

DISSERTATION

EVALUATION OF STUDENT ENGAGEMENT ASSESSMENT  
IN COLORADO STATE UNIVERSITY'S  
WARNER COLLEGE OF NATURAL RESOURCES

Submitted by

Debra Kaye Holman

School of Education

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Summer 2013

Doctoral Committee:

Advisor: William M. Timpson

Co-Advisor: Jerry J. Vaske

Carole Makela

Peter Newman

Holmes Rolston III

Copyright by Debra Kaye Holman 2013

All Rights Reserved

## ABSTRACT

### EVALUATION OF STUDENT ENGAGEMENT ASSESSMENT IN COLORADO STATE UNIVERSITY'S WARNER COLLEGE OF NATURAL RESOURCES

The purpose of this mixed methods study was to conduct a participatory program evaluation of student engagement assessment in Colorado State University's (CSU) Warner College of Natural Resources (WCNR). The college requested the evaluation after completing two pilot studies of undergraduate engagement which led them to consider establishing the Milestones Assessment Program of Student Engagement (MAPSE). WCNR leadership sought to determine (a) the mission, goals, and objectives of assessing WCNR student engagement; (b) how the goals and objectives aligned with CSU's and WCNR's strategic plans; (c) the variables, measures, and outcomes of student engagement assessment in natural resources at CSU; (d) how electronic and classroom survey administrations of WCNR undergraduate student engagement compared; and (e) the operational elements required to support MAPSE. The evaluation was to address these five areas, determine whether an electronic or classroom survey format was best suited for administration in the college, and recommend what survey interval ought to be observed. In conducting the evaluation, administrations of electronic and classroom surveys generated assessment data that were analyzed as an extension of the study.

It was found that WCNR was well-positioned to go forward with establishing MAPSE. The college had mission, goals, and objectives for assessment of student engagement which aligned with CSU and WCNR strategic plans. The evaluation identified practices, indices, and themes of WCNR student engagement for use in MAPSE surveys, and survey findings provided

college leadership baseline data to develop outcomes for undergraduate engagement. Both electronic and classroom survey administrations produced acceptable samples for assessment of WCNR student engagement, with the electronic survey having a more representative sample of students by department and the classroom survey having a more representative sample of students by sex. The electronic survey incurred fewer direct costs of time and human resources. It was recommended that either survey be administered under MAPSE and survey intervals not interfere with other campus-wide survey administrations at CSU.

Analyses of the survey data revealed that WCNR students found the college's practices of engagement important and satisfying. As student satisfaction with course opportunities, faculty advising, and development as natural resource professionals increased, their intent to persist and sense of success in the college and their majors increased. Student satisfaction on development as natural resource professionals was the *only* variable to consistently influence student persistence and sense of success in the college and their majors. Study findings indicated that besides *educationally purposeful activities* associated with student engagement, *professionally purposeful activities* influence natural resource student persistence and success.

*Keywords:* student engagement, persistence, success, natural resources, environmental education, professionally purposeful activities

## ACKNOWLEDGEMENTS

This dissertation was a labor of love to support student development and educational delivery in the natural resources at Colorado State University (CSU). Throughout the intensive work of my doctoral program and my dissertation research, I was supported and encouraged by many.

I thank my extended family—parents, siblings and their spouses, aunts, uncles, cousins, nieces, and nephews—for their love and for cheering me on. My mother, Sharlet Small, read and edited portions of the dissertation, noting sections that could use fine-tuning and better clarity in the writing. I want to thank her for taking the time to go through the pages and being an extra set of eyes on them. My mother, my sister Donna Creighton, Greg Holman, LaWanda Holman, Virgil Holman, and DeAnna Bertwell all went out of their way to encourage me. I am grateful for their support.

My dad, Delbert Small, sent my late Grandma Connie's 1930's era wedding ring to me as I started my doctoral program in 2007. The ring was intended to inspire me in my educational pursuits—reminding me I could get the degree done. Inspire me it did! And it was a constant reminder that if she could do a bachelor's degree late in life, surely I could do a doctorate at mid-life. I wish Daddy and Grandma were still with us to see me complete my doctoral program. I have felt their love and encouragement every day.

