

Understanding the Employability of College Graduates for Success in the Workplace

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ABSTRACT

In our increasingly competitive world, it is critical that college graduates enter the workplace with the appropriate skills to not only survive but also grow their career. Current college graduates have not consistently acquired the skills needed for success in the workplace to learn and thrive continuously in our rapidly changing world. The Virginia Tech College of Agriculture and Life Science must identify the specific strategies that develop best the needed skills for the success of the graduate and society. The purpose of the study was to identify a land grant college of agriculture and life sciences' (LGCALS) current programmatic and classroom strategies for developing students' ability to learn and thrive continuously in our rapidly changing world and a

- (1) explore programmatic strategies for developing students' ability to continuously learn and thrive;
- (2) explore innovative instructors classroom strategies for developing students' ability to learn and thrive continuously;
- (3) describe graduates perceptions of career readiness as measured through the bases of competence inventory, and finally;
- (4) compare programmatic strategies, classroom strategies and graduates' perceptions for career readiness.

A mixed methods convergent parallel design guided the research. Qualitative interviews were employed for exploring experiences using an interpretive, constructivist, and naturalistic approach for research objectives 1 and 2. A cross sectional survey design and questionnaire, *Making the Match*, was used to conduct the quantitative research for objective 3. The mixed methods portion of the convergent parallel design was used to frame and explore research objective 4. Findings of the study detail need for curriculum improvement in problem solving, learning, time management, creativity and change, and personal strengths.

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CHAPTER 1

INTRODUCTION

In our increasingly competitive world, it is critical that college graduates enter the workplace with the appropriate skills to not only survive but also grow their career. However, college graduates often are not prepared properly for success when entering the workforce (Conference Board, 2006). No longer are memorization and content specific knowledge the skills students will need to compete. “Employers are more satisfied with graduates who possess core skills, such as creative and critical thinking, interpersonal, and leaderships skills, than those who simply possess skills specific to their vocation” (Paranto & Kelkar, 1999, p. 84). Other skills including problem solving, communication, and life-long learning are now the basic requirements to be able to compete and be successful (Paranto & Kelkar). However, the employability skills required are not always developed due to gaps in agreement and collaboration between college students, higher education, and potential employers (Rateau & Kaufman, 2009). This often results in graduates who are not prepared to enter the workforce successfully. The connection between employability skills and economic success of the graduate is reflected in employers’ willingness to pay a premium for such skills (Knight & Yorke, 2002). Meanwhile, enhancing students’ employability is vital to the knowledge driven economy of the United States (Hawkrige, 2005). Higher education, future employers, and students must collaborate to ensure college graduates have the needed skills for employability and success.

The role of the university in career preparation often has been to improve and increase students’ content knowledge. Although this approach has been successful for numerous years, in our rapidly changing world, the ability to synthesize, analyze, and think has become more important to the long-term success of the graduates (Conference Board, 2006; McManus, 2005; Paranto & Kelkar, 1999). Additionally, employability skills, including leadership, are learned

through both the classroom and meaningful experiences (Northouse, 2010; Rae, 2007). Although various educators recognize the need for change and are in the midst of change, this must happen at a faster pace. Educators are making changes to curriculum and teaching methods to provide the required thinking skills the graduates need; however, society is changing faster than many universities can adapt. “Educators and employers need to work together to prepare students for the complexities they will encounter as they leave school and enter the workplace” (Evers, Rush, & Bedrow, 1998, p. 4). Barriers to change need to be removed (Rae, 2007).

The Unprepared Workforce

“Employers report hiring substantial numbers of new entrants who are poorly prepared requiring additional company investment to improve workforce readiness skills” and the existence of “a workforce readiness gap” (Conference Board, 2009, p. 4). Additionally, the Conference Board (2006) stated that young college graduates often are unprepared and lack both the basic and applied skills needed for success in their new careers. Employers “have expressed a need for students who can communicate, value teamwork, solve problems, acquire knowledge that is broad and deep, and do so for their entire career” (Sibley & Parmell, 2008, p. 42). Bandura (1986) stated “career pursuits require more than the specialized knowledge and the technical skills of one’s trade” (p. 433).

To be successful in the work environment, employers desire strong communications and interpersonal skills (Conference Board, 2006). Graduates’ willingness and curiosity to become life-long learners has been identified as a critical requirement for success in both personal and professional life (Fallows & Weller, 2000). Life-long learning skills become increasingly important to maintain pace in our diverse, rapidly changing, and complex world (Down, 2003). With the rapid pace of change and complexity comes an increasing need for strong and effective

leadership to guide this change; “our nation is in a leadership crisis, one that requires more and better leadership in all areas of our society” (Eich, 2008, p. 176).

Categories of Employability Skills

Employers want new graduates with a range of skills, both basic academic skills and the ability to apply knowledge. According to Yorke and Knight (2000?, as cited in Hawkrigde, 2005, p. 1), employability is “a set of achievements – skills, understandings and personal attributes that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy.” Organization of employability skills results typically in two distinct categories: basic and applied (Table 1-1). Per the Conference Board (2006), generally employers rated college graduates higher in their proficiency with basic skills, also known as cognitive skills, as compared to applied skills, also known as behavioral skills. Additionally, the Conference Board noted the five most important applied skills identified for improvement are communications, teamwork, critical thinking, and problem solving. A review of related literature confirms the employer ranking (Rateau & Kaufman, 2009). Skills most often noted as required are critical thinking, problem solving, the ability to apply knowledge, communications, effective team abilities, and the ability and willingness to become life-long learners (Alpern, 1997; Atkins, 1999; Coll & Zegwaard, 2006; Dillon, 1992; Down, 2003; Gardner & Liu, 1997; Glover, Law & Youngman, 2002; Holden & Hamblett, 2007; Manninen & Hobrough, 2000; Nabi & Bagley, 1999; Paranto & Kelkar, 1999; Rae, 2007; Sleaf & Reed, 2006; Smith, Wolstencroft, & Southern, 1989).

A recent comprehensive nation-wide study once again confirmed the skills needed as team skills, communications skills, leadership skills, problem solving skills, and self-management skills (Crawford, Lang, Fink, Dalton, & Fielitz, 2011). The literature is rich over the last twenty years in agreement of the required skills graduates need for success in the

workplace. These applied skills noted as requirements are the same skills required of effective leadership as outlined by the skills approach to leadership and the same skills as outlined by Evers et al. (1998) in their model for student skills development in *The Bases of Competence*.

Table 1-1. *Basic and Applied Skills Categories.*

Basic Knowledge / Skills or Cognitive Skills	Applied Skills or Behavioral Skills
English Language (spoken)	Critical Thinking / Problem Solving
Reading Comprehension (in English)	Oral Communications
Writing in English	Written Communications
Mathematics	Teamwork / Collaboration
Science	Diversity
Government / Economics	Information Technology
Humanities / Arts	Leadership
Foreign Languages	Creativity / Innovation
History / Geography	Lifelong Learning
	Work Ethic
	Ethics / Social Responsibility

Note. From: “Are they really ready to work? Employer’s perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce”, 2006, Conference Board, p. 9. Used under fair use guidelines, 2011.

The Leadership Skills Model

The critical issue of skill development in college graduates can be framed by the three-skill approach to leadership as conceptualized by Katz (1955) and later refined by Mumford, Zaccaro, Harding, Jacobs, and Fleishman (2000). Katz’s (1995) original work centered on the three skills required for a successful leader: technical skills, human skills, and conceptual skills. Technical skills include the ability to use specialized knowledge to solve problems, human/people skills as the ability to effectively function and contribute to a team, and the conceptual skills as the integration of activities toward a common goal. The three skills model emphasizes the “skills and abilities that can be learned and developed” (Northouse, 2010, p. 39)

for both effective leadership and as needed by college graduates for success in the workplace as noted by the Conference Board (2006) (Table 1-1).

The model has evolved into a capabilities model where the definition of leadership skills is “the ability to use one’s knowledge and competencies to accomplish a set of goals or objectives” (Northouse, 2010, p. 40). Mumford et al. (2000) stated, “leadership can be framed . . . in terms of capabilities, knowledge, and skills that make effective leadership possible” (p. 12). Effective leadership is the combination of the capabilities, knowledge, and skills that guide the leader in complex problem-solving, including problem recognition, development of potential solutions, and implementation of a successful plan for problem resolution (Mumford et al., 2000). The skills model recognizes that problem solving occurs in a social context where the success of the leader in solving complex problems is based on the leader’s skills and abilities to “communicate vision, establish goals, monitor progress, and motivate subordinates” (p. 17), leading to problem resolution. These skills and abilities required of successful leaders are the same skills and abilities college graduates need for workplace success, as detailed in *The Bases of Competence*.

The Bases of Competence Model

Recognizing the gap in skills development and the critical need for these skills for the success of the individual and society, educators Evers et al. (1998) embarked on a comprehensive study to develop a model that identified the skills and competencies college graduates need for success in the workplace. In a collaborative effort between employers and higher education, the resulting study, *The Bases of Competence*, is a “call to reform . . . to restore the historic role of higher education in preparing graduates for the workplace of the future rather than the past” while telling the “story of what is needed in the workplace, what is missing, and what colleges and universities can do about it” (Evers et al., p. xii).

The result of the research details:

Skills and skill development: general skills that are needed to live, learn, and work in the next century; skills that are foundational to academic and workplace success; skills useful to higher education faculty and instructional development experts as they consider course and program redesign; skills essential to students and graduates as they develop and refine their skills portfolios; and skills functional to workplace trainers as they develop training programs for today's organizations. (Evers et al., 1998, p. xvii)

The result of the multiyear study identified “what university graduates increasingly need but simply cannot get” (Evers et al., 1998, p. xii) from their formal education. Despite this solid framework of reform, barriers to change remain, gaps still exist, and graduates continue to enter the workplace unprepared.

Failures in Collaboration

A review of literature revealed numerous challenging opportunities for the various stakeholders to collaborate if the issue of skills development in college graduates is to improve (Rateau & Kaufman, 2009). Failures to collaborate are obvious as employers continue to voice concern that the curriculum and standard teaching methods are not generating the graduates and future leaders they desire to hire (Conference Board, 2009; Conference Board 2006; Evers et al., 1998). Additionally, Glover et al. (2002) reported that collaboration between higher education and employer has been weak. Realizing only the best and brightest can expect good jobs (Dillon, 1992), the issue of collaboration becomes even more critical for improvement. Per Evers et al. (1998), “the problem is that education institutions and organizations that employ college graduates are for the most part isolated spheres” (p. xviii). Two strategies that will close this gap include instructional strategies and program planning strategies.

Instructional Strategies

Educational reform is difficult and change will not be instantaneous (Barr & Tagg, 1995). Changes in educational strategies “can pose challenges to the structure, system and culture” of higher education (Rae, 2007, p. 605). One strategy to close the gap is innovative teaching strategies, understanding teaching strategies of the past “fail to develop the full battery of skills and abilities desired in a contemporary college graduate” (Duch, Groh, & Allen, 2001, p. 4). For graduates’ long term success in our rapidly changing world, the role of teaching and learning must shift from ‘knowing what’ (or content), to a pedagogy of ‘knowing how to find out’ and ‘learning to learn’ (Harvey, 2005, p. 13). Barr and Tagg (1995) stated:

A college’s purpose is not to transfer knowledge but to create environments and experiences that bring students to discover and construct knowledge for themselves, to make students members of communities of learners that make discoveries and solve problems. (p. 699)

There must be a paradigm shift in higher education away from a teaching paradigm to a learning paradigm, where the focus is on student learning; however, this shift is difficult and often met with resistance (Barr & Tagg, 1995). Coll and Zegwaard (2006) argued that instructors may not have had the proper training or knowledge to implement the pedagogies that develop best the desirable skills students need. Weimer (2002) stated instructors are often hesitant to move to a learner-centered environment due to lack of support from peers or administrators. Rae (2007) continued by stating there can be resistance from both administrators and instructors to form the needed collaborative partnerships with all stakeholders. Resistance to change can and does come from numerous areas and must be removed for future progress.

Program Planning Strategies

Program planning is a systematic process of needs assessments, planning, implementation and evaluation of academic programs and curriculum (Cervero & Wilson, 2006; Ruben, 2008) and come in various formats, with no one format deemed as best for every need (Caffarella, 2002; Cervero & Wilson, 2006). Although there is recognition for the need of effective and regular program planning to remain abreast with the changing world and to ensure the desired results of the program are being attained, many universities need a more rigorous approach to planning with the “capability of bridging the cultural gap” between all stakeholders, thus resulting in effective programs leading to desired outputs (Ruben, 2008, p. 1).

Ruben (2008) acknowledged there are various program planning approaches that attempt to “close the loop” (p. 2). One such approach, as proposed by Caffarella (2002) in the *Interactive Model of Program Planning*, provides “one avenue that helps planners get through this maze of tasks, people issues, and political agendas . . . to assist them in getting from start to finish” (p. 15). One distinguishing difference in the Caffarella (2002) model from other models is “people and places are acknowledged as important in the planning process” (p. 20), a critical issue for overall success of the program plan and outcomes. Recognizing planning involves people and should include all stakeholders in the process, the question arises as to sorting through the various stakeholder interests for final decision making and “whose educational vision will prevail as the planning begins” (Cervero & Wilson, 2006, p. 9). Program planning offers a powerful strategy to ensure needs are met and the desired outcomes of a program are produced, while recognizing planners must include all stakeholders in a process that is both ethical and democratic (Cervero & Wilson, 2006).

Opportunities through Path-Goal Leadership Theory

The path-goal leadership theory can guide efforts to develop the appropriate skills among college students and address the failures in collaboration between stakeholders. Path-goal theory is based on leader strategies to define goals, clarify paths, remove obstacles, and provide support for the follower. Path-goal theory, as conceptualized by House (1971), and later refined by various noted leadership researchers (Northouse, 2010), “specifies leader behaviors that enhance subordinate empowerment and satisfaction and work unit and subordinate effectiveness” (House, 1996, p. 323). This statement on the role of a leader is similar to the role of an instructor as noted by Schunk (2008) to enhance both student learning and students’ desire to learn by focusing on student motivation.

Although path-goal theory is viewed typically as a leadership theory, it has direct application to the classroom, as the role of a leader and the role of an instructor are very similar (Northouse, 2010; Weimer, 2002). Northouse (2010) stated, “the overarching purpose of leadership is to guide and coach subordinates as they move along the path to achieve goals” (p.135). This statement is similar to the Weimer’s (2002) description of an effective instructor as “my role . . . is a guide and resource to the students” (p. 76), providing support and guiding the student on the path to success. Consistent with the path-goal theory, university administrators in their role as leaders “facilitate collaborative relationships,” “provide guidance,” and “clarifying goals” for stakeholders (House, 1996, pp. 335-336).

Historical Context of the Land Grant University

In the 1800s, higher education in the United States was for the wealthy typically, and there were limited opportunities for the working class to receive a higher education. Recognizing this need and consistent with path-goal theory of leadership, [I’m not sure I understand this adverb clause.] United States leaders removed the obstacles and barriers to higher education

with the enactment of the Morrill Land Grant Act of 1862. The Act established a national educational system designed as the “people’s university” (Rich, Merchant, & American Academy of Political and Social Science, 2003, p. 3) . . . “to teach such branches of learning as are related to agriculture and the mechanical arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life” (Committee on the Future of Colleges of Agriculture in the Land Grant University System, Board of Agriculture, 1995, p. 2). Previous to this Act, higher education was “reserved for, and helped preserve, the aristocracy of the society” (Rich et al., 2003, p. 4). With the Morrill Act, doors to education were opened to all class levels with attention to studies in the agricultural and mechanical fields, which often were overlooked by the traditional universities of the time (Rich et al., 2003). This historic legislation offered the opportunity for underserved Americans to learn “the skills that ultimately would undergird the emerging agricultural and mechanical revolutions” (Boyer, 1990, p. 5).

As noted by the Committee on the Future of Colleges of Agriculture in the Land Grant University System (1995) the original purpose of the land grant university was to “serve the needs of the farmer, farm family, rural community, and national economy” while instructing students (p. vii). The Committee also recognized that the public has different needs today, and the role and purpose of the land grant university must remain relevant to our modern times.

Virginia Agricultural and Mechanical College was founded in 1872 as the state’s land grant institution with significant “technical expertise in agriculture and engineering” (Virginia Tech, 2006). Now known as Virginia Tech, the university has a current mission statement reflecting the changing needs of society that includes commitment to “strong undergraduate education with a special emphasis on professional development,” graduates who are “holistically educated and who can assume leadership roles in a democratic society,” and preparation of its

graduates for success in the marketplace (Virginia Tech, 2006). In summary, “the quality of an undergraduate degree program cannot be separated from the successes and failures of its graduates in the marketplace” (Andelt, Barrett, & Bosshamer, 1997, p. 47).

Context of Agriculture

Higher education is caught in dialogue with employers that is often confusing as employers may be looking for different skill sets within the different industries; including the context of agriculture and life sciences. Andelt et al. (1997) found graduates of colleges of agriculture and life sciences “did not acquire the knowledge, competencies, skills and abilities to accommodate employers’ needs while in college” (p. 47). Additional information is needed by higher education concerning the exact skills and competencies employers require of graduates of colleges of agriculture to develop better the curriculum and teaching strategies needed that results in graduates who are prepared properly (Andelt et al., 1997).

Research conducted to determine the exact skills and competencies requirements of graduates of colleges of agriculture (Andelt et al., 1997; Robinson, Garton, & Vaughn, 2007) showed skills in communications, interpersonal skills, leadership, problem-solving and critical thinking are needed for success in the workplace. These skills for graduates of colleges of agriculture are the exact same as the skills noted by the Conference Board (2006) as needed by all college graduates for success in the workplace

Recent research conducted at two other land grant institutions similar to Virginia Tech used *The Bases of Competence* model to provide insight into employability skills development. These studies were conducted at the University of Missouri (Robinson et al., 2007) and later at the University of Kentucky (Robinson, 2009). Results of the two studies indicated graduates’ perceptions of skill importance were higher than their perceptions of readiness. Although these two studies were conducted at similar land grant institutions with similar college of agriculture

students, they are not generalizable to the students at all land grant institutions; therefore, further study is needed for a complete understanding of findings and the development of plans for improvement in the employability skills and future success of graduates at Virginia Tech University.

Problem Statement

Current college graduates have not consistently acquired the skills needed for success in the workplace to learn and thrive continuously in our rapidly changing world. The College of Agriculture and Life Science must identify the specific strategies that develop best the skills needed for the success of the graduate and society.

Purpose and Objectives

The purpose of the study was to identify a land grant college of agriculture and life sciences' (LGCALS) current programmatic and classroom strategies for developing students' ability to learn and thrive continuously in our rapidly changing world, and assess recent graduates' experiences of those strategies.

The specific objectives included:

1. Describe LGCALS undergraduate program coordinators' perceived strategies for developing students' ability to learn and thrive continuously in our rapidly changing world.
2. Describe LGCALS innovative instructors' classroom strategies for developing those same skills in their students.
3. Describe recent graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the *Bases of Competence* inventory.
4. Compare and contrast programmatic strategies, classroom strategies, and graduates' experience with respect to the required skills for career success.

Significance

The outcomes of this applied research add to the body of knowledge on the leadership theories of the skills approach and path-goal leadership as related to the enhancement of student employability skills. Leaders at Virginia Tech will be able to identify strategies to increase and improve collaborative relationships with stakeholders, while instructors will be able to identify those teaching strategies that develop students' employability skills. All stakeholders will be able to understand better graduates' perceptions of the importance of the different employability skills needed for success and their readiness to use these skills in the workplace. Obstacles and barriers to the successful development of employability skills will be identified. This information will allow educators to evaluate better the classroom instructional strategies that develop those skills graduates' require for success in the workplace.

Traditionally, both the skills approach to leadership and path-goal theory have been applied to understanding effective leadership and followership in a business setting. The findings of this research will expand the application of the theories to the classroom and give clarity to the roles of an effective program coordinator and instructor. Additionally, the theories can be applied to students and add clarity to the roles and accountabilities of students on their journey to gain the required skills in a learner-centered classroom.

Overview of Methodology

The research design included both a qualitative and quantitative section. A convergent parallel design guides the mixing of the qualitative and quantitative data. A convergent parallel design (Figure 1-1):

Occurs when the researcher uses concurrent timing to implement the quantitative and qualitative strands during the same phase of the research process, prioritizes the methods

equally, and keeps the strands independent during analysis and then mixes the results during the overall interpretation. (Creswell & Plano Clark, 2011, p. 70)

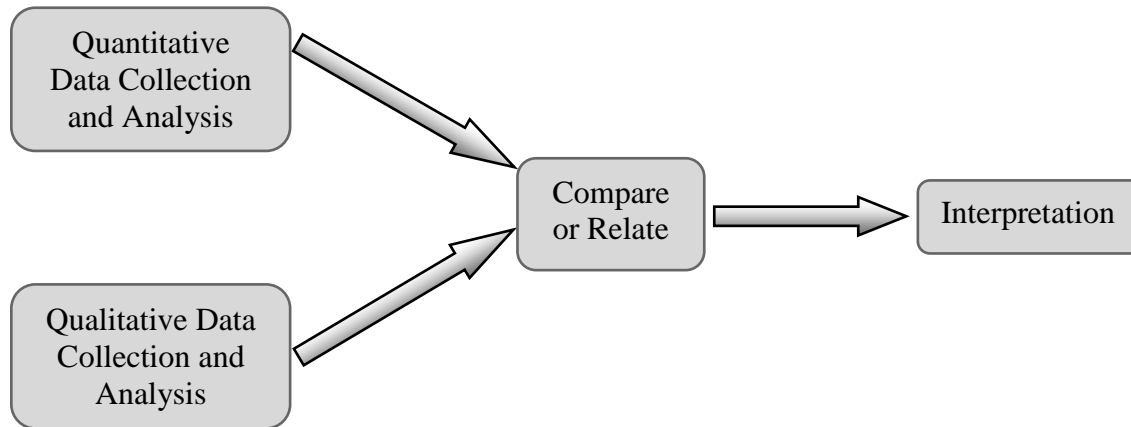


Figure 1-1. The Convergent Parallel Mixed Methods Research Design. Note. From “Designing and Conducting Mixed Methods Research,” by J. W. Creswell and V. L. Plano Clark, 2011, p. 69. Copyright 2011 by Sage Publications, Inc. Used under fair use guidelines, 2011.

Qualitative interviews were employed for exploring experiences using an interpretive and constructivist approach. Research objective 1 included focus group interviews with Virginia Tech College of Agriculture and Life Sciences (CALs) program coordinators’ perceived strategies for developing students’ ability to continuously learn and thrive in our rapidly changing world. Research objective 2 included interviews of innovative instructors of Virginia Tech CALs to explore classroom strategies for developing those same skills in their students. Research objective 3 included a cross sectional survey design and questionnaire to describe graduates’ perceptions of LGCALS contributions for career readiness of the identified skills as measured through the bases of competence inventory. And, research objective 4 compared programmatic strategies, classroom strategies, and graduates experience with respect to the required skills for career success.

Researcher's Personal Epistemology

The understanding of the researcher's personal epistemology is critical as "epistemologies undergird all phases of the research process" and "shape scholars' abilities to comprehend and appreciate the research of others" (Pallas, 2001, p. 6). A researcher's personal epistemology involves their philosophical assumptions and guides their research design based on their unique worldview (Creswell, 2009).

I bring to the research a personal worldview based on social constructivism, where "individuals seek understanding of the world in which they live and work" and "meanings are constructed by human beings as they engage with the world they are interpreting" in a social context while interacting with others (Creswell, 2009, p. 8). The qualitative portion of my research will be interpretive as "data do not speak for themselves; they are interpreted through complex cognitive processes [by the researcher]" (Rossman & Rallis, 2003, p. 36). I also bring to the research over 30 years of career experiences in the hiring, training, supervision, and performance evaluation of numerous, recent graduates of land grant universities. With these experiences, I grew curious as to why many of these recent graduates were successful quickly in the workplace while others failed to meet the demands of their new careers. As I reflect on these experiences, I ask myself continually if it was the skills of communications, problem-solving, critical thinking, and interpersonal development which caused the difference in workplace success or failure.

Definition of Terms

Employability Skills: per Yorke and Knight (2004) "a set of achievements – skills, understandings and personal attributes that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy" (as cited in Hawkrigde, 2005, p. 1).

Employer: The person or organization that employs a college graduate, particularly those of the Virginia Tech College of Agriculture and Life Sciences.

Innovative Instructor: An instructor in the Virginia Tech College of Agriculture and Life Science at Virginia Tech that has been noted for teaching excellence.

Program Coordinator (Coordinating Counselor): A faculty member of the College of Agriculture and Life Science, Virginia Tech working directly with the Associate Dean and Director to provide curricula that are relevant.

Recent graduate: A bachelor's degree graduate of the College of Agriculture and Life Science at Virginia Tech from December 2008 to May 2010.

Stakeholders: Students, graduates, educators, administrators, instructors, and employers.

Assumptions

For the overall success of this study, the researcher assumed all participants of the research (graduates, innovative instructors, and program coordinators) responded accurately to the various instruments and interviews. Self-administered surveys have certain disadvantages that must be taken into account. Certain “respondents with low motivation levels or those which have to finish quickly . . . may choose the first defensible answer they come to rather than the best answer” (Dillman, Smyth, & Christian, 2009, p. 130). Measurement error or participants answering questions inaccurately are a risk (Dillman et al., 2009). Additionally, a potential risk of self-administered surveys occurs when “no interviewer is present means that unclear questions cannot be explained” (Rea & Parker, 2005, p. 9). Potential threats to the accuracy of the interview in the qualitative portion included participants responding in ways they believe the interviewer desires, or failures in the participant's ability to remember various situations (Seidman, 1998).

Secondly, the researcher assumed response rates are adequate to continue with the research. Response rate is defined as the percentage of participants that responded to the initial contact and completed the questionnaire and a “response rate of 50 percent can be considered satisfactory for purposes of analysis and reporting of findings as long as the researcher is satisfied in the representativeness of the respondents” (Rea & Parker, 2005, p. 11). Nonresponse error “occurs when the people selected for the survey who do not respond are different from those who do respond in a way that is important to the study” (Dillman et al., 2009, p. 17).

Limitations

For the success of the study, there were certain limitations that must be minimized or eliminated including financial support to implement the study as designed. The use of mail surveys, following the Dillman et al. (2009) process, can be prohibitively expensive; however, requests for financial support was made to various offices at Virginia Tech or other organizations to offset these expenses.

Secondly, this study was limited to coordinating counselors, innovative instructors, and graduates of Virginia Tech’s College of Agriculture and Life Sciences who were employed recently. Graduates, coordinating counselors, and innovative instructors of peer colleges and institutions are different, and the results of this study are not generalizable to those populations.

The qualitative portion of the study was viewed through the lens of the researcher. Based on the previous career of the researcher, I bring a bias to the study. Bias was minimized using strategies of “writing with detailed and thick description, and taking the entire written narrative back to participants in member checking” of interviews and the use of direct quotes (Creswell, 2007, p. 209).

Summary

The purpose of the study was to identify a land grant college of agriculture and life sciences' (LGCALS) current programmatic and classroom strategies for developing students' ability to continuously learn and thrive in our rapidly changing world, and assess recent graduates' experiences of those strategies. The chapter also provided the background and significance of the problem. Skills development in college graduates is critical for the success of the graduates as they move into their careers. The leadership theories of the skills approach and path-goal theory were introduced to ground and frame the problem from a theoretical perspective. The specific objectives include:

1. Describe LGCALS undergraduate program coordinators' perceived strategies for developing students' ability to continuously learn and thrive in our rapidly changing world.
2. Describe LGCALS innovative instructors' classroom strategies for developing those same skills in their students.
3. Describe recent graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the *Bases of Competence Inventory*.
4. Compare and contrast programmatic strategies, classroom strategies, and graduates experience with respect to the required skills for career success.

The following section, Chapter 2, includes a review of current literature relative to the problem and the theoretical and conceptual frameworks that guide the study.

CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of the study was to identify a land grant college of agriculture and life sciences' (LGCALS) current programmatic and classroom strategies for developing students' ability to continuously learn and thrive in our rapidly changing world, and assess recent graduates' experiences of those strategies.

The specific objectives include:

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The outcomes of this applied research add to the body of knowledge on the leadership theories of the skills approach and path-goal leadership as related to the enhancement of student employability skills. Leaders at Virginia Tech will be able to identify strategies to increase and improve collaborative relationships with stakeholders, while instructors will be able to identify those teaching strategies that develop students' employability skills. All stakeholders will be able to better understand graduates' perceptions of the importance of the different employability skills needed for success and their readiness to use these skills in the workplace. Obstacles and barriers to the successful development of employability skills will be identified. This information will

allow educators to better evaluate the classroom instructional strategies that develop those skills graduates' require for success in the workplace.

Traditionally both the skills approach to leadership and path-goal theory have been applied to understanding effective leadership and followership in a business setting. The findings of this research expand the application of the theories to the classroom and give clarity to the roles of an effective program coordinator and innovative instructor. Additionally, the theories can be applied to students and add clarity to the roles and accountabilities of students on their journey to gain the required skills in a learner-centered classroom.

Introduction to the Review of Literature

Students are graduating often from higher education without the required skills to become a life-long learner enabling them to compete better and lead in the increasingly complex and changing world (Conference Board, 2006). To address this critical issue, an understanding of the current drivers and gaps leading to the situation are required. This examination includes a clear understanding of: 1) employer needs, 2) the essential skills and competencies required of college graduates, 3) contributions from higher education, 4) collaboration and program planning, and 5) the role of the land grant institutions.

Employer Needs

In our rapidly changing world, content and knowledge also change quickly. For success in the workplace, graduates need the skills to adapt and grow with the changes. Skills development enables individuals to “learn, critique, and use new knowledge” (Evers et al., 1998, p. 4). Employers want graduates who can deal effectively with the change “and thrive on it . . . employees who are quick to learn” (Harvey, 2005, p. 16). Graduates willingness and ability to learn is critical for their success and overall employability readiness (Coll & Zegwaard, 2006).

Employability Readiness

In a recent survey of leading US Chief Executive Officers conducted by the Conference Board, “over half (57%) . . . report education and workforce preparedness is a ‘very important’ or ‘most important’ policy issue” (2006, p. 12). The Conference Board (2006) findings “reflect employers’ growing frustrations over the lack of skills they see in new workforce entrants” (p. 10). Additionally, Paranto and Kelkar (1999) reported employers were often not satisfied with graduates’ ability to think; and employers noted continually the importance of critical thinking skills over content. Employers desire critical thinking skills with “graduates who can think on their feet and determine ways to accomplish tasks” (Robinson et al., 2007, p. 20). When compared to critical thinking skills, content has become less important to employers based on their ability to teach through experience the subject matter required for the job (Alpern, 1997; Sleaf & Reed, 2006).

Strong communications skills are of extreme importance to employers (Fallows & Weller, 2000). Written and verbal communications skills are required if an individual is to think critically and quickly in various situations. Schmidt (1999) reported the development of these communications skills can be enhanced through classroom writing activities. Schmidt (1999) also contended that the connection between writing and thinking is ‘so rich’ to use as a developmental tool. Employers desire good written communications skills, and writing in the class environment is one method to improve these skills (Schmidt, 1999). Teamwork is a regular occurrence in many employment settings with a need for strong communications skills to function successfully in a team (Sleaf & Reed, 2006). Per Cole and McCroskey (2003), communications skills development is crucial, as strong oral skills are needed not only to interact successfully on teams, but with peers and supervisors as well.

Experience, Education, Skills, and Training

A common finding in the literature was the importance of previous work experience for the success of the new graduate (Rateau & Kaufman, 2009). Employers highlight the importance of previous work experience as a means for the student to mature and gain real life experience that only work can provide (Sleap & Reed, 2006). Work experiences were noted typically as internships, part time employment during college years, or summer jobs. The integration of experiential learning methods and work-related programs had a significant impact on the development of competencies resulting in a more ‘work ready’ and a ‘more balanced graduate’ (Coll & Zegwaard, 2006, p. 30). In the past, students were told often that part-time work during their time in higher education could interfere potentially with their education. Now, with the improved understanding of the benefits of work-related learning experiences, students are being encouraged to seek out part-time jobs (Harvey, 2005).

Fallows and Weller (2000) cited the ability to contribute quickly to the success of the organization as a primary need of employers. With previous work experience, graduates adjusted to their first job more easily and expressed a better understanding of different organizational cultures. They also felt their employability skills were better developed, allowing them to contribute to the organization faster (Fallows & Weller). Additionally, there is a link between work experience and higher salary, indicating employers value and are willing to pay for the positive impact previous work experience brings (Harvey, 2005). Although there were many references to the advantages of work experience, the literature offered little insight into any plans or changes by students, employers, or higher education to incorporate or require work experience as part of the experience of higher education.

Essential Skills and Competencies

The need for improved employability skills is linked to the success of the individual and to the success of society. Hawkrige (2005) stated employability skills were a requirement in a knowledge-driven economy with a strong connection between economic success of society and education of the workforce. Without the required employability skills, the United States is at risk of losing its economic competitive advantage to other countries. The need for improved employability skills was a constant theme throughout the literature (Rateau & Kaufman, 2009). The definition of employability skills was stated in many articles; however, there was no clear agreement on the definition. Additionally, there was a lack of shared terms and definitions to describe the many employability skills (Smith et al., 1989). This results in confusion between higher education, students, and potential employers. Without commonly agreed upon definitions of the terms and phrases, it becomes difficult to completely understand and act on the needed improvements in employability skills (Alpern, 1997).

Skills Leadership Approach

The skills approach to leadership is based on the concept leadership skills can be developed “over time as a function of education and experience” (Mumford et al., 2000, p. 21). In this model, skills are “what leaders can accomplish” and defined “as the ability to use one’s knowledge and competencies to accomplish a set of goals or objectives” (Northouse, 2010, p. 40).

As conceptualized by Katz (1955), the required workplace skills include technical skills, human skills, and conceptual skills. Technical skills as those skills such as the content specific knowledge the individual must have for “understanding of, and proficiency in, a specific kind of activity, particularly, one involving methods, processes, procedures, or techniques” (Katz, p. 91). Human skills centered on the leader’s ability to work successfully with individuals and teams

while building cooperation among team members. For success in human skills, an individual must have a strong sense of self-awareness and the skill of working comfortably with others. The third skill required was conceptual skills or the skills to work with ideas and concepts, and the ability to bring together and make meaning of all the various functions and roles within an organization or the “sensing of the organizations as a whole” (Katz, p. 93).

Later, researchers developed further the concept into the leadership skills model, in which “leadership can be understood in terms of knowledge, problem solving skills, solution constructions skills, and social judgment needed to solve” complex problems (Mumford, Zaccaro, Connely, & Marks, 2000, p. 155). A key finding of their research, different from previous leadership theories, was the important issue that “knowledge and skills are developed capabilities that emerge over time as a function of education and experience” (Mumford et al., 2000, p. 21). The three components of the skills model are divided into components of individual attributes, competencies, and leadership outcome. The skills, attributes, competencies, and outcomes of the model, as noted previously by the Conference Board (2006), are the same skills employers are looking for in college graduates moving into the workplace. From this work, the modified version of the leadership skills model emerged, with the core of the model surrounding the learned competencies of problem solving skills, social judgment skills, and knowledge (Figure 2-1).

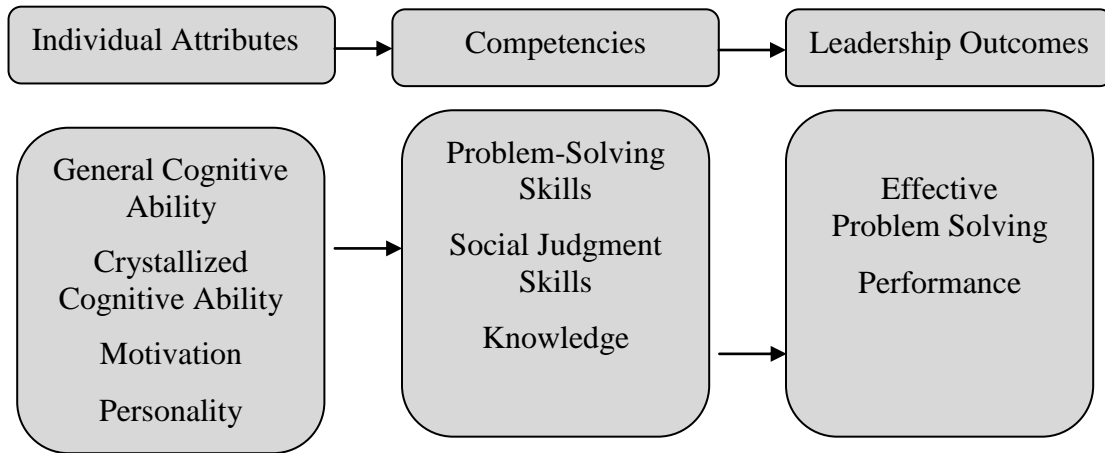


Figure 2-1: Three Components of the Skills Model. Note. From “Leadership: Theory and Practice,” by P. G. Northouse, 2010, p. 44. Copyright 2010 by Sage Publications, Inc. Used under fair use guidelines, 2011.

Schunk (2008) stated problem solving “refers to people’s efforts to achieve a goal for which they do not have an automatic solution” (p. 196). Schunk continued by stating the cognitive process of problem solving is critical to real learning. Successful problem solving skills are creative approaches to a problem and include the ability to define the situation, gather the appropriate data for decision making, and formulate various options to resolve the issue in a logical process (Northouse, 2010). Social judgment skills are the skills needed to understand the differences in each individual and the ability to work effectively with others or in teams. Knowledge, according to Mumford et al. (2000), is needed for effective performance in two important areas. First, knowledge is the foundation for problem solving skills in the defining of the problem, formulating ideas to better understand the problem and developing potential problem solving options, and finally the development of strategies for solution. Second, knowledge is required for an understanding of the people one is surrounded by. Knowledge is needed for the successful communications of visions, goal establishment, and successful motivation of others.

Bases of Competence

As noted in the review of literature, there was often a lack of shared understanding and definitions concerning the key skills graduates need for success in the workplace (Rateau & Kaufman, 2009); the result is confusion as “faculty views may be in conflict with those of other education stakeholders such as employers” (Coll & Zegwaard, 2006, p. 30). Additionally “there is no consensus in the academic literature regarding which particular transferable personal skills are most and least important” (Bennett, 2002, p. 459). Without this common agreement, higher education does not always understand employers’ needs; therefore, it cannot make the changes needed in curriculum, teaching styles, and skill development (Coll & Zegwaard, 2006; Slep & Reed, 2006). In a collaborative effort between employers and higher education to address this confusion and lack of agreement, Evers et al. (1998) embarked on a comprehensive study to develop a model that identifies the skills and competencies college graduates need for success in the workplace. The results of this study, *The Bases of Competence*, addressed the confusion noted often in the literature by identifying clearly those skills required for college graduates needed for success in the workplace. *The Bases of Competence* is a “model of general skills that college graduates need to develop to be able to thrive in the workplace and serve as a foundation for lifelong learning” while the model “has utility for students, educators, employees, and human resource experts for the foreseeable future” (Evers et al., 1998, p. 6). *The Bases of Competence* is a model for addressing “partnership advancement between colleges and work organizations” (Evers et al., p. xxiv).

The research findings identified sixteen skills required for success in the workplace. From the skills, four bases of skills constructs emerged which were consistent with the current literature as: Mobilizing Innovation and Change, Managing People and Tasks, Communicating,

and Managing Self. Skills within each of the four constructs are described by Evers et al. (1998,) as:

1. Mobilizing Innovation and Change to include conceptualizing, initiating, and managing significant changes as compared to the current.
2. Managing People and Tasks to include the planning, organizing, coordinating and resource control required to accomplish a stated task.
3. Communicating to include interpersonal skills needed to effectively work with others to gather, analyze, and communicate information.
4. Managing Self to include continually maximizing and developing one's ability to successfully deal with daily challenges and the increasingly complex world.

Strikingly, the skills constructs identified by Evers et al. (1998) are the same as the technical, human and conceptual skills required for success of leaders as identified by Katz (1955), and later refined by Mumford et al. (2000). Additionally, as noted previously, these are the same skills and abilities that “can be developed over time through education and experience” (Northouse, 2010, p. 43).

Contributions from Higher Education

Preparing students for employability is a fundamental role of higher education (Nabi & Bagley, 1999). The role of higher education is a theme throughout many of the articles and focuses on the need for change in various areas including: curriculum, teaching methods, expected educational outcomes to keep pace with the changing world, and the need to partner with future employers (Rateau & Kaufman, 2009). When examining curriculum, multiple sources highlighted the need to keep curriculum current with the changing world (Atkins, 1999; Fields, Hoiberg, & Othman, 2003; Garton & Robinson, 2006; Hawkrigde, 2005; Paranto & Kelkar, 1999; Rae, 2007; Smith & Betts, 2000; Suvedi & Heyboer, 2004; Conference Board,

2006; Whittington & Newcomb, 1992). New teaching methods and strategies must be integrated into the college classroom where emphasis is placed on “learning to learn . . . with a shift in pedagogy from ‘knowing what’ to ‘knowing how to find out’” (Harvey, 2005, p. 17); “learning how to learn” (Atkins, p. 267); and the need for graduates that “know how rather than simply knowing that” (Robinson et al., 2007, p. 19). In recognition of the need to respond to the changing world, Fields et al. (2003) noted that institutions “are in the midst of change, with 94% of the responding 52 institutions changing mission, departments and/or undergraduate majors from 1997 through 2002” (p.7). Educators are making efforts to change and equip better their students; however, society and technology are changing faster than many universities, resulting in graduates who enter the work environment often lacking the necessary skills (Rae, 2007).

Motivation

Motivation has been critically linked to learning and students’ desire to learn (Schunk, 2008). To understand the role of motivation in learning and desire to learn, a clear definition of motivation is required including a concept that explains why people think and behave as they do (Weiner, 1992). From a cognitive perspective, motivation is the “process whereby goal-directed activity is instigated and sustained” (Pintrich & Schunk, 1995, p. 4). Motivation to learn is “the tendency to find learning activities meaningful and worthwhile and to benefit from them – to try to make sense of the information available, relate this information to prior knowledge, and attempt to gain the knowledge and skills the activity develops” (Wlodkowski, 2008, p. 5). Motivation is a key concept of teaching and learning theories in the classroom. We know motivation can be taught (Allen & Hartman, 2009) and a student’s real, deep learning is correlated highly with their motivation (Markwell, 2006). Research has shown when instructors create a classroom environment enhancing student motivation, students are more likely to be engaged actively and interested in their academic growth and learning (Schunk, 2008). One such

classroom motivation theory, the expectancy-value theory, holds that student learning depends on how much value the student places on the learning outcomes and the degree the individual believes the learning goals are attainable (Schunk, 2008). For students' deep learning, they must see value in the learning outcomes and goal attainment; assignments and class activities need to be relevant and real-world; and the student must feel clearly that the assignments or activities are attainable, without being either too easy or so difficult it cannot be attained (Schunk, 2008).

Learner-Centered Instruction

The central tenets of a learner-centered (LC) pedagogy, per noted author and scholar Maryellen Weimer in her *Learner-Centered Teaching: Five Key Changes to Practice* (2002), include major changes to the traditional class, including the balance of power, function of content, role of the teacher, responsibility for learning, and the purpose and process of evaluation. A shared definition of learner-centered “focuses attention squarely on learning: what the student is learning, how the student is learning, the conditions under which the student is learning, whether the student is retaining and applying the learning, and how current learning positions the student for future learning” (p. xvi). LC “refers to environments that pay careful attention to the knowledge, skills, attitudes, and beliefs that learners bring to the educational setting” (Bransford, Brown, & Cocking, 2000, p. 133) while attempting “to help students make connections between their previous knowledge and their current academic tasks” (p. 153). Additionally, learning is the “acquisition of new information or skills; it involves a long-term change in mental representations or associations as a result of experience” (Ormrod, 2008, p. 167). Learning, per Kolb (1984), is the transformation of experience into knowledge and is a lasting change. Learning becomes a “dynamic process of restructuring” (McManus, 2005, p.142) versus a cumulative process as in the traditional classroom.

In a LC classroom, the teacher becomes coach, guide, and model for the student. A coach and guide by listening actively to students as they construct their new knowledge, discussing the students' thoughts, and, when needed, asking questions about alternative ways of looking at the issue. In their new role, instructors also become active learners themselves through discussions with the students, thus, becoming a model for students by demonstrating continuously what an engaged, motivated learner looks like. From Bandura (1986) and the social cognitive theory, modeling has a strong potential to change others' behaviors and actions. Schunk (2008) stated, "by observing others, people acquire knowledge, rules, skills, strategies, beliefs, and attitudes" (p. 78). A powerful message instructors' must consider includes:

Because it is important that our actions as instructors exemplify the actions we want our students to develop, we pay close attention to the way that our own mental models and actions as professors are reflecting or not reflecting the theories we are teaching. In other words, we continually ask ourselves: Are we walking the talk?

(Foster & Carboni, 2009, p. 688)

In a LC environment the teacher acts as coach, guide, and model for the student, similar to the role of a leader in the path-goal theory of leadership where the leader guides the followers to goal attainment.

Path-Goal Theory Aligned with Contributions from Higher Education

Path-goal theory of leadership was promoted first by Robert House (1996) using "Vroom's expectancy theory of motivation to identify the effects of leader behavior on subordinate outcome variable" (Schriesheim & Neider, 1996, p. 317). Path-goal theory "is a dyadic theory of supervision in that it does not address the effect of leaders on groups or work units, but rather the effects of superiors on subordinates" (House, 1996, p. 325). House (1996) proposed further that the theory affects the follower's motivation, job performance, and

satisfaction as the leader defines the goals, clarifies the path, removes obstacles in the way of the path, and provides support to the individual follower (Northouse, 2010). This theory is based on the relationship between leader and follower, similar to a classroom and the relationship between instructor and student. Individuals are motivated to accomplish their work when leaders define goals clearly, define the path to goal attainment, remove barriers to goal attainment, and provide the necessary assistance towards goal attainment (Rowe, 2007). Path-goal theory is “concerned with how formally appointed superiors affect the motivation and satisfaction of subordinates” (House, 1996, p. 325). Key constructs of the theory, as shown in Figure 2-2, state the role of the leader is to improve associates’ motivation by improving their performance, defining goals, clarifying the path, removing obstacles, and providing support (Northouse, 2010).

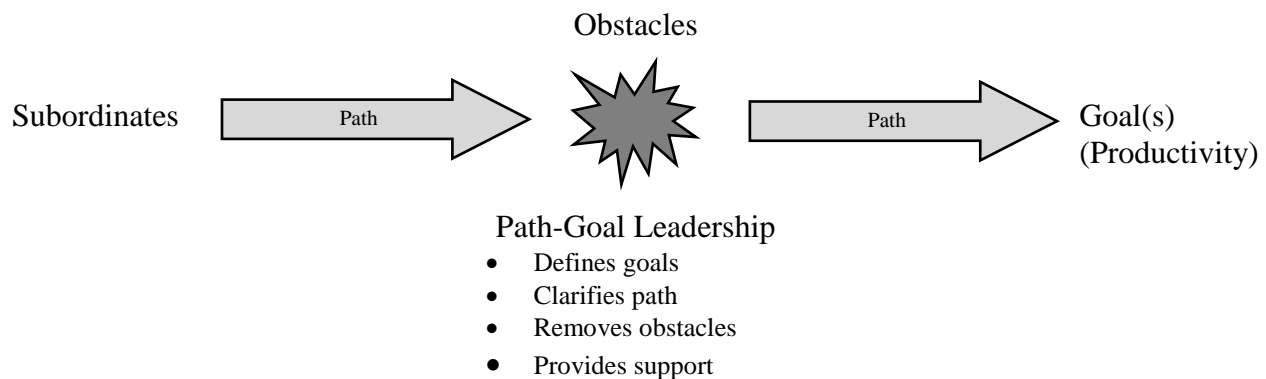


Figure 2-2: The Basic Idea Behind Path-Goal Theory. Note. From “Leadership: Theory and Practice,” by P. G. Northouse, 2010, p. 126. Copyright 2010 by Sage Publications, Inc. Used under fair use guidelines, 2011.

The connections between the path-goal theory of leadership and its application in a classroom are apparent in the fact that motivation is key to the success in both leadership theory and teaching and learning theory. Motivation ties all the different learning theories together as it is a common and required aspect for all successful learning (Schunk, 2008). As an instructor, path-goal theory has the potential for powerful learning in the classroom as the instructor defines

the goal, clarifies the path, removes obstacles, and provides support. An instructor, similar to a leader, generates motivation when the leader “makes the path to the goal clear and easy to travel through coaching and direction, when [the leader] removes obstacles and roadblocks to attaining the goal and when [the leader] makes the work itself more personally satisfying” (Northouse, 2010, p. 126). The path-goal leadership theory also has application to a learner-centered classroom in that the behaviors of the leader and instructor are similar. In both situations of leader or instructor, they must be flexible to move easily between four different behaviors based on the follower or student needs. According to House (1996) these behaviors and outcomes include: 1) directive path-goal clarifying leader behavior, 2) supportive leader behavior, 3) participative leader behavior, and 4) achievement oriented behavior. These behaviors and outcomes are consistent with teaching and learning theory, as described by Weimer (2002). House (1996) originally conceived path-goal as a type of situational leadership theory understanding leader behaviors would need to change based on the individual follower’s needs. In a modern classroom composed of numerous students, where each brings their own unique knowledge, experiences, and needs, it becomes apparent that path-goal leadership theory has the potential to be a powerful model for instructors to implement in the classroom.

Collaboration and Program Planning

The review of literature noted continually the need for collaboration not only between employer and university, but collaboration between all stakeholders (Rateau & Kaufman, 2009). In our world of increasing complexities and rapid change, universities must evaluate and modify the curriculum continually to meet students’ needs (Garton & Robinson, 2006). If new teaching strategies or curriculum are to be developed, there must be collaboration between all stakeholders in educational program planning resulting in shared understanding of the desired student learning outcomes. Effective educational programs meet the needs of participants, and

one way to determine if the need is being met is to “ask the participant . . . ask the bosses of the participants . . . ask others who are familiar with the job . . .” (Kirkpatrick & Kirkpatrick, 2006, p. 4); once again highlighting the need for collaboration between all stakeholders for successful program evaluation. “The task of producing marketable graduates requires an on-going sensitivity to the changing needs and perceptions of prospective employers” (Andelt et al., 1997, p. 47), while “customer feedback is an established concept of strategic planning” (Cole & Thompson, 2002, p. 34).

Although there are many program evaluation models, one model for adult learners is the *Interactive Model for Program Planning* (Caffarella, 2002). An essential component of the planning process includes “thinking through strategies for obtaining support from the wider community” (Caffarella, p. 98) as the model recognizes the importance of input from all stakeholders and the early and continuing buy in from stakeholders. One strategy to obtain this support is through the use of advisory boards. When developed properly, the advisory board includes members from the various stakeholder groups with the role to “influence . . . and affect the direction and form of the education” (Caffarella, p. 98). The Caffarella model outlines clearly the principles, guidelines, member roles and responsibilities, and authorities of the advisory board to ensure its objectives are accomplished.

A second model for adult education program planning is the respected model by Cervero and Wilson (2006). While similar to the Caffarella model, this model differentiates itself by noting the critical role of planners as they “negotiate interests in relations to power” (Cervero & Wilson, 2006, p. vi). Planning adult educational programs becomes a series of negotiations between people often with different interests, goals, and outcome expectations; as the authors frame the “planning practice as a social activity of negotiating interests in relationships of power” (p. 5).

The Role of the Land Grant Institution

Recognizing we live in a rapidly changing world, it is critical land grant universities “review their curricula and ensure graduates are prepared for success in their 21st century . . . careers” (Hamilton, Lau, Hanagriff, & Hamilton, 2007, p. 80). Consistent with this need for curricula review, the *National Research Agenda for Agricultural Education and Communication* (Osborne, 2007) includes multiple research priorities to challenge agricultural educators to evaluate their curricula and programs. The findings of this study will shed light on the following research priority areas:

1. “Improve the success of students enrolled in agricultural and life sciences academic and technical programs with a specific objective to identify what teaching . . . strategies most effectively and efficiently yield desired student outcomes . . .?” (p. 7).
2. “Assess the effectiveness of educational programs in agricultural and life sciences including how well do program graduates perform in the workplace?” (p. 7).

The current Virginia Tech mission statement reflects the changing needs of society and the role of the land-grant institution with a commitment to “strong undergraduate education with a special emphasis on professional development,” graduates who are “holistically educated and who can assume leadership roles in a democratic society” and prepare its graduates for success in the marketplace (Virginia Tech, 2006).

Summary

This chapter provided a review of literature related to the critical problem of skills and proficiencies development required of an undergraduate curriculum that prepares students for success in the workplace. The chapter explored the skill needs and expectations employers have of recent college graduates they employ, including the current employability readiness of graduates and the role of previous work experience in students’ skill development. In addition,

the chapter provided the theoretical framework for the study including the skills model of leadership as related to the essential skills and competencies graduates must possess for career success; and the connection between leadership skills and employability skills was shown. A model of skills development, *The Bases of Competence*, was introduced which defines clearly the skills needed for success in the workplace and the need for collaboration between all stakeholders in the development of employability readiness. The contributions from higher education, including the role of the land grant university, was discussed in developing employability readiness, including the critical need to move to a learner-centered environment with a focus on the student, not the content. Motivation, as related to teaching and learning and the similarities as related to leader and follower was discussed. A second theoretical perspective, the path-goal theory of leadership, was discussed and the connection between the role of a leader (follower) and the role of an instructor (student) was shown.

The following section, Chapter 3, includes methods used to conduct the study and the analysis of data.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

The purpose of the study was to identify a land grant college of agriculture and life sciences' (LGCALS) current programmatic and classroom strategies for developing students' ability to continuously learn and thrive in our rapidly changing world, and assess recent graduates' experiences of those strategies.

The specific objectives included:

1. Describe LGCALS undergraduate program coordinators' perceived strategies for developing students' ability to continuously learn and thrive in our rapidly changing world.
2. Describe LGCALS innovative instructors' classroom strategies for developing those same skills in their students.
3. Describe recent graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the *Bases of Competence Inventory*.
4. Compare and contrast programmatic strategies, classroom strategies, and graduates experience with respect to the required skills for career success.

The outcomes of this applied research add to the body of knowledge on the leadership theories of the skills approach and path-goal leadership as related to the enhancement of student employability skills. Leaders at Virginia Tech will be able to identify strategies to increase and improve collaborative relationships with stakeholders, while instructors will be able to identify those teaching strategies that develop students' employability skills. All stakeholders will be able to better understand graduates' perceptions of the importance of the different employability skills needed for success and their readiness to use these skills in the workplace. Obstacles and barriers to the successful development of employability skills will be identified. This information will

allow educators to better evaluate the classroom instructional strategies that develop those skills graduates' require for success in the workplace.

Traditionally, both the skills approach to leadership and path-goal theory have been applied to understanding effective leadership and followership in a business setting. The findings of this research will expand the application of the theories to the classroom and provide clarity to the roles of an effective university administrator and instructor. Additionally, the theories can be applied to students and add clarity to the roles and accountabilities of students on their journey to gain the required skills in a learner-centered classroom.

Research Design

The research design “is a logical plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about these questions” (Yin, 2003, p. 20). A mixed methods convergent parallel design guided the research (Figure 3-1). Qualitative interviews were employed for exploring experiences using interpretive, constructivist and naturalistic approach for research objectives one and two. A cross sectional survey design and questionnaire was used to conduct the quantitative research for objective three. The mixed methods portion of the convergent parallel design was used to frame and explore research objective four. Before any data collection was initiated a research proposal was submitted to the Virginia Tech Institutional Review Board (IRB) for approval. IRB approval was granted before any contacts were made with participants.

