

# **The Potential of Experiential Learning Models and Practices In Career and Technical Education & Career and Technical Teacher Education**

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## **ABSTRACT**

*Since inception, career and technical education programs have embraced experiential learning as a true learning methodology for students to obtain occupational skills valued by employers. Programs have integrated classroom instruction with laboratory experiences to provide students a significant opportunity to learn. However, it is questionable as to the level of authentic experiential learning instructional practices that are actually taking place. This paper explores the tenets of experiential learning and considers the application of true experiential learning pedagogy into secondary career and technical programs along with teacher education programs in career and technical education. If the concept of experiential learning instructional pedagogy is to provide an authentic context in which students can benefit from it, educators should expand their knowledge of implementing experiential learning into their programs. Additionally, career and technical education teacher educators may enhance their programs by providing instruction to pre-service teachers in authentic experiential learning pedagogy.*

## **Introduction**

Experiential learning has been a major component of career and technical education for many years; however implementation of experiential learning in career and technical education often differs from the research based theoretical framework of true experiential learning. Additionally, some career and technical teacher education programs often invoke the term experiential learning in working with students in teacher preparation programs when research models of experiential learning may not completely guide their pedagogy. Knobloch (2003) raised the question or point that many educators are familiar with “hands-on” learning but questions this approach to teaching as actually constituting the principles of experiential learning. This article will explore experiential learning theory and view those theories from two perspectives: a) a secondary career and technical education teacher education perspective, and b) a secondary career and technical education perspective. This article will also address the potential for contemporary career and technical teacher education and secondary career and technical education to accurately apply these theories of experiential learning in formal and informal educational settings.

## **Experiential Learning Theory**

Over the years, the topic of learning has been examined extensively and has received considerable attention in educational and neurological areas. For example in 2000, The National Research Council published *How People Learn: Brain, Mind, Experience, and School*. This publication addresses such pertinent education pedagogical topics as how experts differ from

novices, learning and transfer of knowledge, mind and brain, effectively designing learning environments, and effective teaching and learning. The concept of learning taxonomies have been studied and implemented into classroom – especially Bloom’s Taxonomy of Cognition (Bloom, Engelhart, Furst, Hill, & Krathwohl (1956). Similarly, many educational research studies have been focused on the theoretical underpinnings of experiential learning, especially Kolb’s research on experiential learning theory published in 1984. The term experiential learning is a broad term, generally used by educators to describe a series of pragmatic activities sequenced in such a way that it is thought to enhance the educational experience for the student learner. However, in reality, literature related to this topic has revealed that scholars in the field of experiential learning have used this term in two dichotomous but significantly related contexts (Smith, 2001; Brookfield, 1983). For this reason it may be difficult to fully understand the topic of experiential learning without examining its diverse contexts.

The first context of experiential learning as Smith (2001) described it is the “sort of learning undertaken by students who are given a chance to acquire and apply knowledge, skills and feelings in an immediate and relevant setting” (p. 1). This type of experiential learning could naturally align with a contemporary career and technical education and/or agricultural education program, which prepare students for advanced level occupations in the workplace or post-secondary education. Another example might be a workforce education development program with a specific focus on occupationally oriented pragmatic activities where a predetermined level of accuracy is desired. Whatever the educational setting, the important point to remember with this first concept of experiential learning is that it involves a direct experiential encounter with the learning event rather than simply a thought process associated with the learning (Borzak, 1981) (see Figure 1).

