

# **IMPACTS AND BENEFITS OF A COLLEGE WIDE-LEARNING AND WORK EXPERIENCE PROGRAM**

Charles Steiner, Iowa State University  
Michael Retallick, Iowa State University

## **Abstract**

The Science With Practice(SWP) program links student learning outcomes and College of Agriculture employment experiences by providing experiential learning opportunities on university research laboratories, farms, greenhouses, and other units while meeting the employment needs of the faculty and staff. The purpose of this study was to determine the impacts and benefits of SWP program as perceived by the faculty and student participants. A web-based survey developed and implemented by the researchers was used to elicit responses that would aid in documenting the impact and benefits of the program. In an effort to gain a more in-depth, holistic picture of the impact of the program, open-ended questions were developed in addition to closed-ended questions. The findings of the study revealed a successful program that achieved the expected learning outcomes for both students and faculty mentors. SWP provides an example of experientially based learning within the context of adult learning theory. Faculty mentors and students in the program witnessed improvements in critical life skills, improved communication, and increased preparation for future careers.

## **Introduction**

“We won’t meet the needs for more and better higher education until professors become designers of learning experiences and not teachers” Spence, 2001 (as cited in Fink, 2003, p. 1). “The basic problem is that, although faculty members want their students to achieve higher kinds of learning, they continue to use a form of teaching that is not effective at promoting such learning” (Fink, 2003, p. 3).

The process of improving and expanding undergraduate education opportunities exists at colleges and universities around the country. One of the five priority areas in the universities strategic plan is to strengthen undergraduate, graduate, and professional education to enhance student success at the university and beyond. This educational priority includes improved rigor, challenge and international reputation of academic programs. Strengthening students’ critical thinking, creative abilities, and communication skills are also educational priorities under our new strategic plan. Increased interdisciplinary and experiential learning opportunities are other critical goals under this plan.

The Science With Practice (SWP) program was specifically designed to meet the priorities and goals listed in the universities strategic plan. Budgetary issues and the ensuing loss of resources, including faculty, have stretched academic programs and departments thin. At the same time, student tuition costs continue to rise and the availability of financial resources are limited to students. SWP also assists by increasing student work opportunities and helps faculty and students defray costs through Agricultural Endowment funding that supports the undergraduate wages of SWP participants.

The purpose of SWP is to provide opportunities for students in agriculture to learn while working with faculty and staff in university research laboratories, farms, greenhouses, and other units through a planned education and work experience program. The program helps students defray some college expenses and gives students the opportunity to earn academic credit. SWP is a program designed to facilitate learning through a planned learning and work experience. This experience is tied to a university research project or program that involves gathering information, communicating with their faculty mentor and through written and oral requirements where the academic credits are earned.

The student learning outcomes for the SWP program include: acquiring technical agricultural skills; developing organizational and planning skills related to research and other experiences; developing skills related to data collection, research procedures, written and oral communication, human resources management, teaching and critical analysis of data. Increased understanding of research activities, linkages to higher level course work, and gaining an understanding of the connection between research and practical, real world situations/problems are also learning outcomes of SWP.

The SWP program has several requirements for earning the academic credit that go beyond the typical student work experience. Students and their faculty mentors work together to develop a learning agreement outlining that purpose, goals and expectations of the project. The students develop weekly journal entries describing their experience and activities. They write a final reflection, assemble a portfolio of selected materials and accomplishments, and conduct an oral presentation of the semester long experience.

### **Theoretical Framework**

The focus of the SWP program is grounded in student-centered, experiential and adult learning theory. "Learning experientially in authentic contexts has been a foundational model of teaching and learning in agricultural education" (Knobloch, 2003a, p.22). Significant results have been noted in informal educational settings such as early field experience and internship programs.

