Journal of Human Sciences and Extension

Volume 3 | Number 1 Article 9

2-28-2015

Informal, Non(-)formal, or Free-choice Education and Learning? Toward a Common Terminology for Agriscience and Ag-STEM Educators

Kathryn A. Stofer
University of Florida, stofer@ufl.ed

Informal, Non(-)formal, or Free-choice Education and Learning? Toward a Common Terminology for Agriscience and Ag-STEM Educators

Acknowledgments

The author wishes to thank Dr. Laura Warner for thoughtful feedback on this manuscript.

Informal, Non(-)formal, or *Free-choice* Education and Learning? Toward a Common Terminology for Agriscience and Ag-STEM Educators

Kathryn A. Stofer
University of Florida

Education professionals must re-examine the use of labels for education and learning in diverse settings in light of new understandings of how people learn and updated goals for broader interdisciplinary work. The varied use of the terms informal education, nonformal education, and formal education draw distinctions that serve to divide, not unite, those working to support a wide variety of learners for similar agriscience education goals. What in Extension education is nonformal learning is informal learning in science education. Juxtaposing informal learning or nonformal learning with formal learning also serves, in the eyes of some outside the profession, to devalue the learning that actually predominates human learning, at least in terms of time and opportunity. Education privileges the facilitator, not the learner. One potential new term for consideration is free-choice learning. By breaking down silos, working across disciplinary boundaries, and embracing common terminology that puts the learner at the center, a profession of educators can better leverage resources, increase visibility, and ultimately, support constituents.

Keywords: informal education, nonformal education, agriscience education, nonformal learning, free-choice learning, science education, agricultural education, Extension education

Science, agriculture, and environmental education professionals must re-examine use of labels for work in diverse settings in light of new understandings of how people learn and updated goals for broader interdisciplinary work. Over 20 years ago, Etling (1993) warned of the dangers of a too-casual use of terminology in the context of agricultural education, including conflicts and struggles for resources within departments that arose from juxtaposing *formal* and *nonformal education*. Heimlich (1993) called for clearer definitions of *informal* and *nonformal* so that environmental educators could use the associated techniques. Researchers in science education began to discuss a need to replace the terms *informal education* and *informal learning*, which had gained favor among museum educators and others (Dierking, Falk, Rennie, Anderson, & Ellenbogen, 2003; Falk, 2001a; Falk & Dierking, 1998), to free informal education from problematic contrasts with formal education. Today, discussion in science education in

Direct correspondence to Kathryn A. Stofer at stofer@ufl.edu

Journal of Human Sciences and Extension Volume 3, Number 1, 2015

particular continues (Tal & Dierking, 2014), but the conversation lacks significant voices from agricultural, Extension, and to a lesser extent, environmental education, even as agricultural educators push for reintegration with science, technology, engineering, and math (Ag-STEM) and recognition of the connections among domains (Hillison, 1996; Thoron & Myers, 2008).

The rise of research around learning in all environments has been dramatic over the last two decades (Bell, Lewenstein, Shouse, & Feder, 2009; Cash, 2001; Falk & Dierking, 2000; Phipps, 2010; Stevenson, Brody, Dillon, & Wals, 2013; Thoron & Myers, 2008) and has given new or renewed direction. Calls within science education urge better contextualization of academic science (Bell et al., 2009; Bransford, Brown, & Cocking, 2000; NGSS Lead States, 2013; Rivet & Krajcik, 2008). Agricultural education lately aims to reintegrate and reiterate science, technology, engineering, and math (STEM) in its programs, bringing together professionals from diverse disciplines for a common goal of improved understanding (Thoron & Myers, 2008). In its second century, the University of Florida's IFAS Land Grant Extension still aims to help state residents address a wide range of public challenges (Univeristy of Florida IFAS Extension, 2013). Learning outcomes improve when varied activities supporting learning in all settings complement rather than compete with one other (Falk, 2001b; Fallik, Rosenfeld, & Eylon, 2013).