My life partner, Steve Mackessy, was my rock on whom I leaned through the late nights and early mornings of writing. Whether warming my cold toes at 2 am when I crawled into bed, getting me coffee at 5:30 am on waking, or helping me talk through sections of the writing, your loving kindness meant that I did not go this alone. Plus, your dog Megen gave me hours of

companionship during the long periods of writing. Truly, she is a “meg-nanimous” wonder pup! I have been blessed by the presence of both of you in my life.

I have also been blessed with many close friends who supported me during my doctoral program and dissertation research. Paul Borba, Erna Harboe, Jane Shelly, Srilekha Srinivasan, Steve Laws, and Jenny Jones: I’ve know most of you since we were kids and our connections run deep. Katie Goulet and Stephanie South, you two hold a special place in my life, and I am grateful for your friendship. Kenny Lyngen, Bjørn Birkeland, Joe Beal, Ram Narayanamurthy, Monique Laws, and Jim Chapman, thank you, too, for cheering me on. Lorna and Clark McGregor, you have believed in and encouraged me for a very long time. I hope I’ve done you proud.

All my friends, colleagues, and students on Facebook who gave “thumbs-up” to my reports of progress, wrote encouraging posts, or sent private notes of love and support: Thank you. I felt the love many, many times over, and I was humbled by it.

My doctoral committee was in a word: Amazing. Bill Timpson and Jerry Vaske, you were like fathers to me, guiding me through the research process, challenging me when I needed to be challenged, and encouraging me when I felt overwhelmed. In having the opportunity to write and edit for each of you on other research projects, my writing and critical thinking were strengthened and improved. I was able to apply what I learned to the writing of the dissertation, and I know the result is stronger for your guidance and mentorship. Carole Makela, I owe you a debt of gratitude I can never repay. I will try to pay it forward to others whom I have the opportunity to mentor in the future. You read the entire dissertation word-for-word more than once, providing substantive commentary and edits along the way. Thank you. Thank you. Thank you. Peter Newman, if it were not for you, your passion for education, and your love of the

students in Warner College of Natural Resources, this research project would never have come about. Your vision to assess dimensions of student engagement apart from NSSE not only strengthened undergraduate student development in WCNR but also gave me a dissertation project I was thrilled to undertake. Your leadership and vision inspire. Finally, Holmes Rolston, III, you were the first CSU faculty member with whom I studied, and you helped open doors for me in my interdisciplinary pursuits in educational leadership, sustainability, and student engagement. Your classes were the most challenging I have ever taken, and I am a better thinker and writer for having studied with you. Thank you for serving on my doctoral committee and being a part of my life.

Other individuals at CSU whom I would like to thank include the members of the WCNR Student Engagement Assessment Team: Jerry Vaske, Peter Newman, Ethan Billingsley, Katie Lyon, Tim Archie, Mary Veronin, Derrick Taff, Brain Gates, Becky Thomas, Tiffany Espinosa, the members of the WCNR College Council, and the WCNR undergraduates from NRRT 365 and 465. Karen Atler was a tremendous help near the end of my writing. Key CSU faculty and staff who contributed to this project include: Paul Thayer, CSU Student Affairs; Laura Jensen and Heather Novak, CSU Institutional Research; Jim Banning, David Most, Gene Gloeckner, Rich Feller, and Michael De Miranda, School of Education; CSU Morgan Library research librarians and staff, including Merinda McLure, Allison Level, and Dawn Paschal; Mike Gould, College of Business; and Brett Bruyere, Josh Goldstein, and Barb Richardson, Warner College of Natural Resources. I would also like to acknowledge the School of Education Hotdog Closet Support Group: Christine Aguilar, Larry Botnick, Noorie Brantmeier, Karen Gardenier, Badaruddin Ibrahim, Dean Nelson, Lisa Pitot, Melanie Ramey, Kahirol Salleh, Nor Lisa

Sulaiman, Lory-Ann Varela, Lowell Wightman, and Rusmin Yunus. Working with you was a delight!