Experiential learning has several principles that influence this type of teaching and learning ranging from students' real experiences and the teacher as facilitator (Herbert, 1995) to concrete experience and abstract conceptualization (Kolb, 1984). The work of Kolb (1984) increased the awareness of experiential education as a way to revitalize the university curriculum and cope with changes facing higher education. His work and the work of others in experiential learning have been based on the framework of experiential learning originally developed by John Dewey. "I take it that the fundamental unity of the newer philosophy is found in the idea that there is an intimate and necessary relation between the processes of actual experience and education" (Dewey, 1938, p. 19-20). This growing acceptance of experiential learning and the connection between actual experience and education has led to significant research in the area (Andreasen, 2004; Cheek et al., 1994; Hughes and Barrick, 1993; Westera, 2002).

Kolb defines experiential learning as a "framework for examining and strengthening the critical linkages among education, work, and personal development" (Kolb, 1984, p. 4). Kolb

(1984) explains that experiential learning methods emphasize the critical linkages developed between the classroom and real world. There is a renewed focus on the importance of application of previous experiences within the context of higher education and student learning experiences (Fink, 2003). There is also the idea of improved student learning with the changing role of the teacher as a facilitator (Herbert, 1995). These concepts were showcased in a recent issue of the Agricultural Education Magazine (2003) with the theme being “the role of the teacher in facilitation of learning.” Articles focused on issues related to facilitative learning and teaching with specific examples. Knobloch (2003b), as theme editor for the magazine, identified a common thread among the articles related to the role of the teacher as a facilitator; namely, the teacher’s role included being developmental, challenging, relational, flexible, adaptable, integrating, and reflective. If this is the case, much of the work related to facilitation in experiential learning occurs outside the classroom, namely, planning the learning experience, providing the setting, gathering information, and providing the context necessary for experiential learning to occur.

Andragogy and the concept that adults and children learn differently was first introduced in the early 1970s by Malcolm Knowles. Defining andragogy has led to a significant amount of research and study that has described it as a set of guidelines (Merriam, 1993), a philosophy (Pratt, 1993), a set of assumptions (Brookfield, 1986), and a theory (Knowles, 1989). The main focus is on the adult learner and the ability to design learning opportunities that are significant.

In agricultural education, the word pedagogy, which literally means the art and science of teaching children, is a commonly used term (Knowles, et al, 2005). The profession also uses student-centered learning which accounts for the learner as a student or child. There has been a discussion of the natural maturation process and dependency that involves the use of pedagogical practices versus andragogy. The natural maturation toward self-direction as compared with the culturally permitted rate of growth of self-direction is visually depicted in Figure 1.

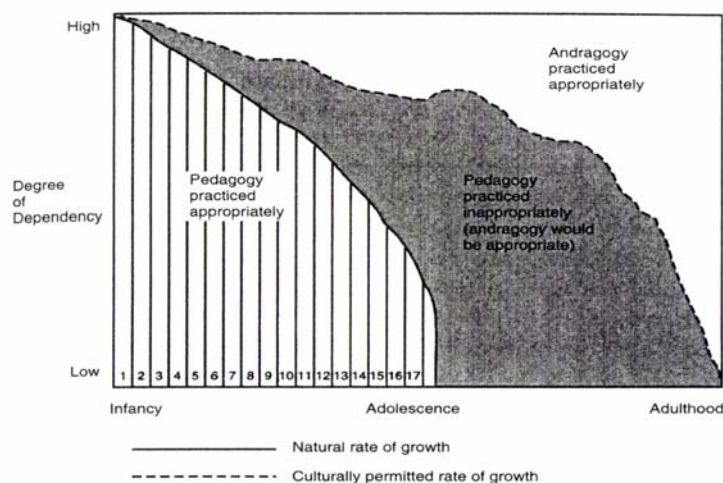


Figure 1. The natural maturation toward self-direction as compared with the culturally permitted rate of growth of self direction

Note: From *The Adult Learner* (p. 63), by M. S. Knowles, E. F. Holton III, and R. A Swanson (6<sup>th</sup> ed), 2005, San Diego, CA: Elsevier, Inc. Copyright 2005 by Elsevier Inc. Reprinted with permission of the authors.