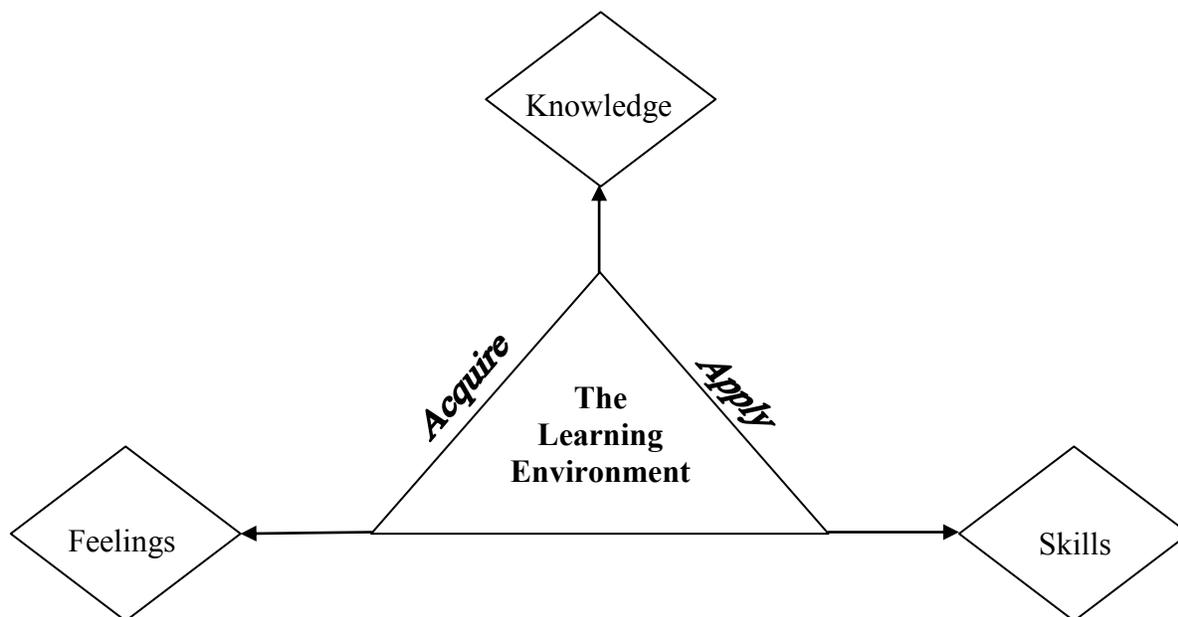


Figure 1 Experiential learning via a direct educational encounter (Borzak, 1981).

This direct experiential encounter with a learning event requires active engagement of the student as opposed to passive engagement commonly associated with teacher directed instruction that generally results in minimal student interaction in the learning process.

The second context of experiential learning described in the literature addresses students' reflection on direct participation and direct encounters within the events of everyday life (Houle, 1980). This concept of experiential learning presents itself in a less structured format and in some respect aligns with the term "life-long-learning" (see Figure 2). As Smith (2001) noted, this form of experiential learning "is not sponsored by some formal educational institutions, but by people themselves" (p. 1). It represents the idea of learning new things based on the innate variations of life-experiences one attains each day. However there are some structured teaching strategies and activities that call upon this form of experiential learning, which include learning logs/journals and concept mapping to name a few.



*Figure 2* Experiential Learning Throughout Life (Houle 1980)

### **Experiential Learning Theory and Teacher Education in Career and Technical Education**

While both of these concepts of experiential learning revealed by the literature are of great importance, the direct educational encounter (i.e., Figure 1) found within David Kolb's work (Experiential Learning Theory) perhaps has the greatest potential within a career and technical educational setting and the potential to enhance the teacher education process. Experiential Learning Theory (ELT) has steadily gained acceptance and popularity in education and serves as an invaluable resource for teaching and learning (Kolb & Kolb, 2006). Kolb draws upon the works of Dewey, who stressed the role of experience in the learning process (Rudowski, 1996). Thus, Kolb's experiential learning model is grounded in the theoretical framework of personal experience (Ausburn & Brown, 2006). Consequently, Kolb's ELT is built on six propositions (Kolb & Kolb, 2005) which are as follows:

- (a) Learning is best conceived as a process, not in terms of outcomes. To improve learning in higher education, the primary focus should be on engaging students in a process that best enhances their learning a process that includes feedback on the effectiveness of their learning efforts.
- (b) All learning is relearning. Learning is best

facilitated by a process that draws out the students' beliefs and ideas about a topic so that they can be examined, tested, and integrated with new, more refined ideas. (c) Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. Conflict, differences, and disagreement are what drive the learning process. In the process of learning one is called upon to move back and forth between opposing modes of reflection and action and feeling and thinking. (d) Learning is a holistic process of adaptation to the world and not just the result of cognition. Learning involves the integrated functioning of the total person thinking, feeling, perceiving, and behaving. (e) Learning results from synergetic transactions between the person and the environment. (f) Learning is the process of creating knowledge. (p. 194).