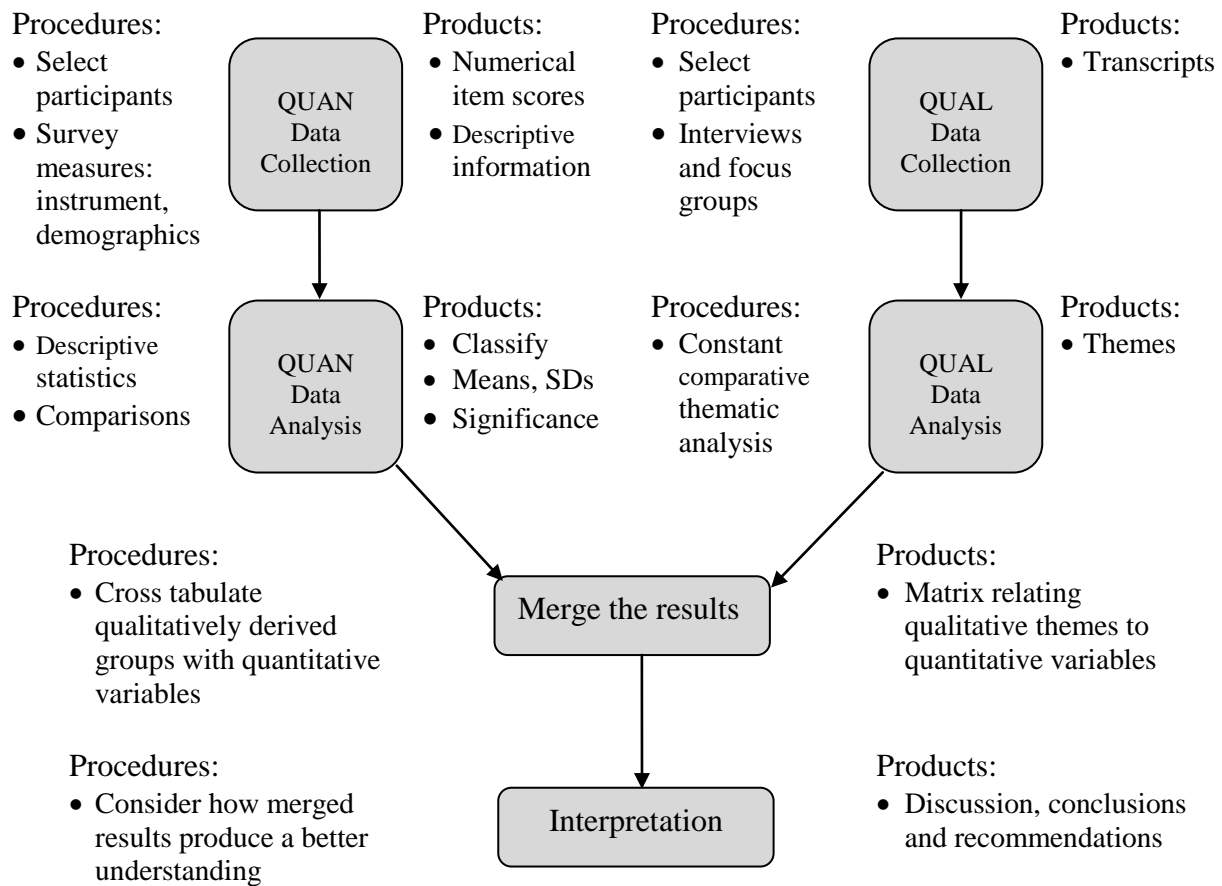


Figure 3-1. The Products and Procedures of a Convergent Parallel Design. Note. From “Designing and Conducting Mixed Methods Research,” by J. W. Creswell and V. L. Plano Clark, 2011, p. 118. Copyright 2011 by Sage Publications, Inc. Used under fair use guidelines, 2011.

The research design emerged from an extensive review of the literature. A literature review is a strong “argument that promotes a thesis position by building a case from the credible evidence based on previous research” (Machi & McEvoy, 2009, p. 4). Knowledge emerges from the review that is the foundation of support for a thesis position and the need for future research addressing the research question.

Qualitative Inquiry

“The process of designing a qualitative study begins not with the methods—which is actually the easiest part of research, I believe—but instead with the broad assumptions central to qualitative inquiry, a worldview consistent with it, and in many cases, a theoretical lens that

shapes the study” (Creswell, 2007, p. 42). The propositions, or facts, emerged during the review of literature and were used in support of writing the research question and objectives.

A portion of the research included qualitative inquiry, using interviews. Interviews were conducted, because “at the root of in-depth interviewing is an interest in understanding experience of other people and the meaning they make of that experience” (Seidman, 1998, p. 3). Interviews were conducted with program coordinators and innovative instructors at Virginia Tech University, CALS. Prior to development of the interview guides, the researcher developed sets of *a priori* propositions (Appendices A and B). A priori propositions are the study component that “directs attention to something that should be examined within the scope of the study” (Yin, p. 22). These propositions were used later to write the exact interview guidelines to ensure the actual research questions and phenomenon were explored; however, the actual interviews were more conversational than structured questions and answers (Yin, 2003) . Prior to the interviews, the interview guides (Appendices C and D) were reviewed with different committee members and adjustments made based on their feedback. The purpose of the review was to ensure the both the questions and structure of the interview were appropriate to address the research question (Seidman, 1998) and make any necessary changes to the guideline.

Focus group interviews with program coordinators explored the perceived strategies for developing students’ ability to learn continuously and thrive in our rapidly changing world. Interviews with innovative instructors explored classroom strategies for developing those same skills in their students. The qualitative inquiry process mirrored closely the circle of activities or phases as proposed by Creswell (2007): identifying the participants to interview, gaining access, purposefully sampling, collecting data, recording of information, resolving issues that may arise, and storing data.

Trustworthiness

Trustworthiness of the qualitative portion of the research, per Lincoln and Guba (1985), is the ability of the researcher to persuade the consumer of the research that the findings are worthy and includes the four criteria of credibility, transferability (consistency), dependability, and confirmability. The four criteria of trustworthiness (Lincoln & Guba, 1985) include:

1. Credibility – Were the researchers analysis and interpretations of the phenomenon explored believable?
2. Transferability (consistency, fittingness) – Was the information concerning the participants descriptive and inclusive, allowing for others to evaluate similarities to other participants? Can the research findings have application to other similar participants?
3. Dependability – Does the researcher demonstrate reliability in the process followed including a logical process that was documented well?
4. Confirmability – Were the findings linked and founded in the data without the researcher inserting bias?

Lincoln and Guba (1985) go on to state that trustworthiness is the researchers' ability to persuade the consumer of the research that the findings are worthy. There are multiple methods to determine the trustworthiness of the research findings. One such method is member checks, allowing participants to review the findings to determine if they view the outcomes as accurate (Creswell, 2009; Seidman, 1998). Member checks were implemented for review of findings and researcher interpretations of interviews with innovative instructors. Additionally, trustworthiness was enhanced by the use of "rich, thick descriptions" (Creswell, 2010, p. 191) and the use of direct quotes; both efforts to persuade the reader that the findings are worthy.

Researcher Role

The role of the researcher in qualitative inquiry is critical as “data do not speak for themselves: they are interpreted through complex cognitive processes” by the researcher as they construct knowledge (Rossman & Rallis, 2003, p. 36). The researcher:

Makes meaning of (interprets) what he learns as he goes along. Data are filtered through the researcher’s unique ways of seeing the world – his lens or worldview. Given this interpretive nature of qualitative research, the researcher’s personal biography shapes the project in important ways. It is crucial, therefore, that researchers develop an acute sensitivity to who they are in their work. (Rossman & Rallis, 2003, p. 36)

Understanding I bring a unique view concerning the problem statement based on my career, I recognized the importance of my role in shaping the research. Additional comments on the role of the researcher follow in the discussion of the objectives.

Quantitative Research

The quantitative section included the measurement of data using a questionnaire. The advantage in “using measurement is that one may apply the powerful tools of mathematics to the study of phenomena” (Pedhazur & Schmelkin, 1991, p. 17). Survey research was “conducted by interviewing a small portion of a large population through the application of a set of systematic, scientific, and orderly procedures for the purpose of making accurate generalizations about the large population” (Rea & Parker, 2005, p. 264). Questionnaires or surveys “typically collect three types of information: descriptive, behavioral, and attitudinal” (Pedhazur & Schmelkin, p. 6). The research followed a systematic process including development of appropriate sampling design, appropriate instrumentation that addressed the research question, collection of data, analysis of data, and the final written report.

Validity

Validity of the quantitative instrument is defined often as the “adequacy and appropriateness of interpretations and actions based on test scores” (Messick, 1994, p. 1); however, a major issue of reviewing the validity of an instrument is “ascertaining what constitutes ‘appropriate’, and ‘meaningful’” (Pedhazur & Schmelkin, 1991, p. 30). Validity for this research is best described as “one validates, not a test, but an interpretation of data arising from a specified procedure” (Pedhazur & Schmelkin, p. 31). Face validity, or “does the instrument look as if it would measure what it intends to measure” (Hittleman & Simon, 2006, p. 126) was established and required modifications made based on the recommendation of committee members and previous research that used the same instrument with a similar target group.

Reliability

Reliability “refers to the degree to which test scores are free from errors of measurement” (Pedhazur & Schmelkin, 1991, p. 82) and should not be confused with validity as the two measures do not test the same topic. Reliability, or consistency, and repeatability of an instrument were reported as a reliability coefficient, or Cronbach’s alpha in this case, a numeric value between 0 and 1, with higher values indicating stronger instrument consistency (Hittleman & Simon, 2006).

Mixed Methods Research

The strategy of inquiry was based on both qualitative and quantitative methods “recognizing that all methods have limitations, researchers felt that biases inherent in any single method could neutralize or cancel the biases to the other methods” (Creswell, 2009, p. 14). Additionally, per Creswell and Plano Clark (2007), using both methods “in combination provides a better understanding of the research problems than either approach alone” (p. 5). The two

methods build and support each other and are “interconnected and interrelated so that the study appears as a cohesive whole rather than as fragmented isolated parts” (Creswell, 2007, p. 42).

A convergent parallel design guided the mixing of the qualitative and quantitative data. This method is based on separate analysis of the qualitative interviews and the quantitative survey data, followed by merging of the data looking for similarities or differences in findings and final researcher interpretation. A convergent parallel design

Occurs when the researcher uses concurrent timing to implement the quantitative and qualitative strands during the same phase of the research process, prioritizes the methods equally, and keeps the strands independent during analysis and then mixes the results during the overall interpretation. (Creswell & Plano Clark, 2011, p. 70)

Objective 1: Describe Program Coordinators’ Strategies

The first objective of the study was to describe LGCALS undergraduate program coordinators’ perceived strategies for developing students’ ability to continuously learn and thrive in our rapidly changing world.

Population and Sample

Identification of coordinating counselors for participation in focus groups was coordinated through the College of Agriculture and Life Sciences Office of Academic Programs. Seventeen of the nineteen undergraduate coordinating counselors were contacted representing ten of the eleven CALS undergraduate departments. Two undergraduate coordinators were not contacted as they were also included in the population and sample for research objective two. Recruitment was accomplished through written correspondence (Appendix E) explaining IRB approval, the purpose of the study, confidentiality, and voluntary participation. After repeated communications, eleven individuals agreed to participate in the focus groups, and the balance declined based on time commitments or conflict of schedule. One scheduled focus group had

only two scheduled participants and had to be cancelled; the two participants were unable to reschedule and attend a focus group on another date. Two focus groups were scheduled with three participants in the first focus group and six participants in the second focus group. In total, nine coordinating counselors representing six of the ten CALS undergraduate departments participated in focus groups.

Data Collection

Similar to one-on-one interviews, the data collection phase for a focus group is designed as an open-ended interview allowing participants to respond in their own words and terms (Patton, 2002) and where the researcher can probe into the facts of a matter including ideas, feelings and opinions about the phenomenon and experiences (Yin, 2003). Focus groups were used to collect data as

Focus groups are advantageous when the interaction among interviewees will likely yield the best information, where interviewees are similar and cooperative with each other, when time to collect information is limited, and when individuals interviewed one-on-one may be hesitant to provide information. (Creswell, 2007, p. 133)

A critical phase in data collection begins with “gaining access through the gatekeeper, gaining the confidence of participants” (Creswell, 2007, p. 120). Collection of data, or interviews, consisted of a two phase approach with the first phase soliciting interest and the second phase the actual focus group session to explore the phenomenon itself. The solicitation of interest occurs first and is a process to introduce the phenomenon being researched, describe the process, and discuss ethical issues including confidentiality. To introduce the study and its purpose, the Associate Dean and Director, College of Agriculture and Life Sciences Academic Programs discussed the study with coordinating counselors at a regularly scheduled meeting,

noted each would receive a recruitment letter from the researcher, and encouraged voluntary participation.

The focus group sessions were conducted in a large classroom in Litton-Reaves Hall at Virginia Tech. Tables and chairs were arranged to provide a comfortable and conducive environment for discussion. Names plates were positioned on the tables so that all participants would know names of other participants. The meeting started with an informal introduction of me, my research interests, and the purpose of the study. Additionally, proof of IRB approval and confidentiality were discussed, followed by signing of duplicate copies of the informed consent (Appendix F) with the participants retaining one copy and the researcher retaining the second signed document. Each participant was asked to introduce themselves and their department. Before the actual interview started, I requested and gained permission to audio record the interview. IRB approved interview guides (Appendix C), developed from the set of *a priori* propositions (Appendix A), were used. The interview guide was designed not only to address the research question but to sequence the questions, beginning with general questions and then moving to deeper questioning to explore the phenomenon better. Interview guides were reviewed with one committee member to determine the clarity of questions and the adequacy of the interview guide. Adjustments to the guide were made based on feedback. Recorded interviews were conducted, each taking approximately 50 minutes. Rich field notes were taken to ensure small but important details of the discussion were not overlooked. Audio recordings were transcribed verbatim.

Before the focus group sessions began, the consent form (Appendix F) was reviewed and participants had the opportunity to sign the consent indicating their willingness to participate in the study. Once the interview began, the researcher reviewed the interview guide for questioning,

but also remained flexible to ask appropriate probing questions to understand better the participants' experiences.

Data Analysis

Data analysis of the focus group sessions with program coordinators was through a process of whole text analysis, as developed by Glaser and Strauss (1967), including identifying, coding, and categorizing data into patterns while remaining aware of the researcher's stance on the phenomenon. The analysis was "fluid and generative" (Corbin & Strauss, 2008, p. 160) consisting of immersing oneself into the experience, analyzing the materials, coding the data, and organizing the codes into categories. The analysis phase was a process in which the raw data were "turned into *findings or results*" (Lofland, Snow, Anderson, & Lofland, 2006, p. 195) and was an inductive process moving from small detail and very specific to a higher or more general level of findings. During the session, audio recordings were taken as well as rich notes capturing the key participant experiences, words, and phrases. Field notes were proof read multiple times for the researcher to begin to "feel" the experience and listen for words that brought meaning to the phenomenon. Coding of the field notes began as "the process of sorting your data into various categories that organize it and render it meaningful" and included the "defining what the data are all about" (Lofland et al., p. 200). Once coding of concepts was completed, the process of categorizing (also known as themes), began by placing together concepts with shared meaning, thus allowing the reduction of large amount of data into fewer, more manageable, yet more broad, categories; a process known as categorical aggregation (Creswell, 2007, p. 164). During the process of categorizing, codes, memos, or reminders of interesting concepts were written and reviewed continually during the research process. The final categories were placed in a table and used by the researcher to describe the findings and results of the research.

Objective 2: Describe Innovative Instructors' Classroom Strategies

The second objective for the study was to describe LGCALS innovative instructors' classroom strategies for developing students' ability to continuously learn and thrive in our rapidly changing world.

Population and Sample

Identifying the potential list of innovative instructors to interview was coordinated through the College of Agriculture and Life Sciences Office of Academic Programs. Selection of innovative instructors was purposeful, "to show different perspectives on the problem" (Creswell, 2007, p. 75) and based on teaching excellence and recognition. Selection of innovative instructors participating in the interview process also had to consider their willingness to share their experiences of the phenomenon and the ability to richly and effectively communicate the actual experiences. Sample size included enough instructors for saturation, "a point in the study at which the interviewer begins to hear the same information reported" by participants (Seidman, 1998, p. 48). Initially, seven instructors from seven different CALS departments were selected. Recruitment of the instructors was accomplished through written correspondence (Appendix E) explaining IRB approval, purpose of the study, confidentiality, and voluntary participation. Repeated communications with the eight innovative instructors resulted with five agreeing to participate, two declined based on time commitments, and one refused to reply to any of the various recruitment communications.

Data Collection

For the one-on-one instructor interviews, the data collection phase was designed as an open-ended interview, allowing the participant to respond in their own words and terms (Patton, 2002), and where the researcher could probe into the facts of a matter including ideas, feelings and opinions about the phenomenon and experiences (Yin, 2003). The power of "in-depth

interviewing is an interest in understanding the experience of other people and the meaning they make of that experience” (Seidman, 1998, p. 3). Each participant in the interviews was considered as a single unit of analysis.

Interview guides (Appendix D) were developed from the set of *a priori* propositions (Appendix B). Interview guides were reviewed with one committee member to determine the clarity of questions and the adequacy of the interview guide; adjustments to guidelines were made based on their feedback.

A critical phase in data collection begins with “gaining access through the gatekeeper, gaining the confidence of participants” (Creswell, 2007, p. 120). Collection of data, or interviews, consisted of a two phase approach, with the first phase consisting of soliciting interest and the second phase the actual interview to explore the phenomenon itself. Through detailed written communications (Appendix E), the solicitation of interest occurred first and was a process to introduce the phenomenon being researched, describe the process, and discuss ethical issues including confidentiality. The time period between the written correspondence and the actual interview gave the participants time to reflect upon the phenomenon and their experiences, thereby better preparing the participants to share their experiences.

Each actual interview session began with introductions in an effort to build trust. According to Laferriere (as cited in Becker, 1986), the first meeting is a time to build trust and good rapport between the researcher and the participant. This trust was critical for the participant to feel safe and be able to describe their experiences completely. Before the interview began, the consent form (Appendix F) was reviewed and the participant had the opportunity to sign the consent, indicating their willingness to participate in the study. Once the interview began, the researcher reviewed the interview guide for questioning but also remained flexible to ask appropriate probing questions to better understand the experiences. The interview guideline was

designed not only to address the research question but was purposefully designed to sequence the questions, beginning with general questions and then moving to deeper questioning to better explore the phenomenon. Each actual audio recorded interview lasted approximately 50 minutes, and was captured with rich written field notes to insure small but important details of the interview were not overlooked in the analysis phase. Full verbatim transcripts were completed.

Data Analysis

Data analysis of the one-on-one interviews with innovative instructors was through a process of whole text analysis, as developed by Glaser and Strauss (1967), including identifying, coding, and categorizing data into patterns while remaining aware of the researcher's stance on the phenomenon. The data analysis was "fluid and generative" (Corbin & Strauss, 2008, p. 160) consisting of immersing oneself into the experience, analyzing the materials, coding the data, and organizing the codes into categories. The analysis phase was a process in which the raw data were "turned into *findings or results*" (Lofland, Snow, Anderson, & Lofland, 2006, p. 195) and was an inductive process moving from small detail and very specific to a higher or more general level of findings. During participant interviews, audio recordings were taken as well as rich notes capturing the key participant experiences, words, and phrases. Field notes were proof read multiple times for the researcher to "feel" the experience and listen for words that bring meaning to the phenomenon. Coding of the field notes began and was "the process of sorting your data into various categories that organize it and render it meaningful" and was the "process of defining what the data are all about" (Lofland et al., p. 200). Once coding of concepts was completed, the process of categorizing (also known as themes), began by placing concepts with shared meaning together, thus allowing the reduction of large amount of data into fewer, more manageable, yet more broad, categories; a process known as categorical aggregation (Creswell, 2007, p. 164). During the process of categorizing, codes, memos, or reminders of interesting

concepts were written and continually reviewed during the research process. The final categories were placed in a table and were used by the researcher to describe the findings and results of the research.

Objective 3: Describe Graduates' Perceptions of Career Readiness

The third objective was to describe recent graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the bases of competence inventory.

Population and Sample

Identifying the potential list of graduates to survey was accomplished by working directly with the Office of Alumni Relations at Virginia Tech. For the 18-month period from December 2008 to May 2010, there were 1,045 CALS graduates (Table 3-1). Of the total population ($N = 1,045$), 353 (33.8%) were male and 692 (66.2%) were female. Although this study was only interested in those that did not pursue additional education after graduation, the total population included CALS graduates that did not pursue further education as well as graduates who went on to graduate school or professional school. Based on current Virginia Tech Career Service information (Virginia Tech, 2010) for the last three years, a weighted average of 42.5% of CALS graduates go on to graduate or professional school. Therefore, 42.5% ($n = 444$) did not meet the criteria of this research as graduates entering the workplace upon completion of their undergraduate degree. Reducing the total population by those who did not meet the criteria resulted in a target sampling frame of 601 CALS graduates between December 2008 and May 2010. Of the target sampling frame ($N = 601$), projected males were 203 (33.8%) and projected females were 398 (66.2%). A critical question in survey research is how many participants (sample size) are required "so that generalizations can be made about the entire population" (Rea & Parker, 2005, p. 142). Sample size must take into account the level of confidence and

confidence intervals. Per Rea and Parker (2005), the level of confidence “is the level of risk the researcher is willing to accept” while the confidence interval determines the level of sampling accuracy that the research obtains” (p. 142). Following procedures as outlined by Rea & Parker for small populations ($N = 601$), using a 95% confidence level and a 5% confidence interval, results in 235 required participants responding to the survey. Additionally, per the Office of Alumni Relations, response rates of CALS graduates ranged from 40% to 50%. Based on these numbers, a census approach would yield the minimum number of 235 participants required.

Table 3-1: *Numbers of Virginia Tech CALS Graduates across Undergraduate Majors by Year*

Undergraduate Major	2008	2009	2010	Total	% of Total
Agricultural and Applied Economics (AAEC)	16	38	28	82	7.8
Agricultural Sciences (AGSC)	3	14	12	29	2.8
Animal and Poultry Sciences (APSC)	23	81	68	172	16.5
Biochemistry (BCHM)	7	69	72	148	14.2
Biological Systems Engineering (BSE)	4	22	16	42	4.0
Crop and Soil Science (CSES)	5	21	7	33	3.2
Dairy Science (DASC)	1	15	14	30	2.9
Environmental Science (ENSC)	5	24	15	44	4.2
Food Science and Technology (FST)	4	15	9	28	2.7
Horticulture (HORT)	13	16	16	45	4.3
Human, Nutrition, Foods, and Exercise (HNFE)	30	171	167	368	35.2
Other	5	14	5	24	2.3
Total	116	500	429	1045	100.0

Instrumentation

After an extensive review of the literature, one questionnaire was identified that addressed employability skills of recent college graduates. It was the *Making the Match Year 3 Questionnaire for Graduates*, developed by Evers et al. (1998). Later, Robinson (2006) modified the questionnaire and conducted a similar study with a comparable target population at the University of Missouri – Columbia, College of Agriculture, Food and Natural Resources. The

instrument was a comprehensive measure of the different employability skill requirements or the bases of competence constructs including: Mobilizing Innovation and Change; Managing People and Tasks; Communicating; and Managing Self (Evers et al., 1998).

The internal consistency of the instrument, or the “chance that the subject’s observed score and true score can be considered similar,” is reported and “expressed in decimal form, ranging from .00 to 1.00. The higher the coefficient, the higher the instrument’s reliability” (Hittleman, 2006, p. 128). The four different base competencies or constructs as measured by the *Making the Match* survey were measured for internal consistency reliability by Evers et al. (1998) indicating high reliability. The authors noted:

In this book, bases competencies represent functionally related skill sets. Skills are not possessed in isolation . . . they reinforce one another. As we conducted analyses of the skills, we could see patterns among groups of skills. Factor analyses were conducted. . . To reiterate, the four bases of competence are composites of the eighteen skills, each of which is a composite of specific items dealing with different facets of the skills.

(Evers et al., 1998, pp. 24-37)

Additionally, Robinson, Garton, and Terry (2007) noted a “Cronbach’s alpha of .94 was realized, indicating the instrument possessed internal consistency in measuring the variable of interest” (2006, p. 59). Results from Evers et al. (1998) include:

1. Mobilizing Innovation and Change including the ability to conceptualize; creativity, innovation, and change; risk-taking; and visioning. Internal consistency reliability ranging from .890 to .907 (p. 39).
2. Managing People and Tasks including coordinating; decision-making; leadership and influence; managing conflict; and planning and organizing. Internal consistency reliability ranging from .900 to .910 (p. 39).

3. Communicating including interpersonal; listening; oral communication; and written communications. Internal consistency reliability ranging from .847 to .862 (p. 39).
4. Managing Self including learning; personal organization and time management; personal strengths; and problem solving and analytic. Internal consistency reliability ranging from .880 to .888 (p. 39).

The actual questionnaire for this study was a shortened version of the original questionnaire as established by Evers et al, (1998) focusing on five of the original seventeen skills. (Appendix G.) Employability skills were rated on a five-point Likert-type scale with anchors provided for no importance (0), minor importance (1), moderate importance (2), major importance (3), and don't know (9). "Measurement instruments that are collections of items combined into a composite score, and intended to reveal levels of theoretical variables not readily observable by direct means, are often referred to as scales" (DeVellis, 2003, p. 8). The questionnaire was self-administered and included a researcher designed supplement to gather basic demographic information (Appendix H).

Borich needs assessment. To allow for prioritizing of improvement efforts, the *Making the Match* survey was typically analyzed using a Borich (1980) needs assessment format. The format assesses perceived level of importance versus competence of specific skills, resulting in a mean weighted discrepancy score (MWDS) identifying those areas that are in most need of improvement.

Discrepancy scores were calculated by subtracting the competence rating from the importance rating. Weighted discrepancy scores were calculated by multiplying the discrepancy score by the mean of the importance scores. Finally, the Borich needs assessment score, or the MWDS, was calculated by taking the sum of weighted discrepancy scores and dividing by the total number of responses.

Consistent with previous research employing the same instrument with a similar population (Robinson & Garton, 2008), MWDS rankings were divided into four categories noting the need for curriculum improvement as:

1. Category I with MWDS greater than .80 indicating skills in most need of curriculum enhancement.
2. Category II – MWDS ranging from .50 to .79 indicating moderate need for curriculum enhancement.
3. Category III – MWDS ranging from .30 to .49 indicating a low need for curriculum enhancement
4. Category IV – MWDS below .30 indicating no real need for curriculum enhancement.

Participant Recruitment

Guidelines detailed by Rea and Parker (2005) and *The Tailored Design Method* (Dillman et al., 2009) guided the communications with potential participants. Graduates' contact information, received from the Office of Alumni Relations at Virginia Tech for CALS graduates from December 2008 to May 2010, detailed over 99% of graduates' current email and mailing addresses. With these high levels of contact information, a mixed-mode survey design was implemented. In recent years, mixed-mode survey designs have “gone from being a novelty to a necessity for many survey situations” and the increase in mixed-mode surveys is “directly related to the technological and cultural changes and their impact on survey practices” (Dillman et al., 2009, p. 300). Consistent with Dillman et al. (2009), mixed-mode surveys included mail and internet contacts. “Multiple contacts are essential for maximizing response” to surveys (Dillman et al., 2009, p. 242). The contacts followed *The Tailored Design Method* (Dillman et al., 2009) system of five contacts including a (1) prenotice letter, (2) the questionnaire mailing, (3) thank

you note, (4) reminder and replacement questionnaire, and (5) a final contact of increased urgency and different mode of delivery (Appendices I and L).

Challenges to the use of internet based surveys have been accessibility of participants to computers and the internet. An additional critique has been the level of skill set of participants to properly respond to the survey (Dillman et al., 2009). However, the participants were recent college graduates, and recent research indicates 85% of college graduates have access to computers and the internet and the skills required to complete an internet survey (Jones, 2002).