Ultimately, the specific labels Ag-STEM practitioners and researchers use within our varied individual settings may be moot. However, we are more and more frequently crossing domain and disciplinary boundaries to create programming and reach publics. We also spend more time interfacing with audiences outside Ag-STEM education that may have different culturally-derived meanings of the terms we use in a professional sense. Taking the time to consider and adopt carefully constructed choices of language about what we do and how and why we do it can facilitate this broader communication.

Without a unified understanding of the affordances and constraints offered by various settings and programs, integrated Ag-STEM education remains largely imaginary, fractured between and among traditional agriculture and STEM education and various settings. Without common terms, we will talk at cross-purposes, thwarting our efforts to embrace commonalities and raise awareness of what we do for our clients and our future partners, funders, and policymakers.

Colliding Worlds

Etling (1993) suggested the main distinctions among the terms *formal*, *nonformal* or *non-formal*, and *informal* education lay in the structure of the curricula in various programs (p. 73) (Table 1). Throughout the rest of this article, *nonformal* includes both versions of the spelling, with and without the hyphen, unless otherwise specified. Etling (1993) argued for the adoption of "nonformal" (p. 73) without a hyphen to professionalize the agriculture Extension experiences while distinguishing them from traditional classroom curricula.

Table 1. Characteristics of Education Settings as Described by Etling (1993)

Setting	Structure	Example
Informal	Little to none	Everyday, incidental
Nonformal	Some	Extension programming
Formal	High	K-12 school classrooms

On the other hand, Etling (1993) suggests that *informal* education is based on experiences that are neither planned nor organized, such as when a child learns to speak, and become education when an outsider interprets or corrects them for the learner. In fact, neuroscientists and educational psychologists now know that learning to speak, even by imitation and trial-and-error, is a highly structured process, though perhaps not a conscious one (Davis & Bedore, 2013). Furthermore, deliberate, reflective trial-and-error forms the basis of inquiry learning suggested by Dewey (Biesta, 2007).

Meanwhile, many other STEM educators and facilitators have adopted *informal* education to describe activities to promote learning outside of the formal school context, in science centers and museums, at camps, with homeschoolers and "unschoolers," and online (Luke, Camp, Dierking, & Pearce, 2001). There is broad recognition of the term *informal science education* (Luke et al., 2001), though environmental educators use *informal* and *nonformal* almost interchangeably (North American Association for Environmental Education, 2009). Informal science education has been characterized, improved, and even formalized (Phipps, 2010) to the point of showing actual learning gains in out-of-the-classroom programs (Ramsey & Edwards, 2004; Rennie, 2007). Each context for learning provides structure in myriad ways and in myriad forms, with a fluid nature of scaffolding when the learner needs and wants it.

Today there are several related concepts that researchers and practitioners of a variety of Ag-STEM-promotion activities draw upon that have yet to be encapsulated in one term free of the connection to *formal* (Fallik et al., 2013; Tal & Dierking, 2014). *Inquiry*, or lately, science and engineering *practices* (Next Generation Science Standards, 2013) describe experiences in authentic science and engineering designed to improve process skills as much as, if not more than, content knowledge, aligning with U.S. K-12 classroom science standards. Formal schools may, on their own or in partnership with other organizations, provide *out-of-school* or *after-school* Ag-STEM or environmental education programs (Kahne et al., 2001). Some practitioners perform *outreach* to communities, especially when helping researchers show broader impacts of their grant projects than the fundamental research knowledge that results from their investigations (National Science Foundation, 2013). Educators also speak of *science, environmental, or agricultural literacy* (Brown, Ryoo, & Rodriguez, 2010; Feinstein, 2011; Lin & Shi, 2014; Miller, 2010a, 2010b; Miller & Pardo, 2000); *communication* (Jurin, Roush, & Danter, 2010; Leeuwis, 2004; Nisbet & Scheufele, 2009); and *public understanding of* and *public engagement with science* (Lehr et al., 2007; Lundy, Ruth, Telg, & Irani, 2006; McCallie et al., 2009; Shirk et al., 2012) to help build meaning among various populations with various