Kolb's ELT model identifies four modes of grasping experience. These modes are Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation modes. These four modes are also represented in Kolb's experiential learning cycle. While practicing career and technical teachers and/or teacher educators who employ Kolb's model in their instructional design might have a preference for which of the four modes to introduce students to first, Kolb and Fry (1975) asserted that the learning process can begin for students at any one of the four modes and should be viewed as a continuous cycle (see Figure 3).

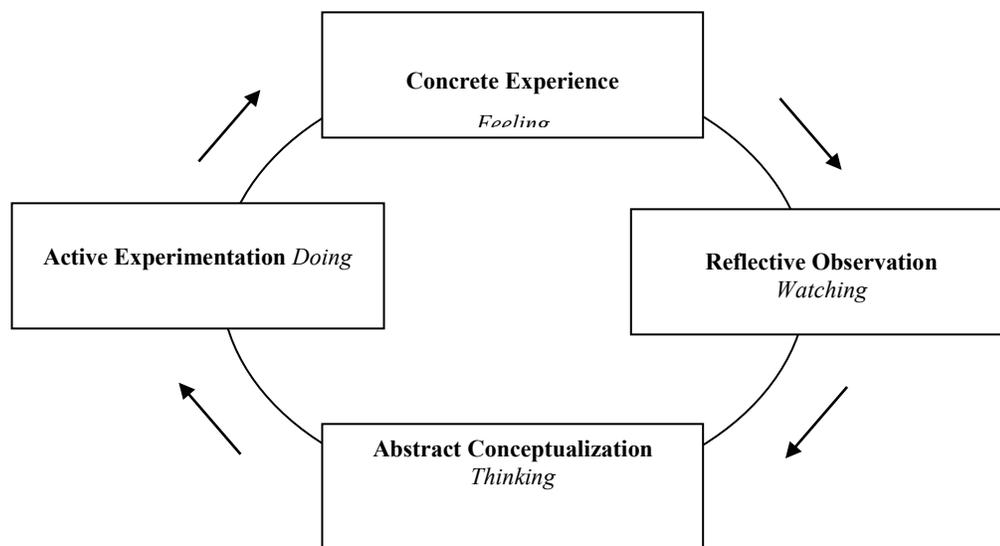


Figure 3 The four modes of Kolb's Experiential Learning Cycle. (Kolb and Fry 1975)

While Kolb and Fry state that the learning process can begin at any one of the four modes within the cycle, Smith (2001) states that:

The learning process often begins with a person carrying out a particular action and then seeing the effect of the action in this situation. Following this, the second step is to understand effects in the particular instance so that if the same action was taken in the same circumstances it would be possible to anticipate what would follow from the action. In this pattern the third step would be to understand

the general principle (or conceptual framework) under which the particular instance falls. (p. 4)

In their unique formal educational settings, the individual career and technical educator and/or teacher educator who implements experiential learning theory models in their pedagogy might often use their best professional judgment given the situation on how to cycle through the four modes of experiential learning in ways that best promote student learning. The transfer of learning via experience is of the greatest importance with this model. This perspective on learning transfer is supported by the findings of the National Research Council (2000). The authors emphasize that organizing information into a conceptual framework allows for greater transfer because it allows the student to apply what was learned in new situations and to learn related information more quickly. As the learning concepts are reinforced, the learner will transfer the learning beyond the formal education setting into other elements of life including work and post-secondary educational experiences.

#### Experiential Learning and Intelligence Styles

To improve the likelihood of increased student achievement through more focused pedagogical practices, educational researchers have searched for strategies and techniques to enhance students' educational experience in both formal and non-formal educational environments. The strategies have implications for the Experiential Learning Theory. One method involves "adapting and adopting" teaching strategies and techniques to align with the learning style or intelligence of the student. This technique stems from the belief that there is not a "one-size fits all" approach to teaching and or learning. Several scholars (Hartel, 1995; Jonassen, 1981) have identified that an educator's teaching style is often determined by his or her own learning style rather than on the learning style of the pupil. While findings such as these could be considered alarming, Whittington and Raven (1995) maintained that teaching styles can be altered with conscious effort. This assertion offers encouragement in that teachers who are self-aware with meta-cognitive skills can understand the impact of their learning style on their pedagogical strategies may be able to alter their methods consciously to better teach others with different learning styles. In fact, the ability to understand that meta-cognition often takes the form as an internal dialogue with one's self can be helpful in experiential learning instruction because it affirms the need for the learner to monitor his or her own learning throughout the experiential learning process (National Research Council, 2000).