Data Management

Data analysis began with measures of central tendency or the “statistics that provide a summarizing number that characterizes what was ‘typical’ or ‘average’ for those data” (Rea & Parker, 2005, p. 89). This would typically include measures of mean, median, mode, frequency, and sample size. Central tendency statistics summarize data but “yield only partial information about the variable” (Rea & Parker, p. 98). Additional data analysis included reviews of measures of dispersion or the measure of variability around the mean. Measures of dispersion included standard deviation and range.

Responses and key variables were compared based on the two different modes of internet and surface mail. Additionally, non-response error was analyzed to determine if those who did not complete the survey were different in any matter critical to the study from those who did. Early and late respondents were compared with independent samples *t*-tests for the different constructs. Sample size for comparison was determined based on minimum sample size requirements and the timing of receipt of the responses. Minimum sample sizes of 30 were used to ensure the number of respondents was “large enough to be meaningful practically and statistically” (Lindner, Murphy, & Briers, 2001, p. 52).

A total of 1,045 questionnaires were sent via Survey Monkey and/or surface mail, of which 60 were returned as undeliverable. Of the 1,045 graduates in the total population, 432 returned completed questionnaires, of which 250 met the study criteria, while the balance of 182 indicated pursuit of graduate or professional school upon completion of their bachelor's degree. Questionnaires returned as undeliverable totaled 60, of which 35 were projected to meet the study criteria. A final response rate of those that met the study criteria was 43.5%.

Demographics. Of the 250 respondents who met the study criteria, 84 (33.6%) were male and 166 (66.4%) were female. The most common major was Human, Nutrition, Foods, and Exercise, followed by Animal and Poultry Sciences (Table 3-2).

Table 3-2: *Respondents of VT CALS Graduates Across Undergraduate Majors by Year*

Undergraduate Major	2008	2009	2010	Total	% of Total
Agricultural and Applied Economics (AAEC)	6	13	7	26	10.4
Agricultural Sciences (AGSC)	1	6	4	11	4.4
Animal and Poultry Sciences (APSC)	8	18	24	50	20.0
Biochemistry (BCHM)	2	11	16	29	11.6
Biological Systems Engineering (BSE)	2	3	8	13	5.2
Crop and Soil Science (CSES)	1	6	1	8	3.2
Dairy Science (DASC)	0	5	2	7	2.8
Environmental Science (ENSC)	2	7	3	12	4.8
Food Science and Technology (FST)	2	1	4	7	2.8
Horticulture (HORT)	8	3	7	18	7.2
Human, Nutrition, Foods, and Exercise (HNFE)	7	26	32	65	26.0
Other	0	4	0	4	1.6
Total	39	103	108	250	100.0

Other key demographics included age, internship experience, and qualification as a first-generation college student. The average age of respondents was 24 years old with a standard deviation of .80. During their study at Virginia Tech, 53.5% participated in an internship. Regarding status as a first generation college student, 21.6% of respondents indicated they were part of the first generation in their family to attend college.

Table 3-3 details respondents' GPA using frequency and percentages, showing the highest percentage of respondents (46.7%) reporting a GPA from 3.00 to 3.49 while 36 participants failed to report their GPA.

Table 3-3
Respondents' GPA Profile and GPA Frequency

GPA	<i>f</i>	%
3.50 to 4.00	53	24.8
3.00 to 3.49	100	46.7
2.50 to 2.99	53	24.8
2.00 to 2.49	8	3.7
Total	214	100.0

Table 3-4 details respondents' length of employment, showing the highest percentage of respondents, or 34.7%, reporting length of employment of six months to one year. Nearly 10% of respondents indicated they were currently unemployed.

Table 3-4
Respondents' Length of Employment

Length of Employment	<i>f</i>	%
More than two years	33	15.5
One year to two years	41	19.2
Six months to one year	74	34.7
Less than six months	44	20.7
Not employed	21	9.9
Total	213	100.0

Survey Mode. A mixed-mode survey method including internet and / or mail was used. Final graduate contact information received from the Office of Alumni relations detailed contact e-mail for all but six of the CALS graduates ($N = 1,045$), and only one missing mailing address. The initial email introducing the study, accompanied by a letter of support from the college's Associate Dean and Director for Academic Programs, was sent on February 7, 2011 via a secure web-site, Survey Monkey. Of the initial e-mails sent, 498 bounced as undeliverable. Using the search name feature of the Virginia Tech web site, 286 new e-mail addresses were located, and these individuals were sent the initial survey contact information. Of the 286 new e-mail

addresses, 17 bounced as undeliverable. When a graduate could not be contacted via e-mail, either because of bounced e-mails or no response from the e-mail, they were contacted using surface mail. A total of 838 graduates were contacted using surface mail, of which 60 were returned as undeliverable. Final returned questionnaires by mode resulted in 66.2% returned through the internet and 33.8% returned via surface mail. Of the completed questionnaires meeting the study criteria, 63.6% were from the internet and 36.4% were from surface mail (Table 3-5).

Table 3-5
Survey Response Rate by Mode

Mode	Total Respondents		Respondents Meeting Study Criteria	
	<i>f</i>	%	<i>f</i>	%
Internet	286	66.2	159	63.6
Mail	146	33.8	91	36.4
Total	432	100.0	250	100.0

An independent samples *t*-test comparing internet versus surface respondents results in no significant differences between the two methods at the .05 level. In addition, Internet and mail responses were compared with independent samples *t*-tests for Borich mean weighted discrepancy scores. Results of the independent samples *t*-tests indicated there were no statistically significant differences at the .05 level between the two different modes.

Non-response error. Non-response error was analyzed to determine if those who did not complete the survey were different in any matter critical to the study from those who did. Early and late respondents were compared with independent samples *t*-tests for the different constructs. Additionally, early and late respondents were compared with a chi-square test for the variable of sex, with results indicating there were no significant differences at the .05 level for early and late respondents. Sample size for comparison was determined based on minimum sample size requirements and the timing of receipt of the responses. Minimum sample sizes of 30 were used.

Internet responses were divided into approximately equal quartiles by the date in which they were returned, resulting in early responses ($n = 41$) and late responses ($n = 41$). Mail responses were divided into approximately equal quartiles by date returned; however, the resulting size of each quartile ($n = 23$) was insufficient for analysis. Therefore, the responses were divided into approximately equal one-thirds resulting in early responses ($n = 31$) late responses ($n = 31$), meeting the minimum sample size of 30 (Lindner et al., 2001).

Early and late respondents from the internet mode were compared for mean weighted discrepancy scores (MWDS) using independent samples t -tests. No statistically significant differences at the .05 level were reported for the all five *Bases of Competence* constructs of Problem-solving and Analytic, Personal Organization and Time Management, and Creativity, Innovation and Change, Personal Strengths, and Learning. Additionally, early and late respondents from the mail mode were compared for MWDS using independent samples t -tests. No statistically significant differences at the .05 level were reported for four *Bases of Competence* constructs of Problem-solving and Analytic, Personal Organization and Time Management, and Creativity, Innovation and Change, and Personal Strengths. However, early and late respondents were significantly different for MWDS on the one mail construct of Learning at the .05 level (Table 3-6).

Table 3-6
Comparison of Early and Late Respondents by Mode on Learning Constructs

Mode and Employability Skill Construct	Early Respondents		Late Respondents		p -value
	MWDS	SD	MWDS	SD	
Mail – Learning	.36	1.70	.84	1.88	.003*

* $p < .05$

The Learning construct consisted of three questions of which there was no statistically significant difference between early and late respondents for the mail mode for two of the three questions at the .05 level. There was, however, a significant difference between early and late

responses based on individual samples *t*-tests at the .05 level for the question “Gaining new knowledge in areas outside the immediate job.” Additionally, over 15% of responses to this one question were left blank or rated with a 9 indicating ‘don’t know’, giving reason to believe there is something unique about the question and its relationship to the other two questions in the Learning construct.

Missing data. Missing responses or incomplete data for the skills questions were reviewed based on the formula for completing mean weighted discrepancy scores. Mean weighted discrepancy scores must have responses to both an importance and a competence score for the individual question. When either an importance or competence response was missing, the corresponding item response was re-coded as missing. All responses of ‘don’t know,’ representing 1% of total responses, were re-coded as missing.

Objective 4: Compare and Contrast Strategies

The fourth and final objective of the study was to compare and contrast programmatic strategies, classroom strategies, and graduates’ experience with respect to the required skills for career success.

Merging of Data and Interpretation

Merging or mixing “is the explicit interrelating of the study’s quantitative and qualitative strands” and mixing will occur during the interpretation or analysis phase of the research (Creswell & Plano Clark, 2011, p. 66). Mixing “involves the researcher drawing conclusions or inferences that reflect what was learned from the combination of results” (Creswell & Plano Clark, p. 67) from the quantitative strand and the qualitative strand. The research design merges data “by directly comparing and contrasting quantitative statistical results with qualitative findings for corroboration and validation purposes” (Creswell & Plano Clark, p. 77). As an interpretive phase, the researcher interpreted “in what ways the two sets of results converge,

diverge from each other, relate to each other, and/or combine to create a better understanding” (Creswell & Plano Clark, p. 78). The three strands of data were initially compared and contrasted using a joint display of congruent and discrepant findings followed by a final matrix linking qualitative themes to quantitative finds.

Researcher Bias

Now retired after a very rewarding career in various aspects of senior level management of a business involved in food, the researcher brought to the process many of his own unique experiences, including experiences (both rewarding and frustrating) in the recruitment, training, mentoring, and guiding of young college graduates entering into the workplace. With this career, he had an insider view of what employability skills were and what it takes for an individual to be successful in the workplace. Now, as a doctoral candidate, he looks at employability skills with an outsider view and a more thorough understanding of the educational issues in both assisting students and challenging them in preparation for their career. With the time since retirement from industry, he now has created some distance between inside and outside views. But “as the central role of the researcher as both data experiencer and collector” (Lofland et al., 2006, p. 3), he must remain aware and guarded against the possibility of his own feelings and experiences impacting the research.

Summary

This chapter provided a detailed description of the research design, guided by a convergent parallel mixed methods approach. The chapter also described each of the three different populations of the study, *a priori* propositions, the instrument, and finally procedures for data analysis and merging. Researcher developed interview protocol was used for research objective with CALS program coordinators. A second researcher developed interview protocol was used for research objective with CALS innovative instructors. A standard instrument,

Making the Match, was employed to investigate research objective with recent CALS graduates. Lastly, using a convergent parallel mixed methods design, findings from all three research objectives were mixed for final researcher interpretation.

The following section, Chapter 4, presents findings for each of the research objectives.

CHAPTER 4

RESULTS

The purpose of the study was to identify a land grant college of agriculture and life sciences' (LGCALS) current programmatic and classroom strategies for developing students' ability to continuously learn and thrive in our rapidly changing world, and assess recent graduates' experiences of those strategies.

The specific objectives included:

1. Describe LGCALS undergraduate program coordinators' perceived strategies for developing students' ability to continuously learn and thrive in our rapidly changing world.
2. Describe LGCALS innovative instructors' classroom strategies for developing those same skills in their students.
3. Describe recent graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the *Bases of Competence* inventory.
4. Compare and contrast programmatic strategies, classroom strategies, and graduates experience with respect to the required skills for career success.

A mixed methods convergent parallel design guided the research. For research objectives 1 and 2, the researcher employed qualitative focus group sessions and interviews for exploring experiences using interpretive, constructivist and naturalistic approach. For objective 3, the researcher used a cross sectional survey design and questionnaire to collect quantitative data. For objective 4, the researcher framed and explored the findings using a convergent parallel, mixed methods approach. The method was based on separate analysis of the qualitative focus groups and interviews, and the quantitative survey data, followed by merging of the data, looking for similarities or differences in findings, and final researcher interpretation.

Objective 1: Describe Program Coordinators' Strategies

The first objective of the study was to describe LGCALS undergraduate program coordinators' perceived strategies for developing students' ability to continuously learn and thrive in our rapidly changing world.

Population and Sample

Identification of coordinating counselors for participation in focus groups was coordinated through the College of Agriculture and Life Sciences Office of Academic Programs. Seventeen of the nineteen undergraduate coordinating counselors were contacted representing ten of the eleven CALS undergraduate departments. Two undergraduate coordinators were not contacted as they were also included in the population and sample for research objective 2. Recruitment was accomplished through written correspondence explaining Institutional Review Board (IRB) approval, the purpose of the study, confidentiality, and voluntary participation. After repeated communications, eleven individuals agreed to participate in the focus groups, and the balance declined based on time commitments or conflict of schedule. One scheduled focus group had only two scheduled participants and had to be cancelled; the two participants were unable to reschedule and attend a focus group on another date. Two focus groups were scheduled with three participants in the first focus group and six participants in the second focus group. In total nine coordinating counselors representing six of the ten CALS undergraduate departments participated in focus groups.

Findings of Qualitative Focus Group Sessions

Based on a thematic analysis of the data, the following themes emerged and organize the findings for research objective including programmatic strategies that:

1. Stay abreast of new developments in recommended programmatic and educational practices

2. Develop curricula that are relevant in today's changing world
3. Time and resources to overcome barriers to change.

Theme 1a: Stay abreast of new developments in recommended programmatic and educational practices. Participants agreed educators must remain abreast with the changing world if students are to become life-long learners, especially in times of change. Participants noted one method to stay abreast is an advisory board, as Ben stated:

So even though it's [advisory board] been very helpful in the past, we find it even more helpful now, especially in the economic climate we're in just to have our students be the most competitive they can once they're out the door. (C1198)

Participants of the focus group discussion noted various methods of staying current with the changing world, ranging from formal methods to informal methods. Methods noted most often were personal contacts, participation in different industry boards, communications with graduates of the programs, informal advising councils, and formal advisory boards. All participants recognized the value in staying current and the need to bring information back to the different departments for discussion. Nick summed this need as "we constantly modify our curriculums and change course titles and change course content to reflect changes in the workplace where our students can be employed" (C1321).

Nick described his method by saying "No advisory board, just contact with former colleagues of mine . . . as well as former students" (C199). Ted summed up the informal methods by saying:

So, there's no, at least in our department, there's nothing formal. It's just people bringing back what they're hearing from their people. So it's very ad hoc and informal. It's nothing structured. (C1440)

One participant discussed the value of participating on various industry boards as a means to stay in contact with others who are good sources of information about the changing world. The participant also noted that various faculty members in the department were members of many different boards resulting in a wide range of information to understand better change from many different perspectives. Another participant stated the value of participating on an industry board as they were regularly scheduled, included former graduates of the program, and promoted regular communications. Frank stated, “We stay very up-to-date getting feedback from those folks as employers of our students. I am out there interacting with those folks ten times a year” (C1192).

The nine participants of the focus group discussions represented seven different CALS departments. Of the seven different departments, results of focus group discussion found three departments with formal and active advisory councils and four departments with no council. One participant of a department that does not have an advisory council stated, “We’d like to have an advisory board” (Ben, C1261). The value of an advisory board in a changing world included Irene stating, “They are good for our program” (C1180).

Members of the three advisory boards included various stakeholders, “wide and diverse” (Irene, C1201) groups, and “employers across the spectrum of the different fields” (Ben, C206) from business and industry, as well as former students. Other commonalities of the three advisory groups included regularly scheduled meetings, active participation from members, and regular rotation of members. Irene summed the value of the advisory board best:

[It has] been really valuable so when we are going to make some curriculum changes, we will throw it out, to them and we will ask them what they are seeing in there. They are all in a management position, and they are hiring in the field. So, what are the new employees doing that you think are stellar? And not just our students, but students in

general? Who are you hiring, why did you pick them, what makes them successful?

(C1172)

Program assessment is required to demonstrate educators are in fact remaining abreast with the changing world, resulting in students with the skills to become life-long learners. Similarities and differences in approach to program assessment were discussed; however, there was agreement between all participants when Frank stated assessment of learning outcomes “is the million dollar question” (C1205). Additionally, Ed highlighted the difficulty with assessment when he said, “How do you know until they’ve been out in the workplace. [Then,] they’ve been out in the workplace, what else has influenced them? It’s difficult to assess” (C1523). One similarity in the approach to assessment was the use of the Virginia Tech WEAVEonline, web-based assessment system; however, there was limited discussion as to the effectiveness of the system due to time constraints.

Results indicate distinct differences in the methods of and approach to program assessment based on department; ranging from formal, structured, and regular assessment to informal, unstructured, and occasional assessment. Comments from participants indicate the accreditation of a program drives the differences, because accredited programs had to meet strict program assessment guidelines to maintain their accreditation.

Of the seven CALS departments that participated in focus group sessions, three noted they were accredited. Requirements for formal program assessment for the accredited programs had many similarities in approach as directed by the individual accrediting body. One common assessment tool used by the three departments was student e-portfolios containing reflective questions based on expected student learning outcomes. Ed summed the assessment best:

So our program is accredited and so we have to meet a certain guideline. And so there are a number of things that goes on with that, and I won’t go into a lot of detail on it, but

what we have is we have a continuous improvement process that we go through, the faculty goes through, and there are a number of outcomes that we assess. We assess how well the outcome has been achieved with the use of artifacts. The artifacts are school – student work that’s collected through the school year. We try to assess the ability to communicate, ethical responsibility, professionalism, global context, the impact of [problem] solutions in a global economy, environmental and societal impact. But the one that gets right to this is recognition for the need and ability to engage in life-long learning. (C1141)

There also were distinct differences by the various departments that had informal approaches to assessment. Tanya noted assessment in her department occurred at the end of each semester with faculty coming together for one day to assess learning outcomes and make recommendations for changes and improvements. “We sit down as a faculty and evaluate that [learning outcomes] in small groups, then come back together and then decide whether we’re doing a good job here” (C1251). Most widely noted informal methods to gather information included employer surveys, alumni surveys, and conversations with employers and alumni. One participant stated there is value in talking with former students by asking, “How are things going? What are you doing? I always ask them those questions about courses, internships, what was valuable, what wasn’t valuable.” Due to various barriers, Nick noted frustration in assessment, recommending changes and implementing changes in curriculum:

There are other classes that we could teach, for example [class name] and [class name] which would be more of a field based courses. Myself and a colleague talk about this all the time. But I have been talking about this for years. (C1311)

Theme 1b: Develop curricula that are relevant in today’s changing world.

Participants of both focus group sessions noted, from a program planning level, student readiness

to become life-long learners is enhanced when the curricula includes real-world and relevant learning opportunities. Frank stated his department was in a continuous effort at revising the curriculum to be more “problem solving, real world scenario-based type of approach” (C1097). Various approaches to real-world and relevant opportunities included internships, team and group work, capstone projects, service learning projects, and student advising. Multiple participants discussed the need to build strong foundation knowledge in the first two years of the college experience, followed by year three and four, concentrating of the application of the knowledge to real-world problem solving. Irene noted “to enable students to become successful once they do graduate is that we have foundational knowledge that they need to know, but then the application of it is the priority” (C1076) in year three and four. Ben added it is important to add some basic level of real-world problems to the students even in the foundation classes to encourage students to think, stating “I still present problems” (C1153) in my foundation classes. Nick summed the need for a strong foundation even as the content changes rapidly; “There is no way that we could prepare them to have a knowledge of everything they are going to encounter, but again if we can give them that basic knowledge base...allows them to be life-long learners” (C1158).

The concept of internships was discussed with findings of four departments requiring an internship and two departments strongly encouraging student participation in an internship. The primary advantage of an internship was noted as “real world experience.” Additionally participants discussed one powerful value of an internship that is often overlooked: the student discovering if the career path they are currently pursuing is really the right path. As a means to begin building student accountability, participants noted it was the students’ responsibility to find an acceptable internship position, not the responsibility of the department. Participants stated

other advantages to internships including network building and opportunities for students to demonstrate their capabilities to future potential employers.

Coordinating counselors recognized the need to build teams and group work into the curriculum; and the value of team or group work were most often noted as building interpersonal skills and opportunities to consider different perspectives while problem solving. Nick stated the need for team and group work by saying:

The other thing I try to emphasize with students is that it is not individual. If you are working to...try to solve the overall problem, you need people with expertise in all areas. You need to use your expertise, but also work with others that have dissimilar expertise to solve problems. (C1054)

Another counselor stated his efforts and frustration in developing curriculum that is not only team based, but also multidisciplinary, stating, “It’s difficult” (Ed, C1573).

The participants listed many advantages of and the need for teams and groups; however, frustration was expressed in the problems and issues that are often associated with team and group work. Frustrations were high and counselors were aware that some instructors had given up on teams. Frustrations typically were in response to “invariably one or two people do all the work and the [other] two do nothing” (Nick, C1280). While all recognized the values of teams, there existed multiple frustrations, and no counselors stated they were considering or pursuing incorporating team building into the curriculum.

Coordinating counselors noted recent updates to the curriculum where multiple departments now have required capstone classes or are in the process of adding a capstone. The rationale was that capstones allow for discussion of real-world issues the students will face as they move into the workforce. Rachel stated the capstone was designed to encourage student “problem solving and critical thinking...being open-minded” (C1509) to other perspectives.

Theme 1c: Time and resources to overcome barriers to change. Barriers to change are obstacles for students to become life-long learners, with all coordinating counselors agreeing time and resources were the key barriers. Coordinating counselors agreed they would like to see barriers to change removed with comments including Irene stating instructors “want their students to be the most successful, but it goes back to resources” (C1319). Frank stated “there is a willingness to change to do more if we could” (C1325). And finally, Ben noted “we just don’t have the faculty resources to do all we’d like to do” (C1634).

Participants noted that limited resources and time resulted in large class sizes that “only promote memorization” (Irene, C1082) and restrict the addition of new classes to better meet the changing world. One participant added barriers of time and money limit the critical need for regular and effective program assessment. Other barriers include faculty members that are not keeping up with the changing world as they “aren’t as familiar with what the new trends” (Rachel, C1650) are in the workplace. A second participant noted with limited resources available to each department, there were barriers as a result of different agendas in the department forcing difficult decisions on where to use limited resources. A final limitation of limited resources was noted as “fairly high touch type of activities in terms of . . . time commitment per student” (Ted, C1671) and opportunities for effective student advising.

Objective 2: Describe Innovative Instructors’ Classroom Strategies

The second objective for the study was to describe LGCALS innovative instructors’ classroom strategies for developing students’ ability to continuously learn and thrive in our rapidly changing world.

Population and Sample

Identification of innovative instructors for interview was coordinated through the College of Agriculture and Life Sciences (CALs) Office of Academic Programs. Selection of innovative instructors was purposeful to show different perspectives from different CALs academic departments, as well as their willingness to share their experiences and have the ability to richly and effectively communicate the experiences. Initially, seven instructors from seven different CALs departments were selected. Recruitment of the instructors was accomplished through written correspondence (Appendix E) explaining IRB approval, purpose of the study, confidentiality, and voluntary participation. Repeated communications with the eight innovative instructors resulted with five agreeing to participate, two declined based on time commitments, and one refused to reply to any of the various recruitment communications.

Findings of Qualitative Interviews

Based on a thematic analysis of the data, the following themes emerged and organized the findings for research objective including innovative instructors' classroom strategies that:

1. Demonstrate enthusiasm for student learning
2. Experiment actively with new ideas for educational practice
3. Approach teaching with a guiding mentality more than a directing mentality
4. Foster student ownership of learning
5. Stay abreast of new developments in recommended educational practices
6. Time and resources to overcome barriers to change

Theme 2a: Demonstrate enthusiasm for student learning. Recruitment letters sent to the potential participants stated "You have been identified as an innovative instructor by others." With this statement participants had an opportunity to reflect on the definition of an innovative instructor. Leading up to the interviews, no formal definition was given to the participants with a

goal of hearing how they would define innovative. The actual interviews opened with the question “You have been identified as an innovative instructor by others. Please tell me why you think they feel you are an innovative instructor?”

Participant reaction to the question ranged from facial expressions of uncertainty to smiles indicating some pleasure in this recognition. Initial verbal responses included Flor stating she was “curious to know what that means” (I1012), followed by a laugh, and Jean responding “I have no idea” (I1010), while Sam indicated “That’s a good question...I am not 100% sure” (I1013). These initial statements of surprise and curiosity were followed by more detailed responses including Deb stating, “I think probably because I incorporate different thing in my classes. They’re not static. They change” (I1010). Liz responded, “We’re doing things a little bit differently . . . the collaborative teaching approach, and our commitment to both experiential learning and interdisciplinary learning” (I1021). Flor stated, “I don’t just get up and talk about content... so many of my classes are discussion based” (I1020).

Jean had a statement that best summed up the comments of all instructors:

I would have to say it’s because I make an effort to be on the same level as my students. So I make an effort to have rapport with them that enables them to see me as a human. And what I mean by that is someone who has deadlines, and expectations, just like they do, and whatever I expect from them works both ways. And, I think they relate to that and hopefully learn from it. (I1011)

Passion for teaching was noted in each of the five interviews as well as the satisfaction of seeing students learn. As Sam stated, it is very rewarding to see students “get it” (I1338). Researcher field notes from each interview noted various body language including hand gestures, facial expressions, and smiles as additional indication of participants’ passion for teaching.

When asked, what is it that you do that is innovative, the responses were rich. One commonality between all five instructors was their continual effort at trying new strategies in the classroom. Jean best summed the continual efforts by stating she was trying a new strategy this year, “I’m hoping, and obviously I’m excited, and I’m hoping it goes well” (I1149). And when discussing her strategies she regularly “tweaks it just a little bit here and there” (I1224). Themes that follow detail key findings of what defines the instructors as innovative.

The interview included one question of participants to identify the skill set area they perceived their strategies best help students develop. They were again asked the same question to identify the second skill set area their strategies best help students. The five options for skill set areas included: learning to learn, priority setting, the ability to work independently and in groups, identifying problems and solving problems, and adapting to change. Results show four instructors noted learning to learn as the skill area their strategies help students develop most, followed by one instructor noting problem solving. When asked to identify the second skill set area, two instructors noted problem solving, two noted adapting to change, and one noted the ability to work independently and in groups.

Theme 2b: Experiment actively with new ideas for educational practice. Innovative instructors continually noted their willingness to try new classroom teaching and learning strategies. During the interviews, rich field notes were taken not only of the important body language and voice that gave meaning to the words; field notes were also taken of the environment where the interviews took place, in this case interviews occurred in the innovative instructors’ office. In each office there were books or papers about teaching and new teaching methods. These books were not stored in a bookcase to give an appearance of a scholarly office, instead they were laying on working tables and desks, and it was apparent the readings were actively being used for instructors to explore new methods. In one interview, I had to actually lay

my notepad on top of three new books about different teaching strategies and methods, and the books appeared to have been used extensively.

Jean stated, “This year I’ve tried something totally different, which I’m a little scared of” (I1127). She indicated that she found the new teaching method while reading “a blurb on teaching”. Jean went on to state, “So I’m hoping, and obviously I’m excited, and I’m hoping it goes well. I have no idea” (I1149). Jean, in her excited tone of voice and smile, went on with her on-going work in implementing another new strategy:

So right now, this is my third or fourth semester teaching it [class], and this was when in my head I had planned to revamp it, because up until now it’s been getting the material. It’s a new course. It was a new course when I started getting new books, getting it under my belt, figuring out what it was, we needed out of it, and now it’s at a point where I’ve gotten all that down. Everything’s on Scholar. I’m uploading new material, but I’m able to change it, tweak it just a little bit here and there, and respond to the comments the students have given in the past. So that’s what I’m trying to do. (I1219)

Flor noted she had just implemented a new teaching strategy that “is sufficiently novel for most undergraduates” (C1316) and now would like to continually review the new method to ensure it is meeting the learning objectives. Flor also noted the value in attending other professors’ classes to pick up new ideas and her regular participation in professional development opportunities.

Sam noted his efforts of trying new strategies with “I have attended several workshops” (I1086) to gain new insight on other methods. Similar to Flor, suggesting attending other instructors classes to pick up new ideas, Sam does much the same. In his effort to improve and implement new strategies he said:

[I] go around talking to different faculty members identified as being good teachers mostly by word of mouth or from staff members and students just asking questions. How do you approach a course? What do you think is important? What kind of things are you trying to achieve? (I1095)

In summary, innovative instructors were willing to spend the required time for new strategies and to make informed choices concerning what to implement for the desired learning outcome. The instructors all recognized new strategies take time, but they also recognized they could not be stagnate in their strategies.