Journal of Human Sciences and Extension Volume 3, Number 1, 2015

backgrounds. Finally, some characterize education as *lifelong*, *lifewide*, and *lifedeep* (i.e., learning is not a separate thing that is performed at certain times in one's life, in certain activities, or in certain settings, but is rather incorporated in everything we do in a variety of ways) (Falk & Dierking, 2012).

To organize Ag-STEM interests within a larger frame, researchers and practitioners need some sort of taxonomy. Science center professionals struggle for recognition and clear definition of their myriad roles in the education system (Tran, 2007, 2008; Tran & King, 2009). Many are not simply museum educators delivering classroom-style programs. Nor are they only exhibit managers and staff, facilitating learning in the exhibits and in programs for public audiences in addition to keeping the interactive exhibits running. Today, when people ask me what I do, if I say I am a professor of "science education," many ask me what I teach. However, if I say I research "learning," I can open up a broader discussion about the types of audiences, subjects, and settings I explore. Educators and students across the country who seek professional development programs and graduate study in these areas have to do multiple keyword searches to be sure they have captured all the varieties of offerings. An agreement on common terminology would allow us to align ourselves more readily even across institutions with different subject matter but similar underlying educational aims, such as history and art museums.

Even beyond the dilemma of informal or nonformal, *education* and *learning* are sometimes used synonymously, further confounding matters. As Etling (1993) wrote, "teaching, by itself, does not constitute learning" (p. 73). Education in general over the past 20 years has embraced more learner-centric approaches (Bransford et al., 2000; National Research Council, 2012), what Etling (1993) suggested was the hallmark of nonformal education. Falk (2001b) suggests using *education* to refer to contexts and programs for learning and reserving *learning* for the resulting outcomes of educational experiences. *Education* strikes fear of testing, assessment, and judgment into the hearts of many (Luke et al., 2001). *Learning*, however, is something people want to do, and that desire doesn't disappear after leaving the formal school system behind, no matter at what age one leaves. This is evident in the enduring popularity of museums (Center for the Future of Museums, 2014), the abundance of Internet sites dedicated to learning (Forsyth, 2014), and the use of leisure time for educational activities through travel and tourism (Packer, 2006; Rollins, 2010; Van Winkle & Lagay, 2012).

Therefore, consider another term, coined by Falk and Dierking (1998): *free-choice learning.* They defined free-choice learning as voluntary, self-paced, nonsequential, and reflecting learner-perceived choice and control (Falk, 2001b; Falk & Dierking, 1998). Free-choice learning considers the social context and motivation of the learner (Falk, 2001b) in addition to the physical setting and structure implied by *formal, nonformal,* and *informal* as Etling (1993) described them. Falk points out that *free-choice learning* does not exclude the presence of a

Journal of Human Sciences and Extension Volume 3, Number 1, 2015

teacher or facilitator or even a structured activity, but rather most free-choice learning involves learning through carefully designed experiences with defined outcomes, whether or not someone else guides the activity (Falk, 2001b).

Falk and Dierking convened a free-choice learning conference to begin to "forge collaborations between disparate parts of the science learning community" (Luke et al., 2001, p. 162). Participants remained undecided on whether to use *free-choice* or *informal learning*, with some arguing for retaining informal due to the term's currency in the field (Luke et al., 2001). Others argued a decision could not be made without representatives from certain segments of the nonschool field, namely the media and libraries not present despite invitations to attend. Participants did recognize that the field needed further discussion on terminology, mental models, and research methods for common understanding (Martin, 2001). Efforts at NARST, formerly the National Association of Research on Science Teaching, began in 2002 with a recognition that *informal science learning* was an inadequate term (Dierking et al., 2003). A decade later, the diversity of research perspectives employed has expanded, but no consensus among terms yet exists (Fallik et al., 2013; Tal & Dierking, 2014).