Several professional colleagues from outside CSU supported me during this study. Those individuals include: George Mehaffy, American Association of State Colleges and Universities; Harry Boyte and Dennis Donovan, Center for Democracy & Citizenship; Paul Strom, Joan Digby, Bob Spurrier, Rosalie Otero, and Ada Long, National Collegiate Honors Council; Jim Tweedy, Jeanne Hart-Steffer, and the other members of the ACPA Sustainability Advisory Committee; Paul Rowland, Association for the Advancement of Sustainability in Higher Education; Rich Trahan, Jean Schober Morrell, Colleen Denzin, Kay Norton, Lori Reinsvold, Rob Reinsvold, Richard Jurin, Chuck Olmsted, Susan Keenan, Mark Thomas, Sue Gould, Bob Brunswig, Loree Crow, Mike Kimball, Catie Rohloff, Marie Livingston, Tom Smith, Caroline Weldon, and Andrew Wastell, University of Northern Colorado (UNC); and my colleagues and friends among the Colorado Network of Women Leaders, including Jan Nerger, Jodie Hanzlik, and Becky Trentlage of CSU; Katrina Rodriguez of UNC; and Cathy Lucas of Metropolitan State College of Denver.

Finally, I would like to acknowledge and thank the students, faculty, and staff of CSU's Warner College of Natural Resources without whom this entire project would never have been possible. Thank you.



## TABLE OF CONTENTS

ABSTRACT.....	ii
ACKNOWLEDGEMENTS.....	iv
LIST OF TABLES.....	xii
LIST OF FIGURES.....	xiii
CHAPTER 1: INTRODUCTION.....	1
Statement of Purpose.....	1
Dissertation Format of Publishable Manuscripts.....	2
Institutional Context.....	2
Review of Theory, Practice, and Assessment Associated with Engagement.....	4
Theories Associated with Student Engagement.....	5
Experience and education.....	6
Experiential learning.....	6
Student effort and college student experiences.....	7
Student involvement.....	7
Student engagement.....	8
Practices Associated with Student Engagement.....	10
Student involvement.....	10
Principles for good practice.....	11
Active learning.....	12
NSSE benchmarks.....	12
High-impact practices.....	13
National Assessments Associated with Student Engagement.....	14
Analyses of educational research.....	15
<i>The Impact of College on Students</i> .....	15
<i>How College Affects Students</i> .....	16
Longitudinal studies in American higher education.....	16
<i>Cooperative Institutional Research Program (CIRP)</i> .....	17
<i>College Student Experiences Questionnaire (CSEQ)</i> .....	17
<i>National Survey of Student Engagement (NSSE)</i> .....	18
Delimitations and Limitations of the Evaluation.....	19
Relationship to WCNR and CSU Strategic Plans.....	19
Generalizability of Findings from Surveys of WCNR Engagement.....	20
Applicability of the Evaluation in Higher Education.....	20
Assumptions Framing the Evaluation.....	21
Significance of the Study.....	21
Researcher’s Perspective.....	22
CHAPTER TWO: PARTICIPATORY EVALUATION OF STUDENT ENGAGEMENT ASSESSMENT: A CASE STUDY IN NATURAL RESOURCE AND INTERDISCIPLINARY ENVIRONMENTAL EDUCATION.....	25

Introduction.....	25
Student Engagement in Higher Education.....	25
Student Engagement in Environmental Education.....	26
Evaluation Questions.....	28
Institutional and Evaluation Context.....	29
Learning, Discovery, and Engagement.....	29
Assessment and Evaluation of Engagement.....	30
Focus and Design.....	31
Focusing the Inquiry.....	31
Formative Design.....	32
Articulating the mission, goals, and objectives.....	32
Reviewing alignment with CSU and WCNR strategic plans.....	32
Identifying variables, measures, and outcomes.....	33
Comparing electronic and classroom survey administrations.....	34
Evaluating operational elements to support MAPSE.....	34
Findings.....	35
Mission, Goals and Objective of Assessing Student Engagement.....	35
Alignment with CSU and WCNR Strategic Plans.....	35
Variables, Measures, and Outcomes of Engagement.....	36
Independent variables and measures.....	36
Dependent variables and measures.....	38
Demographic variables.....	39
Outcomes for student engagement.....	39
Comparisons between Electronic and Classroom Survey Administrations.....	43
Operational Elements to Support MAPSE.....	45
Discussion.....	48
Establishment of MAPSE.....	48
Production of Department-Level Data.....	49
Similarities between MAPSE and NSSE Variables.....	49
MAPSE Student Outcomes as Dashboard Indicators.....	50
Implications for Practice.....	50
Effective Academic and Student Affairs Collaboration.....	50
Assessment in Natural Resource and Interdisciplinary Environmental Education.....	51
Concluding Remarks.....	52