#### Kolb's Learning Styles

One such example of adapting and adopting strategies includes Kolb's learning styles (in addition to the six propositions of ELT) found within the ELT (2005), which identified two dialectically related modes of grasping experience: Concrete Experience (CE) and Abstract Conceptualization (AC) and two dialectically modes of transforming experience: Reflective Observation (RO), Active Experimentation (AE) (a.k.a., experiential learning cycle). Thus, based on the preferences for one of the polar opposites of each of the aforementioned modes four learning styles become readily apparent (Evans, Forney, & Guido-Dibrito, 1998). Kolb's learning styles are briefly defined as follows:

- (a) Converging - Abstract Conceptualization and Abstract Experimentation are dominant learning style abilities. Learners that prefer this style tend to excel at finding pragmatic mythologies of working with ideas and theories and are inclined to be good at problem solving and technical tasks,
- (b) Diverging - Concrete Experience and Reflective Observation are dominant learning style abilities. Learners that prefer this style tend to perform well in situations that call for generation of ideas (brainstorming)
- (c) Assimilating - Abstract Conceptualization and Reflective Observation are dominant learning style abilities. Learners that prefer this style tend to excel at understanding and organizing a range of information and would often times rather work with concepts than people, and
- (d) Accommodating - Concrete Experimentation and Abstract Experimentation are dominant learning style abilities. Learners that prefer this style tend to excel at hands on learning activities and enjoy completing new experiences and complex tasks (Kolb & Kolb, 2005).

Kolb's Experiential Learning Theory uses an instrument known as the Learning Style Inventory (LSI) to assess individual learning style. The LSI is set up in a simple format, which usually provides an interesting self-examination from the learner being assessed, and also provides discussion that identifies valuable information regarding the individual's approaches to learning (Kolb & Kolb, 2005). Smith and Kolb (1986) identified the reliability Cronbach alpha coefficients of the LSI as ranging from .73 to .88. Watson and Bruckner (as cited in Evans, Forney, & Guido-Dibrito, 1998) found the reliability Cronbach alpha coefficients of the LSI ranged from .76 to .85. While the LSI appears to be a reliable assessment tool yielding internally consistent scores, Kolb (1976) has suggested the best measure of his instrument is not reliability but rather construct validity. As an example, Ferrell (1983) conducted a factor-analytic comparison of four learning style instruments and determined a match was present between the factors and learning style on the original LSI contributing to construct validity. Furthermore, Evans et al (1998) noted construct and concurrent validity of the LSI have received several endorsements. Educators can use student learning styles information obtained from an LSI to adopt and adapt instructional strategies to enhance the educational experience for the student learner within a formal or non-formal educational setting that is tailored to his or her preferred style of learning.

## **Experiential Learning and Career and Technical Education**

According to Scott and Sarkees-Wircenski (2008), career and technical education (CTE) serves the purpose of providing learning experiences that help student explore career areas and prepare for employment and independent living. The authors further state that CTE curricula include a focus on the development of foundational skills, such as basic skills, thinking skills, and personal qualities, as well as a common core of workplace competencies and the specific skill competencies required for each occupational area. Additionally, Scott and Sarkees-Wircenski assert that CTE programs utilize situations in the classrooms and laboratories as well as supervised work experiences, which take place in actual worksites. These situations are tailored to represent the environment that the student might expect to encounter in the workplace. For example, an automotive technology CTE program must have an appropriate laboratory large

enough for diagnostic and repair equipment along with lifts and space for multiple vehicles simultaneously. CTE instruction consists of classroom teaching, laboratory applications, and supervised work experience along with career and technical student organization activities. Students learn concepts or theories in the classroom and form the basis for other types of work experiences including supervised instruction in the laboratory, which is characterized by problem-solving and “hands-on” experiences in application of the theory knowledge learned. This is often referred to by educators as the use of authentic experiential learning in a career and technical education setting. Additional real-life experiences are offered by performing specific skills and gaining employment experience at an on-the-job location in the industry for which the program provides learners career and technical education.

