires a stable, qualified workforce that possesses a diverse range of skill sets suitable for employment in jobs ranging from the on farm setting to positions as Ph.D. scientists in highly sophisticated laboratories. However, attracting the best and the brightest to pursue careers in agriculture remains a challenge. According to the Coalition for a Sustainable Agricultural Workforce (n.d.), major obstacles exist to recruiting students into careers in the agricultural sciences, including budget constraints, student misconceptions and competition for the most talented from the basic sciences and industry.

These challenges also represent our opportunities. The National Academy of Sciences (2009) stated that:

During the next ten years, colleges of agriculture will be challenged to transform their role in higher education and their relationship to the evolving global food and agricultural enterprise. If successful, agriculture colleges will emerge as an important venue for scholars and stakeholders to address some of the most complex and urgent problems facing society. (p. 1)

Our discipline is uniquely positioned for an immediate, positive impact on this need as research outcomes are quickly communicated and integrated into K-12, pre-professional, and professional-level educational opportunities. Our profession's knowledge base is rich with cognitive, affective, psychomotor and experiential research and practical understandings. Collectively, we have a foundation towards a comprehensive theory of human learning. This includes retraining existing and developing new human capital in agriculture as part of a life-long learning system.

Our specializations in teacher education, agricultural communication, leadership development, and extension education are grounded in the applied research tradition of solving problems, and our knowledge bases focus on understanding the dimensions of human and social capital in educational and organizational settings. The research endeavors of those in the agricultural education profession are focused on discovering, testing and refining those very models, strategies, and tactics that will be needed to create a sufficient scientific and professional workforce that can effectively address current and future challenges. Our areas of scientific focus should include:

- » Developing the models, strategies, and tactics that best prepare, promote, and retain new professionals who demonstrate content knowledge, technical competence, moral boundaries, and cultural awareness coupled with communication and interpersonal skills.
- » Creation of programs that develop the skills and competencies necessary to improve the communications and knowledge sharing effectiveness of all in the agriculture-related workforces of societies.

REFERENCES

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ADDITIONS