Figure 1 outlines the importance of practicing pedagogy at young ages because of the degree of dependency of the child or student. It also identifies an age between adolescence and adulthood where pedagogy is the typical practice but where the principles of andragogy may be more appropriate for teaching and learning.

Knowles, Holton III, and Swanson (2005), identified a set of core adult learning principles that apply to many adult learning situations. The six principles of andragogy are (1) the learner’s need to know, (2) self-concept of the learner, (3) prior experience of the learner, (4) readiness to learn, (5) orientation to learning, and (6) motivation to learn (Knowles, et al, 2005). A visual representation of these principles, along with a variety of other factors that affect adult learning in particular situations is included in Figure 2.

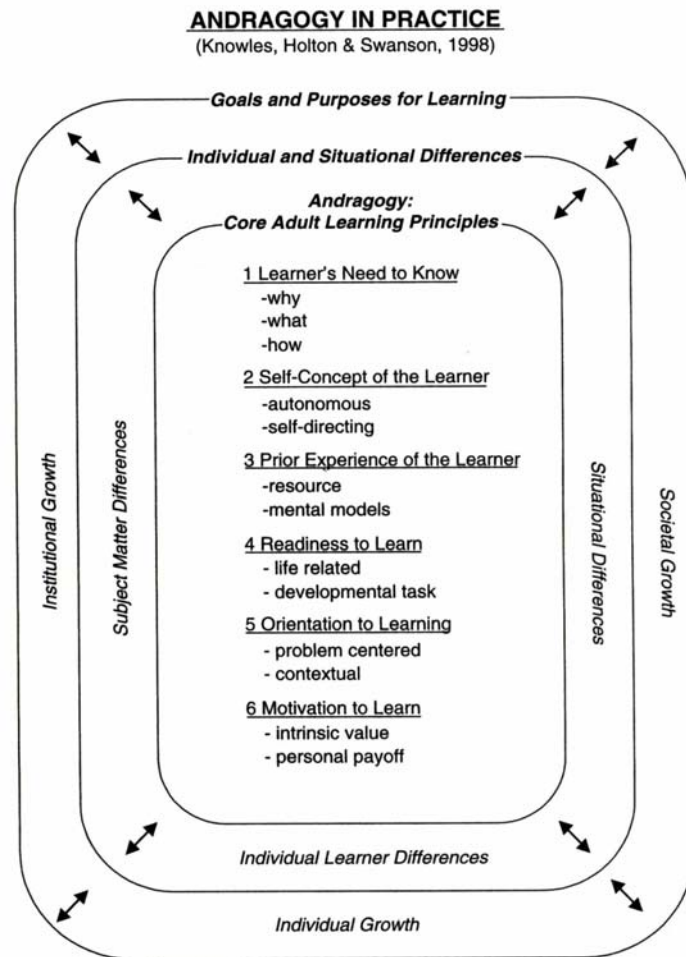


Figure 2. Andragogy in practice (Knowles, Holton, and Swanson, 1998)

Note: From *The Adult Learner* (p. 4), by M. S. Knowles, E. F. Holton III, and R. A Swanson (6<sup>th</sup> ed), 2005, San Diego, CA: Elsevier, Inc. Copyright 2005 by Elsevier Inc. Reprinted with permission of the authors.

Knowles, Holton III, and Swanson's (2005) adult learning principles along with the idea that students in higher education can learn based on these principles is a driving force behind the SWP program. SWP is specifically designed with these experiential and adult learning principles at the foundation.

SWP is a program designed to expand upon the learners need to know and motivation through the use of previous experiences in a specific situation tied to a faculty program or research project at the university. The SWP program builds skills and knowledge that supports the idea of a life-long learner and impacts their future career aspirations. SWP is designed to strengthen undergraduate, graduate, and professional education, enhancing student success at the university and beyond. Thus, meeting the strategic plan of the university and designing learning experiences that promote higher levels of learning.