Bridging the Informal or Nonformal and the Formal

Whether or not *free-choice learning* is the answer, the problems with trying to contrast and separate *formal* and either *nonformal* or *informal* go beyond a simple issue of hyphenation. These terms are still all based in a mindset that privileges a standardized, structured school system, by setting *formal* as the standard against which *informal* and *nonformal* are compared (Falk & Dierking, 1998). Understand I am in no way advocating for a dismantling of a free public primary and secondary education in the United States. Yet, I argue that the broader Ag-STEM educational system needs to be equally valued with schools, and the entire system must realign to support each component, with each segment recognizing the contributions and weaknesses, affordances and constraints the others provide. This argument goes back to Mark St. John in the late 1980s and is reiterated by Falk (2001b) in the argument for a reframing around *free-choice learning.* Such a realignment also would ease the burden of each segment, as the responsibility of *education* would not fall to one segment alone.

Thus, ultimately, I exhort Ag-STEM education professionals to involve ourselves more fully in the discussion not only of terminology but also of philosophy of putting the learner at the center, building on natural inclinations for learning, and bringing in context to support learning development across the lifespan in all settings. A learner-centered approach makes the important unit the learner, not the instructor, facilitator, or setting in which learning takes place. This philosophy shift can encompass all forms of and situations for learning, from the most structured learning within the bounds of a controlled standardized curriculum to the least, responding to the curiosity of an unschooler.

Adopting new language across domains and settings will also work to build the larger knowledge base. New terminology paves the way for a more integrated system approach, providing natural context and reinforcement among topics, programs, facilitators, and settings, as well as with the everyday experience (Fallik et al., 2013), for true cradle-to-grave learning support. Environmental, agriculture, and STEM education can be fully integrated rather than parallel. Then *school* does not have to be the only place someone goes to learn; programs do not have to fit a single education context box of formal, nonformal, or informal; and *learning* is truly a lifelong, lifewide, lifedeep undertaking.

Conclusion

The search continues for a term that captures all learning activities in a unified way to express support of innate human desire to continually quest for knowledge, development, and change. Perhaps that is the problem: The quest is so fundamental as to be assumed, and making explicit and obvious all the ways and settings in which learning occurs is difficult. Humans just learn, period. The continued search for a common definition of our work does not diminish that work in the interim (Gold, 2012).

Free-choice learning is admittedly an unfamiliar term to many, and perhaps even awkward, but it is no more awkward than continuing to lump diverse learning settings under the mantle of "not a traditional formal classroom," perpetuating a divide that pits formal instruction against everything else. Rather than trying to enumerate our differences, let us embrace our commonalities that center on assisting learners. While the term *free-choice learning* may not be the ultimate endpoint, consider it a place to move the discussion forward, more aptly than *formal/nonformal/informal education*, capturing the ideals of a variety of contexts, instruction types, outcomes, and educators who work across settings with a range of levels of structure.

With the burgeoning reintegration of agriculture education and science education, the time is right to truly join the broader discussion, exploring alternative descriptors that more adeptly encompass the broad settings in which we work, the diverse clientele we serve—from teachers to policymakers to the general public to schoolchildren—and the range of ways in which we facilitate growth in understanding. As education and Extension professionals, it is our responsibility to engage in this conversation and reach beyond our traditional, isolated, discipline-based education boundaries to do so. If we do not, we face consequences beyond literature searches requiring several different keywords. We risk duplicating efforts, not providing our work to a broader audience, and most importantly, missing important advances in understanding learning that could benefit our constituents. We must all work together to improve communication among and beyond our interrelated domains and disciplines to advance learning for everyone.

