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Aligning Kolb's Experiential Learning Theory with a Comprehensive Agricultural Education Model

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Experiential learning has been a foundational tenant of agricultural education since its inception. However, the theory of experiential education has received limited attention in the permanent agricultural education literature base. As such, this philosophical manuscript examined Kolb's experiential learning process further, and considered the implications for experiential learning theory (ELT) in secondary agricultural education. Specifically, the researchers outlined Kolb's ELT and conducted a telephone interview with Dr. David A. Kolb. Analysis of the interview indicated that experiential learning is a critical component of a comprehensive agricultural education model (i.e., three–circle model). It was explained that experiential learning builds meta–cognitive skills and can be goal–oriented and assessed. However, agricultural educators must be present and purposeful when providing experiences for students. Additionally, they must ask reflection questions (e.g., "What happened?" "Now what?" "So what?") during each phase of ELT throughout the comprehensive agricultural education model (i.e., classroom and laboratory, Supervised Agricultural Experience [SAE], and FFA). Based on these conclusions, a Comprehensive Model for Secondary Agricultural Education was proposed to include the role of experiential learning more intentionally.

Keywords: experiential learning, agricultural education, Kolb, teacher preparation

Introduction

John Dewey (1938) stated, "amid all uncertainties there is one permanent frame of reference: namely, the organic connection between education and personal experience" (p. 25). Agricultural education has been experiential in nature since its inception (Cheek, Arrington, Carter, & Randell, 1994; Hughes & Barrick, 1993; Knobloch, 2003; McLean & Camp, 2000; Roberts, 2006; Stewart & Birkenholz, 1991), as made evident by supervised agricultural experience programs (SAE), field trips, student teaching experiences, problem solving methods, and service–based learning (Roberts, 2006). Though the opportunity for involvement in learning experiences is many, Knobloch (2003) purported "the greatest challenge for today's teachers and students of agriculture is to move beyond the 'doing' and ensure that all learning is connected to thinking and knowledge that will be easily remembered and applied later in life" (p. 31). It is important to not overlook the last word in experiential learning, and that is *learning*.

Dewey (1938) explained that, "A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize in the concrete what surroundings are conducive to having experiences that lead to growth" (p. 40). Contrasting this sentiment, Roberts (2006) asserted that despite the robust use of experiential learning in agricultural education, "the theory behind the practice of experiential learning has had limited attention in the permanent agricultural education literature" (p. 18). The concept of *experiential learning* has been applied to a multitude of contexts in agricultural education, which has led to some misunderstanding and a lack of common verbiage around the topic (Roberts, 2006). "Meaningful discussions have been further hampered in that the terms have been used to describe many different teaching approaches including field work experiences, internships, previous work experience, outdoor education, adventure education, vocational education, lab work, simulations, and games (Itin, 1999, p. 91). Roberts (2012) posed the question, "How do we hang on to the distinctive ways experiential education frames the educational process while at the same time ensuring that it does not become quaint and overly isolated?" (p. 9). He followed with the response, "This is the role of philosophy" (p. 9).

Purpose

This philosophical manuscript seeks to discuss the specific role experiential learning plays in agricultural education through the lens of Kolb's (1984) Experiential Learning Theory (ELT). In meeting that purpose, the authors: (a) outlined the theoretical tenants of Kolb's ELT, (b) applied Kolb's ELT in the context of agricultural education, and (c) enriched the current model of agricultural education to include the role of experiential learning more intentionally. The authors examined publications within Kolb's comprehensive ELT bibliography (Kolb & Kolb, 2005a) in order to glean an in–depth theoretical framework of ELT that is relevant to agricultural education. Finally, the authors then specified the role of ELT in agricultural education by integrating ELT into the existing comprehensive agricultural education model (Phipps, Osborne, Dyer, & Ball, 2008)

Indicative of philosophical research, it is important to note that the purpose is not to furnish *irrefutable proofs*, but rather to provide concepts to incite further discussions, insights, arguments, and discussions – a *show and tell* of sorts (Reichling, 1996). Sound philosophical arguments require both analysis and synthesis of concepts and theories, as well as an emergent design or method that provides freedom in the design and delivery, resulting in an infinite number of variations (Reichling, 1996). As such, an analysis of Kolb's (1984) ELT and a synthesis of those tenants in the context of agricultural education follows.

Analysis of Kolb's Experiential Learning Theory

Kolb's (1984) ELT asserted that, "Learning is the process whereby knowledge is created through the transformation of experience." (p. 38). This perspective of the learning process originated through the work of foundational theorists of experiential learning (Dewey, 1910/1997, 1934, 1938, 1958; Freire, 1974; James, 1890, 1907; Lewin, 1951; Rogers, 1961) who placed intentional action based on subjective experience at the center of learning (Kolb & Kolb, 2009). Kolb and Kolb, (2005b) noted six propositions shared by these scholars that served as the foundation for ELT. First, learning is conceived best as a *process* instead of a *product*. To improve learning, the focus should be placed on engaging students in a process that facilitates optimal learning. This includes providing feedback on the effectiveness of students' learning efforts. As Dewey (1897) noted, "education must be conceived as a continuing reconstruction of experience" (p. 79). Next, all learning is relearning. A student's beliefs and ideas on a topic must be considered so they can be drawn out, tested, examined, and integrated into the new concepts. Third, learning requires the resolution of conflicts between dialectically opposed modes of adaption to the world. Conflict, dissonance, and disagreement drive learning. In the process of learning, an individual is called to maneuver back and forth between opposing modes of reflection and action. Fourth, learning is a holistic process of adaptation to the world that involves more than simple cognition. Learning involves the person as a whole and includes thinking, feeling, perceiving, and behaving. Fifth, learning results from synergistic transactions between the learner and his or her experiences. Using Piaget's (1971) language, learning occurs through equilibration of the dialectic processes of assimilating new experiences into existing concepts and accommodating existing concepts into new experiences. Finally, learning is the process of creating knowledge. ELT follows constructivist views of learning in that it is the process of connecting new experiences and knowledge to the learner's pre–existing personal knowledge. This constructivist approach contrasts the majority of educational practices today, which involves the transmission of ideas that were previously fixed.