Scott and Sarkees-Wircenski (2008) emphasize that most career and technical education programs are real-life in nature and should be experiential with students writing about what they learned, how they applied it and how they can become a better employee. Kolb and Kolb (2005) experiential learning theory also aligns with Scott and Sarkees-Wircenski in that experiential learning and real life learning are mutually supportive. While the nature of CTE programs is similar throughout the country, the inclusion of experiential learning techniques throughout a students’ learning experience can provide significant benefit according to Kolb and Kolb (2005).

Many career and technical educators endorse the application of theoretical knowledge in a lab or career and technical setting as representing an experiential base that provides students with diverse learning opportunities and experiences. Doolittle and Camp (1999), state that experiential learning aligns with constructivism which posits that learners construct meaning from their experiences. In related findings, Phipps and Osborne (1988) support the experiential focus on secondary agricultural education as being a long standing creed to the profession by stating that the emphasis is on learning by doing. Phipps and Osborne further state that the emphasis on experience is apparent in the attention given to laboratory work, field trips, problem solving, and supervised occupational (agricultural) experience programs. In agricultural education and other CTE programs, students acquire the theoretical knowledge in a classroom and subsequently apply that knowledge to a known situation that calls upon the recently learned knowledge to perform a series of tasks in an occupational-like setting that authentically relates to the real occupational setting. This process is often embraced as the implementation of research-based experiential learning. While these processes constitute components of experiential learning, the partial application of theoretical experiential learning principles to contextual occupational situations does not embrace the fullest extent of experiential learning.

### **Experiential Learning in Authentic Contexts**

Knobloch (2003) stated that learning experientially in authentic contexts has been a foundational model of teaching and learning in agricultural education. Learning experientially in authentic contexts also occurs in other areas of career and technical education such as automotive technology and construction technology. Knobloch also stated that reform models for education have called for models of teaching and learning that alter the role of the instructor from actually delivering knowledge to being a facilitator of knowledge. These reform models of knowledge facilitation also correlate with the four mode cycle of experiential learning described by Kolb.

While there is some debate over the linkage between experiential learning and authentic learning, it is clear that students learn through real life experiences and experience shapes a person's capacity to bundle or chunk knowledge from past experiences to shape future experiences (Buriak, McNurlen & Harper, 1996). Knobloch also made the point that many educators are familiar with "hands-on" or applied learning but questions whether or not this approach to teaching encompasses the constituting the principles of experiential learning. Additionally, multiple career and technical student organizations express their commitment to the benefits of learning through experience via many activities of a truncated version of authentic experiential learning; however, it is questionable as to the level of experiential learning that is taking place. Many of those learning activities are mostly application or activity based without alignment to a theoretical model of experiential education such as Kolb's four modalities which is detailed previously in this article. For example, career development events in career and technical student organizations provide challenging activities for students and are often labeled as authentic experiential learning activities, yet important areas (such as reflection on learning) are not part of the expectations for students. One theory is that while teacher education program graduates use what they consider experiential learning pedagogical elements in their teaching, it is possible that their actual knowledge of experiential learning theory is limited. As Roberts (2006) stated the theory behind the practice of experiential learning has had limited attention in agricultural education literature which suggests that it may be limited in authentic use in secondary agricultural education and other career and technical education programs. This may also hold true for broader career and technical education as well; especially in following the existing model of career and technical education as described by Scott and Sarkees-Wircenski (2008). To offer a more thorough perspective on experiential learning and its authentic role in career and technical education, we must an examination must be made of how experiential learning is a component of teacher education programs and investigate how the models of experiential learning are used in career and technical education settings.

### **Experiential Learning and Secondary Career and Technical Education**

A further review of the literature examines experiential learning in the areas of career and technical teacher education and career and technical secondary education. The literature suggests the importance of experiential learning in secondary students' success; thus, the inclusion of experiential learning instruction in teacher education programs should be considered vital to preparing teachers in career and technical education fields. While various models of authentic experiential learning were proposed, Kolb's four-modality model (1984) was most prevalent in the review of the literature. Possibly the most concerning part of the literature review was that multiple studies reported using experiential learning as a foundation for the teaching process or research study, when in reality, most of the research studies lacked, or failed to report, information beyond the "hands-on" experience which is often portrayed as being experiential learning. This is especially true at the secondary career and technical education level.