Journal of Human Sciences and Extension Volume 3, Number 1, 2015

References

Bell, P., Lewenstein, B., Shouse, A. W., & Feder, M. A. (Eds.). (2009). *Learning science in informal environments: People, places, and pursuits*. Washington, DC: National Academies Press.

Biesta, G. (2007). Why "What Works" won't work: Evidence-based practice and the democratic deficit in educational research. *Educational Theory*, *57*(1), 1–22. doi:10.1111/j.1741-5446.2006.00241.x

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (2000). *How people learn: Brain, mind, experience, and school* (Expanded edition.). Washington, DC: National Academies Press.

Brown, B. A., Ryoo, K., & Rodriguez, J. (2010). Pathway towards fluency: Using "disaggregate instruction" to promote science literacy. *International Journal of Science Education*, *32*(11), 1465–1493. doi:10.1080/09500690903117921

Cash, D. W. (2001). "In order to aid in diffusing useful and practical information": Agricultural Extension and boundary organizations. *Science, Technology, & Human Values*, *26*(4), 431–453. doi:10.1177/016224390102600403

Center for the Future of Museums. (2014). *Building the future of education: Museums and the learning ecosystem*. Washington, DC: American Alliance of Museums.

Davis, B., & Bedore, L. M. (2013). *An emergence approach to speech acquisition: Doing and knowing*. New York, NY: Psychology Press.

Dierking, L. D., Falk, J. H., Rennie, L., Anderson, D., & Ellenbogen, K. (2003). Policy statement of the "informal science education" ad hoc committee. *Journal of Research in Science Teaching*, *40*(2), 108–111. doi:10.1002/tea.10066

Etling, A. (1993). What is nonformal education? *Journal of Agricultural Education*, *34*(4), 72–76. doi:10.5032/jae.1993.04072

Falk, J. H. (Ed.). (2001a). *Free-choice science education: How we learn science outside of school*. New York, NY: Teachers College Press.

Falk, J. H. (2001b). Free-choice science learning: Framing the discussion. In J. H. Falk (Ed.), *Free-choice science education: How we learn science outside of school* (pp. 3–20). New York, NY: Teachers College Press.

Falk, J. H., & Dierking, L. D. (1998, June). Free-choice learning: An alternative term to informal learning? *Informal Learning Environments Research Newsletter*, *2*.

Falk, J. H., & Dierking, L. D. (2000). *Learning from museums: Visitor experiences and the making of meaning*. Lanham, MD: AltaMira Press.

Falk, J. H., & Dierking, L. D. (2012). Lifelong science learning for adults: The role of free-choice experiences. In B. J. Fraser, K. Tobin, & C. J. McRobbie (Eds.), *Second international handbook of science education*, 1063-1079. New York, NY: Springer.

Fallik, O., Rosenfeld, S., & Eylon, B.-S. (2013). School and out-of-school science: A model for bridging the gap. *Studies in Science Education*, *49*(1), 69–91. doi:10.1080/03057267.2013.822166

Feinstein, N. (2011). Salvaging science literacy. *Science Education*, *95*(1), 168–185. doi:10.1002/sce.20414

Forsyth, I. (2014). *Teaching and learning materials and the Internet*. New York, NY: Routledge.

Gold, M. V. (Ed.). (2012). Sustainable agriculture: Definitions and terms. U.S. Department of Agriculture, Special Reference Briefs Series, SRB 99-02. Retrieved from http://www.nal.usda.gov/afsic/pubs/terms/srb9902.shtml

Heimlich, J. E. (1993). Nonformal environmental education: Toward a working definition. *The Environmental Outlook*, ERIC/CSMEE Informational Bulletin, 1–8.

Hillison, J. (1996). The origins of agriscience: Or where did all that scientific agriculture come from? *Journal of Agricultural Education*, *37*(4), 8–13. doi:10.5032/jae.1996.04008

Jurin, R. R., Roush, D., & Danter, K. J. (2010). *Environmental communication: Skills and principles for natural resource managers, scientists, and engineers* (2nd ed.). New York, NY: Springer.