These six principles, outlined previously, provide the foundation of Kolb's (1984) ELT Model (see Figure 1). ELT explains that knowledge results from experiences that have been grasped and transformed (Kolb, 1984). The ELT puts forth two dialectically related modes of grasping experience—Concrete Experience (CE) and Abstract Conceptualization (AC)—as well as two dialectically related modes of transforming experience—Reflective Observation (RO) and Active Experimentation (AE) (Kolb & Kolb, 2009). The result of these two dimensions of learning, prehension and transformation, are four different elementary forms of knowledge—divergent knowledge, assimilative knowledge, accommodative knowledge, and convergent knowledge (see Figure 1).

Kolb (1984) explained that an experience grasped through apprehension and then transformed through intention results in divergent knowledge. An experience grasped through apprehension and transformed through extension is accommodative knowledge. An experience grasped through comprehension and transformed through intention yields assimilative knowledge. Finally, an experience grasped through comprehension and transformed through extension leads to convergent knowledge (see Figure 1). In order to facilitate learning, not only must the experience be grasped, but it must also be meaningful and relevant (Knapp & Benton, 2006) because students remember knowledge longer when they have experienced it actively (Knapp & Benton, 2006).

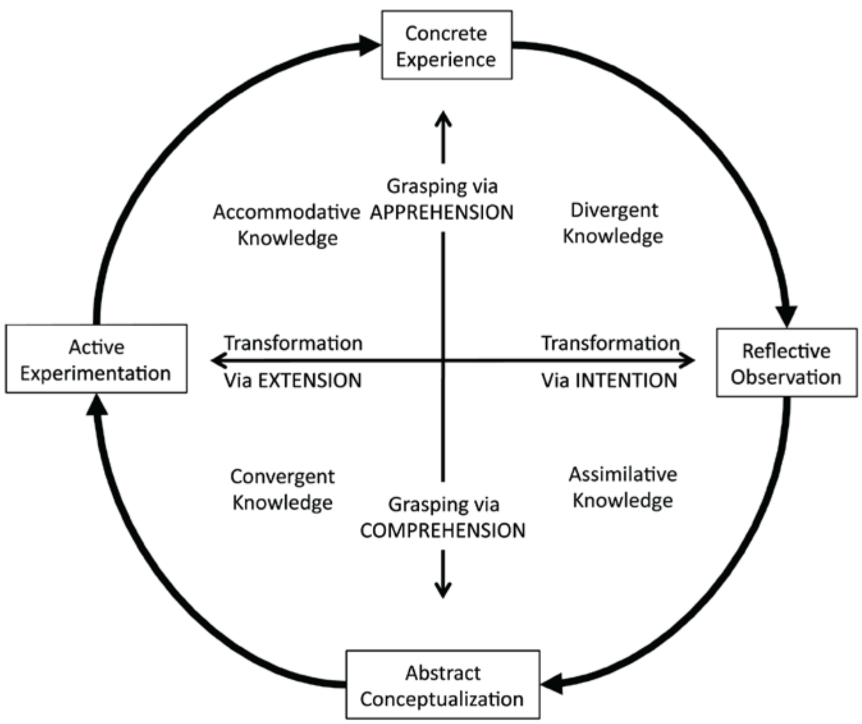

Figure 1. Model of Experiential Learning Process. Reprinted from *Experiential Learning: Experience as the Source of Learning and Development* (p. 42), by David A. Kolb, 1984, Englewood Cliffs, NJ: Prentice–Hall, Inc. Copyright 1984 by Prentice–Hall, Inc. Reprinted with permission.

Experiential learning occurs through a creative tension between the four learning modes—CE, RO, AC, and AE—that is responsive to certain contexts (see Figure 1). Thus, the learning process is portrayed as a learning cycle where the learner assumes each of the four domains—experiencing, reflecting, thinking, and acting (Kolb & Kolb, 2005b). The recursive process is responsive to each learner, learning experience, and content learned. Immediate or concrete experiences are the impetus for observations and reflections. Reflections are then assimilated and deduced into abstract concepts from which new implications for action are drawn. These new implications are then used for active experimentation, which leads to new concrete experiences (Kolb & Kolb, 2005b).