Literature related to experiential learning demonstrated the importance of a concrete experience as a crucial component of experiential learning. However, the process of experiential learning is more than just the experience (Roberts, 2006). Roberts also examined experiential learning in agricultural education and found that experiential learning, or components of the experiential learning process, was researched and discussed. However, the theory of experiential

learning was not explored deeply in the agricultural education literature. A model, based on the context of the learning, was developed to aid educators in defining learning activities in a systematic manner. The current literature review indicated that a minimum of three steps were required for experiential learning to be considered “complete”.

To further explore the evolution of experiential learning, a review of John Dewey’s work in the field is appropriate. Dewey (1938) theorized that the basic element required for learning was experience. However, Dewey also believed that reflection was a key component in making an experience worthwhile; thus, Dewey believed that experience and reflection were both required for an experience to lead to true learning for future application. In other words, without reflection by the learner on the experience, the learning was not truly experiential. Kolb’s research into experiential learning supports Dewey’s view. Kolb’s (1984) model of experiential learning included four modes as part of the learning cycle; Enfield, Schmitt-McQuitty, and Smith (2007) cited a five-step model as being used in much of the current 4-H curriculum. Other models (Dewey, 1938; Juch, 1983) of experiential learning have been presented, or theorized in the past. Each model of experiential learning includes some form of experience, reflection, and application. Most importantly each theoretical model of the experiential learning cycle does not “stop” at the experience which is often characterized by the application of theoretical knowledge learned in a formal educational setting. When learning stops at the experience, it limits the learner’s capacity to reflect on the experience and to acquire a deeper understanding from it.

While there is variation among experiential learning models commonalities also exist between them in that each includes some form of experience, reflection, and application. The student teaching experience, as an example, can be seen as both experience and application depending on the view which one takes at any point in time during the student teaching process. Student teaching could be the application of what was learned in the pre-service coursework. It could also be viewed as another actual experience that should be reflected upon, and learning from that experience, and subsequent reflection, should be applied to future teaching situations. For the cycle of experiential learning to be unbroken, between experience and future application, a learner needs a valid context in which to reflect upon what has happened in the experience. If the reflection component is omitted, then students are not engaging in theory-based experiential learning and are being denied the opportunity for greater learning through experience. For example, athletic coaches in sports such as football and basketball routinely use film of previous contests to reflect on the performance of the team with and without the team present. The coach will use “film study” to reflect or critique his or her own performance as a coach along with reflecting on the team’s performance in a film session with the team or with specific team members. In this situation, the learning is consistently experiential since Kolb’s four modes are present in the coaching aspect with an emphasis on reflection following each practice or contest.

Problem based learning, which has been embraced in the career and technical education field, is also directly related to experiential learning. Agricultural educators at the secondary and post-secondary levels have long been advocates of Problem Based Learning, which uses problems to lead the learning experience (Retallick & Miller, 2005). Boone (1990) examined student achievement and retention of knowledge based on the use of the problem solving approach to teaching. Boone found that students who were taught through the problem solving approach retained the content better than those taught using the subject matter approach. Dyer and Osborne (1996) compared the problem solving approach and the subject matter approach to

teaching to determine the effectiveness of each based on the student's learning style. Dyer and Osborne found that regardless of the student learning style, measured using the Group Embedded Figures Test (GEFT) (Witkin, Oltman, Raskin, & Karp, 1971), agricultural education students were better able to solve problems when the problem solving approach was used, rather than the subject matter approach of lecture and information transmission from teacher to student. In other words, the researchers found that teaching problem solving with a problem solving pedagogy yielded substantial benefit to student learning. Flowers and Osborne (1988) also examined the problem solving and subject matter approaches to teaching and the impact of each approach on student achievement and retention. Findings indicated that level of achievement did not vary based on teaching approach; however, the students taught using the problem solving approach did retain information better than those taught by the subject matter approach. Consequently, students in this case displayed a preference for the problem solving approach as evidenced by their ability to retain information better. Trede and Whitaker (2000) examined educational needs of beginning farmer education and found that participants wanted education that was based on experiences, problem solving, and hands-on activity.