CHAPTER 3: WIDENING THE LENS OF ASSESSMENT ON STUDENT ENGAGEMENT IN ENVIRONMENTAL AND NATURAL RESOURCE EDUCATION.....	53
Introduction.....	53
Documenting Engagement in Environmental and Natural Resource Education.....	54
Assessing Engagement in Environmental and Natural Resource Education.....	55
Widening the Lens of Assessment.....	56
Institutional Context.....	56
Colorado State University.....	56
Warner College of Natural Resources.....	57

Conceptual Framing.....	57
WCNR Indices of Student Engagement .....	57
Barriers to Student Success.....	58
Methods.....	59
Sampling Design.....	59
Collection of Demographic Data .....	59
Measures .....	60
Analyses.....	60
Results.....	62
Descriptive Analyses .....	62
Importance and Satisfaction Percentages.....	63
Importance and Satisfaction Means .....	66
Importance and Satisfaction Matrices.....	66
Barriers to Student Success.....	72
Discussion.....	73
Summary of Findings on WCNR Student Engagement .....	73
Implications for Delivery of WCNR Student Engagement .....	73
Limitations of the Study and Future Directions for Research .....	75
Further Widening the Lens: Professionally Purposeful Activities .....	75

CHAPTER FOUR: STUDENT ENGAGEMENT IN NATURAL RESOURCES: THE INFLUENCE OF SATISFACTION ON PERSISTENCE AND SUCCESS .....	77
Introduction.....	77
Defining Success as Retention and Persistence to Degree Completion .....	77
Defining Success as Student Engagement .....	79
Purpose and Research Questions .....	80
Institutional and Study Context .....	80
Conceptual Framing.....	81
Themes of Natural Resource Student Engagement .....	81
Student Persistence .....	82
Student Success.....	82
Methods.....	83
Sampling Design and Collection of Demographic Data.....	83
Measures .....	83
Analyses.....	84
Results.....	85
Population and Sample Demographics .....	85
WCNR Themes of Engagement.....	86
Student Persistence and Sense of Success .....	87
Predicting Persistence and Success.....	88
Discussion.....	93
Summary of Findings.....	93
Assessing satisfaction, persistence, and success.....	93
Predicting persistence and success.....	94
Extending the predictive models.....	95
Implications for Delivery of WCNR Student Engagement .....	95

Limitations of the Study and Future Directions for Research .....	96
Satisfaction on advising .....	96
Satisfaction on experiential learning.....	96
Persistence and success.....	96
Identifying students “at-risk” for not being retained .....	97
Extending the Study Findings beyond the Natural Resources.....	98
Satisfaction with Student Engagement .....	98
Professionally Purposeful Activities.....	98
CHAPTER 5: SUMMARY OF KEY FINDINGS, RECOMMENDATIONS, AND DIRECTIONS FOR RESEARCH .....	100
Introduction.....	100
Key Findings and Recommendations .....	100
WCNR Student Engagement Assessment .....	100
WCNR Practices, Indices, and Themes of Student Engagement.....	101
Importance and Satisfaction with Student Engagement .....	102
Barriers to Student Success.....	103
Relationships between Student Satisfaction, Persistence, and Success .....	104
Directions for Research.....	105
MAPSE Outcomes and Milestones Dashboard Indicators .....	105
Academic and Student Affairs Collaboration .....	106
Professionally Purposeful Activities.....	106
REFERENCES .....	108
APPENDIX A: CSU IRB 11-2603H – ELECTRONIC SURVEY .....	124
APPENDIX B: CSU IRB 11-2603H – APPROVAL .....	147
APPENDIX C: ELECTRONIC SURVEY .....	150
APPENDIX D: ELECTRONIC SURVEY – EMAIL PRE-INVITATION .....	159
APPENDIX E: ELECTRONIC SURVEY – EMAIL INVITATION .....	160
APPENDIX F: ELECTRONIC SURVEY – EMAIL 1ST REMINDER .....	162
APPENDIX G: ELECTRONIC SURVEY – EMAIL 2ND REMINDER.....	164
APPENDIX H: ELECTRONIC SURVEY – POSTCARD INVITATION.....	166
APPENDIX I: ELECTRONIC SURVEY – FLYER.....	168
APPENDIX J: CSU IRB 11-2603H AMENDMENT – CLASSROOM SURVEY.....	170
APPENDIX K: CSU 11-2603H AMENDMENT – APPROVAL.....	195
APPENDIX L: CLASSROOM SURVEY .....	198
APPENDIX M: CLASSROOM SURVEY – CONSENT FORM.....	200