Kolb (1984) suggested that, "the learning process is not identical for all human beings. Rather, the physiological structures that govern learning allow for the emergence of unique individual adaptive processes that tend to emphasize some adaptive orientations over others" (p. 62). The idea of learning styles describes the individual difference in learning based on the person's preference for the different modes of learning—CE, RO, AC, and AE. Each individual's hereditary equipment, particular life experiences, and the current demands of any situation catalyze the development of a preferred way of choosing among learning modes (Kolb, 1984).

ELT argues that an individual's learning style is, "not a psychological trait, but a dynamic state resulting from synergistic transactions between the person and the environment . . ." (Kolb & Kolb, 2009, p. 315). Kolb (1984) stated that,

> The stability and endurance of these states in individuals comes not solely from fixed genetic qualities or characteristics of human beings: nor, for that matter, does it come from the stable fixed demands of environmental circumstances. Rather, stable and enduring patterns of human individuality arise from consistent patterns of transaction between the individual and his or her environment. (p. 63)

Research on ELT has focused on the concept of learning styles, specifically Kolb's Learning Style Instrument (KLSI) (Kolb, 2007). Though only four learning styles were proposed originally (Kolb, 1984), the instrument has now been expanded to nine to describe various learning preferences better (Kolb & Kolb, 2005b; Kolb & Kolb, 2009). Four of these style types emphasize one of the four learning modes: Experiencing (CE), Reflecting (RO), Thinking (AC), and Acting (AE). Four other learning styles emphasize two of the learning modes, one from the grasping dimension and one from the transforming dimension: Diverging (CE and RO), Assimilating (AC and RO), Converging (AC and AE), and Accommodating (CE and AE). The final style type, balancing (CE, RO, AC, and AE), represents a balance of each learning mode.

In 1991, Boyatzis and Kolb made a distinction between learning styles and learning skills. Though studies show that learning styles vary over short periods of time (Sims, Veres, Watson, & Buckner, 1989), data (Kagan, 1989) suggest that learning styles maintain a longer, more stable nature. In contrast, skills are developed by learning from experience and, as a result, are more variable and subject to intentional personal development. A learning skill is defined as, "a combination of ability, knowledge, and experience that enables a person to do something well within a specific situation and is subject to intentional development" (Boyatzis & Kolb, 1995, p. 2). The focus on learning skills led to the development of the Learning Skills Profile (LSP; Boyatzis & Kolb, 1992) instrument. The LSP instrument correlates each of the learning modes of ELT to a job–related skill type. Divergent knowledge is represented by interpersonal skills. Assimilative knowledge is represented by information skills. Convergent knowledge is represented by analytical skills, and accommodative knowledge is represented by action skills (Boyatzis & Kolb, 1991). The concept of human development is important in order to understand ELT more fully as learning skills can be developed intentionally. Kolb (1984) posited that, "the experiential learning theory of development focuses on the transaction between internal characteristics and external circumstances, between personal knowledge and social knowledge. It is the process of learning from experience that shapes and actualizes developmental potentialities" (p. 133).

The ELT of Growth and Development (Kolb, 1984) begins with development in each of the four modes of learning. Affective complexity in concrete experience leads to higher–order sentiments; perceptual complexity in reflective observation results in higher–order observations; symbolic complexity in abstract conceptualization results in higher–order concepts; and behavioral complexity in active experimentation results in higher–order actions. The model of development (see Figure 2) is depicted as a cone with the base representing the lower levels of development and the apex representing the peak of development. The cone highlights the idea that, as a person develops, the four modes of learning become more integrated and complex.