Tightening budgets, higher tuition costs, and the ever present need to continually expand and improve the learning opportunities for undergraduate students are being witnessed at academic institutions across the country. These issues are in conflict as the professions attempts to improve and expand educational opportunities with less faculty and limited or reduced resources. The SWP program was designed to assist with all of these issues. SWP provides a framework for learning through undergraduate employment experiences tied to university grants, programs, and projects. SWP provides a means for hiring more students at a reduced cost while also building a larger educational connection to the activities that are the foundation of the university.

SWP was developed using experiential learning philosophies and andragogical learning principles, but do these philosophies and principles have an impact on those who participate?

### **Purpose and Objectives**

The primary purpose of this study was to determine the impact SWP had on those who participated. The study focused on four research objectives.

1. To determine the extent to which students' skills improved as a result of SWP.
2. To determine whether SWP better prepared students for a career.
3. To determine whether SWP improved the working relationship between student and faculty mentor.
4. To identify the perceived benefits of the program from the perspectives of the student and the faculty mentor.

### **Methods**

A web-based survey developed and implemented by the researchers using Dillman's (2000) tailored design method was used for the study. The questions were designed to elicit

responses that would aid in documenting the impact and benefits of the program. Field notes taken by the researchers during the development and launch of the program were used to assist in the development of the questions. In an effort to gain a more in-depth, holistic picture of the impact of the program, open-ended questions were developed in addition to closed-ended questions (Ary, Jacobs, & Razavieh, 2002).

The instrument consisted of a series of Likert-type questions along with open-ended follow-up questions. To meet the first objective, a series of seven questions using a four-point Likert-type scale ranging from no improvement (1) to extreme improvement (4) was used to measure the participants' perception related to the extent of the students' improvement of skills. Because of the individualized nature of each student's experience, respondents were also given the choice to mark "not applicable." The second objective was met using yes or no questions in conjunction with open-ended follow-up questions allowing the respondents to further explain their responses. The third objective was met using four-point Likert-Type questions ranging from no change (1) to extreme change (4) to measure the degree of perceived change as a result of the program and open-ended questions. The fourth objective was met using 1) yes or no questions and associated open-ended follow-up questions and 2) individual stand-alone open-ended questions. The instrument was reviewed by a panel of university faculty familiar with the program for content and face validity.

The population of the study consisted of 28 total participants (13 faculty members and 15 students). The response rate was 92.9% ( $n = 28$ , 13 faculty members, and 13 students). Because of the high rate of response, non-response was not considered a threat to validity (Lindner, Murphy, & Briers, 2001). It was concluded that the results could be generalized to the intended population. It should be noted that the researchers coordinated the SWP program and conducted this study.

SWP was a semester-long program, which took place during the spring 2005 term. The evaluation and data collection components of the program were communicated to the participants on a regular basis from the start-up workshop through the conclusion meeting. The data were collected during the last two weeks of the academic term. Three contacts were made by email to each participant: 1) cover letter and link to the web address where the survey could be found, 2) thank you email and reminder with web link, 3) final reminder with the web link was sent to the non-respondents. Human subjects approval was obtained via the Institutional Review Board and informed consent was obtained by each respondent prior to the completion of the survey instrument.

Both quantitative and qualitative methods were used to analyze the data (Krathwohl, 1998). The quantitative data were coded and analyzed using SPSS. Descriptive statistics, including percentages, frequencies, means, and standard deviations were used. The qualitative data obtained through the open-ended questions were analyzed using the constant comparative method (Merriam & Associates, 2002). Emerging findings were confirmed through the triangulation of multiple investigators; rich, thick descriptions; and peer evaluations (Merriam & Associates) completed by the program's steering committee.

## Findings

Twenty-six participants (13 faculty, 13 students) responded to the survey following their participation in SWP. Nearly all of the participants (91.7%, 22 of 24 respondents; 12 of 12 faculty, 10 of 12 students) stated that the program met their overall expectations. The respondents reported that their overall impression of SWP was that it was worthy of continuing with a few changes ( $M = 3.23$ ,  $SD = .48$ ). All faculty (13 of 13 respondents) and 85% of the students (11 of the 13 students) stated that they would be willing to participate in the program again.