## LIST OF TABLES

Table 1. <i>WCNR Indices and Practices of Student Engagement</i> .....	37
Table 2: <i>Percentage Satisfaction on WCNR Themes of Student Engagement</i> .....	40
Table 3. <i>Percentage Agreement on Success and Persistence</i> .....	41
Table 4. <i>Percentage of Responses on Barriers to Student Success</i> .....	42
Table 5. <i>Comparative Categories for MAPSE Survey Administrations</i> .....	43
Table 6. <i>Comparative Demographics for the Surveys</i> .....	44
Table 7: <i>Comparative Operational Elements Required to Support MAPSE</i> .....	47
Table 8: <i>Comparative Percentages for Survey Population and Sample</i> .....	62
Table 9: <i>Importance and Satisfaction on WCNR Indices and Practices of Engagement</i> .....	64
Table 10: <i>Percentage of Participants Identifying Barriers to Student Success</i> .....	72
Table 11. <i>Comparative Analyses of the Survey Population and Sample Demographics</i> .....	85
Table 12: <i>Satisfaction on WCNR Themes of Student Engagement</i> .....	86
Table 13. <i>Logistic Regression Models Predicting Persistence and Sense of Success</i> .....	89
Table 14: <i>Goodness of Fit Indicators for Persistence and Success Models</i> .....	90
Table 15: <i>Comparative Percentages for Students At-Risk for Leaving</i> .....	92

## LIST OF FIGURES

<i>Figure 1.</i> Importance and Satisfaction Measures and Interpretive Grids .....	61
<i>Figure 2.</i> Warner Course Experiences: Importance-Satisfaction Means.....	67
<i>Figure 3.</i> Warner Experiential Learning: Importance-Satisfaction Means .....	68
<i>Figure 4.</i> Warner Faculty Advising: Importance-Satisfaction Means.....	69
<i>Figure 5.</i> Warner Community and Climate: Importance-Satisfaction Means .....	70
<i>Figure 6.</i> Natural Resource Professionalism: Importance-Satisfaction Means .....	71

## CHAPTER 1: INTRODUCTION

### **Statement of Purpose**

The purpose of this mixed methods study was to conduct a program evaluation of student engagement assessment in Colorado State University's (CSU) Warner College of Natural Resources (WCNR). The college requested the evaluation after completing two pilot studies of undergraduate engagement that yielded analyses informative to WCNR decision-makers responsible for overseeing engagement and supporting student success. In weighing considerations to build on the pilot studies and establish the Milestones Assessment Program of Student Engagement (MAPSE), WCNR leadership sought answers to the following questions:

1. What are the mission, goals, and objectives of assessing WCNR student engagement?
2. Do the goals and objectives align with CSU's and WCNR's strategic plans?
3. What are the variables, measures, and outcomes of student engagement assessment in natural resources at CSU?
4. How do electronic and classroom survey administrations of WCNR undergraduate student engagement compare?
5. What are the operational elements required to support MAPSE?