Theme 2c: Approach teaching with a guiding mentality more than a directing mentality. Throughout the interviews, participants continually referenced the critical role they play in guiding students in their learning. Overarching comments for this theme included Flor noting that students may not recognize the value of a specific strategy or may fear a new strategy requiring the need for instructors to spend time discussing with students the value of the strategy. When asked how her students react to the new strategy Flor noted the students' reaction as, 'You want me to what? How do I do that?' Because they just have had no practice . . . and so reassurance is really my main strategy for responding" (I1460).

The instructors also noted their role in creating a class environment conducive to learning. A safe environment where students can ask questions, explore ideas or practice expressing their thoughts without feeling intimidated. Liz notes a safe environment includes an environment where the instructor can challenge the student "but not to disrupt them to the point where they're not able to move forward" (I1209). A class environment conducive to learning also must consider the balance of power between instructor and student. Multiple instructors noted giving students' choices and options as one method to share power. Flor noted authority is

shared “when students practice critiquing others’ work, and to see that I’m not the sole authority in the class” (I1572).

The limitations of lecture and the function of content were noted as important concepts in creating a learning environment. Common agreement on the value of lecture in learning included comments from Flor as “people don’t learn by lecturing” (I1414) and lecture must be replaced by discussion and problem solving. Sam noted lecturing “just throws that body of knowledge out there” (I1280) without any chance for discussion and real student learning. Sam also noted, unfortunately due to large class sizes, lecture may be the only real option. Flor summed the issue of lecture best with her thoughts that instructors must make the right choices, and if an instructor is “going to spend all that time...crafting that perfect PowerPoint . . . spend it on something that will help students learn instead of crafting the perfect PowerPoint” (I1442). The value of content elicited strong feelings from all instructors’ starting with Liz and “I hate” (I1362) the word content and education is not content. She continued by stating some instructors are teaching only for content in preparation for tests and to get “things done.” Jean sums the instructors overriding feeling about teaching for content alone by stating, “I don’t care that you can name 23 kinds and not know what they do. I’d like you to be able to tell me what they do,” (I1318) suggesting that the process of problem solving is more important than content. Sam best sums the concepts of lecture and content from student feedback stating, “The students found it to be boring, the straight lecturing of information and then regurgitation of that information” (I1063).

There was common agreement between all instructors that students must be challenged if they are to learn and become life-long learners. However, before challenging the student, early in the term the instructor must evaluate where the students are in their learning. Flor states “you have to know where your students are, so if you don’t know what they know already, how are you going to help them move their knowledge and skills forward?” (I1069). Multiple instructors

stated that large class sizes make this assessment difficult or impossible. After assessment students can be challenged at new levels.

Jean sets high expectations for her students and said students know “when I’m disappointed when they haven’t met my expectations” (I1026). Each instructor noted multiple ways to challenge students; however, there was common agreement that asking students questions challenges them to think, and students learn when instructors ask challenging questions followed by discussion. There was also agreement that students want to be challenged. Sam noted students want to be challenged based on conversations where students expressed enjoyment because of the learning experience in writing a critical analysis paper, an assignment that Sam considers the most rigorous assignment in the class. Liz best sums the concept that students want to be challenged with a statement from a student noting, “You will learn a lot; it is very hard work, but you will learn a lot” (I1446).

Flor noted she challenges her students continually, but follows the challenges with encouragement and reassurance. Student reaction to challenging assignments may be displayed in fear of failure, but are followed by reassurance:

[Students] say ‘I’ve never done this before. Oh my God! What do I do?’ ‘Well you know what . . . the class before you did it just fine and they’ve never done it before either. You’ll be fine.’ I’ll give examples from previous years for them to see. ‘This is what we’re aiming for,’ and I actually have them write critiques of previous years’ proposals so they get practice writing critiques, they get practice thinking. . . and some will actually ask me, ‘Were those professional proposals?’ No this was last year’s class. You can do this. I know you can do this. (I1246)

The concept that learning includes the ability to defend an individual's ideas was noted in each interview. Instructors stated that for students to become life-long learners, they must know how to find literature, determine what is factual, and construct knowledge. Liz stated:

Students must be able to defend their thoughts, you need to have an argument, It's not just enough to have an idea. 'Where are you learning this? What's the argument about?' It's historically embedded somewhere: 'Well, learn that. Get uncomfortable with it! Challenge it!' (I1636)

Liz sums it best by stating, "Ground yourself with something!" (I1191).

For students to be able to defend their ideas, there was agreement students must be able to decipher good information from bad. The instructors also noted students often find it difficult to determine which data are relevant: how to prioritize and differentiate information. Multiple references from instructors were made noting this as a critical role for the innovative instructor in guiding students in their learning while offering reassurance and feedback to the student. Flor stated she helps students "learn how to prioritize . . . this is where I start . . . this is what I have to do next" and "I try to help them pay attention to this, pay attention to this figure, read this part . . ." (I1467). Deb sums this best by challenging students to find literature for a written class paper:

And in that class, that's where they write the report that they do. It has to be solid information, and so we get into the whole information technology area. How do you know it's a good source and screen out stuff that doesn't make any sense or is not good science-based type information? So they learn to start. They learn to discern, hopefully learn to discern a little bit between good solid information and stuff that belongs off in the trash can somewhere. (I1140)

All innovative instructors used writing in their classes as both a means to foster learning and critical thinking and as a means of evaluation of student learning. Although there was

consensus of the value of writing for student learning, Liz stated “I’m continually shocked of how little writing people are doing on campus,” (I1324) suggesting that higher education does not stress the importance of writing to foster learning. As Flor noted, the advantages of writing included forcing students to “think deep” (I1255), or to think critically. Deb noted the learning value of a two-page written paper as the short length forces students to “think” (I1229) in order to be concise. Three innovative instructors mentioned the learning value in requiring students to resubmit graded written papers. Typical written assignments mentioned included reviews of articles, written projects, analysis of case studies, and peer evaluation of others’ writing. Again, the instructors noted that large class size can be a limitation to the use of writing. Liz summed the value of writing as, “People learn in the writing. You actually are explaining yourself and we need to make space for that” (I1316).

All innovative instructors actually used writing as a means of evaluating student learning. Typical forms of evaluation included written assignments with grading based on how well they can defend their thoughts. Flor summed writing for evaluation as:

And I score their [written] responses on the case [analysis], so those are summative assessments, based on the ability to propose a solution, propose a rationale, a legitimate rationale, so they have to understand, and then some points for coherence and logic in their writing... The point is that they have to be able to defend their choices and those defenses have to be legitimate. (I1131)

Theme 2d: Foster student ownership of learning. There was clear and passionate agreement among all innovative instructors that students must accept their responsibility in learning. Key concepts in learning how to become a life-long learner included the value of groups or teams in learning, understanding and respecting different perspectives, the ability to adapt to change and set priorities, the ability to find new information, and the application of

knowledge to real world situations. Innovative instructors employed various strategies in the classroom that promote and foster the key learning concepts allowing students to learn how to learn.

There was shared agreement that students learn from each other. Innovative instructors continually noted students learn when they see others succeed, review others assignments, listen to different perspectives on the same topic, help other students, and work together to solve a complex problem. The innovative instructors noted many different classroom strategies that address this. Key strategies included the use of discussion, groups work, and teams.

A key benefit of discussion, group work, and teams centers on introducing students to the many different perspectives other students in the class may have. The instructors agreed that the different perspectives were critical to learning as they caused dissonance, pushing the student to resolve the conflict of different ideas. Liz noted, “Through discussions, they get to see multiple perspectives, and they get to see how other students see problems and identify problems” (I1179). Problem-posing or the discussion of a specific complex issue, was often noted as another effective method to introduce different perspectives; causing students to reflect on “Where do you see yourself in the problem? And let’s discuss what it means. What is this problem?” (Liz, I1153)?

Group and team work were also noted as beneficial to student learning as these provide students with the opportunity to work with others who may look at a problem differently. Other benefits of group or team work included learning to work with others while building social and communications skills. Although all instructors noted the positive learning outcomes of group work and teams, there were multiple references noting students do not always know how to successfully function as a group or team. Additionally, multiple instructors noted they did not have time to coach students on how to work on a team effectively. When asked if students know

how to function on a team, Deb stated she expected students to know how to work in a group or team before coming to her class. She continued by stating,

It's pretty much learning by the seat of your pants, and if it's a dysfunctional team, OK, I'll step in, but other-wise I'm counting on them being able to sort it out. ... That's actually one reason I'm not doing as much team activities in my class is because I didn't feel like I could put the time into it. (I1207)

When I asked a similar question, do you do anything to help your students understand how to be a good team member, Flor responded, "That's a good question, and I probably don't spend as much time teaching about that explicitly" (I1171). Overall, the innovative instructors recognized the value of groups and teams, expected students entering class to have the proper skills to function successfully, and had limited time in assisting students in understanding better how to function successfully in a team or group.

The interview guidelines addressed the concept of moving away from "know what" to "know how to find out" and "learning to learn." Based on the fact the world is changing rapidly and content is changing rapidly, the innovative instructors all agreed in the importance of students accepting responsibility for learning and knowing how to continually learn. Multiple, innovative instructors noted learning to learn means taking what you know and learning new thing from it. Liz stated learning to learn is really "learning to transform, [or] learning to change" (I1423). Sam characterized his concept of learning to learn and his challenge to students as:

I hope I am preparing them . . . , I hope they are hearing that message in other places that preparing them to realize that you can't just get comfortable with the information that you have and you need to constantly be processing new information, learning new information to keep what you're doing in contest. That is important to me. Don't think you have memorized this information and you got it – you can run with it and realize that

this is important knowledge for you to possess, but your ability to see it in the context that it's in and ability to adapt to changes that are coming, is going to depend on your ability to assimilate new information that is coming down the pipe. (I1297)

Key concepts innovative instructors noted that assist students in becoming life-long learners included the ability to organize and prioritize, the ability to adapt to change, and the application of new knowledge. Flor stated in problem solving, she helps students learn to organize and prioritize by taking them “through chunk by chunk” (I1466) in small steps and:

They learn how to prioritize. ‘OK this is where I have to start. This is what I have to do next,’ and then I help them organize it because I think that’s one of the big things when you’re moving from novice to expert; how do you organize information in a way that makes it meaningful. And so I make my organization really explicit, so they can see how I do it, and they can come to developing their own way of organizing ideas...I will help them prioritize what is the big idea and what are littler ideas. (I1467)

In a world of rapid change, students must have the ability to adapt to change while continuing to learn. Liz noted, “If you’re going to be a life-long learner, you certainly have to have the skills of understanding of how to find the information, where to go and look for it” (I1668). All innovative instructors noted as critical the skill of knowing how to find information for a student to become a life-long learner with the ability to adapt to change. However, it was also noted that finding the information alone was not enough; students must know how to analyze the information. Deb stated she regularly challenges students to find new information and as a part of life-long learning, “once you’re forced . . . then you have to do it” (I1260) students discover they can find new information. Multiple innovative instructors stated holding the student accountable to find the information was only part of the learning, they must also know how to analyze the information and come to class prepared to discuss the information.

Instructors noted that once students find, analyze and discuss the information and issue, they must be able to build new knowledge and be able to apply the new knowledge to real world applications. As noted earlier, the importance of understanding different perspectives is critical to building new knowledge and innovative instructors help their students break the issue into ‘chunks’, organize and prioritize new information, so they can build new knowledge. Flor stated “I give them practice doing that over and over and over again” (I1166).

Theme 2e: Stay abreast of new developments in recommended educational practices. Innovative instructors recognized the need for effective program planning to stay abreast with the changing world if students are to become life-long learners. In support, instructor comments of effective program planning ranged from yearly, formal departmental planning meetings, to “we look at feedback as critical” and curriculum is like building blocks put together “where if you take that one [class] out this parts going to start falling” (I1354). At the opposite extreme comments included an informal approach to program planning and the issue of time constraints limiting planning and assessment.

On a personal level each instructor was trying to stay abreast with the changing world through workshops, personal contacts, and working with other instructors. Flor noted that due to the rapid change in content she no longer uses textbooks. Liz noted that not only was the content changing but the need to stay abreast with changing pedagogy was critical in assisting students in their life-long learning with the statement, “Our pedagogy has to change. Our scholarship has to change” (I1617).

On a formal program planning basis, there was variation in responses by the instructors based on their department. One instructor noted good communications between the department and various stakeholders, including employers and former students, as a result of one person in the department designated to this role. The same instructor also noted receiving regular feedback

and communications as a result of regularly scheduled curriculum meetings. Another instructor was unaware if there was a functioning advisory board in place and limited communications with stakeholders, including employers.

Informally, four of the five instructors noted regular contacts and feedback from former students that were now employed in their respective fields. According to Sam, “The students that go out of here, at least from the students that I am aware of, have all done pretty well and have moved up” (I1416) . This suggested that what the department was doing was successful and that former students can be a good source of information in an attempt to stay abreast and make changes where necessary. In her conversations with former students Jean regularly asks the question “what are you missing” (I1249) as a means to better understand where changes to the curriculum may be needed. This valuable feedback from graduates allows Jean to make small but important changes: “We tweak what we hear!” (I1274).

Theme 2f: Time and resources to overcome barriers to change. Barriers that would prevent students from becoming life-long learners were a continual theme throughout each of the interviews. There was agreement between the five innovative instructors that time and resources were barriers that prevented them from further assisting their students in their growth. When asked what barriers she faced for learning improvements, Liz stated “resources and time. Resources, I mean, the resources to do it and the time to do it well!” (I1570). With this statement Liz, as did all innovative instructors, displayed her passion for teaching and learning. Jean summed it well as:

Instructors noted they faced decisions daily on how to use their own time, as all had research appointments as well as teaching appointments. The time requirements in gaining tenure were also mentioned as a barrier, forcing instructors to make difficult decisions on the amount of time they spend on teaching.

All five instructors noted that time and resource barriers limited their opportunities in developing and implementing new strategies in the classroom. They also noted that with the rapid change in the world there was a need for them to regularly update their strategies or develop completely new strategies. Three instructors also noted that implementing a new strategy takes time, is difficult, and can be ‘scary’, with Jean stating “I’ve tried something totally different, which I’m a little scared of” (I1128). Various instructors noted that new strategies are often met with student resistance. When discussing implementing a new strategy, such as problem solving or the use of teams, with her students, Jean noted student reaction: “And the first time they heard this, you could see the look on their face, they’re just, pardon but, they’re pissed!” (I1391).

Limited resources often result in large class sizes as noted by four instructors. Each instructor noted the disadvantages of large class sizes as a barrier to get to know their students, barriers to discussion to hear different perspectives, barriers to use writing as a learning opportunity and evaluation method, and lastly, a barrier for effective assessment of student learning outcomes.

One instructor noted academic silos are barriers to students becoming life-long learners as silos limit students opportunities to hear different perspectives from other students in different majors. The instructor noted that for students to learn to solve complex problems, they must work on an interdisciplinary team, where multiple perspectives from many disciplines can be discussed. Liz stated, “Could you imagine what we could do if we just got rid of those little titles above our department doors, and we just focused on the issues. That would be interesting, wouldn’t it?” (I1596).

Objective 3: Describe Graduates' Perceptions of Career Readiness

The third objective was to describe recent graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the bases of competence inventory.

Population and Sample

Identifying the potential list of graduates to survey was accomplished by working directly with the Office of Alumni Relations at Virginia Tech. For the 18 month period from December 2008 to May 2010, the total population frame was 1,045 CALS graduates, although this study was only interested in those that did not pursue additional education after graduating. The total population included CALS graduates that did not pursue further education as well as graduates who went on to graduate school or professional school. Based on current Virginia Tech (2010) Career Service information for the last three years, a weighted average of 42.5% of CALS graduates go on to graduate or professional school; therefore, 42.5% (n = 444) did not meet the criteria of this research as graduates entering the workplace upon completion of their undergraduate degree. Reducing the total population ($N = 1,045$) by those that do not meet the criteria resulted in a target sampling frame of 601 CALS graduates between December 2008 to May 2010.

A total of 1,045 questionnaires were sent via Survey Monkey and/or surface mail, of which 60 were returned as undeliverable. Of the 1,045 graduates in the total population, 432 returned completed questionnaires, of which 250 met the study criteria, while the balance of 182 indicated pursuit of graduate or professional school upon completion of their bachelor's degree. Questionnaires returned as undeliverable totaled 60, of which 35 were projected to meet the study criteria. A final response rate of those that met the study criteria was 43.5%.

Survey Findings

Mean weighted discrepancy scores (MWDS) for the five constructs were determined and ranked in order of importance based on skill needs. Using the MWDS, the five skills constructs and the 24 individual employability skills questions were then ranked in order of importance based on higher scores indicate the need for improvement (Table 4-1).

Table 4-1
Borich Mean Weighted Discrepancy Scores Ranked by Construct

Construct	MWDS	S.D.
Problem-solving and Analytic	.67	1.86
Personal Organization and Time Management	.67	1.86
Creativity, Innovation, and Change	.46	1.84
Personal Strengths	.45	1.72
Learning	.35	1.92

The constructs of Problem-solving and Analytic (.67), and Personal Organization and Time Management (.67) had the highest MWDS, while the construct of Learning (.35) had the lowest MWDS. The four constructs were then ranked, based on MWDS, into the four categories (Robinson & Garton, 2008) prioritizing need for curriculum improvement as:

Category I – MWDS greater than .80 indicating a high need for curriculum improvement

Category II – MWDS ranging from .50 to .79 indicating a moderate need for curriculum improvement

Category III – MWDS ranging from .30 to .49 indicating a low need for curriculum improvement

Category IV – MWDS less than .30 indicating negligible need for curriculum improvement.

The constructs of Problem-solving and Analytic (.67), and Personal Organization and Time Management (.67) fell into Category II (MWDS ranging from .50 to .79), indicating there was a moderate need for curriculum improvement. Scores for Problem-solving and Analytic

indicate graduates recognized this skill as of major importance and moderately competent in performing the skill for success in the workplace. Scores for Personal Organization and Time Management indicate graduates recognized this skill as of major importance and moderately competent in performing the skill for success in the workplace.

The three constructs of Creativity, Innovation, and Change (.46), Personal Strengths (.45), and Learning (.35) fell into Category III (MWDS ranging from .30 to .49) indicating there was a low need for curriculum improvement. Scores for Creativity, Innovation, and Change indicate graduates recognized the skill as of moderate importance and moderately competent in performing the skill for success in the workplace. Scores for Personal Strengths indicate graduates recognized this skill as of major importance and moderately competent in performing the skill for success in the workplace. Scores for Learning indicate graduates recognized this skill as of moderate importance and moderately competent in performing the skill for success in the workplace.

No constructs fell into Category I, which would have indicated a high need for curriculum changes, and there were no Category IV constructs, which would have indicated a negligible need for curriculum improvement.

Respondents' perception of the importance of each employability skill for success in the workplace was determined with a mean score. Additionally, respondents' perception of their own competence in performing each employability score was determined with a mean score. Scores were then converted to scale measurements of no importance / competence, minor importance / competence, moderate importance / competence, and major importance / competence. Table 4-2 details graduates overall perceptions of importance and competence in each of the five construct.

Table 4-2
Student Perceptions of Importance and Competence for Employability Skills

Construct Skill	Importance	Competence
Problem-solving and Analytic Learning	Major	Moderate / Major
Personal Organization and Time Management	Major	Major
Creativity, Innovation and Change	Moderate	Moderate
Personal Strengths	Major	Major / Moderate

Mean weighted discrepancy scores for each of the 24 employability skills were calculated and ranked based on need for improvement as shown in Table 4-3. Respondents' perception of the importance of each employability skill for success in the workplace was determined with a mean score. Additionally, respondents' perception of their own competence in performing each employability score was determined with a mean score.

Table 4-3
Borich Mean Weighted Discrepancy Scores Ranked for Employability Skills, Organized by Construct

Construct	Skill	Importance	Competence	MWDS
Problem-solving and Analytic				
	Solving problems	2.85	2.43	1.19
	Identifying problems	2.84	2.51	0.96
	Prioritizing problems	2.78	2.48	0.84
	Identifying essential components of the problem	2.55	2.27	0.74
	Sorting out the relevant data to solve the problem	2.54	2.32	0.55
	Contributing to group problem solving	2.35	2.39	-0.09
Learning				
	Keeping up-to-date on developments in the field	2.54	2.15	1.01
	Gaining new knowledge in areas outside the immediate job	2.12	2.08	0.12
	Gaining new knowledge from everyday experiences	2.59	2.61	-0.04
Personal Organization and Time Management				
	Allocating time efficiently	2.78	2.32	1.28
	Setting priorities	2.79	2.52	0.75
	Managing / overseeing several tasks at once	2.63	2.50	0.43
	Meeting deadlines	2.70	2.63	0.23
Creativity, Innovation and Change				
	Adapting to situations of change	2.70	2.42	0.73
	Keeping up-to-date with external realities related to your company's success	2.26	2.00	0.59
	Reconceptualizing your role in response to changing corporate realities	2.10	1.92	0.41
	Initiating change to enhance productivity	2.38	2.22	0.39
	Providing novel solutions to problems	2.20	2.11	0.19
Personal Strengths				
	Functioning well in stressful situations	2.84	2.48	1.00
	Functioning at an optimal level of performance	2.75	2.50	0.71
	Responding positively to constructive criticism	2.60	2.35	0.66
	Maintaining a positive attitude	2.66	2.54	0.38
	Maintaining a high energy level	2.41	2.37	0.08
	Ability to work independently	2.69	2.73	-0.11

Note: Scale: 0 = No Importance / Competence, 1 = Minor Importance / Competence, 2 = Moderate Importance / Competence, 3 = Major Importance / Competence

The skill and ability of Allocating Time Efficiently had the highest MWDS (1.28), indicating respondents noted it as an employability skill of high importance (2.78) for their success in the workplace coupled with their perception of relatively lower competence (2.32) in performing the skill (Table 4-3). Respondents also noted the Ability to Work Independently with the lowest MWDS (-0.11), indicating respondents perceived it as an employability skill of lower importance (2.69) for their success in the workplace coupled with the perception of higher competence (2.73). Overall, graduates perceived 21 of the 24 skills higher in importance than their own perceived competence in performing the skill.

Based on Borich needs assessment MWDS, six skills fell into Category I, indicating a high need for curriculum improvement. As shown in Table 4-4, the skills included: Allocating Time Efficiently (1.28), Solving Problems (1.19), Keeping Up-to-Date on Developments in the Field (1.01), Functioning Well in Stressful Situations (1.00), Identifying Problems (.96), and Prioritizing Problems (.84). Four of the five bases competencies constructs had a minimum of one skill in need of high curriculum improvement; raising concern as to “the theoretical relationship of a variable to other variables” (DeVellis, 2003, p. 53) in the same construct.

Table 4-4
Individual Skills in High Need for Curriculum Improvement and Related Construct

Construct		Construct
Skill	MWDS	
Allocating Time	1.28	Personal Organization and Time Management
Solving Problems	1.19	Problem-solving and Analytic
Keeping Up-to-Date	1.01	Learning
Functioning Well - Stress	1.00	Personal Strengths
Identifying Problems	.96.	Problem-solving and Analytic
Prioritizing Problems	.84	Problem-solving and Analytic

One researcher designed question asked respondents to rank order the skill area they perceived to be most developed or improved through their academic experience at Virginia Tech. Skill areas of Learning to Learn, Priority Setting, Ability to Work Independently and in Groups,

Identifying Problems and Solving Problems, and lastly, Adapting to Change were rank ordered 1 through 5, with a 1 being the most improved or developed (Table 4-5).

Table 4-5
Graduates' Ranking of Skills Most Developed or Improved

Employability skill	% Identified at Each Rank				
	1	2	3	4	5
Learning to learn	24.0	14.0	20.5	16.0	25.5
Priority setting	21.9	18.4	28.1	18.4	13.2
Ability to work independently and in groups	15.4	20.9	18.4	24.9	20.4
Identifying problems and solving problems	18.8	24.8	23.8	19.8	12.9
Adapting to change	20.0	22.9	13.2	19.5	24.4

Note. Rank 1 = Most developed / improved; 5 = Least developed / improved

Rankings indicate the highest percent of graduates (24.0%) noted Learning to Learn as the skill most developed or improved through their academic experience at Virginia Tech; however, the rankings also indicate the same skill, Learning to Learn, as the skill least improved or developed (25.5%). To better understand the ranking results, points were assigned to each ranking where a rank of 1 = 1 point, 2 = 2 points, 3 = 3 points, 4 = 4 points, and 5 = 5 points. A summation of points awarded gives further clarity to the skills ranking (Table 4-6). Following a points earned scenario, graduates ranked the skills of Priority Setting as most developed or improved during their academic experience at Virginia Tech. Identifying Problems and Solving Problems was ranked second, and the Ability to Work Independently and in Groups was noted as least developed or improved.

Table 4-6
Earned Points for Graduate's Ranking of Skills Most Developed or Improved

Employability skill	Summed Points for Each Rank					Total Points	Final Rank
	1	2	3	4	5		
Learning to learn	24.0	28.0	61.5	64.0	127.5	305.0	3
Priority setting	21.9	36.8	84.3	73.6	66.0	282.6	1
Ability to work independently and in groups	15.4	41.8	55.2	99.6	102.0	314.0	5
Identifying problems and solving problems	18.8	49.4	71.4	79.2	64.5	283.3	2
Adapting to change	20.0	45.8	39.6	78.0	122.0	305.4	4

Note. Rank 1 = 1 point, 2 = 2 points, 3 = 3 points, 4 = 4 points, and 5 = 5 points.

Objective 4: Compare and Contrast Strategies

The fourth and final objective of the study was to compare and contrast programmatic strategies, classroom strategies, and graduates experience with respect to the required skills for career success.

Merging of Data

Findings of the three strands of data were compared and contrasted in a joint display of congruent and discrepant data (Appendices M, N, O, P, and Q). Data were compared and contrasted at the MWDS construct level for the five constructs. Data were compared for the five skill areas noted as most improved or least improved by graduates during their college experience. Additionally, data were compared and contrasted for the six skill items noted as Category I in need of curriculum improvement. The mixing of the data (Table 4-7) compares and contrasts the three strands of data of students' perceptions with innovative instructors' strategies and with coordination counselors' programmatic strategies.