Kahne, J., Nagaoka, J., Brown, A., O'Brien, J., Quinn, T., & Thiede, K. (2001). Assessing after-school programs as contexts for youth development. *Youth & Society*, *32*(4), 421–446. doi:10.1177/0044118X01032004002

Leeuwis, C. (2004). *Communication for rural innovation: Rethinking agricultural Extension* (3rd ed.). Ames, IA: Blackwell.

Lehr, J. L., McCallie, E., Davies, S. R., Caron, B. R., Gammon, B., & Duensing, S. (2007). The value of "dialogue events" as sites of learning: An exploration of research and evaluation frameworks. *International Journal of Science Education*, *29*(12), 1467–1487. doi:10.1080/09500690701494092

Lin, E., & Shi, Q. (2014). Exploring individual and school-related factors and environmental literacy: Comparing U.S. and Canada using PISA 2006. *International Journal of Science and Mathematics Education*, *12*(1), 73–97. doi:10.1007/s10763-012-9396-2

Luke, J. J., Camp, B. D., Dierking, L. D., & Pearce, U. J. (2001). The first free-choice science learning conference: From issues to future directions. In J. H. Falk (Ed.), *Free-choice science education: How we learn science outside of school* (pp. 151–162). New York, NY: Teachers College Press.

Lundy, L., Ruth, A., Telg, R., & Irani, T. (2006). It takes two: Public understanding of agricultural science and agricultural scientists' understanding of the public. *Journal of Applied Communications*, *90*(1), 55–68.

Martin, L. (2001). Free-choice science learning: Future directions for researchers. In J. H. Falk (Ed.), *Free-choice science education: How we learn science outside of school* (pp. 186–198). New York, NY: Teachers College Press.

McCallie, E., Bell, L., Lohwater, T., Falk, J. H., Lehr, J. L., Lewenstein, B. V., … Wiehe, B. (2009). *Many experts, many audiences: Public engagement with science and informal science education*. Washington, DC: Center for Advancement of Informal Science Education.

Journal of Human Sciences and Extension Volume 3, Number 1, 2015

Miller, J. D. (2010a). Adult science learning in the Internet era. *Curator: The Museum Journal*, *53*(2), 191–208. doi:10.1111/j.2151-6952.2010.00019.x

Miller, J. D. (2010b). The conceptualization and measurement of civic scientific literacy for the Twenty-First Century. In J. Meinwald & J. G. Hildebrand (Eds.), *Science and the educated American: A core component of liberal education* (pp. 241–255). Cambridge, MA: American Academy of Arts and Sciences. Retrieved from http://www.amacad.org/pdfs/slacweb.pdf

Miller, J. D. Y., & Pardo, R. (2000). Civic scientific literacy and attitude to science and technology: A comparative analysis of the European Union, the United States, Japan, and Canada. In M. Dierkes & C. von Grote (Eds.), *Between understanding and trust: The public, science and technology* (pp. 81–130). New York, NY: Routledge.

National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. Washington, DC: National Academies Press. Retrieved from http://www.nap.edu/catalog.php?record_id=13165

National Science Foundation. (2013, November). *Grant proposal guide*. Office of Management and Budget. Retrieved from http://www.nsf.gov/pubs/policydocs/pappguide/nsf14001/gpgprint.pdf

NGSS Lead States. (2013). *The Next Generation Science Standards*. Retrieved from http://www.nextgenscience.org/next-generation-science-standards

Nisbet, M. C., & Scheufele, D. A. (2009). What's next for science communication? Promising directions and lingering distractions. *American Journal of Botany*, *96*(10), 1767–1778. doi:10.3732/ajb.0900041

North American Association for Environmental Education. (2009). *Nonformal environmental education programs: Guidelines for excellence*. Washington, DC: North American Association for Environmental Education.