Beyond answering these five questions, the evaluation produced recommendations on which survey format—electronic or classroom—was best suited for administration and what interval—annual or some other timeframe—ought to be observed in WCNR's administration of a student engagement survey. In conducting the evaluation, administrations of electronic and classroom survey formats generated assessment data that were analyzed as an extension of the study. For the electronic survey, importance and satisfaction on variables of student engagement in the natural resources and barriers to student success in the college were examined. For the classroom

survey, student satisfaction was further explored in relation to student persistence and sense of success.

### **Dissertation Format of Publishable Manuscripts**

This dissertation is organized as a series of publishable manuscripts prepared for submission to education journals. Chapter 1 serves as an introduction to the study and provides a review of the primary literature related to student engagement in higher education. Chapter 2 focuses on the central elements of the program evaluation. It explores five questions based in considerations on establishing MAPSE and includes comparisons of electronic and classroom survey administrations conducted as part of the evaluation. Chapters 3 and 4 look more closely at the data from the electronic and classroom surveys, the analyses each supported, and their findings concerning WCNR student engagement. Finally, Chapter 5 summarizes the results of the program evaluation and assessments. The final chapter also discusses implications of the study's findings and recommendations for future research in student engagement.

### **Institutional Context**

WCNR (2012c) is the largest named and most comprehensive natural resources college in the United States. The college promotes itself as a global leader in “learning, discovery and engagement that guides natural resource conservation, sustainability, and stewardship” (WCNR, 2011a, para. 6). WCNR education involves close interaction between faculty and students in classroom, field, and research-based activities focused on skill development in specific areas, such as communication and teamwork (WCNR, 2005, 2011a, 2011b).

WCNR teaching and learning models align with higher education theory and practice on experiential, involved, and engaged learning (Astin, 1984; Bonwell & Eison, 1991; Chickering, 1977; Chickering & Gamson, 1987, 1991; Dewey, 1916, 1938; Feldman & Newcomb, 1970;



Kolb, 1984; Kolb & Fry, 1975; Kuh, 2008; Kuh, Kinzie, Schuh, & Whitt, & Associates, 2010; Kuh, Schuh, Whitt, & Associates, 1991; Pace, 1984; Pascarella & Terenzini, 1991, 2005).

Within these traditions, students are deemed successful by a variety of measures, two of the most common of which are whether they are retained at the university and leave having earned their degrees (Kuh et al., 2010; National Leadership Council for Liberal Education and America's Promise, 2009; Pascarella & Terenzini, 2005). The college's commitment to student learning and engagement is aimed at fostering student success, including retention and persistence to degree completion (WCNR, 2005). Beyond supporting degree attainment, WCNR endeavors to produce professionals who are "exceptionally well-prepared for a lifelong career in natural resources" (WCNR, 2011c, para. 2).

Historically, assessment of WCNR student engagement has occurred at the university level through CSU's participation in the National Survey of Student Engagement (NSSE). Administered annually in the United States and Canada, with over 1,500 participating institutions since 2000, NSSE assesses "collegiate quality" in higher education (NSSE, 2012a, para. 1) and "the amount of time and effort students put into their studies and other educationally purposeful activities" (NSSE, 2012a, para. 1). Participating institutions receive individualized reports of their students' engagement and comparative analyses of engagement at peer institutions (NSSE, 2012c). For a given college or university, the reports support examination of "how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate" (NSSE, 2012a, para. 1).

Although CSU Academic and Student Affairs rely on NSSE as a means of evaluating campus-wide student engagement (CSU, 2012), WCNR leadership determined in 2008 that NSSE data were insufficient for meeting the scope of engagement-related assessment sought in

the college. Specifically, they found (a) the subsample of WCNR students participating in NSSE (2008b) was too small to support department-level analyses of engagement; (b) NSSE lacked assessment of specific practices and milestones in the journey of WCNR student engagement, such as the summer field experience in Pingree Park (WCNR, 2012a); (c) NSSE predominantly measured student behavior in educationally purposeful activities and assessed little of students' sense of importance or satisfaction with those activities; and (d) NSSE assessment did not include questions about students' intention to persist in their programs, sense of success, or potential barriers to their persistence and success in college.