Table 4-7

Mixing the Three Strands of Data

Construct / Skill	Graduates	Innovative Instructors	Coordinating Counselors
Problem-solving and Analytic	<p>Graduates MWDS of .67 for this base of competence construct indicated a moderate need for curriculum improvement. Graduates also noted a strong need for curriculum improvement in the specific skill areas of solving problems, identification of problems, prioritization of problems, and identification of the components of the problem.</p>	<p>Classroom strategies center on the problem-solving process including problem posing, problem identification, prioritizing, and solving problems. Strategies also included problem solving individually and in groups allowing for sharing different perspective on the approach to problem solving. Instructors noted barriers to implement their strategies often included large class sizes.</p>	<p>Programmatic strategies included real-world and relevant student experiences in problem-solving including internships, service-learning projects, capstone classes, and projects all of which are designed to enhance student problem-solving skills. Counselors noted they often revised the curriculum to be problem solving based. Opportunities to improve the curriculum included regular assessments, and formal approaches to communications with stakeholders.</p>
Personal Organization and time Management	<p>Graduates MWDS of .67 for this base of competence construct indicated a moderate need for curriculum improvement. Graduates also noted a strong need for curriculum improvement in the specific skill area of allocating time efficiently.</p>	<p>Classroom strategies center on students taking responsibility for their own learning, requiring students to find their own sources of information, holding students responsible for meeting the agreed upon class schedules. Student one-on-one advising was recognized as a strategy to discuss student issues and guide them through priority setting and managing time. Instructors noted barriers to implement their strategy of advising included large class sizes and limited time, including time requirements needed for research and progress in attaining tenure.</p>	<p>Programmatic strategies included opportunities for instructors and other faculty to work closely with students to discuss student issues and guide them through priority setting and managing time. Counselors noted barriers to implement this strategy included limited time and resources to guide students and large class sizes.</p>

Table 4-7 Continued
Mixing the Three Strands of Data

Construct / Skill	Graduates	Innovative Instructors	Coordinating Counselors
Creativity, Innovation, and Change	<p>Graduates' MWDS of .46 for this base of competence construct indicated a low need for curriculum improvement.</p> <p>Graduates also noted a strong need for curriculum improvement in the specific skill area of adapting to situations of change.</p>	<p>Innovative instructors implement new strategies into the classroom and then guide students in understanding the benefits of the new strategy; therefore, reducing student resistance and fear of change.</p> <p>An additional strategy is requiring students to find outside sources of information so they will know how to find the needed information as change arises.</p> <p>Instructors noted their own desire to have improved communications with stakeholders so that they too could remain abreast with and adapt to change themselves.</p>	<p>Coordinating counselors' strategies to remain abreast with change ranged from formal to informal and regular to sporadic communications and meeting with stakeholders. The informal and sporadic communications and meetings limit opportunities for counselors to remain abreast with change.</p>
Personal Strengths	<p>Graduates' MWDS of .38 for this base of competence construct indicated a low need for curriculum improvement.</p> <p>Graduates also noted a high need for curriculum improvement in the specific skill area of functioning well in stressful situations.</p>	<p>Innovative instructors worked to build students ability to prioritize, find information, and problem solve. With these skills students could handle the demanding work load expected of them.</p> <p>Instructors also gave students regular and often constructive feedback allowing students allowing students to gain experience in responding appropriately to constructive criticism.</p> <p>Instructors noted their strategies were often limited by large class sizes.</p>	<p>Coordinating counselors' strategies to enhance personal strengths included internships and other work related activities outside the class giving students opportunities to grow their own personal strengths.</p> <p>These strategies were often limited as not all departments require or offer such learning opportunities for students.</p>

Table 4-7 Continued
Mixing the Three Strands of Data

Construct / Skill	Graduates	Innovative Instructors	Coordinating Counselors
Learning	Graduates' MWDS of .35 for this base of competence construct indicated a low need for curriculum improvement. Graduates noted a high need for curriculum improvement in the specific skill area of keeping up to date in their field.	Innovative instructors' strategies focused on building students ability and responsibility to find sources of information, be able to discern the information, and prioritize the information. Students were required to defend their personal thoughts on the topic while being able to apply the learning to a real world issue. Instructors clearly voiced their personal negative feelings toward lecture based teaching, which only promotes memorization.	Counselors built a curriculum where students received a strong foundation in the topics early in the college experience, and then in their later years students were moved into being able to explain and apply the learnings to real-world issues. Counselors voiced their frustrations with large class sizes that limited instructors' opportunity to have discussion based classes.
Rank ordering of the five skills most or least developed while at Virginia Tech: Learning to Learn, Priority Setting, Work Independently or in Groups, Identifying Problems and Solving Problems, and Adapting to Change	Following a points earned scenario, graduates ranked the skills of Priority Setting as most developed or improved during their academic experience at Virginia Tech. Identifying Problems and Solving Problems was ranked second, and the Ability to Work Independently and in Groups was noted as least developed or improved.	Innovative instructors strategies focused on building students skills in becoming life-long learners as instructors held students responsible for their own learning, required students to find their own sources of information, be able to explain the information and be able to apply the information to a real world issue. Innovative instructors displayed frustrations with students' ability to work in groups and expected students to have the basic skills to function effectively in groups before students entered their class.	Coordinating counselors' strategies to build life-long learning skills focused on exposing students to real-world and experiential scenarios such as internships, projects, and advising. Counselors voiced frustration with developing students' ability to work effectively in teams, and at times, actually avoided the use of teams or groups in the curriculum due to their own frustrations.

Summary

Chapter presented the findings of this study for each of the research objectives and was organized as:

1. Describe LGCALS undergraduate program coordinators' perceived strategies for developing students' ability to continuously learn and thrive in our rapidly changing world.
2. Describe LGCALS innovative instructors' classroom strategies for developing those same skills in their students.
3. Describe graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the *Bases of Competence* inventory.
4. Compare and contrast programmatic strategies, classroom strategies, and graduates experience with respect to the required skills for career success.

The following section, Chapter 5, discusses in detail these findings and presents conclusions, recommendations and implications.

CHAPTER 5

SUMMARY AND DISCUSSION

In our increasingly competitive world, it is critical that college graduates enter the workplace with the appropriate skills to not only survive but also grow their career. However, college graduates are often not properly prepared for success when entering the work force (Conference Board, 2006). No longer are memorization and content specific knowledge the skills students will need to compete. “Employers are more satisfied with graduates who possess core skills, such as creative and critical thinking, interpersonal, and leaderships skills, than those who simply possess skills specific to their vocation” (Paranto & Kelkar, 1999, p. 84). Other skills, including problem solving, communication, and life-long learning, are now the basic requirements to be able to compete and be successful (Paranto & Kelkar). However, the employability skills required are not always developed due to gaps in agreement and collaboration between college students, higher education, and potential employers (Rateau & Kaufman, 2009). This often results in graduates who are not prepared to successfully enter the workforce. The connection between employability skills and economic success of the graduate is reflected in employers’ willingness to pay a premium for such skills (Knight & Yorke, 2002). Meanwhile, enhancing students’ employability is vital to the knowledge driven economy of the United States (Hawkrige, 2005). Higher education, future employers, and students must collaborate to better ensure college graduates have the needed skills for employability and success.

The role of the university in career preparation has often been to improve and increase students’ content knowledge. While this approach has been successful for many years, in our rapidly changing world, the ability to synthesize, analyze, and think has become more important to the long-term success of the graduates (Conference Board, 2006). Additionally, employability skills, including leadership, are learned through both the classroom and meaningful experiences

(Northouse, 2010; Rae, 2007). While many educators recognize the need for change and are in the midst of change, this must happen at a faster pace. Educators are making changes to curriculum and teaching methods to better provide the required thinking skills the graduates need; however, society is changing faster than many universities can adapt. “Educators and employers need to work together to prepare students for the complexities they will encounter as they leave school and enter the workplace” (Evers et al., 1998, p. 4). Barriers to change need to be removed (Rae, 2007).

Purpose and Objectives

The purpose of the study was to identify a land grant college of agriculture and life sciences’ (LGCALS) current programmatic and classroom strategies for developing students’ ability to continuously learn and thrive in our rapidly changing world, and assess recent graduates’ experiences of those strategies.

The specific objectives include:

1. Describe LGCALS undergraduate program coordinators’ perceived strategies for developing students’ ability to continuously learn and thrive in our rapidly changing world.
2. Describe LGCALS innovative instructors’ classroom strategies for developing those same skills in their students.
3. Describe recent graduates’ perceptions of LGCALS contributions for career readiness of the identified skills as measured through the *Bases of Competence* inventory.
4. Compare and contrast programmatic strategies, classroom strategies, and graduates experience with respect to the required skills for career success.

Research Design

A mixed method convergent parallel design guided the research (Figure 5-1).

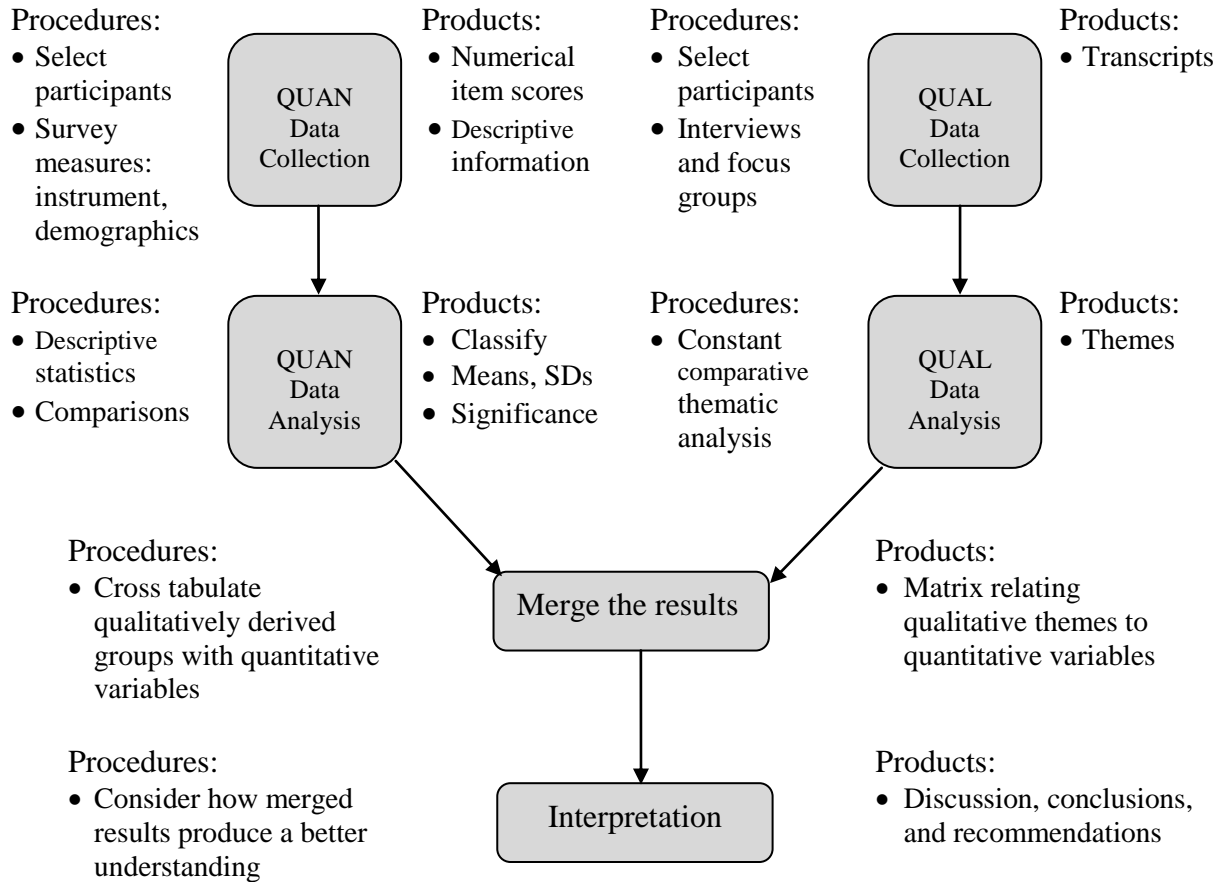


Figure 5-1. The Products and Procedures of a Convergent Parallel Design. Note. Adapted from “Designing and Conducting Mixed Methods Research,” by J. W. Creswell and V. L. Plano Clark, 2011, p. 118. Copyright 2011 by Sage Publications, Inc. Used under fair use guidelines, 2011.

Qualitative focus group sessions and interviews were employed for exploring experiences using interpretive, constructivist, and naturalistic approach for research objectives 1 and 2. A cross sectional survey design and questionnaire was used to conduct the quantitative research for objective 3. The mixed methods design of the convergent parallel design was used to frame and explore research objective 4. The method was based on separate analysis of the qualitative focus

groups and interviews, and the quantitative survey data, followed by merging of the data looking for similarities or differences in findings and final researcher interpretation.

Methodology

Research question one followed qualitative inquiry methods to explore experiences through focus group sessions. Identification of coordinating counselors for participation in focus groups was coordinated through the College of Agriculture and Life Sciences (CALs) Office of Academic Programs. Recruitment was accomplished through written correspondence explaining IRB approval, the purpose of the study, confidentiality, and voluntary participation. In total, nine coordinating counselors, representing six of the ten CALs undergraduate departments, participated in the focus groups.

Research question two followed qualitative inquiry methods to explore experiences through interviews. Identification of innovative instructors for interview was coordinated through the College of Agriculture and Life Sciences Office of Academic Programs. Selection of innovative instructors was purposeful to show different perspectives from different CALs academic departments, as well as their willingness to share their experiences of the phenomenon and ability to richly and effectively communicate the actual experience. In total, five innovative instructors representing five of the ten CALs undergraduate departments participated in interviews.

For objectives one and two, the researcher used IRB approved interview guides (Appendices C & D), developed from the set of *a priori* propositions (Appendices A & B). The interview guidelines were designed not only to address the research question, but were purposefully designed to sequence the questions, beginning with general questions and then moving to deeper questioning to better explore the phenomenon. Interview guides were reviewed with a committee member to determine the clarity of questions and the adequacy of the interview

guide. Adjustments to the guides were made based on feedback. Recorded focus group sessions and interviews were conducted, each taking approximately 50 minutes. Rich field notes were taken to ensure small but important details of the discussion were not overlooked. Audio recordings were verbatim transcribed.

The researcher conducted data analysis of the focus group sessions and interviews through a process of whole text analysis, including identifying, coding, and categorizing data into patterns. The transcriptions and written field notes taken during the interviews were proofed and read multiple times for the researcher to feel the experience and listen for words that bring meaning to the phenomenon. The analysis process was an inductive process moving from small details (codes) to a higher or more general level of findings (categories and themes). During the process of categorizing, codes, memos, or reminders of interesting concepts were written and continually reviewed. The final categories were placed in a table and used by the researcher to describe the findings and results of the research.

Research question three followed quantitative research methods, using a cross sectional survey design and questionnaire. After an extensive review of the literature, one questionnaire was identified that addressed research question three. It was the Making the Match Year 3 questionnaire for graduates (Appendix G), as developed by Evers et al. (1998) and later modified by Robinson (2006). The actual questionnaire was self-administered and included a researcher-designed supplement to gather basic demographic information (Appendix H).

Identifying the potential list of graduates to survey was accomplished by working directly with the Office of Alumni Relations at Virginia Tech. For the 18-month period from December 2008 to May 2010, the total population frame was 1,045 CALS graduates. The total population included CALS graduates that did not pursue further education as well as graduates who went on to graduate school or professional school; this study was only interested in those that did not

pursue additional education after graduating. Based on current Virginia Tech Career Services information (Virginia Tech, 2010) for the last three years, a weighted average of 42.5% of CALS graduates go on to graduate or professional school. Those continuing students did not meet the criteria of this research as graduates entering the workplace upon completion of their undergraduate degree. Accordingly, the total population ($N=1,045$) was reduced to a target sampling frame of 601 CALS graduates between December 2008 to May 2010.

The researcher employed a mixed-mode survey method, including Internet and/or mail, guided by *The Tailored Design Method* (Dillman, Smyth, & Christian, 2009). A total of 1,045 questionnaires were sent via Survey Monkey and/or mail service, resulting in 432 completed and returned questionnaires, of which 250 met the study criteria. The final response rate among those that met the study criteria was 43.5%.

Data analysis of the demographic information included descriptive statistics and measures of central tendency to describe the study participants. Making the Match (Evers et al., 1998) data was analyzed following the Borich (1980) needs assessment method. Mean weighted discrepancy scores (MWDS) for the five constructs were determined and ranked in order of importance based on skills needs. Discrepancy scores for each respondent and for each question were calculated by subtracting the competence rating from the importance rating. Weighted discrepancy scores were calculated for each respondent and for each employability skills question by multiplying the discrepancy score by the mean of all the importance scores. Finally, the Borich needs assessment score, or the MWDS, was calculated by taking the sum of weighted discrepancy scores and dividing by the total number of responses.

A convergent, parallel, mixed methods design was used to frame and explore research question number four. This method is based on separate analysis of the qualitative interviews and

the quantitative survey data, followed by merging of the data looking for similarities or differences in findings and final researcher interpretation.

Findings

Objective 1: Describe Program Coordinators' Strategies

Objective 1 was to describe LGCALS undergraduate program coordinators' perceived strategies for developing students' ability to continuously learn and thrive in our rapidly changing world. Based on a thematic analysis of the data, three themes emerged describing program coordinators strategies for developing student skills:

1. Stay abreast of new developments in recommended programmatic and educational practices.
2. Develop curricula that are relevant in today's changing world.
3. Time and resources to overcome barriers to change.

Objective 2: Describe Innovative Instructors' Classroom Strategies

Objective 2 was to describe LGCALS innovative instructors' classroom strategies for developing those same skills in their students. Based on a thematic analysis of the data, six themes emerged describing innovative instructors' classroom strategies for developing student skills:

1. Demonstrate enthusiasm for student learning.
2. Actively experiment with new ideas for educational practice.
3. Approach teaching with a guiding mentality more than a directing mentality.
4. Foster student ownership of learning.
5. Stay abreast of new developments in recommended educational practices.
6. Time and resources to overcome barriers to change.

Objective 3: Describe Graduates' Perceptions of Career Readiness

Objective 3 was to describe recent graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the *Bases of Competence* inventory. Results from the bases of competence inventory indicate the constructs of Problem-solving and Analytic (.67) and Personal Organization and Time Management (.67) had the highest MWDS, while the construct of Learning (.35) had the lowest MWDS. The four constructs were then categorized, based on MWDS, (Robinson & Garton, 2007)) prioritizing need for curriculum improvement:

Category I – MWDS greater than .80 indicating a high need for curriculum improvement

Category II – MWDS ranging from .50 to .79 indicating a moderate need for curriculum improvement

Category III – MWDS ranging from .30 to .49 indicating a low need for curriculum improvement

Category IV – MWDS less than .30 indicating negligible need for curriculum improvement

Findings indicate the two constructs of (1) Problem-solving and Analytic and (2) Personal Organization and Time Management fell into Category II, suggesting a moderate need for curriculum improvement. The three constructs of (1) Creativity, Innovation, and Change, (2) Personal Strengths, and (3) Learning fell into Category III, suggesting a low need for curriculum improvement. No constructs fell into Category I (high need of curriculum improvement) or Category IV (negligible need for curriculum improvement). In review of the individual questions comprising the five constructs, 13 of the 24 individual questions, or 54.1 percent of the questions were noted as high or moderate need for curriculum improvement. Six of the 24 individual questions, representing four of the five constructs, fell into Category I, indicating a high need for

curriculum improvement. Those items included: allocating time efficiently, solving problems, keeping up-to-date on developments in the field, functioning well in stressful situations, identifying problems and prioritizing problems. Additionally, seven of the 24 individual questions, representing four of the five constructs, fell into Category II, indicating a moderate need for curriculum improvement. Those items included: identifying essential components of the problem, sorting out the relevant data to solve the problem, setting priorities, adapting to situations of change, keeping up-to-date with external realities related to your company's success, functioning well in stressful situations, and responding positively to constructive criticism.

Participants ranked the importance of a skill for workplace success higher than their individual competence in that skill in all five of the constructs and 21 of the 24 individual skill questions. This finding corresponds with previous research on graduates entering the workforce, often ranking the importance of the skill higher than their own competency at performing the same skill (Radhakrishna & Brueing, 1994)

The five bases of competence skills of learning to learn, priority setting, the ability to work independently and in groups, identifying problems and solving problems, and adapting to change were rank ordered following a points earned scenario. Graduates ranked the skills of Priority Setting as most developed or improved during their academic experience at Virginia Tech. Identifying Problems and Solving Problems was ranked second, and the Ability to Work Independently and in Groups was noted as least developed or improved.

Objective 4: Compare and Contrast Strategies

When comparing the three streams of data, key findings included:

1. Agreement between coordinating counselors and innovative instructors on the value in regular and effective program planning; with special attention paid to active communications and collaboration with stakeholders.
2. Agreement between coordinating counselors and innovative instructors in the need to move away from ‘knowing what’ to ‘learning to learn’.
3. A need to develop and implement strategies that focus on learner centered environments.
4. A need to develop further and implement real world and experiential student learning opportunities.
5. A need to explore options to better instruct students on how to function productively on teams, perhaps through the active use of team and group work in the classroom.
6. Agreement between coordinating counselors and innovative instructors that time and resources are limitations for improvements.

Conclusion and Discussion

A mixed methods convergent parallel design guided the research, maintaining findings from research objectives 1, 2 and 3 separately and then merging the three strands of data in research objective 4. This conclusion and discussion section will explore the separate streams of data followed by a final discussion of similarities and differences in findings and researcher interpretation.

Objective 1: Describe Program Coordinators’ Strategies

Objective 1 was to describe LGCALS undergraduate program coordinators’ perceived strategies for developing students’ ability to continuously learn and thrive in our rapidly changing world.

Theme 1a: Stay abreast of new developments in recommended programmatic and educational practices. Program coordinators acknowledged the need to remain abreast with the changing world if students are to become life-long learners. Methods to remain abreast ranged from formal advisory boards, industry board participation, and informal methods such as personal contacts with employers and graduates. As noted by Kirkpatrick and Kirkpatrick (2006), for educational programs to be effective and meet student needs, there must be communication between all the different stakeholders, including employers, graduates, and current students. Program coordinators also noted departmental differences in frequencies of discussion with stakeholders from regular formal meetings to daily dialogue with stakeholders allowing a better understanding of program effectiveness. This is consistent with Conference Board (2006) and Andelt et al. (1997), noting that communications with stakeholders must be regular and on-going. In addition to the informal approach, it would be beneficial for a more formal, planned approach to communicating with stakeholders on a regularly scheduled basis to better ensure coordinators are remaining abreast with the changing world (Caffarella, 2002; Cervero & Wilson, 2006).

Three of the seven departments had active advisory boards that met regularly and included a wide range of stakeholders. Advisory boards were noted as helpful to better understand the changing world and update curriculum to meet changing needs. One significant contribution of advisory boards was the opportunity to keep curriculum current with the changing world, as noted by the Conference Board (2006). While four departments did not have advisory boards there was general agreement in the value of forming and maintaining active and productive advisory boards. One department stayed abreast with stakeholders through faculty members' active participation in industry boards. Participation in industry boards provided active and regular communications as a means to stay abreast with the changing world. It would be

beneficial for the four departments that do not have advisory boards to further explore this option as a means to improve communications with stakeholders and make an informed choice on how to proceed.

One factor causing inconsistencies in approach to remaining abreast was the result of outside accreditation by three of the seven departments represented. Participants noted that to remain accredited the departments must have formal methods of communication with stakeholders, including the formation of active advisory boards.

Theme 1b: Develop curricula that are relevant in today's changing world.

Participants agreed curricula and program strategies must include learning opportunities that are relevant to the changing world. Coordinators recognized the need to shift from strategies and curricula that promote content to new strategies that promote and emphasize student growth in learning to learn, consistent with current literature (Atkins, 1999; Harvey, 2005; McManus, 2005; Robinson et al., 2007, Weimer, 2002). Various programmatic approaches to real-world and relevant opportunities included internships, team and group work, capstone projects and classes, service learning projects, and student advising. The different programmatic approaches were designed to promote basic knowledge as a foundation, problem-solving of real world issues, and collaborative work with others, all required for student growth of life-long learning skills.

The value of formal internships was noted as a powerful learning opportunity where students are introduced to real-world experiences, and was consistent with the literature (Coll & Zegwaard, 2006; Rateau & Kaufman, 2009; Slep & Read, 2006). Four of the seven departments required internships, while two departments encouraged internships strongly as a programmatic strategy to enhance students' skill in becoming a life-long learner. Understanding the importance to student growth, coordinating counselors should explore and promote additional and required

on-campus experiential learning opportunities including service learning projects, capstone classes and projects, and student involvement in clubs and organizations outside the classroom (Coll & Zegwaard, 2006; Sleaf & Reed, 2006). In a collaborative effort working with all stakeholders, internships should be promoted or required further (Coll & Zegwaard) by the various departments that do not have required internships programs.

Current programmatic strategies of internships, capstone projects and classes, and service learning projects were also noted as opportunities to promote skills and abilities to function actively in teams, a key skill for student success in the workplace (Conference Board, 2006). Team and group work actively promote other required skills of interpersonal skills and opportunities to consider different perspectives of other students (Michaelsen, Bauman Knight, & Fink, 2004). Coordinating counselors, while recognizing the value of teams in promoting life-long learning skills, also voiced strong frustration in students' lack of understanding of teams and how to function successfully on a team. There was agreement that students should come prepared properly into a class with a basic understanding of teams. Few skills are needed for success in the workplace more than the ability to function productively in (Conference Board, 2006). Consistent with the goals of effective program planning (Cervero & Wilson, 2006) and the critical need for team skills (Conference Board, 2006), program coordinators must address their frustrations of students' lack of knowledge and skills for productively functioning on a team by implementing strategies that address the issue. Working collaboratively with instructors, students should be held accountable for their ability to function and contribute to a team once they have received the proper training on team building skills.

Theme 1c: Time and resources to overcome barriers to change. The most noted barriers to change were time and resources. All participants agreed in the value of formal program assessment and the value of stakeholder involvement. The three departments that were

accredited stated they were actively and routinely conducting program evaluation and making improvements to the curricula based on assessment. These participants agreed the accreditation, while very time consuming, was in essence forcing the department to conduct the evaluations and make changes as needed. For the balance of the departments, program assessment was conducted informally and not always on a scheduled basis, resulting in frustrations. The participants stated their support for assessment and improvement but were unable to complete these in a more formal and effective manner. In our rapidly changing world, a key element in effective program planning includes summative and formative program assessment (Caffarella, 2002). Those departments that currently do not have a formal method for program evaluation should further explore how they might accomplish this critical step understanding current resource limitations.

Objective 2: Describe Innovative Instructors' Classroom Strategies

Objective 2 was to describe LGCALS innovative instructors' classroom strategies for developing those same skills in their students.

Theme 2a: Demonstrate enthusiasm for student learning. Consistent with motivation theory (Schunk, 2008) and learner-centered pedagogy (Weimer, 2002), student learning is enhanced when instructors show passion for teaching and the topic. Passion for teaching included a strong desire by each instructor to assist, or guide, students in their learning. Innovative instructors motivated their students by challenging them with real-world and relevant assignments and discussions where students could connect their learning to the real world. These instructors understand student learning depends on how much value the student places on the learning outcomes and the degree the individual believes the learning goals are attainable. Again, consistent with Schunk and Weimer, innovative instructors challenged the students

beyond their comfort zone, but goals were always within reach. Innovative instructors were also passionate about trying new teaching methods and strategies despite the fear of trying something new and while trying to balance other responsibilities of their position including research and extension.

Theme 2b: Actively experiment with new ideas for educational practice. Consistent with the tenants of learner-centered pedagogy (Weimer, 2002), innovative instructors were characterized as guides for their students, creating safe learning environments for students to explore, giving students options and control of classroom decisions, and presenting students with real world and relevant issues for problem solving. Innovative instructors continually were trying new classroom teaching strategies and methods which were often met with students that did not understand or appreciate the new strategy. Acting as a guide, instructors explained the rationale behind the new strategy, allowing students a better understanding of the positive learning outcomes. Safe learning environments were created as instructors were receptive to student questions and concerns while allowing students to explore and discuss their thoughts. Administrators and department heads should actively promote other instructors into adapting a learner-centered pedagogy, if students are to meet the needs of the workplace. Instructors should actively implement learner-centered environments where the emphasis is on learning and not content, students accept responsibility for their own learning, and students are challenged in a safe environment (McManus, 2005; Michaelsen et al., 2004; Weimer, 2002).

Theme 2c: Approach teaching with a guiding mentality more than a directing mentality. Innovative instructors communicated to students their responsibility for learning and held students accountable for learning. Instructors also employed classroom strategies and methods that promoted active life-long learning including team and group learning, encouraging discussion of different perspectives on issues, challenging students to find relevant literature on

the different topics and then be able to discern what information is important. Each of these strategies promoted and required student involvement in the learning process. Instructors also actively promoted and challenged students to be able to apply the new concepts to real-world issues and problem solving. Passive forms of student learning, including excessive lecturing, memorization of content, and providing students with the needed resources without challenging the student to find the resource, were unacceptable practices in their classrooms (Harvey, 2005; McManus, 2005).

Theme 2d: Foster student ownership of learning. Consistent with learner-centered teaching, students must take responsibility for their own learning (Weimer, 2002). Each of the innovative instructors clearly recognized the importance of explaining the rationale supporting this strategy. Instructors also guided students in their development of taking ownership through the use of motivation. Strategies to motivate students (Schunk, 2008; Weimer, 2002; Wlodkowski, 2008), including giving students choices in their education with the understanding responsibility to learn, are enhanced when students have a say in their education. Instructors also motivated students by challenging them, but always with the understanding that the challenge, while difficult, was in reach of the student.