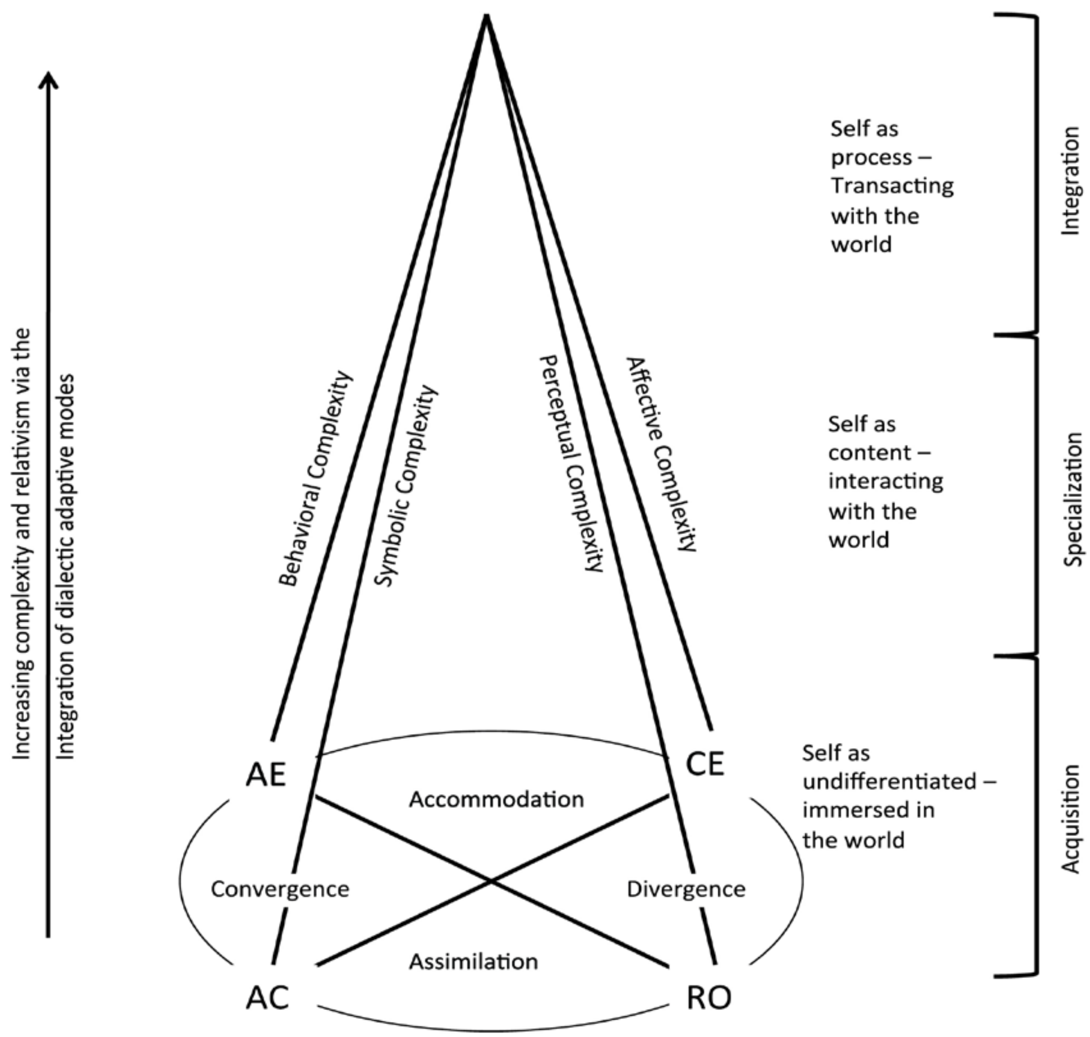

Figure 2. The Experiential Learning Theory of Growth and Development. Reprinted from *Experiential Learning: Experience as the Source of Learning and Development* (p. 141), by David A. Kolb, 1984, Englewood Cliffs, NJ: Prentice–Hall, Inc. Copyright 1984 by Prentice–Hall Inc. Reprinted with permission.

Further, the developmental process is broken down into three major stages—acquisition, specialization, and integration (Kolb, 1984). Embedded within each major stage, are three forms of consciousness that govern the growth, referred to as performance, learning, and development. These stages relate to maturational stages that occur in humans, as described by Piaget and Inhelder (1969). Kolb (1984) noted that, though the three levels of development appear linear, each individual will progress through the levels at different rates, and many sub–levels based on each individual learner exist.

Applying Kolb's Experiential Learning Theory in the Context of Agricultural Education

Experiential learning is an integral element of agricultural education, but the exact relationship or role of ELT has remained somewhat ambiguous (Roberts, 2006). In order to move beyond the analysis of Kolb's ELT explained earlier, and into the synthesis of ELT in agricultural education, it is important to discuss the relationships between ELT and agricultural education. Collaboration with David A. Kolb helped clarify the connection of ELT in the context of agricultural education, allowing movement from analysis to synthesis. Collaboration led to the conclusion that experiential learning should: (a) encompass each of the three components of the agricultural education model, (b) require purposeful and planned support from the agricultural education instructor, (c) lead to the development of important meta–cognitive skills, and (d) include curriculum planning and assessment.

Experiential Learning Should Be Infused Into the Three Components of the Agricultural Education Model

The experiential learning model, when placed on the agricultural education model, illustrates the total learning experience of agricultural education. Agricultural education has a great advantage in that the entire program is so easily experiential. Most classrooms today are very sterile environments and the opportunity to move outside of the classroom into relevant agricultural contexts is exactly what education needs. Although, traditionally, SAEs have been referred to as the experiential component of the agricultural education model (McLean & Camp, 2000), each of the three components included in the agricultural education model must encompass rich experiences. The experiential learning cycle provides a good framework to compliment the existing agricultural education model. The three components of agricultural education fit nicely into the experiential learning cycle. The formal instruction seems to be more related to the abstract, where FFA is more of the concrete and reflective component. The SAE is more the field project or the whole achievement converging aspect. In general, agricultural education teachers are naturally covering a lot of the learning emphasis on the different modes of the learning cycle.

A direct connection between what is being taught in the classroom and the student's SAE project is insignificant. What is most important, however, is allowing students to identify an area of interest or passion and assisting them in building a project around that area of interest. Once student interest is achieved, an instructor can deliver content in the formal setting of the classroom in a way that helps students transfer learning from one experience to another (i.e., SAE and classroom). There is meta–learning that is going on there about how to solve problems on your own, and how to implement a plan. That is kind of independent of what the project is about. Operating from the *learning how to learn* template, if a beef production SAE is delivered at a high level, it can be transferred to a diversified crop SAE in terms of the use of similar meta–skills.

Teachers begin to see meta–skills emerge as students are provided opportunities to take personal responsibility in achieving the goals of a project over time. The purpose of the SAE should be to build student interest and develop important meta–skills—both of which support the classroom and FFA components also.

Experiential Learning Requires Purposeful Support from the Instructor

Teachers must be present and mindful throughout the experiential process in order to guide and direct the learning process. The instructor is called to connect with students' prior knowledge and play different roles during each phase of the experiential learning model. Throughout teacher education, it is important to emphasize that students are learning all the time. These are principles of experiential learning – that you are learning all the time, and that their role as a teacher is to capitalize on the experiences they are having and help them reflect together about them and make sense of them. Experiences are very useful ways of helping with the personal development and moral development of students.