To generate engagement-related data beyond that provided by NSSE, college leaders authorized pilot studies of student engagement in 2009 and 2010. In collaboration with CSU Student Affairs, which provided access to Campus Labs®, a firm that works with higher education institutions and organizations to administer electronic surveys, the college administered electronic surveys to the WCNR undergraduate population. Findings from the pilot studies provided a clearer picture of student experiences and allowed for more focused delivery of resources in support of engagement and success. Recognizing the value of the pilot studies to the college, WCNR leadership initiated an evaluation of their assessment practices to support the establishment of the Milestones Assessment Program of Student Engagement (MAPSE) to regularly collect data on undergraduate student engagement in the college.

### **Review of Theory, Practice, and Assessment Associated with Engagement**

When focusing on student engagement, one quickly becomes aware of what Wolf-Wendel, Ward, and Kinzie (2009) called the *tangled web of terms* related to student engagement in higher education. Terms such as experiential learning, student involvement, and student engagement are often used interchangeably without differentiating the ways each contextualizes

the college experience (Pike & Kuh, 2005; Wolf-Wendel et al., 2009). While the concepts are interrelated, they view student development through different lenses. In trying to reduce confusion over the similarities among the terms, Wolf-Wendel et al. (2009, pp. 425-426) described them as having a shared “focus on student development and success, [with] each concept contributing a unique and nuanced piece of understanding” about the undergraduate student experience.

One way to see the differences between student engagement and related theories is to examine them side-by-side. Expanding the review to include associated practices and national assessments reveals how each has been applied in education. The review that follows presents key theories, highlights educational best practices, and provides brief descriptions of national assessments of student engagement and related theories. Each section is presented historically, unearthing the foundations on which student engagement stands in American higher education.

### **Theories Associated with Student Engagement**

The earliest documented education theorist in Western tradition was likely Socrates who more than two thousand years ago applied what became known as the Socratic Method to engage students in their learning (Plato, 1986). Socrates believed that students ought to be more than passive receptacles receiving information conveyed to them by their teachers. He required his students to consider difficult questions and reason answers through dialogue and debate. His approach to student development was considered radical for his time. Accused of corrupting the minds of youth, he was tried, convicted, and sentenced to death by the Athenian court (Plato, 1986). His ideas, however, survived him, contributing to a rich heritage of theory associated with student experience, effort, involvement, and engagement in education. While the theories vary in

their emphasis on the roles of institutions, teachers, and students, each has a shared interest in student development and success.

**Experience and education.** The American educational philosopher John Dewey is credited with being a central leader in two educational movements that arose in the early 1900s: Pragmatism and Progressivism (Henson, 2006). Pragmatists, whose ideas were drawn from those of European philosophers such as Francis Bacon and Immanuel Kant, promoted education linked to direct experience (Henson, 2006). Progressives, like Pragmatists, advanced education tied to experience but believed it essential for teachers to connect students' learning to their interests (Henson, 2006). In treatises, such as *Democracy and Education* (1916) and *Experience and Education* (1938), Dewey explored the purpose and practice of education based in experience. He said it was not a question of whether students had experiences but rather what kinds and what “*quality* [Dewey’s emphasis] of experience” they had in their learning (1938, p. 27). At a fundamental institutional level, he believed the responsibility of democratic societies and governments was to provide quality experiences to support student growth and development (Dewey, 1916, 1938). Within the school and the classroom, he held the responsibility for student learning extended to both teachers and students working collaboratively and cooperatively (Dewey, 1938). In Dewey’s view, the joint endeavor in learning best supported student development and success and was a practice of democracy itself: participatory and engaged (Dewey, 1916, 1938).

**Experiential learning.** Building on the work of Dewey and his focus on the student experience, Kolb (1981, 1984; Kolb & Fry, 1975) theorized that students exhibited specific styles of learning and clustered according to their learning styles in academic disciplines (Kolb, 1981, 1984). In his theory of *experiential learning*, Kolb (1984) identified four basic types of

learners—doers, observers, thinkers, and experimenters—each with their own orientation and ways of taking part in educational experiences. While Kolb was developing his theory of experiential learning, Chickering (1977) sought to examine how instructors met the challenge of students' different learning styles in the classroom. Undertaking case studies in the academy, Chickering (1977) identified diverse techniques in experience-based learning used to support student development and success in higher education.