Theme 2e: Stay abreast of new developments in recommended educational practices. Similar to coordinating counselors, there was agreement for the value and need for regular and effective program planning. Consistent with the goals of effective program planning (Cervero & Wilson, 2006), instructors noted their support for effective program planning and assessment as an opportunity to receive needed feedback to ensure the desired educational results were achieved. Innovative instructors had many different approaches to remaining abreast with new developments in educational practice. Many of these approaches were informal, and the method most noted was conversations with graduates of the program. Questions to the graduates,

such as what is working for you and what recommendations would you have for improvement, were typical of the conversations. Instructors then make adjustments based on what they heard. Instructors also noted the value in formal program planning and assessment as a better means of staying abreast and receiving the critical feedback they desired. Until program assessment is formally implemented, the instructors appeared to be successfully gathering information through their contacts that gave them the desired information. Again, innovative instructors' comments mirrored those of coordinating counselors on barriers. There was agreement in willingness to review and implement new teaching methods and strategies; however, time limitations, often a result of pursuit of tenure, limited opportunities to implement new strategies.

Objective 3: Describe Graduates' Perceptions of Career Readiness

Objective 3 was to describe recent graduates' perceptions of LGCALS contributions for career readiness of the identified skills as measured through the *Bases of Competence* inventory.

The constructs of Problem-solving and Analytic (.67), and Personal Organization and Time Management (.67) fell into Category II (MWDS ranging from .50 to .79), indicating there was a moderate need for curriculum improvement. Conference Board (2006) findings detail these same skills in need of curriculum improvement for success in the workplace. These findings suggest strategies currently employed by CALS coordinating counselors and instructors appear to be having an impact on student learning, yet continued efforts to improve in these areas should be made through both programmatic and instructional strategies.

Scores for both Problem-solving and Analytic and Personal Organization and Time Management indicate graduates view these skills to be of major importance and are moderately competent in performing the skill for success in the workplace. Graduates perceptions on importance of these skills are consistent with Conference Board (2006) findings that note employers seek graduates with strong problem solving skills, and personal organization and time

management skills. These findings also suggest the various CALS coordinating counselors and innovative instructors acknowledge the importance of building these skills. Consistent with the Radhakrishna and Brueing (1994) study, graduates ranked the majority of skills as higher in perceived importance than their own perceived competence at the same skill.

While no individual construct was noted as in high need of curriculum improvement, six of the individual skill questions, representing four of the five constructs, were noted as in high need of curriculum improvement. Those skills included allocating time efficiently, solving problems, keeping up-to-date on developments in the field, functioning well in stressful situations, identifying problems, and prioritizing problems. Three of these skills (solving problems, identifying problems, and prioritizing problems) are part of the Problem-solving and Analytic construct. Graduates' ability to problem solve has been noted as one of the five most important skills identified for improvement in higher education (Conference Board, 2006) and one of the most important skills for workplace success (Crawford et al., 2011; Evers et al., 1998). Strong leadership skills were also noted as requirements for success in the workplace (Conference Board; Crawford et al.). While it was noted that both problem-solving and leadership skills are required for workplace success, the skills model of effective leadership is based on strong problem-solving skills (Northouse, 2010); hence for effective leadership, future leaders must possess strong problem-solving skills.

Focus on construct analysis alone would indicate only moderate to negligible improvements are needed in preparing students for success in the workplace. To better understand areas in need of curriculum improvement, an examination of the individual skill comprising each of the five bases of competence constructs was conducted and was valuable to a better overall understanding of needs. Seven of the 24 individual questions, representing four of the five constructs, fell into Category II (MWDS ranging from .50 to .79), indicating a moderate

need for curriculum improvement. Those skills included identifying essential components of the problem, sorting out the relevant data to solve the problem, setting priorities, adapting to situations of change, keeping up-to-date with external realities related to your company's success, functioning well in stressful situations, and responding positively to constructive criticism. The individual skill questions of identifying essential components of the problem and sorting out the relevant data to solve the problem are included in the Problem-solving and Analytic construct. Consistent with the findings above, these are important skill areas noted in need of improvement in higher education (Conference Board, 2006), required for workplace success (Crawford et al., 2011; Evers et al., 1998), and critical in developing future leaders (Northouse, 2010). These finding suggest continuing efforts for improvement should be made.

When reviewing individual questions of the different constructs, one concern that arises was the fact that individual questions within a construct should 'behave' in the same manner as the construct (DeVellis, 2003). Better put, if the analysis of the Problem-solving and Analytic construct resulted in moderate need for curriculum improvement, it might be suspected that the six individual questions of the construct would also result in need for moderate curriculum improvement; however, finding in this study detail three of the six questions in need of high curriculum improvement. Factor analysis is one method to further investigate this issue as the function of factor analysis "is to help an investigator determine how many latent variables underlie a set of items. Factor analysis could help the investigator determine whether one broad or several more specific constructs were needed to characterize the item set. Factor analysis would also be useful in better understanding the item non-response error reported for the mail mode construct of Learning.

Based on the researchers' current understanding, no other study at Virginia Tech, CALS, using the Making the Match questionnaire has been conducted; however one such study has been

conducted at a similar institution. A similar study conducted by Robinson and Garton (2008) at the University of Missouri-Columbia, College of Agriculture, Food and Natural Resources, with results compared on 24 individual skills (Table 5-1). The Missouri study looked only at the skill level and not the base competencies construct level; therefore, no comparison was made at the construct level.

Results between the two studies are strikingly similar with exact matches for need of curriculum improvement in ten of the 24 different skills. Additionally, of the remaining 14 skills, none are separated by more than one category of need for improvement. The results here noted Problem-solving and Analytic as in most need for curriculum improvement, while the Missouri study noted “the employability skill in greatest need of curricular attention, according to graduates was problem solving” (Robinson & Garton, 2008, p.102).

Table 5-1
Need for Curriculum Improvement by Institution and by Skill Based on Borich Discrepancy Scores

Construct Skill	Institution	
	Missouri	Virginia Tech
Problem-solving and Analytic		
Solving problems	High	High
Identifying problems	High	High
Prioritizing problems	High	High
Identifying components of the problem	High	Moderate
Sorting out the relevant data to solve the problem	Low	Low
Contributing to group problem solving	Negligible	Negligible
Learning		
Keeping up-to-date on developments in the field	High	High
Gaining new knowledge outside the job	Low	Negligible
Gaining new knowledge from everyday experiences	Low	Negligible
Personal Organization and Time Management		
Allocating time efficiently	High	High
Setting priorities	Moderate	Moderate
Managing / overseeing several tasks at once	Moderate	Low
Meeting deadlines	Low	Negligible
Creativity, Innovation and Change		
Adapting to situations of change	High	Moderate
Keeping up-to-date with external realities related to your company's success	Moderate	Low
Reconceptualizing your role in response to changing corporate realities	Low	Low
Initiating change to enhance productivity	Moderate	Low
Providing novel solutions to problems	Moderate	Negligible
Personal Strengths		
Functioning well in stressful situations	High	High
Functioning at an optimal level of performance	High	Moderate
Responding positively to constructive criticism	High	Moderate
Maintaining a positive attitude	Moderate	Low
Maintaining a high energy level	Low	Negligible
Ability to work independently	Low	Negligible

Note. From: "An assessment of the employability skills needs by graduates in the College of Agriculture, Food and Natural Resources at the University of Missouri", 2008, Robinson, J., & Garton, B., *Journal of Agricultural Educations*, 49(4), pp. 96-105. "Assessing the employability of college graduates for success in the workplace", 2011, Rateau, R.J., (Doctoral dissertation, Virginia Tech, in progress).

Skill areas of Learning to Learn, Priority Setting, the Ability to Work Independently and in Groups, Identifying Problems, Solving Problems, and Adapting to Change were rank ordered following a points earned scenario. Graduates ranked the bases of competency skills of Priority Setting as most developed or improved during their academic experience and Identifying Problems and Solving Problems were ranked second. These findings suggest student growth in these important skill areas; but as noted above, additional emphasis on development of these skills must be considered. Additionally, the ability to work independently and in groups was noted as least developed or improved during the academic experience. This finding is a concern as the ability to work independently and in groups has been identified as a key requirement for success in the workplace (Conference Board, 2006; Evers et al., 1998) and improvements in students academic experience should be made.

The three remaining constructs of Creativity, Innovation, and Change (.46), Personal Strengths (.45), and Learning (.35) fell into Category III (MWDS ranging from .30 to .49), indicating there was a low need for curriculum improvement. Consistent with the literature, these constructs are critical for workplace success (Coll & Zegwaard, 2006; Evers et al., 1998; Sleaf & Reed, 2006). The findings indicate that graduates' perceptions of competence in these skills are in need of improvement to meet the workplace requirements.

A summary of objective three details a moderate need for curriculum improvement for the two bases of competence constructs of Problem-solving and Analytic and the construct of Personal Organization and Time Management. The three remaining bases of competence were rated as negligible need for curriculum improvement. However, within each of the five bases of competence constructs there are individual skills in either high or moderate need for curriculum improvement. Educators must implement strategies for improvement in these areas for the success of our graduates. The similar study conducted at the University of Missouri shows

similar graduate perceptions which should be further explored to better understand commonalities and differences in the two programs in an effort to implement curriculum improvements.

Objective 4: Compare and Contrast Strategies

Objective 1 was to describe LGCALS undergraduate program coordinators' perceived strategies for developing students' ability to continuously learn and thrive in our rapidly changing world.

Mixing of the three strands of findings highlights strategies that are resulting in the intended positive impact or in need of improvement as measured through graduate perceptions. Graduates' perceptions of the importance and their competence in the skill construct of Problem-solving and Analytic imply need for moderate curriculum improvement, similar to the Missouri study. Innovative instructors are addressing this need for improvement directly through their classroom strategies moving away from 'knowing what' to strategies of 'learning to learn'. Important concepts innovative instructors employ in guiding their students are improved abilities to organize and prioritize information in a problem solving effort. Innovative instructors take time to explain the problem solving process and recognize that skill is built and enhanced through regular 'practice'; therefore, classroom strategies are centered around problem solving (Schunk, 2008). Innovative instructors also challenge their students to find relevant data on the various topics and be able to discern what was the critical information and what it really means. Stated simply, students are required to think, build new knowledge, and be able to defend their thoughts. Innovative instructors acknowledged their desire to further implement new / improved classroom strategies to develop this construct area, but also noted time and resource constraints often limited opportunities to make these improvements. Coordinating counselors are addressing the need for improvement by requiring students' completion of learning opportunities that

enhance and promote problem solving skills, such as service learning projects, capstone classes and projects, and internships (Coll & Zegwaard, 2006; Rateau & Kaufman, 2009; Slep & Read, 2006).

Graduates' perceptions of the importance and their competence in the skill construct of Personal Organization and Time Management again imply need for moderate curriculum improvement, again similar to the Missouri study. Innovative instructors are addressing this need for improvement directly through holding their students accountable for their own learning, developing responsibility, and meeting deadlines. A shared concept with all innovative instructors was their expectation that students come to class prepared and ready to discuss the topic. Additionally, innovative instructors took personal time to encourage students but also let students know when they were disappointed in the students when they did not accept ownership for their own learning (Schunk, 2008). Programmatic strategies to enhance student growth in Personal Organization and Time Management again included capstone projects, service learning opportunities, and internships. Based on focus group data there are areas that must be explored for additional programmatic strategies that directly address this construct. One starting point for improvement is the value of and necessity of formal program planning and assessment as noted by Caffarella (2002), Cervero and Wilson (2006), and Kirkpatrick and Kirkpatrick (2006).

Graduates' perceptions of the importance and their competence in the three skill constructs of (1) Creativity, Innovation, and Change, (2) Personal Strengths, and (3) Learning support current programmatic and instructional strategies, because they have the intended positive impact on student growth and learning. However, it should also be noted there remain multiple individual skills within the three constructs that have need for improvement. The construct of Creativity has four of the five skills in need of moderate to low improvement. Personal Strengths has four of the six skills in need of high, moderate, or low improvement. And

finally, the Learning construct has one of the three skills noted as in high need for curriculum improvement. Educators must address these needs for the success of our students as each of the three constructs is noted as critical for workplace success (Conference Board, 2006).

As noted previously, a key skill for success is the ability to function productively in teams and groups (Michaelsen et al., 2004). Results show graduates rank ordered their ability to work independently and in groups last in a ranking of skills that were most improved during their academic experience. This finding supports the statements from coordinating counselors in their frustration in developing and implementing programmatic strategies that incorporate teams. Additionally, innovative instructors noted frustration with students entering their classes without the basic understanding of how to function productively on a team. This is one significant area for improvement, as coordinating counselors and instructors should collaborate to explore options to improve this issue. Again, the recommended starting place for improvement begins with a formal program evaluation and assessment (Caffarella, 2002; Cervero and Wilson, 2006; Kirkpatrick & Kirkpatrick, 2006).

In summary, results indicate multiple areas for improvement in both programmatic and instructor strategies at Virginia Tech, CALS. The results for developing students' ability to continuously learn and thrive in our rapidly changing world are based on students' perceptions of the importance of key skills and students' perceptions of their competence in performing the same skills for success in the workplace. Results here also suggest that innovative instructors are addressing the various needs graduates have for success in the workplace while acting as models for teaching and learning success. Administrators and department heads should consider encouraging and adapting similar strategies of the innovative instructors as it appears they have the potential to make significant contributions to student learning. Consideration should be given

to the recommendations as shown below for Virginia Tech, CALS to remain abreast with the changing world and better prepare the future leaders our society needs.

Implications

The implications of this study provide insight as to how the two leadership theories have application in higher education with intended results of graduates that are better prepared for workplace success. Higher education and employers of CALS graduates working collaboratively will be able to better understand and develop curriculum that produces the graduates with the skills required for workplace success. Finally, educators will be able to use the *Bases of Competence* as a guide for designing curriculum and strategies that develop those skills graduates need for success in the workplace.

Skills Approach to Leadership Theory

The three skills model of leadership as conceptualized by Katz emphasizes the “skills and abilities that can be learned and developed” (Northouse, 2010, p. 39) for both effective leadership and as needed by college graduates for success in the workplace.

Research objective 1 and 2 examined efforts to develop strategies that promote student growth to continuously learn and thrive in our rapidly changing world. Similar to the skills approach to leadership, capabilities and knowledge are emphasized by program coordinators and innovative instructors as student “have to learn some foundation knowledge and the ability to be able to find new knowledge that they need to know, but then the application of it is the priority” (Irene, C1078). Innovative instructors stress students are also introduced in how to apply knowledge in a step-by-step process to recognize and solve complex problems. Mumford et al. (2000) state effective leadership is the combination of the capabilities, knowledge, and skills that guide the leader in complex problem-solving, including problem recognition, development of potential solutions, and implementation of a successful plan for problem resolution. Results

indicate that both program coordinators and innovative instructors emphasize strong problem solving skills in their strategies to educate students and prepare them for the workforce. Research objective 3 explores student perceptions of their own competence in problem solving show a need for curriculum improvement.

The skills model “is characterized as a capability model because it examines the relationship between a leader’s knowledge and skills (i.e., capabilities) and the leader’s performance” (Northouse, 2010, p. 43). These are the same skills and knowledge students need for success in the workplace. The three skills model should be considered as a framework for enhancing students learning. The model is similar to higher education as it begins with building foundation knowledge and cognitive abilities enhanced by motivating students. The process of growth continues with the ability to problem solve while working in a social context, and the end result is superior performance (Northouse). For student success, instructional and programmatic strategies must be enhanced to better develop students ability to problem solve in a complex world.

Path-Goal Theory

House (1996) states path-goal theory is “concerned with how formally appointed superiors affect the motivation and satisfaction of subordinates” (p. 325), an analogy to the relationship between instructor / coordinating counselor with students. Key constructs of the theory are the role of the leader (instructor / coordinating counselor) to improve associate (student) motivation, therefore their performance, by defining goals, clarifying the path, removing obstacles, and providing support (Northouse, 2010). Consistent with motivation theory (Schunk, 2008) and learner-centered pedagogy (Weimer, 2002) students learning is enhanced when instructors show passion for teaching and the topic. Passion for teaching included a strong desire by each instructor to assist, or guide, students in their learning. Innovative instructors

motivated their students by challenging them with real world and relevant assignments and discussions where students could connect their learning to the real world. These instructors understand student learning depends on how much value the student places on the learning outcomes and the degree the individual believes the learning goals are attainable. Again, consistent with Schunk and Weimer, innovative instructors challenged the students beyond their comfort zone, but goals were always within reach. Innovative instructors were also passionate about trying new teaching methods and strategies despite the fear of trying something new; and while trying to balance other responsibilities of their position including research, outreach and tenure. Path-goal theory has an application for higher education as educators (instructors, program coordinators, and administrators) define goals for all to work towards. Educators must then clarify the path for all to take while removing those roadblocks or obstacles that prevent goal attainment. Lastly, educators must provide the needed support for others to attain their goals. “The theory reminds leaders [educators] that the overarching purpose of leadership is to guide and coach subordinates as they move along the path to achieve a goal” (Northouse, p. 133).

Recommendations for Practice

Based on the findings and conclusions of this study, the researcher recommends the following for educators at Virginia Tech:

- Academic administrators and innovative instructors should promote and implement learner-centered teaching into the classroom at Virginia Tech. Weimer’s (2002) book on *Learner-Centered Teaching* could be used as a guide.
- Program coordinators should review opportunities for a more formal, planned approach to communicating with stakeholders on a regular scheduled basis to better ensure they are remaining abreast with the changing world, including the option of advisory boards.

Caffarella's (2002) book on *Planning Programs for Adult Learners: A Practical Guide for Educators, Trainers, and Staff Developers* could be used as a guide.

- Program coordinators should explore and promote additional experiential learning opportunities including service learning projects, capstone classes and projects, student involvement in clubs and organizations and internships. Evers et al. (1998) book on *The Bases of Competence: Skills for Lifelong Learning and Employability* could be used as a guide.
- Formal and regular program assessment should be required if the learning experience is to meet the rapidly changing needs of the world. The Cervero and Wilson (2006) book on *Working the Planning Table: Negotiating Democratically for Adult, Continuing, and Workplace Education* could be used as a guide.
- Program coordinators and instructors should explore and adapt additional / improved strategies that encourage and promote student growth in problem solving, such as team based learning and case studies. The Duch et al. (2001) book on *The Power of Problem-based Learning: A Practical "How to" for Teaching Undergraduate Courses in any Discipline* could be used as a guide.

Program coordinators and instructors should explore and adapt additional / improved strategies that encourage and promote student growth in personal organization and time management, such as holding students responsible and accountable for meeting deadlines and coming to class properly prepared to discuss issues. Weimer's (2002) book on *Learner-Centered Teaching* could be used as a guide.

- Program coordinators and instructors should explore and adapt improved strategies that encourage and promote student growth in ability to function productively in teams or

groups. The Michaelsen et al. (2004) book on *Team-based Learning: A Transformative Use of Small Groups in College Teaching* could be used as a guide.

- CALS administrators should hold faculty members accountable for making the changes recommended from this study.

Recommendations for Research

- Investigate through factor analysis the construct validity of the *Making the Match* instrument before future use of the questionnaire. This analysis would lead to a better understanding of why specific questions of the individual constructs behave differently than the construct as a whole. Additionally, the analysis would lead to a better understanding of differences in responses from early and late respondents.
- Explore the results of this study by academic major to better understand the differences that may exist by graduates' major. Similarities and differences in results by department would better inform coordinating counselors and instructors of the different strategies that are resulting in positive impacts on student learning.
- Compare and contrast Virginia Tech versus University of Missouri results to better understand best practice principles, with special emphasis placed on the qualitative portions which the University of Missouri did not conduct. Similarities and differences in results between the two universities would inform administrators and others, of the different strategies that are resulting in positive impacts on student learning.
- Replicate this study with other LGCALS to further explain differences and similarities of results and best practices.
- Explore the different methods innovative instructors implemented to operationalize their teaching and learning strategies in the classroom. Additional classroom observation would be a critical component of such a study.

- Interview additional instructors noted as innovative to further explore classroom strategies that promote student growth in the *Bases of Competence* skill sets and promote students' ability to continuously learn and thrive in a world of change.
- Explore differences in students' perceptions on the *Bases of Competence* skill sets between departments that do have formal advisory boards and formal assessment versus those departments that do not.
- Investigate the direct relationship between classroom practices and development of employability skills. Such a study may need to capture data throughout a college student's experience rather than waiting until after graduation.

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APPENDICES

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APPENDIX A

a priori Propositions for Research Objective 1

Proposition	Supporting Literature	Research Question
<p>The world is rapidly changing and becoming more complex. There is a need for educators to partner with future employers to better understand the desired learning outcomes.</p>	<p>a. Multiple sources highlighted the need to keep curriculum current with the changing world (Atkins, 1999; Fields, Hoiberg, & Othman, 2003; Garton & Robinson, 2006; Hawkrigde, 2005; Paranto & Kelkar, 1999; Rae, 2007; Smith & Betts, 2000; Suvedi & Heyboer, 2004; Conference Board, 2006; Whittington, 1992).</p> <p>b. Higher education does not always understand employers' needs; therefore, cannot make the needed changes in curriculum, teaching styles and skill development (Coll & Zegwaard, 2006; Slep & Reed, 2006).</p>	<p>Please describe how you maintain and develop curriculums that are relevant to today's changing world.</p>
<p>Collaboration between all stakeholders is needed to better prepare students for the complex and changing world.</p>	<p>a. There is a need for effective and regular program planning to remain abreast with the changing world and to ensure the desired educational results of the program are being attained (Caffarella, 2002; Cervero & Wilson, 2006; Ruben, 2008).</p> <p>b. Planners must include all stakeholders in a process that is both ethical and democratic (Cervero & Wilson, 2006).</p> <p>c. Collaboration with stakeholders is a requirement of the job description of a Virginia Tech Department Head (Virginia Tech, 2010).</p>	<p>a. Please describe your efforts to remain abreast to the changing world.</p> <p>b. Please describe how you determine the desired educational outcomes of your program.</p> <p>c. Please describe your efforts to collaborate with stakeholders to determine educational needs and desired student learning.</p>
<p>One noted method of program planning in education includes the formation of advisory boards.</p>	<p>a. Program planning offers powerful strategies to ensure needs are met and the desired outcomes of a program are produced (Cervero & Wilson, 2006).</p> <p>b. If an advisory board is formed, there must be a genuine interest in listening to stakeholder needs and there must be clear roles of accountability of the different board members (Cervero & Wilson, 2006).</p>	<p>a. Please describe for me what methods you currently use to collaborate with all stakeholders.</p> <p>b. If you have not implemented program planning into your department, please describe why you have decided against this method.</p>

a priori Propositions for Research Objective 1 Continued

Proposition	Supporting Literature	Research Question
		c. If you do have an advisory board what are the roles of the different members, how do you choose the members, how often do you meet, what positive outcomes are the result of the board?
Previous work experience matters.	<p>a. Employers highlight the importance of previous work experience as a means for the student to mature and gain real life experience that only work can provide (Sleap & Reed, 2006).</p> <p>b. Work experiences were typically noted as internships, part time employment during college years or summer jobs (Rateau & Kaufman, 2009).</p> <p>c. Work experiences had a significant impact on the development of competencies resulting in a more 'work ready' and a 'more balanced graduate' (Coll & Zegwaard, 2006, p. 30).</p>	<p>a. Assuming your department does not have a program or requirement for work experiences, describe the efforts your department is making toward establishing these work experiences for your students.</p> <p>b. If your department does have a program, describe the advantages and issues of the program.</p> <p>c. Describe your departments' current view of internships, etc. and do you have plans on requiring student internships?</p>
Barriers to educational change must be removed.	<p>a. Path-goal theory states the role of the leader is to define the goals, clarifies the path, removes obstacles in the way of the path, and provides support to the individual follower (Northouse, 2010).</p> <p>b. "Educators and employers need to work together to prepare students for the complexities they will encounter as they leave school and enter the workplace" (Evers et al., 1998, p. 4).</p>	<p>a. What barriers to change do you encounter?</p> <ol style="list-style-type: none"> 1. from the institution 2. from your followers 3. from stakeholders 4. from students <p>b. Describe the efforts and progress currently or planned to remove the barriers.</p> <p>c. Describe the leadership efforts to provide the support instructors require for the needed changes in teaching strategies.</p>

a priori Propositions for Research Objective 1 Continued

Proposition	Supporting Literature	Research Question
	d. Coll and Zegwaard (2006) argue instructors may not have the proper training or knowledge in implementing the pedagogies that best develop the desirable skills students need. Weimer (2002) states instructors are often hesitant to move to a learner-centered environment due to lack of support from peers or administrators.	

APPENDIX B

a priori Propositions for Research Objective 2

Proposition	Supporting Literature	Research Question
There is a need for educators to partner with future employers to better understand the desired learning outcomes.	<p>a. Multiple sources highlighted the need to keep curriculum current with the changing world (Atkins, 1999; Fields, Hoiberg, & Othman, 2003; Garton & Robinson, 2006; Hawkrigde, 2005; Paranto & Kelkar, 1999; Rae, 2007; Smith & Betts, 2000; Suvedi & Heyboer, 2004; Conference Board, 2006; Whittington, 1992).</p> <p>b. Higher education does not always understand employers’ needs; therefore, cannot make the needed changes in curriculum, teaching styles and skill development (Coll & Zegwaard, 2006; Sleaf & Reed, 2006).</p>	<p>a. Please describe how you maintain and develop curriculums that are relevant to today’s changing world.</p>
The world is rapidly changing and becoming more complex.	<p>a. New teaching methods and strategies must be integrated into the college classroom where emphasis is placed on “learning to learn...with a shift in pedagogy from ‘knowing what’ to ‘knowing how to find out’” (Harvey, 2005, p. 17); “learning how to learn” (Atkins, 1999, p. 267); and the need for graduates “know how rather than simply knowing that” (Robinson et al., 2007, p. 19).</p>	<p>a. Please describe what teaching strategies you typically use in the classroom.</p> <p>b. Please describe teaching strategies that you have implemented or plan to implement that will address the shift from content to learning.</p>
Employers report their frustration that graduates are not properly prepared in skills development.	<p>a. Employability skills, including leadership, are learned through both the classroom and meaningful experiences. (Northouse, 2010; Rae, 2007).</p> <p>b. The Conference Board (2006) findings “reflect employers’ growing frustrations over the lack of skills they see in new workforce entrants” (p. 10).</p> <p>c. Skills including problem solving and communication are now the basic requirements to be able to compete and be successful (Paranto & Kelkar, 1999).</p>	<p>a. Please describe for me what strategies you employ in the classroom that allows skills development.</p> <p>b. Please describe for me what strategies you employ in the classroom that enhances problem solving and communications skills development.</p>

a priori Propositions for Research Objective 2 Continued

Proposition	Supporting Literature	Research Question
	d. Specific areas of deficiencies typically noted are critical thinking, work ethic, problem solving, verbal and written communications, and the ability to effectively contribute to a team effort (Conference Board, 2006).	c. Please describe for me what strategies you employ in the classroom that enhances critical thinking skills development.
The ability to interact successfully on a team is a requirement for success in the workplace.	Specific areas of deficiencies typically noted are the ability to effectively contribute to a team effort (Conference Board, 2006).	a. Please describe for me what strategies you employ in the classroom that enhances the ability to successfully contribute to a team effort.
The yearning for and skill in becoming a lifelong learner is required in the workplace.	Life-long learning skills increasingly important to maintain pace in our diverse and rapidly changing world (Down, 2003).	a. Please describe how you foster an attitude of learning every day.
Barriers to educational change must be removed.	“Educators and employers need to work together to prepare students for the complexities they will encounter as they leave school and enter the workplace” (Evers et al., 1998, p. 4).	What barriers to change do you encounter? a. from the institution b. from your department c. from your peers d. from students e. from employers

APPENDIX C

FOCUS GROUP GUIDELINE QUESTIONS

Coordinating Counselors Focus Group Guideline Questions

Participant Codes: _____

Date: _____

Pre-Session Activities:

- Participants must sign and return the consent form before beginning and recording the session.