All learning is experiential. Listening to a lecture is an experience, and sometimes a very powerful one. The term experiential learning is redundant. Learning is a concept that is built upon how experiences change people. However, the experience itself does not constitute learning. Rather, the learner must reflect, draw abstractions, and experiment actively using the newly constructed knowledge to transform learning.

When a teacher connects to the student's prior knowledge and personal interest, the learning is more enduring and there is more of it. One of the primary goals of an educator must be to start with the student's understanding and build on that. Educators tend to over structure experiences and should remember that adequate learning space must be provided for students to experience and connect to their personal interest. It is important for teachers to be mindful of how students are making sense of what they're looking at. It is critical that the teacher be present for these experiences in order to serve as a constant guide helping students construct meaning. Learning can really start anywhere, but to have a full learning cycle, it is important to go through all the learning modes, in some way or the other, not necessarily in order. Instructors should teach around the cycle, and teach to all learning modes at some point in the curriculum.

One of the biggest disconnects in the use of experiential learning is the missing connection between the teacher and the experience. The agricultural educator plays an important role during each phase of the learning cycle. From concrete experience to reflection, the teacher's role is facilitator. They are drawing out the student and their interest, and then from reflection to abstraction, the teacher's role is subject expert – making the connection between what they have experienced and observed and the concepts the agricultural educator wants to teach. And then from abstraction to action, the teacher's role is evaluator or standard setter sharing with students the goals you need to achieve and the right answers, so to speak. From action up to experience again, it is a coach that is applying the knowledge back into your experience. It requires a coaching perspective in which the teacher stands back and watches what the person does and helps them do it better.

Experiential Learning Leads to Meta–Cognitive Skill Development

Teaching and developing meta–cognitive skills supports both the learning process and the overall growth of agricultural education students. An educator has at least two goals: (a) to teach people the content, and (b) to teach them how to learn it. One way to do that is to focus on meta–cognition as a component of the curriculum. Using the KLSI (Kolb & Kolb, 2005c) as a platform for discussing how each student learns. The more students know about learning, the better. If students are challenged to move through all four learning modes in the experiential learning model, they are building their meta–cognitive abilities constantly.

How exactly can this development of meta–level skills be assessed or validated? One solution is to change the focus of outcome evaluations. Move beyond assessing concepts or ideas – learning the material, and extend assessment to measuring meta–cognitive or meta–level skills that students are developing. Planning, goal setting, persistence and self–direction are examples of meta–level skills. A more detailed list of meta–level skills are noted and assessed in the LSP (Boyatzis & Kolb, 1992).

Experiential Learning Requires Purposeful Curriculum Planning and Assessment

Experiential learning curriculum, when designed and executed properly, can have positive effects on both formal and informal assessments. There is evidence to support the idea that experiential learning produces results that are better than traditional educational models. This assertion was supported through the mention of studies (Ash & Clayton, 2004; Eyler & Giles, 1999; Eyler & Halteman, 1981; Steinke & Buresh, 2002; Steinke & Fitch, 2003) that have examined the effectiveness of experiential learning on knowledge retention in a number of domains.

Experiential learning can be goal–oriented and standards–based. Educators have objectives that need to be communicated, and students can be directed to those goals as teachers serve the role of evaluator mentioned earlier. Consider an agricultural education course with learning objectives related to lake ecosystems. The curriculum would include a concrete experience, which could include a trip to a local lake, a video, or a guest speaker. This experience would then be reflected on purposely through journals that noted what individual students found interesting. Following that reflection, the teacher would make conceptual material available about the targeted information in the lesson guiding students gently to the intended learning outcomes. Finally, students would apply some kind of action application based on what they learned. This might take the form of a lake clean up day or informational school presentation, which correlates with a curriculum goal or objective upon which learning activities are planned around the learning cycle. In terms of assessment, students could write an essay about the trip to identify if the intended goal was achieved. Teachers could also use a typical objective assessment. Though experiential learning may be more time and effort intensive, it produces richer, more enduring learning.

As a final point to consider, educators should be aware of the tendency for standards to dictate classroom experiences, or lack thereof, to the point where students are able to master and do well on the test, but will totally forget the content because it is irrelevant to their life and their goals. Agricultural education is at an advantage in that it is so easily experiential, and that strength should not be ignored.

Synthesis: Overlaying Kolb's Experiential Learning Theory on the Agricultural Education Model to form a Comprehensive Agricultural Education Model

Traditionally, educators have identified SAE programs as the primary experiential learning tool in agricultural education (Benson, 1981; Cheek et al., 1994). However, Kolb (1984) asserted that all learning is experiential. Thus, experiential learning plays an integral role in the entire agricultural education model, not just the SAE component. Croom (2008) concluded, "for the [agricultural education] model to be successful to a significant degree, there must be a commitment by all stakeholders to deliver all components collectively" (p. 118). To that end, the Comprehensive Model for Secondary Agricultural Education (see Figure 3) was proposed in order to operationalize the role of experiential learning further in relation to agricultural education. The purpose was not to propose a new model for agricultural education, but rather to enrich the current one. It is the hope of the authors that their work can be additive and useful to secondary agricultural teachers as a means of justifying the nature of their jobs (i.e., teaching in an experiential manner).