Other researchers in agricultural education (Parr & Edwards, 2004) have begun to explore inquiry based learning, which is similar to problem based learning except the learner is not given a "problem", but rather finds the "problem" on his or her own (Retallick & Miller, 2005). Mowen and Harder (2005) suggested that experiential learning should be incorporated into existing units of instruction. Mowen and Harder also believed that while experiential learning may require more time for planning and implementation, the benefits of actively engaging students in the learning outweigh the negatives. Less content may be covered when using experiential learning compared to a more "traditional" teaching approach such as lecture or discussion, but students may gain a deeper understanding of the material at hand; thus, the learning may be more than illusory (Shulman, 2000). This view of less content but deeper understanding is supported by the National Research Council's findings in *How People Learn* from 2000. In one of the three implications for teaching based on the research described in the book, the authors state that teachers must teach subject matter in depth, providing many examples in which the same concept is at work and providing a firm foundation for factual knowledge. The authors further state that:

Superficial coverage of all topics in a subject area must be replaced with in-depth coverage of fewer topics that allows key concepts in that discipline to be understood. Teachers must come to teaching with the experience of in-depth study in the subject area themselves and he or she must be familiar with the relationship between information and the concepts that help organize information in the discipline (p.20).

In support of the need for experience in learning, Esters and Bowen (2004) found that urban agriculture students' choice of career was impacted, at least partially, by the opportunity to participate in a learning experience related to various careers. Andreasen (2004) stated that the Problem Solving Approach to learning is very similar to Kolb's (1984) model of experiential learning. Experiential learning is an important part of agricultural education and Andreasen believed that capstone courses were an opportunity to bring connection of previous learning together through experiences.

Experiential learning must include but not be limited to the experience of “hands-on learning” in career and technical education. An examination of the National FFA Organization and the National 4-H reveals agricultural education’s commitment to “hands on learning.” “Learn by doing” and the FFA motto of; “Learning to Do, Doing to Learn, Earning to Live, Living to Serve” are clear indicators of both organizations’ belief in hands-on experiences. Agricultural education and the National FFA Organization encourage what they deem to be experiential learning through the use of FFA activities, laboratories, field trips and Supervised Agricultural Experiences (SAE) (Arrington & Hoover, 1994). However, do these youth organizations truly embrace a research based theory of experiential learning to the fullest? Do they give students the best possible opportunity to learn and demonstrate their learning in this way?

Croom (1991) and Spiess (1992) both discuss experiential learning and its connection to SAE. Richardson (1994) discussed the importance of preparing Agricultural Extension programming that promoted experiential activities, which are defined as “doing” activities. Danneberger (1994) described using class projects as a way to give students the opportunity to gain knowledge and experience that will be needed in the future, mainly for future employment. However, the definition of experiential learning in these articles, and many others in agricultural education prior to 2001, seem to indicate that having an “experience”, and possibly application of the experience, was considered experiential learning. While the components of reflection and application may be implied in the articles, there seems to be little indication of the critical components of experiential learning theory in many studies or reports describing experiential learning in agricultural education.

As a youth educational organization external to formal schooling yet aligned closely with education about agriculture, 4-H offers an interesting perspective on learning by experience. Educational evidence in 4-H includes a focus of training and evaluation in experiential learning (Diem, 2001; Enfield, Schmitt-McQuitty, & Smith, 2007). Enfield, Schmitt-McQuitty, and Smith (2007) stated that 4-H has used experiential learning for decades and that the most commonly used model in 4-H is based upon the work of Kolb (1984) and Pfeiffer and Jones (1985). Enfield, Schmitt-McQuitty, and Smith developed and evaluated experiential learning workshops for 4-H volunteers. The findings indicated that participants were able to gain new knowledge of experiential learning cycle, as well as apply the new knowledge in their own program. Enfield, Schmitt-McQuitty, and Smith concluded that through experiential learning opportunities 4-H members would truly learn the content. Hansen (2000) questioned whether some students have difficulty learning because these students are better able to learn through action compared to abstract learning (which may be the privileged pedagogical strategy in more formal educational settings in and out of career and technical education). Hansen believed that an experiential learning curriculum could provide relevance to the current curriculum in technology education. During a time when there is a call for increased accountability, a curriculum that is able to help all learners is crucial.