The first objective was to determine the extent to which students' skills improved as a result of SWP. Participants were asked to identify the extent to which they had seen improvement in the following areas: communication, time management, responsibility, organization, self-confidence, listening skills and research skills. Respondents were given the option to mark "not applicable" if the individualized agreements and experiences were not developed such that they would engage that specific skill.

Table 1 provides the means and standard deviations for the faculty, student, and aggregate responses for each skill. As an aggregate, students and faculty reported moderate skill improvement as a result of SWP. Faculty reported extreme improvement in the areas of self-confidence and research, while student reported extreme improvement in the area of communication.

*Table 1*

*Extent to which students' skills improved as a result of SWP*

Skill	Total			Faculty			Students		
	<i>N</i>	<i>M</i> <sup>a</sup>	<i>SD</i>	<i>N</i>	<i>M</i> <sup>a</sup>	<i>SD</i>	<i>N</i>	<i>M</i> <sup>a</sup>	<i>SD</i>
Communication	25	3.44	.58	12	3.33	.65	13	3.54	.52
Time management	25	3.20	.76	12	3.00	.85	13	3.38	.65
Responsibility	24	3.42	.72	11	3.36	.67	13	3.46	.78
Organization	24	3.21	.59	11	3.09	.54	13	3.31	.63
Self-confidence	24	3.38	.65	12	3.50	.67	12	3.25	.62
Listening	23	3.26	.86	10	3.40	.70	13	3.15	.99
Research	21	3.48	.60	8	3.63	.52	13	3.38	.65

<sup>a</sup> Scale: 1 = No improvement, 2 = Some improvement, 3 = Moderate Improvement, 4 = Extreme improvement

In addition to the seven skills specifically identified, respondents were provided an open-ended "other" option to list other areas where improvements were made by students or witnessed by mentors. Mentors reported that students were more organized and reliable and showed more ownership, motivation, and interest in their work. They also observed that students took action that was beyond the call of duty and participated even though they did not need the credit.

Students reported that their thinking became more diverse. Students wrote that they learned how to be more flexible and how to work as a team. According to students, SWP provided the drive and opportunity to pursue a dream. The following quote encapsulates the mean of the program according to one student.

*“This project gave me an intense taste for a few weeks in working in a world where I want to establish a real career; my drive to pursue this career tract has grown exponentially, and has moved beyond obsession into something more tangible.” ~ A.B., Student*

The second objective was to determine whether SWP better prepared students for a career. All respondents (100%, 13 faculty, 13 students) agreed that the SWP experience better prepared students for a career. Nearly all (92.3%, 24 of 26 respondents; 100%, 13 of 13 faculty; 84.6%, 11 of 13 students) believed that SWP assisted in the transition from a sole work experience to one of working and learning. Mentors and students identified goal setting and the development of a learning agreement as the genesis for the transition of the experience from one solely of work to one in which learning occurs.

The additional comments related to the impact SWP had on career development, which were provided through open-ended follow-up questions, were overwhelmingly positive. Mentors reported that the SWP experience goes beyond career development and that it helps aid and assist students in daily life activities (i.e. dealing with other people, confidence in decision-making, self-confidence). Students gained valuable hands-on experience, which are demanded by today’s employers. Mentors also reported that students began to understand what research is and why certain experiments are conducted. According to the mentors, networking with influential people has also encouraged students to pursue a career in research.

*“The presentation alone is a great learning tool. Most employers will expect this in the future, whatever profession chosen.” ~ M. R., Mentor*

*“The experience reaffirmed his desire to pursue a career in research, and yes, the skills he has learned make him better prepared.” ~ A. B., Mentor*

Students believed that SWP better prepared them for a career because of the practical laboratory experience as well as improved problem-solving, communication, technological, and management skills. Learning job-specific technical skills through SWP improved opportunities in the students’ desired field (i.e. owning their own cattle someday, developing an understanding of graduate research, and developing interviewing skills).