At the core of the model is the idea that the experiential learning cycle is embedded in each of the three circles. Drawing on the work of key theorists (Dale, 1946; Etling, 1993; Joplin, 1981; Steinaker and Bell, 1979), Roberts (2006) suggested that experiences occur in unique contextual settings. In order to foster a better understanding and vocabulary around experiential learning in agricultural education, each experience should be defined through four dimensions: the level, the duration, the intended outcome, and the setting (Roberts, 2006). This definition is implied in the Experiential Agricultural Education Model as each component of the model represents experiences in different contexts. For example, a student may be involved in an Introduction to Agriscience class (Instruction) which could be defined as a formal setting, focusing on abstract concepts, over the period of one semester, with the goal of exposure and participation to key agricultural concepts and FFA opportunities. Another student may be involved with their SAE project, in a non–formal setting, more focused on concrete skills, over the course of four years, with the goals of internalization and dissemination around their specific interest and career choices.

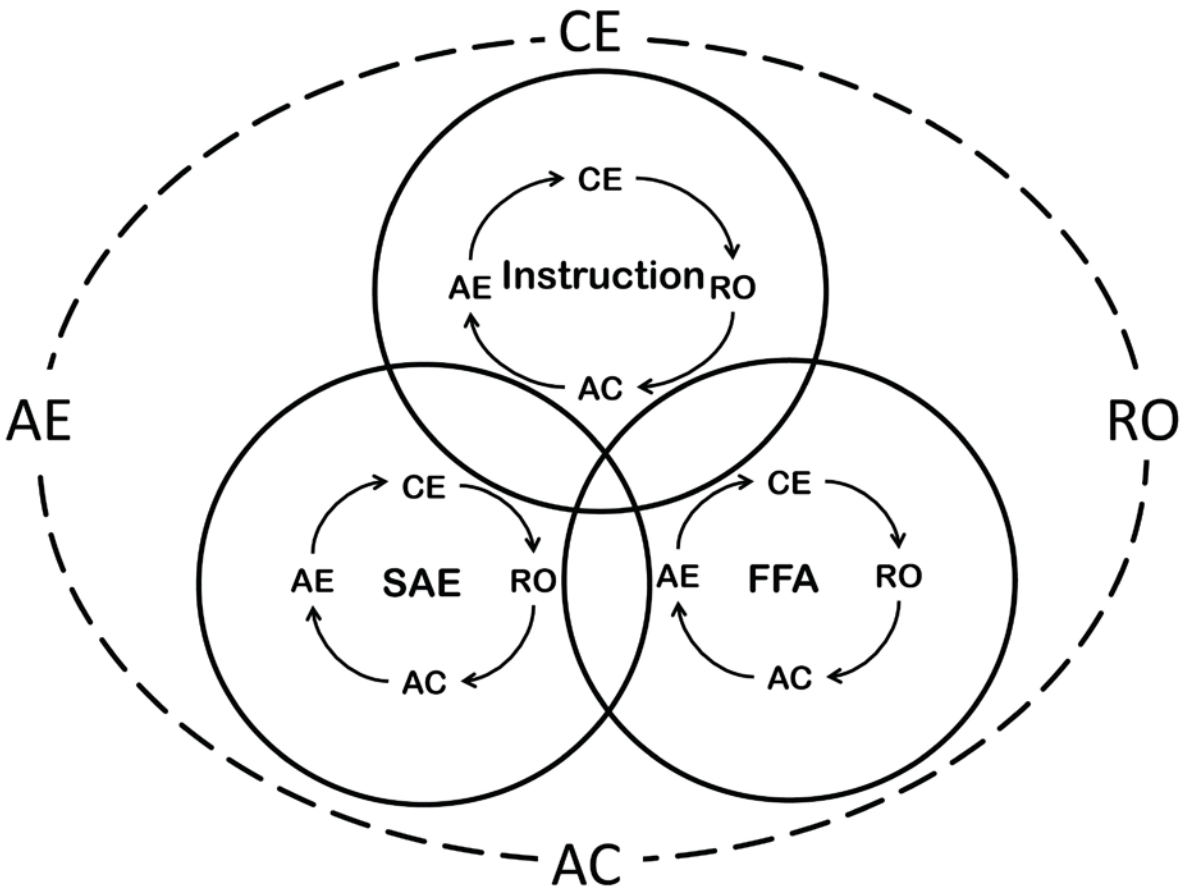

Figure 3. Comprehensive Model for Secondary Agricultural Education

Phipps et al. (2008) suggested three questions that should follow any concrete experience: (a) What happened?, (b) So what do I conclude?, (c) Now what do I do? These questions are fundamental in guiding instruction experientially. As such, students should be provided the opportunity to choose an area of interest, engage in concrete experiences, think about those experiences, build abstract concepts with the aid of their instructor, and utilize the learning as they continue to experiment actively. For example, if a student has chosen to exhibit a steer, he or she must have the opportunity to groom that animal on his or her own. Following that experience, the student should reflect by asking, *What happened?* With help from his or her advisor, the student should then develop abstract concepts about the grooming process, and try it again with the newfound knowledge.