Davis, Trexler, and Haynes (2003) examined student comfort with experiential learning in a post-secondary agriculture course and found that student learning style did not impact student comfort in the course, which used experiential learning as the course structure. The

authors concluded that students were able to maximize their preferred learning style, and minimize their learning weaknesses, because of the experiential learning model employed. Specht and Sandlin (1991) found that students taught using experiential activities retained concepts better over time compared to students taught using the traditional lecture method. The study used activities that were similar to those that would occur in the "real world". Another advantage that experiential learning provided in the study was the students' opportunity to work in groups through a collaborative learning setting.

Knobloch (2003) concluded that teachers and teacher educators of agriculture should base instruction on an experiential learning model based on philosophies of Dewey, Knapp, Stimson, and Lancelot. Each of these educational philosophers believed that experience was critical to learning. Even today, within agricultural education, many opportunities for student learning are based on the student participating in an experience. These experiences may come through classroom or laboratory instruction, through FFA and its many career development and leadership activities, or through Supervised Agricultural Experience programs. However, Knobloch questioned, as did Dewey (1938), whether just "experiencing" something was going to lead to learning. More specifically, Knobloch questioned whether "hands-on" learning, as it is often referred to in agricultural education, equates to experiential learning. Knobloch stated that agriculture teachers need to move beyond the "doing" and work towards connection, and retention, of knowledge and skills that can be used in future situations, rather than just making it fun for the students. Cano (2005) believed that, "David Kolb developed the most established model of experiential learning" (p. 2). Cano reinforced the importance of allowing students to become active in their learning through the use of experiential learning. Kolb's four modes of experiential learning (Concrete Experience, Abstract Conceptualization, Reflective Observation, and Active Experimentation) may have special relevance here in that without each of the four modes, true or authentically based experiential learning is weakened with possible negative consequences for student learning.

Kolb's (1984) model of experiential learning allows students to learn the course content in the way that best suits their learning style. The four-component model allows students to learn through experience (concrete experience), reflection (reflective observation), application (active experimentation), and abstraction (abstract conceptualization). Depending on an individual student's learning style, he or she may learn the course content better at a different point in the experiential learning cycle as described previously in the article.

## **Conclusions and Recommendations**

In research on experiential learning several themes can be observed after reviewing the literature. First, experiential learning can take place through a direct educational encounter or via the everyday events of life. Second, Kolb's work (Experiential Learning Theory) appears to have the greatest potential within an educational setting and ability to enhance the teacher education process. Third, and finally, the transfer of learning based on characteristics of the individual (including, but not limited to learning style and intelligence) are of great importance within experiential learning.

Much of what has been written in terms of experiential learning in the career and technical education of agriculture has been focused on the experience itself, rather than the “complete” cycle of experiential learning. The experience has mostly referred to the hands-on application of learning. Whether the cycle is made up of three, four, or even five components, the cycle contains more than just an experience or completing a hands-on task. To complete the cycle reflection is needed on the experience, as well as application according to most models of experiential learning. Teacher education programs, especially in career and technical education and agricultural education, should continue or begin to, include instruction on the entire process of experiential learning not just the importance of a hands on concrete experience. Teacher educators should also be made aware that experiential learning is a process and not just simply providing learners with the opportunity to take part in an activity. There must be, at a minimum according to the literature, reflection, and opportunity for the student to transfer the learning (application). Missing one or more of the steps in the process could put some learners at a disadvantage, according to Kolb’s (1984) research on experiential learning and student learning styles. It could also deny students the opportunity to experience the content through their own preferred learning style as opposed to an instructor preferred or endorsed method of instruction that may or may not address learning styles. Researchers in agricultural education have conducted multiple studies on student learning styles, mostly through the use of the GEFT. While this measure is valid and reliable, further research on student learning styles in career and technical education could use Kolb’s model of experiential learning to explore student’s learning styles and the impact of experiential learning on those students.

Additionally, further research into how experiential learning is aligned with other learning research will provide the profession a better understanding of why experiential learning offers a sound opportunity to improve student retention and provide students with richer experiences. Research into how people learn based on the mind, brain, and experience and the relationship to acquiring career and technical education knowledge could also offer direction towards providing more appropriate or better designed learning environments inclusive of research based models of authentic experiential learning.

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