*“I learned the value of communication and the importance of evaluation not only in the area of program planning, but also for life.” ~K. S., Student*

The third objective was to determine whether SWP improved the working relationship between student and faculty mentor, which was one of the expected outcomes of this program. Mentors commented on the quicker and stronger connection with new student employees while those working with students in the past mentioned more interaction and the ability to rely more on students. Students mentioned the increased interaction with their mentors. All participants

realized some improvement in the working relationship between faculty/staff mentors and students (Table 2).

Table 2

*Improvement in Working Relationship between Faculty/Staff Mentor and Student*<sup>a</sup>

Degree of Improvement	Total <sup>b</sup>		Faculty <sup>c</sup>		Students <sup>d</sup>	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Extreme Improvement	7	28.0	3	25.0	4	30.8
Moderate Improvement	15	60.0	8	66.7	7	53.8
Little Improvement	3	12.0	1	8.3	2	15.4
No Improvement	--	--	--	--	--	--

<sup>a</sup> Scale: 1 = No improvement, 2 = Some improvement, 3 = Moderate Improvement, 4 = Extreme improvement    <sup>b</sup> Mean = 3.16, SD = .624; <sup>c</sup> Mean = 3.17, SD = .577; <sup>d</sup> Mean = 3.15, SD = .689

The final objective of the study was to identify the perceived benefits of the program from the perspectives of the student and the faculty mentor. To ensure the success of the SWP program, effort was made to document how the program had improved or benefited those involved, and how it may have changed the direction of undergraduate student employment in the College of Agriculture. Most of the respondents (88.5%, 23 of 26 participants; 84.6%, 11 of 13 faculty; 92.3%, 12 of 13 students) reported that SWP improved the students' willingness to learn.

Nearly two-thirds of the respondents (64.0%, 16 of 25 respondents; 69.2%, 9 of 13 faculty; 58.3%, 7 of 12 students) reported that SWP created unanticipated benefits. Via an open-ended question, mentors reported several benefits to themselves and the students. Mentors reported that they were pleased to have the opportunity to mentor a student. They believed their SWP involvement gave them a chance to lighten their load and transfer activities and duties to students, who were willing and interested. Mentors also reported learning more about technological advancements because, as students struggled, they were able to learn right along with the student. Mentors also reported that their responsibility as a mentor caused them to work on their communication, relationship, and management skills. The experiences associated with the relationships between the faculty mentors and the students provided the synergy for further creativity and the development of other research ideas and projects.

*"I get a lot of satisfaction from providing opportunities for young people to get hands-on experience in scientific research. Many barrel on through college and jump into graduate school motivated by an interest in science, but without any practical experience to see if they really like doing it. Working closely with an undergraduate is also refreshing because they typically ask very good questions and they don't have the blinders on that someone working in the field for a long time may have developed."*     ~ A. B., Mentor

*“I found myself taking more time to make sure I knew what I was doing in order to explain to someone what is to be accomplished.” ~ J. C., Mentor*

*“Through the process of SWP, when applying it more broadly, I felt a lot more like a mentor to all the undergraduate workers in the office (not just the SWP student) than a boss.” ~ S. T., Mentor*

Students identified unanticipated benefits to SWP as well. Students developed a greater interest in research and graduate education. Many students commented that the skills and knowledge learned from their SWP involvement can't be taught in a classroom but have to be learned through hands-on experience. They stated that SWP provided the opportunity to develop and enhance those skills that could not be taught in the formal classroom.