Classroom and laboratory experiences, including guest speakers, research projects, science experiments, greenhouse or school farm work, and group projects provide the impetus for the experiential learning process. Students should reflect on the knowledge provided by their instructor, connect that reflection to abstract academic concepts, and experiment actively with that knowledge in new contexts. Experiential instruction can be directed and standards–focused through the instructor's role as evaluator during the abstract conceptualization phase. As discussed earlier, it does not matter where instruction begins in the cycle so long as students are exposed to all four modes of learning. In order to optimize learning from FFA experiences, students must also pass through each of the learning modes. For example, the National FFA Convention may serve as a powerful, concrete experience. However, it is critical that students reflect on that experience, whether through group discussions, a daily journal, or another method. Those reflections will lead to abstract concepts. Then students experiment actively with their newfound theories through opportunities afforded by their local chapter.

An important component to this model is learning/development *space* as described in Bronfrenbrener's (1977, 1979) work on the ecology of human development. Bronfrenbrener (1977, 1979) defined the ecology of learning/development spaces as a topologically nested arrangement of structures, each contained within the next. A learner's microsystem includes his or her immediate setting, while the macrosystem refers to overarching institutional patterns and values of the wider culture. The proposed model (see Figure 3) contains a student's microsystem, contained within the three inner circles, and macrosystem depicted with a dotted line surrounding the entire three–circle model. The macrosystem, in the proposed model, is not static, but rather is moving constantly as a student progresses through various aspects of agricultural education, and represents the more holistic, long–term experience of agricultural education. This macrosystem growth and development that occurs is depicted in the Growth and Development Model for Secondary Agricultural Education (see Figure 4).