Packer, J. (2006). Learning for fun: The unique contribution of educational leisure experiences. *Curator: The Museum Journal*, *49*(3), 329–344. doi:10.1111/j.2151-6952.2006.tb00227.x

Phipps, M. (2010). Research trends and findings from a decade (1997–2007) of research on informal science education and free-choice science learning. *Visitor Studies*, *13*(1), 3–22. doi:10.1080/10645571003618717

Ramsey, J. W., & Edwards, M. C. (2004). Informal learning in science: Does agricultural education have a role? *Journal of Southern Agricultural Education Research*, *54*(1), 86–99. Retrieved from http://www.jsaer.org/pdf/vol54Whole.pdf

Rennie, L. J. (2007). Learning science outside of school. In S. K. Abell & N. G. Lederman (Eds.), *Handbook of research on science education* (pp. 125–167). New York, NY: Routledge.

Rivet, A. E., & Krajcik, J. S. (2008). Contextualizing instruction: Leveraging students' prior knowledge and experiences to foster understanding of middle school science. *Journal of Research in Science Teaching*, *45*(1), 79–100. doi:10.1002/tea.20203

Rollins, E. W. (2010). *Mapping ecotourism learning: Using concept maps to evaluate visitor learning during an informal boat-based sea life viewing program* (Master's Project). Corvallis, OR: Oregon State University. Retrieved from http://hdl.handle.net/1957/15747

Shirk, J. L., Ballard, H. L., Wilderman, C. C., Phillips, T., Wiggins, A., Jordan, R., … Bonney, R. (2012). Public participation in scientific research: A framework for deliberate design. *Ecology and Society, 17*(2), 29. doi:10.5751/ES-04705-170229

Stevenson, R., Brody, M., Dillon, J., & Wals, A. E. J. (Eds.). (2013). *International handbook of research on environmental education*. New York, NY: Routledge.

Tal, T., & Dierking, L. D. (2014). Learning science in everyday life. *Journal of Research in Science Teaching*, *51*(3), 251–259. doi:10.1002/tea.21142

Thoron, A. C., & Myers, B. E. (2008). Agriscience: Sustaining the future of our profession. *The Agricultural Education Magazine*, *80*(4), 9–11. Retrieved from http://www.naae.org/profdevelopment/magazine/

Tran, L. U. (2007). Teaching science in museums: The pedagogy and goals of museum educators. *Science Education*, *91*(2), 278–297. doi:10.1002/sce.20193

Tran, L. U. (2008). The work of science museum educators. *Museum Management and Curatorship*, *23*(2), 135–153. doi:10.1080/09647770802012219

Tran, L. U., & King, H. (2009). Shared professional knowledge. *Journal of Museum Education*, *34*(2), 149–162. doi:10.1179/jme.2009.34.2.149

University of Florida IFAS Extension. (2013). Shaping solutions for Florida's future: The UF/IFAS Extension roadmap 2013-2023. Gainesville, FL: University of Florida. Retrieved from http://extadmin.ifas.ufl.edu/images/lrp2.pdf

Van Winkle, C. M., & Lagay, K. (2012). Learning during tourism: The experience of learning from the tourist's perspective. *Studies in Continuing Education, 34*(3), 339–355. doi:10.1080/0158037X.2011.646981

Kathryn Stofer, Ph.D., Research Assistant Professor of STEM Education and Outreach in the Department of Agricultural Education and Communication at the University of Florida, researches public engagement with agriscience. She works to bridge agriculture and science education and involve the public in use and production of agriscience knowledge, drawing on her background in biology, science journalism and education, and learning in museums.

Acknowledgement

The author wishes to thank Dr. Laura Warner for thoughtful feedback on this manuscript.

Journal of Human Sciences and Extension Volume 3, Number 1, 2015