*“It allowed me to become involved in more practical research, rather than just helping the grad students in the lab with their research.” ~ Z. S., Student*

*“My career tract has been accelerated by leaps and bounds, thanks to SWP.” ~ A. B., Student*

*“I have benefited by learning a variety of skills, and learning to work with others. Many of these skills can't be taught in a classroom, but have to be learned through hands-on experiences.” ~ J. R., Student*

*“Prior to SWP, the student was responsible for a few things in the office, but mainly just to help as needed. With SWP the student was given greater responsibility that required their own creativity.” ~ L. H., Mentor*

*“I have always been an employee that asked a lot of questions and I understood what we were doing. But I never took the time to correlate it to my classes. SWP reinforced how much my classes tie in to my job and vice-versa.” ~ H. H., Student*

Mentors and students were asked, via an open-ended question, to pick the one aspect of SWP that had the most significant impact on them. Mentors mentioned several student components of the program including preparing and delivering a public presentation; journaling, which forced students to verbalize and reflect; and the learning agreement, which outlined the goals and expectations related to the learning experience. Mentors also wrote that the benefits of SWP included student ownership and career enhancement. Finally, mentors reported that an additional benefit of SWP is the opportunity for students to learn and earn money simultaneously.

*“Summarizing the work experience [via a final, reflective report] at the end of the semester had the greatest impact on the student. It forced them to think of everything they had learned during the experience and communicate it to an audience. It also strengthened the communication skills by learning how to educate an audience unfamiliar with the topic.” ~ M. D., Graduate Student Mentor*

Students also identified one aspect of SWP that had the most significant impact on them. They reported that the learning agreement was beneficial because it provided independence, ownership, pride, and drove them to work harder. Also, in conjunction with the learning agreement, students reported that goal setting and journaling on a regular basis was beneficial because helped students stay organized and understand what it was they were supposed to do related to their work and learning responsibilities.

### **Conclusions, Implications, and Recommendations**

The SWP program was designed to increase the educational opportunities and combat the budgetary and financial constraints for both students and faculty at the university. The study revealed positive impacts on both students and faculty in several key areas. Students were able to gain valuable life skills along with higher levels of learning related to specific university research projects and programs while earning academic credit. Faculty mentors witnessed increased communication and increased responsibility from their undergraduate employees while also gaining matching funds for hiring SWP participating students.

The focus of the SWP program was improving undergraduate educational opportunities while also recognizing the importance of experiential learning and the need for increased opportunities for student learning. The SWP program was designed with these commitments in mind and has proved to be a unique opportunity for both mentors and students to increase learning opportunities from their experiences. SWP provides an experientially based learning situation that utilizes andragogy and adult learning principles as the foundation for instruction rather than the traditional pedagogical methods of instruction. Kolb's work with experiential learning and Knowles focus on adult learning theory have provided the framework for the SWP program design and have proven to be successful in this type of learning environment.

Experiential learning is the foundation for combining students past and current experiences into a significant learning experience through their actual work with designed learning requirements. Knowles, Holton III, and Swanson (2005), examined the concept that undergraduate students are prepared for learning guided by andragogical principles rather than pedagogy and supports this use by SWP. Knowles, Holton III, and Swanson (2005), also outline the six principles of adult learning that are the focus of the SWP program. SWP guides in development of critical linkages among education, work, and personal development as outlined by Kolb (1984).

Experientially based learning framed within the research and functions of the College of Agriculture have positively impacted both students and mentors. Students have improved valuable skills and increased learning in many areas specific to their degree programs. Mentors have gained undergraduate employees that are more willing to become involved in the learning process and are better able to manage the responsibilities and duties of their position; thus, increasing the mentors' abilities to rely more on students and allocate their resources elsewhere. Students and mentors have commented on the program's ability to expand learning through development of projects, reports, and presentations related to specific agricultural programs.

The SWP program better prepared students for a career and has successfully linked working and learning experiences within agriculture at the university. The overall impact of the SWP program was positive for both students and faculty mentors. In all seven critical skill areas discussed in the survey instrument, moderate to extreme improvement was reported by all participants, ensuring that SWP was preparing students for the future. Improved communication and stronger working relationships between students and faculty mentors were documented throughout the survey results. It is clear that the SWP program has room for improvement but that the learning outcomes and objectives of the program are currently being achieved.