Introduction:

- The leader summarizes the purpose of the interview, confidentiality, length of the interview, the fact there are no right answers, and that it is ok to disagree.

Opening Questions:

- The workplace is changing rapidly and becoming more complex. Please tell me what you are doing on a programming level to enhance students' readiness.

Notes:

Probe: Do any of you do anything similar?

Notes:

- Tell me about how you develop and maintain curricula that are relevant to the changing world.

Notes:

Probe:

Notes:

Program Level Strategies - Skills Development

- How would you typically describe the expected learning outcomes of your programs?

Notes:

Probe: How do you measure the learning outcomes?

Notes:

- Current literature describes a need for graduates with improved skills in areas of learning to learn, priority setting, ability to work independently and in groups, identifying problems and solving problems, and adapting to change. Of these 5 skill set areas, let me repeat them... (1, 2, 3, 4, 5) which do you feel you do the best at helping your students through your strategies and why?

Notes:

Probe:

Notes:

- Please tell me what you are doing on a programming level to enhance students' specific skills development in this area. Let me repeat them (1, 2, 3, 4, 5) and talk about any you wish.

Notes:

Probe:

Notes:

- Key classes?
- Other program requirements?
- What barriers must be removed to develop and implement such a program?

Notes:

Probe:

Notes:

- Let's talk about a 2nd skill area of (1, 2, 3, 4, 5).

Notes:

Probe:

Notes:

- Key classes?
- Other program requirements?

- What barriers must be removed to develop and implement such a program?

Notes:

Probe:

Notes:

Summary and Closing

- Before closing I would like to summarize the main points you discussed today. First, you mentioned...(present summary of main points here)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

- Does this capture what we discussed?

Notes:

- Would you recommend any changes in my summary and where?

Notes:

- Is there anything that we did not talk about that you believe is important to add?

Notes:

- Thank you for your time and comments.

APPENDIX D
INSTRUCTOR GUIDELINE QUESTIONS

Innovative Instructor Interview Guideline Questions

Participant Code: _____

Date: _____

Pre-Session Activities:

- Participants must sign and return the consent form before beginning and recording the session.

Introduction:

- The leader summarizes the purpose of the interview, confidentiality, length of the interview, the fact there are no right answers, and that it is ok to disagree.

Opening Questions:

- (*Participant name*), you have been identified as an innovative instructor by others. Please tell me why you think they feel you are an innovative instructor.

Notes:

Probe: What do you think you do that is innovative?

Notes:

Probe: Have you always approached your teaching the same way? And if differently, how?

Notes:

Teaching Methods and Strategies - Skills Development

- How would you typically describe the expected learning outcomes of your class?

Notes:

Probe: How do you measure the learning outcomes?

Notes:

- Current literature describes a need for graduates with improved skills in areas of learning to learn, priority setting, the ability to work independently and in groups, identifying problems and solving problems, and adapting to change.
- Of these 5 skill set areas, let me repeat them... (1, 2, 3, 4, 5) which do you feel you do the best at helping your students through your strategies?

Notes:

Probe:

Notes:

- Please describe that specific strategy.

Notes:

.

Probe:

Notes:

- How do your students react to this strategy?
- Do other instructors use this strategy to your knowledge and if so how?
- Probe: are there adaptations of the approach?

- What do you think are barriers that keep other instructors from using this strategy?

CIRCLE BACK to a 2nd and possibly a 3rd skill set area

- Let's talk about a 2nd skill set area or one of these....(1,2,3,4,5)
- Of the remaining 4 skill set areas, let me repeat them... (1, 2, 3, 4, 5) which do you feel you do the best at helping your students through your strategies?

Notes:

Probe:

Notes:

- Please describe that specific strategy.

Notes:

.

Probe:

Notes:

- How do your students react to this strategy?
- How do other instructors use this strategy
- Probe: are there adaptations of the approach
- What do you think are barriers that keep other instructors from using this strategy?

IF NEEDED DISCUSS A 3RD SKILL SET AREA, OR MOVE ON

Let's move on to another topic.

- Current literature describes a need to change teaching methods from “knowing what” to “knowing how to find out” and “learning to learn”. Please describe for me how your current teaching methods and strategies are meeting this need for “learning to learn”.

Notes:

Probe:

Notes:

Summary and Closing

- Before closing I would like to summarize the main points you discussed today. First, you mentioned...*(present summary of main points here)*

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

- Does this capture what we discussed?

Notes:

- Would you recommend any changes in my summary and where?

Notes:

- Is there anything that we did not talk about that you believe is important to add?

Notes:

(Participant's name), based on some of the innovative strategies you discuss would it be possible to observe one of your classes that you will be using one of these strategies? If so do you have a date?

- Thank you for your time and comments.

APPENDIX E
INSTRUCTOR RECRUITMENT LETTER



College of Agriculture
and Life Sciences

Department of Agricultural and Extension Education
2270 Litton Reaves Hall (0343)
Blacksburg, Virginia 24061
540/231-6836 Fax: 540/231-3824
www.aee.vt.edu

[Date]

Dear Participant Name:

Hello Dr. [Name].

Working with the Virginia Tech College of Agriculture and Life Sciences your name has been mentioned as an innovative classroom instructor.

As a future instructor myself, I am interested in learning more about teaching strategies. If possible I would like to speak with you about your innovative teaching strategies and how you implement them in the classroom. I have research and teaching interests in better understanding classroom strategies for developing students' ability to continuously learn and thrive in our rapidly changing world.

I would expect our discussion to take no more than 45 minutes of your time and can take place at a location and time that meets your schedule.

Please seriously consider my request and thank you for your consideration. I will contact you in the next few days with the goal of speaking with you soon.

Sincerely,

Richard J. Rateau
Doctoral Candidate
931-261-4466
rrateau@vt.edu

Dr. Eric K. Kaufman
Assistant Professor, Agricultural and Extension Education
540-231-6258
ekaufman@vt.edu

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APPENDIX F
INFORMED CONSENT FORM

**Virginia Polytechnic Institute and State University
Informed Consent for Participants in Research Projects Involving Human Subjects**

Project Title: Understanding the Employability of College Graduates for Success in the Workplace

Investigators: Mr. Richard Rateau, Graduate Research Assistant
Dr. Eric K. Kaufman, Assistant Professor

I. Purpose of Research

The purpose of the study will be to measure and classify employability skills of recent graduates from The College of Agriculture and Life Sciences (CALs) at Virginia Tech, their employers and former instructors. The research question will focus on the perceptions of both the recent graduates and their new employers to better understand the employability skills graduates perceive they have and need for success in the workplace, while assessing the employer to better understand their perception of the employability skills needed and the actual skill attainment of the employee. The outcomes of this applied research will assist current and future students, Virginia Tech, and potential employers of graduates of CALs.

II. Procedures

You will also be asked to provide basic demographic information about yourself. You then will be asked to complete the Making the Match Questionnaire. Both the demographic questionnaire and the Making the Match Questionnaire survey are written documents.

Or, for those being interviewed, you will be asked to share with the interviewer your experiences as a academic administrator or an instructor / faculty of Virginia Tech College of Agriculture and Life Sciences. The interview will take no more than one hour in total and will occur at a mutually agreed upon location.

III. Risks

This study has been submitted, reviewed and approved by the Virginia Tech Institutional Review Board. It received the “exempt” status which means that it is seen as the safest of all possible research. Individual answers and identities of the participants will be protected all times.

IV. Benefits

There are no direct benefits to the participants. The indirect benefits are your experiences and opinions which will be used in the research as possible means to continually improve a Virginia Tech students learning and ability to contribute meaningfully to their employer. There has been no promise or guarantee of benefits that have been made to encourage you to participate. Subjects may contact the researchers for a total summary of the study results.

V. Extent of Anonymity and Confidentiality

Protecting your identity is a top priority of this study. By participating in this research project, your information will be kept strictly confidential. Any information in the recorded interviews that potentially could identify you or others will be altered to insure confidentiality. Your name and any names you use during the interview will be assigned pseudonyms. At no time will information be released that allows an individual to be identified. At no time will the researchers release the results of the study to anyone other than individuals working on the project without your written consent. Only the research team will have access to your data.

It is possible that the Institutional Review Board (IRB) may view this study's collected data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.

VI. Compensation

There is no compensation for participating in this research.

VII. Freedom to withdraw

Participants are free to withdraw from the study at any time without penalty. Subjects are free not to answer any questions without penalty.

VIII. Participant's responsibilities

I voluntarily agree to participate in this study. I have the following responsibilities:

- Complete demographic questionnaire
- Complete the Making the Match Questionnaire assessment. **(Reword for those being interviewed to: Complete the interview session.)**
-

IX. Participant's Permission

I have read and understand the Informed Consent and the conditions of this project. I have had all of my questions answered. I hereby acknowledge the above and give my voluntary consent:

_____ YES

_____ NO

Participant Signature

Date

Should I have pertinent questions about this research, I may contact:

Dr. Eric K. Kaufman

Assistant Professor, Agricultural and Extension Education

540.231.6258

ekaufman@vt.edu

APPENDIX G

MAKING THE MATCH SURVEY

Please respond to the following items by **circling the response** that most adequately reflects your perception of the **IMPORTANCE** of the skill and your perceived level of **COMPETENCE** at performing the skills.

- **IMPORTANCE** - in the **LEFT column**, indicate how important you believe the corresponding employability skills are to the success of your occupation.
- **COMPETENCE** - in the **RIGHT column**, indicate your perceived level of competence at performing the corresponding skills.

<i>Sample Question</i> Item Circle your response	Importance					Competence				
	No Importance	Minor Importance	Moderate Importance	Major Importance	Don't Know	No Competence	Minor Competence	Moderate Competence	Major Competence	Don't Know
#. Facilitating a panel discussion	0	1	2	3	9	0	1	2	3	9
If you answer “Major Importance” and “Minor Competence”, it indicates that “facilitating a panel discussion” is of major importance to your employment success and that you have minor competence at that skill.										

Item Circle your response	Importance					Competence				
	No Importance	Minor Importance	Moderate Importance	Major Importance	Don't Know	No Competence	Minor Competence	Moderate Competence	Major Competence	Don't Know
Problem-solving and Analytic										
1. Identifying problems	0	1	2	3	9	0	1	2	3	9
2. Prioritizing problems	0	1	2	3	9	0	1	2	3	9
3. Solving problems	0	1	2	3	9	0	1	2	3	9
4. Contributing to group problem solving	0	1	2	3	9	0	1	2	3	9
5. Identifying essential components of the problem	0	1	2	3	9	0	1	2	3	9
6. Sorting out relevant data to solve the problem	0	1	2	3	9	0	1	2	3	9

Item	Importance					Competence				
	No Importance	Minor Importance	Moderate Importance	Major Importance	Don't Know	No Competence	Minor Competence	Moderate Competence	Major Competence	Don't Know
Personal Organization and Time Management										
7. Setting priorities	0	1	2	3	9	0	1	2	3	9
8. Allocating time efficiently	0	1	2	3	9	0	1	2	3	9
9. Managing / overseeing several tasks at once	0	1	2	3	9	0	1	2	3	9
10. Meeting deadlines	0	1	2	3	9	0	1	2	3	9
Creativity, Innovation, Change										
11. Providing novel solutions to problems	0	1	2	3	9	0	1	2	3	9
12. Adapting to situations of change	0	1	2	3	9	0	1	2	3	9
13. Initiating change to enhance productivity	0	1	2	3	9	0	1	2	3	9
14. Keeping up-to-date with external realities related to your company's success	0	1	2	3	9	0	1	2	3	9
15. Reconceptualizing your role in response to changing corporate realities	0	1	2	3	9	0	1	2	3	9
Learning										
16. Keeping up-to-date on developments in the field	0	1	2	3	9	0	1	2	3	9
17. Gaining new knowledge in areas outside the immediate job	0	1	2	3	9	0	1	2	3	9
18. Gaining new knowledge from everyday experiences	0	1	2	3	9	0	1	2	3	9
Personal Strengths										
19. Maintaining a high energy level	0	1	2	3	9	0	1	2	3	9
20. Functioning at an optimal level of performance	0	1	2	3	9	0	1	2	3	9
21. Responding positively to constructive criticism	0	1	2	3	9	0	1	2	3	9
22. Maintaining a positive attitude	0	1	2	3	9	0	1	2	3	9
23. Functioning well in stressful situations	0	1	2	3	9	0	1	2	3	9
24. Ability to work independently	0	1	2	3	9	0	1	2	3	9

APPENDIX H
DEMOGRAPHIC INFORMATION

Code: _____

Instructions: For each question, place an “X” in the appropriate box and/or fill in the appropriate blank.

Demographic Information

Instructions: For each question, place an “X” in the appropriate box and/or fill in the appropriate blank.

1. What is your age in years? _____ Years

2. What was your overall academic GPA upon graduation?
 - 3.50 to 4.00
 - 3.00 to 3.49
 - 2.50 to 2.99
 - 2.00 to 2.49

3. While at Virginia Tech did you complete a career related internship?
 - Yes No

4. How long have you been with your current employer or self-employed?
 - Currently not employed
 - Less than 6 months
 - 6 months to one year
 - One year to two years
 - More than two years

5. Are you employed in a field related to your degree from Virginia Tech?
 - Yes No

6. Please identify your occupation category with your current employer (check one only).

<input type="checkbox"/> Sales / Customer Service	<input type="checkbox"/> Technical / IT
<input type="checkbox"/> Operations	<input type="checkbox"/> R & D / Product Development
<input type="checkbox"/> Human Resources	<input type="checkbox"/> Financial / Accounting
<input type="checkbox"/> Engineering	<input type="checkbox"/> Farming
<input type="checkbox"/> Other	<input type="checkbox"/> Not Employed

7. This study is focused particularly on students who completed a bachelor's degree. Since completing your bachelor's degree program, have you been a full-time graduate student?

Yes No

8. While at Virginia Tech, were you a first generation college student? (First generation is defined as a student who is the first in their immediate family to attend college.)

Yes No

APPENDIX I
PRE-NOTICE LETTER



Virginia Tech *for life*
ALUMNI ASSOCIATION
Keeping the Hokie Nation Connected

www.alumni.vt.edu

College of Agriculture and Life Sciences
www.cals.vt.edu

As recent graduates of Virginia Tech's College of Agriculture and Life Sciences (CALS) you have been selected to participate in an important survey conducted through the university.

The purpose of the research is to better understand your perception of your readiness to move into the workplace upon graduation from Virginia Tech. The information will be used by researchers to not only better understand your skills, but also to further develop the curriculum offered at the university to ensure it is meeting the needs of the marketplace.

You will receive a short questionnaire via e-mail over the next few days and I am requesting your participation for the success of the research. The survey should take approximately 10 minutes to complete. Your participation and response will remain confidential at all times. We ask that you complete the survey by March 14, 2011.

Thank you for your time and participation in this research. Should you have questions or comments please contact directly the lead researcher, Richard J. Rateau, at rrateau@vt.edu or 931/261-4466.

I look forward to your participation.

Sincerely,

A handwritten signature in cursive script that reads "Susan S. Sumner".

Susan Sumner, Ph.D.
Associate Dean and Director
College of Agriculture and Life Sciences Academic Programs

Cc: Eric K. Kaufman, Assistant Professor
Richard J. Rateau, Graduate Research Assistant

APPENDIX J
COVER LETTER



College of Agriculture
and Life Sciences

Department of Agricultural and Extension Education
2270 Litton Reaves Hall (0343)
Blacksburg, Virginia 24061
540/231-6836 Fax: 540/231-3824
www.aee.vt.edu

September 10, 2011

Participant Name

Street

City, State, Zip

Dear Participant Name:

Recently Dr. Sumner, Associate Dean and Director, College of Agriculture and Life Sciences Academic Programs, wrote you and requested that your participation in an important study concerning the graduates of the College of Agriculture and Life Sciences at Virginia Tech. Today I am asking that you complete a short survey to help identify current programmatic and classroom strategies for developing students' ability to continuously learn and thrive in our rapidly changing world, and assess recent graduates' experiences of those strategies

The survey should take you approximately 10 minutes to complete. Protecting your identity is a top priority of this study. By participating in this research project, your information will be kept strictly confidential. Participation is strictly voluntary.

To make your participation in this survey easier, a business reply envelope is enclosed. Please return your survey by [date].

Virginia Tech prides itself in quality, meaningful research that ultimately leads to the improvement of lives and society. Hokies take pride in service to our communities and others. For both of these reasons, please take a few moments and complete this important survey.

Thank you for your participation and time in this important study. Should you have pertinent questions about this research, you may contact:

Sincerely,

Richard J. Rateau
Doctoral Candidate
931-261-4466
rrateau@vt.edu

Dr. Eric K. Kaufman
Assistant Professor, Agricultural and Extension Education
540-231-6258
ekaufman@vt.edu

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An equal opportunity, affirmative action institution

APPENDIX K FOLLOW UP LETTER



College of Agriculture
and Life Sciences

Department of Agricultural and Extension Education
2270 Litton Reaves Hall (0343)
Blacksburg, Virginia 24061
540/231-6836 Fax: 540/231-3824
www.aee.vt.edu

[Date]

Participant Name

Street

City, State, Zip

Dear Participant Name:

Recently we mailed you a questionnaire as part of a research project concerning recent graduates of Virginia Tech and the College of Agriculture and Life Sciences. To date we have not received your returned, completed questionnaire. We are writing to again request your consideration of completing the questionnaire, which we have again enclosed with the consent form.

As you may recall the purpose of the research will allow researchers to better understand your skills and to further develop the curriculum offered to ensure it is meeting the needs of the market place.

The survey should take you approximately 10 minutes to complete. Protecting your identity is a top priority of this study. By participating in this research project, your information will be kept strictly confidential. Participation is strictly voluntary.

To make your participation in this survey easier, a self addressed, stamped return envelope is enclosed. Please return your survey no later than [date].

Thank you for your participation and time in this important study. Should you have pertinent questions about this research, you may contact:

Sincerely,

Richard J. Rateau
Doctoral Candidate
931-261-4466
rrateau@vt.edu

Dr. Eric K. Kaufman
Assistant Professor, Agricultural and Extension Education
540-231-6258
ekaufman@vt.edu

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APPENDIX L
FOLLOW-UP AND THANK YOU



College of Agriculture
and Life Sciences

Department of Agricultural and Extension Education
2270 Litton Reaves Hall (0343)
Blacksburg, Virginia 24061
540/231-6836 Fax: 540/231-3824
www.aee.vt.edu

[Date]

Participant Name

Street

City, State, Zip

Dear Participant Name:

Recently we requested your participation in an important research study concerning graduates of Virginia Tech and the College of Agriculture and Life Sciences. Your input will contribute to the results of the research and will allow for a better understanding of the research area of employability skills of graduates of Virginia Tech.

If you have already completed and returned your survey I would like to say thank you for taking your valuable time and assisting us in this research. If you have not yet completed your survey, please do so today. If you need a replacement survey please feel free to contact me.

We sincerely appreciate your input.

At any point in the future I remain available to answer any questions or comments you may have on this study at rrateau@vt.edu or 931-261-4466.

Sincerely,

A handwritten signature in black ink, appearing to be "R" followed by a stylized flourish.

Richard J. Rateau
Doctoral Candidate
Virginia Tech

Dr. Eric K. Kaufman
Assistant Professor, Agricultural and Extension Education
540-231-6258
ekaufman@vt.edu

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APPENDIX M

JOINT DISPLAY OF PROBLEM-SOLVING AND ANALYTIC CONSTRUCTS

Joint Display of Problem-solving and Analytic Constructs, MWDS = .67

Innovative Instructors Comments		Coordinating Counselors Comments	
Congruent	Discrepant	Congruent	Discrepant
<p>“So I give the students some materials to think about, so whether that’s a paper...or a problem to solve, and I ask them to think about it...so all of my class is very problem based.” (Flor, I1016)</p> <p>“I actually have little guiding questions that take them through ‘chunk by chunk’, so they are not having to tackle the whole problem at one and they learn how to prioritize, OK this is where I have to start.” (Flor, I1462)</p> <p>I help them organize it because I think that’s...how you organize information in a way that makes it meaningful and so I make my organization really explicit so they can see how I do it.” (Flor, I1463)</p> <p>“You want to solve problems,</p>	<p>Willing to implement new strategies, but new strategies takes time and instructors must balance time with other responsibilities “so something has to give. I don’t want it to be teaching, but that’s what gives.” (Jean, I1473)</p>	<p>Employers want our graduates for their problem solving skills. (Nick, C1255)</p> <p>We are “revising that curriculum to be more problem solving, real world scenario-based type of approach.” (Frank, C1097)</p> <p>“We do a lot of scenario questions. They [students] struggle with that because they just can’t memorize.” (Frank, C1105)</p>	<p>Large class sizes prevent real student learning where students “need to mostly memorize the materials.” (Irene, C1082)</p> <p>Time and resources limit learning outcome assessment of existing programs; “but, it is all a matter of resources right now and time constraints.” (Frank, C1233)</p>

but you know, I'm more interested in them being able to identify a problem. That's part of the learning process...I now see a problem, I didn't think that was a problem before." (Liz, I1431)

Innovative instructors recognize the value of groups and teams for student learning as a means to introduce "different perspectives" and "different lenses of perspectives." "They get to see multiple perspectives, and they get to see how other students see problems and identify problems." (Liz, I1179)

Innovative instructors expect students to enter their class with a working knowledge of how to function successfully in a group or team, but often find students ill-prepared. "It's pretty much learning by the seat of your pants and if it's a dysfunctional team, OK, I'll step in, but otherwise I'm counting on them to be able to sort it out." Followed by "I didn't feel I could put that much time into it [instructing students on team building skills]." (Jean, I1207)

Recognizes the importance of group work "you have to have the ability to problem solve as well as work in groups." (Nick, C1254)

Understands many instructors give up on group and team work due to "complaints from the team members" and "invariably one or two people do all the work and the [other] two do nothing." Currently there is no plan to incorporate a team-building class into the curriculum. (Nick, C1280)

Large class sizes are barriers for discussing different perspectives. (Irene, C1081)

APPENDIX N
JOINT DISPLAY OF LEARNING CONSTRUCT

Joint Display of Learning Construct, MWDS = .35

Innovative Instructors Comments		Coordinating Counselors Comments	
Congruent	Discrepant	Congruent	Discrepant
<p>“If you’re going to be a lifelong learner, you certainly have to have the skills of understanding of how to find the information. Where to go look for it.” (Liz, I1668)</p> <p>“They learn to discern, hopefully learn to discern a little between good solid information and stuff that belongs off in the trash can somewhere.” (Deb, I1140)</p> <p>“I try to help them [determine good information], ‘alright pay attention to this, pay attention to this figure, read this part.” (Flor, I1467)</p> <p>I help them “learn how to interpret the data.” (Jean, I1125)</p> <p>“People don’t learn by lecturing.” (Flor, I1409)</p>	<p>Other instructors “are teaching for the tests or teaching to get things done.” (Liz, I1352)</p> <p>Other instructors lecture and spend time “crafting that perfect Power Point, but frankly if you’re going to spend all that time... spend it on something that will help students learn!” (Flor, I1442)</p>	<p>“There is no way we could prepare them to have a knowledge of everything they are going to encounter, but again if we can give them that basic knowledge base, allowing them to be life-long learners.” (Nick, C1158)</p> <p>Accreditation forces formal program assessment and “helps to keep us on track.” (Irene, C1239)</p> <p>“Our program is accredited... what we have is a continuous improvement process... to access [student] ability to engage in life-long learning.” (Ed, C1141)</p> <p>“We also have some courses that have service learning components... that we’d call... real world.” (Irene, C1092)</p>	<p>Barriers of time and resources promote large class sizes where “students have multiple choice tests and they need to mostly memorize the material.” (Irene, C1082)</p> <p>Program assessment in other departments is informal as “but there’s nothing, at least in our departments, there nothing formal.” (Ted, C1440)</p> <p>There is inconsistency in the use of service learning components. (Frank, C1125)</p>

APPENDIX O

JOINT DISPLAY OF PERSONAL ORGANIZATION AND TIME MANAGEMENT

Joint Display of Personal Organization and Time Management Construct, MWDS = .67

Innovative Instructors Comments		Coordinating Counselors Comments	
Congruent	Discrepant	Congruent	Discrepant
<p>“You challenge them in a very comfortable way, yet you know, okay, you’re on the verge of oh, I’m freaking them out” and they have to find the reading materials, “and I expect them to come prepared” and I hold them accountable. (Liz, I1202)</p> <p>I tell my students “it’s not my responsibility to understand why your assignment isn’t on time. I don’t need to understand...you either make the deadline or you don’t...it became pulling them out of that college comfort environment they’ve been into and to plunge them into what felt really scary, but scary in a safe environment” (Jean, I1049)</p>	<p>Working one-on-one with students and good advising is important in helping students prioritize, so there must be a plan in place for advising and how can you effectively advise a large number of students due to resource constraints. (Flor, I1041)</p>	<p>Coordinating counselors recognized the value of working individually with students in advising and assisting them in “high touch type activities in terms of, you know, time commitment per student to do these things” (Ted, C1671)</p>	<p>“We are facing now is all these budget cuts and we’ve lost people over the years through buyouts and we just don’t have the faculty resources to do all we’d like to do.” (Ben, C1633)</p>

APPENDIX P

JOINT DISPLAY OF CREATIVITY, INNOVATION, AND CHANGE

Joint Display of Creativity, Innovation, and Change Construct, MWDS = .46

Innovative Instructors Comments		Coordinating Counselors Comments	
Congruent	Discrepant	Congruent	Discrepant
<p>“They will learn what they need to learn today to answer their own questions in five years. I can not in any way teach them what is going to be discovered in ten years or five years when they’re out in the field. What I can teach them is the basic knowledge of where to go to find your answers and what questions to ask.” (Jean, I1067)</p> <p>“There was student resistance to begin with. There was a lot of student frustration.” (Jean, I1378)</p> <p>We “must be able to persevere in the face of resistance.” (Flor, I1353)</p>	<p>For instructor to keep up with the changing world and what employers are looking for in graduates is difficult. Communications with stakeholders is “not on a systematic basis”. (Flor, I1544)</p> <p>Initiating change in the classroom is difficult for instructors when they are not confident in their changes so “they just forget it. I’m going back to the other way.” (Flor, I1370)</p>	<p>To remain abreast with stakeholders “we have an active and aggressive advisory council. And we tell them what we’re doing and they’re constantly telling us how they view our curriculum relative to sending our students out in the industry.” (Ben, C1182)</p>	<p>Others depend on informal methods to remain abreast “I would say that we, through bringing the alumni back into the classroom and, you know, very informal kind of ad hoc type of ways...but nothing formal like these guys were talking about.” (Luke, C1276)</p>

APPENDIX Q
JOINT DISPLAY OF PERSONAL STRENGTHS

Joint Display of Personal Strengths Construct, MWDS = .38

Innovative Instructors Comments		Coordinating Counselors Comments	
Congruent	Discrepant	Congruent	Discrepant
<p>“People learn in writing. You are actually explaining yourself and we need to make more space for that.” (Liz, I1316)</p> <p>New strategies can cause student stress. “They find a lot of what I do in my class new” and their reaction is ‘I’ve never done this before. Oh my God! What do I do?’ So a lot of what I do is just assure them you can do it.” (Flor, I1237)</p>	<p>“For the students in the [class name] this past [term] where there were 150 of them” (Deb, I1065) the use of writing is a barrier.</p>	<p>Various departments require an internship dealing with day-today situations “and in that, they get real world exposure” working in groups or in teams. (Ben, C1056)</p> <p>“They don’t go out and do one task for 10 or 12 weeks. We mandate they get two weeks in the field, two weeks with the crew foreman, two weeks with the sales office, so they get rotated around the business to get all the different aspects.” (Ben, C1060)</p>	<p>Many students are in large classes and ‘they need to mostly memorize the material.’ (Irene, C1082)</p> <p>Not all departments require internships or other on-the-job type training. (Ed, C1133)</p>