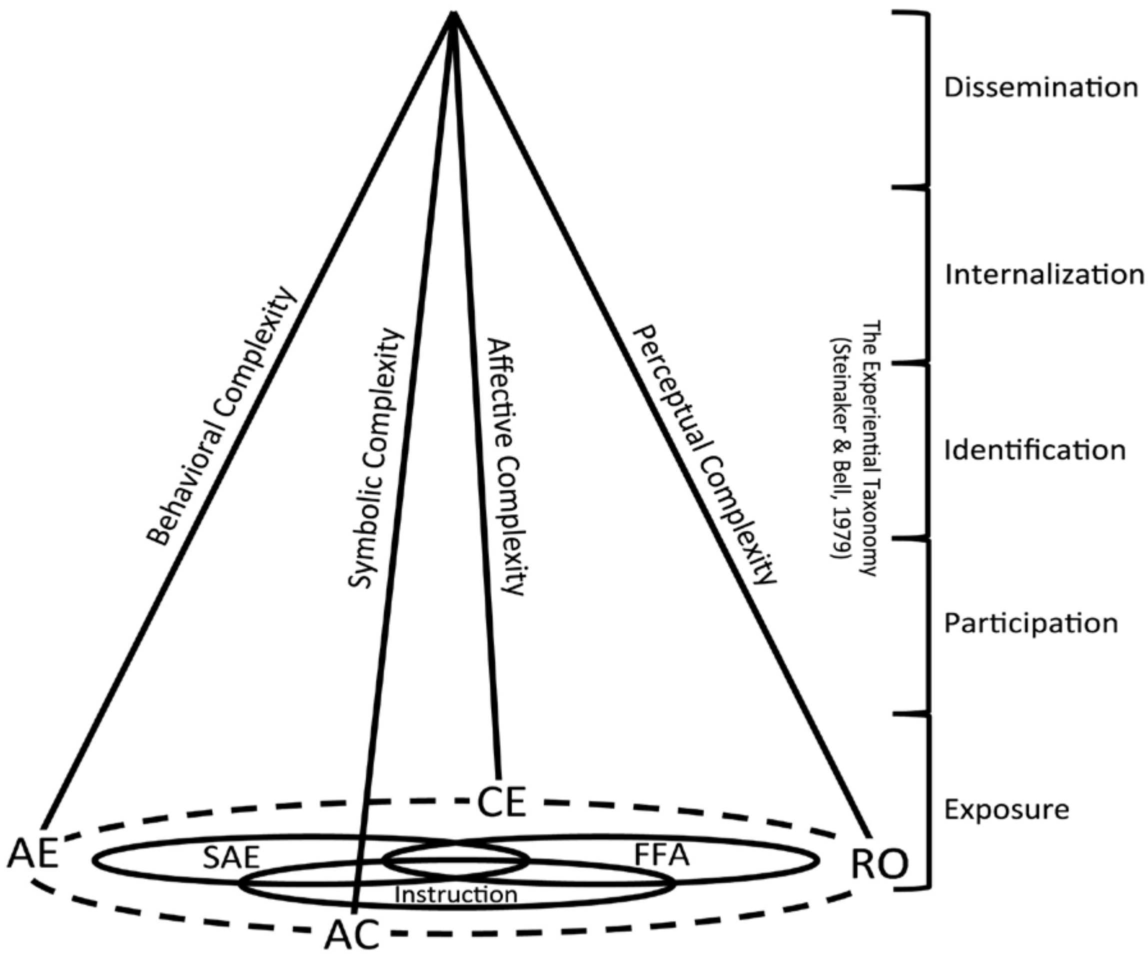

Figure 4. Growth and Development Model for Secondary Agricultural Education

As students participate in the agricultural education program, including classroom instruction, SAE, and FFA experiences, their behavioral, symbolic, affective, and perceptual complexity increases. As students reach the pinnacle of the cone, the four modes of learning become more advanced and complex. This is depicted in the Agricultural Education Growth and Development Model by the juxtaposition of the experiential taxonomy (Steinaker & Bell, 1979) alongside the developmental model indicating that as students progress through the full agricultural education model they should be moving from exposure to dissemination. For example, first–year students are exposed to various opportunities and by the fourth year, dissemination should be evident through students influencing and growing the agricultural education program in their school. Interestingly, the experiential taxonomy proposed by Steinaker and Bell (1979) closely resembles the developmental process derived from Piaget & Inhelder (1969) and embedded in the Experiential Learning Theory of Growth and Development (Kolb, 1984), which was presented earlier (see figure 2). Based on this model, students fully participating in the agricultural education program should move "from a state of embededness, defensiveness, dependence, and reaction to a state of self–actualization, independence, pro–action, and self–direction" (Kolb, 1984, p. 140).

Reflections

Agricultural education is uniquely poised to help students through an effective model of instruction that is experiential by nature. However, simply providing experiences does not constitute learning (Dewey, 1938; Kolb, 1984). As suggested by Roberts (2006), educators must understand ELT fully to effectively operationalize core concepts during instruction. It is imperative that experiences provided in agricultural education, from the livestock exhibition ring to the laboratory activity, and from the state FFA convention to the chapter FFA banquet, include purposeful reflection, gentle guiding toward abstraction, and an opportunity for students to experiment actively with their new found learning. Too often, a myriad of concrete experiences are offered, but valuable meaning is lost due to a lack of purposeful processing. Though this process may take more time and effort, the result constitutes more enduring and relevant learning. To support experiential learning properly, teachers must be present and purposeful with their instruction. Learning outside of the classroom can have value, but teachers must remain focused on the fact that a key tenant of experiential learning is that students are learning, and not just enjoying an experience (Knobloch, 2003; Kolb, 1984). Teachers who desire to implement the learning cycle must be facilitators, experts, evaluators, and coaches. It is important that the instructor begin the experience with the student's interests in mind so students can draw meaning from the experience.

Experiential learning builds meta–cognitive skills (Kolb & Kolb, 2009). As such, an important part of learning should always be learning how to learn, and the KLSI (Kolb & Kolb, 2005c) can support teachers in that process. Students should be provided the opportunity to understand how they learn and the process involved in making meaning of various experiences. Experiences in agricultural education should be goal–oriented and measurable. Today, more than ever, standardized tests and specific standards–based curriculum are the focus of schools. Experiential educators must balance goal–orientation with the "learning space" associated with experiential learning. Educators must be careful to not over structure instruction to the point where concepts become completely irrelevant and are not retained by students. Congruent to this idea, Knobloch (2003) asserted that,

> Agricultural educators who engage students to learn by experience through authentic pedagogy will most likely see the fruits of higher intellectual achievements, not only in classrooms and schools, but more importantly, in their roles as adults as contributing citizens of society. (p. 32)

Praxis

The following recommendations for practice are made:

1. Professional development should be offered to ensure that agricultural educators are able to process experiences better in each of the three components of the agricultural education model (i.e. classroom/laboratory instruction, SAE, and FFA).
2. Teacher preparation programs should utilize the Comprehensive Model for Secondary Agricultural Education proposed in this study to emphasize the role of experiential learning in all aspects of agricultural education more intentionally.
3. Teacher preparation programs should prepare teachers to serve as coaches, facilitators, subject experts, and standard setters while teaching experientially in both formal and non–formal settings.
4. Pre–service agricultural education programs should integrate the KLSI into the curriculum to build an awareness of students' preferred learning styles.
5. Secondary agricultural education instructors should clearly define the context in which various experiences occur in order to better plan, deliver, and assess learning.
6. Secondary agricultural education instructors should assist students in developing meta–level skills such as planning, goal setting, persistence and self–direction to increase their meta–level skills per the LSP.

7. Agricultural education programs should utilize the Growth and Development Model for Secondary Agricultural Education to conceptually design and plan experiences allowing students to progress through the experiential taxonomy.
8. Assessments should be developed to equip agricultural educators better in evaluating student experiences objectively (i.e. rubrics for reflection and authentic and performance–based assessments).

Recommendations for Future Research

Though there is enthusiasm for experiential learning, a paucity of research exists demonstrating the effects of experiential learning methods on learning in secondary education, including agricultural education. Experimental studies should be conducted to determine the effect experiential learning techniques (i.e. moving students through the four modes of learning in a recursive spiral) have on students' learning and retention. Future research should compare students who encounter a series of experiences in agricultural education to those who learn the same concepts in a lecture–based format. Retention of knowledge should be measured to determine the long–term impacts of experiential learning on student memory. Another important question to be investigated is to what extent are meta–level skills learned across the three components of the agricultural education model? The answers to this question hold implications for the value of agricultural education writ large. Which part of the comprehensive model is most impactful to students in regard to learning and acquiring important meta–level skills? Finally, investigating various strategies of reflection and abstraction would provide evidence informing teachers how to *gently guide* students through experiences most effectively.

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