As the SWP program evolves some critical issues need to be addressed to ensure the overall improvement and success of the program. Training and informational meetings for both students and faculty mentors are critical to the overall success of SWP. Time and resources need to be allocated to ensure that all participants understand the purpose and objectives of the SWP program prior to developing the learning agreement. Progress visits and mid-term reports are necessary to ensure that both faculty and students are following through on their assigned responsibilities. Continuous study in subsequent semesters is recommended to increase the sample size and to validate the results of this study over a longer period of time.

Improving educational opportunities and providing significant learning experiences for undergraduate students remains a focus of educational programs. SWP is a program that was designed to meet these needs and bridge the gap between faculty research projects and related programs and student learning experiences. SWP provides the learning outcomes, curriculum, and structure necessary to develop a documented and measurable program that can improve the educational opportunities for undergraduate students and faculty mentors alike. SWP has a universal design that could be altered to fit several different types of educational settings. Allowing students to gain more experience, knowledge, and skills through critical university work experiences fits well within the focus of agricultural education.

## References

- Agricultural Education Magazine. (2003). Theme: The role of the teacher in facilitation of learning. 76(2).
- Andreasen, R. J. (2004). Integrating experiential learning into college of agriculture capstone courses: Implications and applications for practitioners. *North American Colleges and Teachers of Agriculture Journal*, 48(1), 52-57.
- Ary, D., Jacobs, L.C., & Razavieh, A. (2002). *Introduction to research in education* (6<sup>th</sup> ed.). Belmont, CA: Wadsworth/Thomson Learning.
- Brookfield, S. D. (1986). *Understanding and facilitating adult learning*. San Francisco, CA: Jossey-Bass.
- Cheek, J. G., Arrington, L. R., Carter, S., & Randell, R. S. (1994). Relationship of supervised agricultural experience program participation and student achievement in agriculture. *Journal of Agricultural Education*, 35(2), 1-5.

- Dewey, J. (1938). *Experience and education*. New York: Collier.
- Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method* (2<sup>nd</sup> ed.). New York: John Wiley & Sons, Inc.
- Fink, D. L. (2003). *Creating significant learning experiences*. San Francisco, CA: Jossey-Bass, John Wiley & Sons, Inc.
- Herbert, T. (1995). Experiential learning: A teacher's perspective. In B. Horwood (Ed.), *Experience and the curriculum*, p. 19-35. Dubuque, IA: Kendall/Hunt.
- Hughes, M., & Barrick, R. K. (1993). A model for agricultural education in public schools. *Journal of Agricultural Education*, 34(3), 59-67.
- Knobloch, N. A. (2003a). Is experiential learning authentic? *Journal of Agricultural Education*, 44(4), 22-34.
- Knobloch, N. A. (2003b). Reflections on facilitation in agricultural education. *The Agricultural Education Magazine*, 76(2), 4-5.
- Knowles, M. S. (1989). *The making of an adult educator*. San Francisco, CA: Jossey-Bass
- Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2005). *The adult learner* (6<sup>th</sup> ed.). San Diego, CA: Elsevier Inc.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Krathwohl, D. R. (1998). *Methods of educational and social science research* (2<sup>nd</sup> ed.). New York: Addison-Wesley.
- Linder, J.R., Murphy, T.H., & Briers, G.E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43-53.
- Merriam, S. B. (1993). Adult learning: Where have we come from? Where are we headed? *New Directions for Adult and Continuing Education*, (57). San Francisco, CA: Jossey-Bass.
- Merriam, S. B., & Associates. (2002). *Qualitative research in practice: Examples for discussion and analysis*. San Francisco, CA: Jossey-Bass.
- Pratt, D. D. (1993). Andragogy after twenty-five years. *New Directions for Adult and Continuing Education*, (57). San Francisco, CA: Jossey-Bass.
- Spence, L. (2001). The case against teaching. *Change Magazine*, 33(6), 10-19.
- Westera, D. (2002). Experiential learning activities in distance education: Challenges and Examples. *Proceedings of the 18<sup>th</sup> Annual Conference on Distance Education and Learning*, Madison, WI, (Electronic Version).