**Student effort and college student experiences.** While Kolb and Chickering were promoting experiential learning, Pace (1980) was conducting research related to student effort. His interests lay in (a) understanding the responsibilities of students and institutions in learning and development and (b) quantifying *the time and effort* required by students to be successful in college (Pace, 1980). Developing and piloting his College Student Experiences Questionnaire (CSEQ) to over 4,300 students at 13 American universities, he learned that student effort increased with class standing (e.g., from freshman through senior year); student grades were higher for those who reported putting more effort into their education; and academic, intellectual, personal, and interpersonal development increased when students resided on campus and as they advanced in class standing (Pace, 1980). From his findings, Pace (1980) theorized that while institutions could provide enriched learning environments, student development and success were also dependent on students' own commitment of time and effort in the academy.

**Student involvement.** In 1984, Astin, building on his research on student behaviors and persistence in college (Astin, 1975, 1977), proposed the theory of student involvement. As defined by Astin, *student involvement* was “the amount of physical and psychological energy that students devote to the academic experience” (1984, p. 297). Much of his theory focused on the effort students put into college, the quality and quantity of their learning, and their individual

development. The theory also included institutional components and emphasized educational policies and practices that Astin judged effective only in so far as they supported and advanced students' involvement and success in higher education. When Astin published his theory, he was serving as a member of the U.S. National Institute of Education (NIE) Study Group on the Conditions of Excellence in Higher Education, and he received early support for his ideas when the group published their findings in 1984. After undertaking a review of educational reports, commissioning papers and studies, and conducting interviews with researchers, and educators, the NIE Study Group found that student involvement—along with high expectations, assessment, and feedback—was central to improving the quality of the student experience in higher education (1984, p. 17).

Following the publication of his theory, Astin continued research on the college student experience to determine *What Matters in College?* (Astin, 1993) in supporting student development and success. In an issue of the *Journal of College Student Development*, he (Astin, 1999) summarized some of his most significant findings as those demonstrating (a) the effects of academics, faculty, and peer connections on “enhancing almost all aspects of the undergraduate student’s cognitive and affective development” (p. 590) and (b) increased involvement and retention being associated with “the time students devote to various activities” (p. 596) in their education.

**Student engagement.** Pike and Kuh (2005), Kuh (2001, 2009), and Ewell (2010) separately documented the origins of student engagement theory. Pike and Kuh (2005) gave primary credit to Pace (1980, 1984) and Astin (1984) for providing the framework which supports it, although Kuh (2001) also credited Chickering and Gamson (1987) and Pascarella and Terenzini (1991) for providing essential elements to the theory development.

At the time of the theory's creation, concern was rising within education and from government and private sectors that colleges and universities needed to move toward outcomes-based assessment of student development and away from reliance on institutional rankings provided by external organizations in publications such as the *U.S. News and World Report* (Ewell, 2010; Kuh, 2001, 2009; Pike & Kuh, 2005). Through the support of the Pew Charitable Trusts (Ewell, 2010; Kuh, 2009), leading educational theorists and researchers—among them Pace, Astin, Kuh, and Ewell—were convened to develop a national assessment program which would seek voluntary participation from colleges and universities in the United States (Kuh, 2009). Those gathered for the meetings believed the most promising direction lay in (a) building on established assessments connected to research on student effort (Pace, 1980, 1984) and involvement (Astin, 1984) and (b) bolstering public accountability by linking findings to institutional improvement in higher education (Ewell, 2010; Kuh, 2009; NSSE, 2012e).

As the assessment program took shape and the National Survey of Student Engagement (NSSE) was developed, both were tied to the creation of a new theory of the student experience: *student engagement*. NSSE leadership defined student engagement in relation to the body of research which supported it:

What is student engagement? Student engagement represents two critical features of collegiate quality. The first is the amount of time and effort students put into their studies and other educationally purposeful activities. The second is how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate in activities that decades of research studies show are linked to student learning. (2012a, para. 1)

Distilling the theory to its essential elements, student engagement was described as participation in educationally purposeful activities and institutional resources directed toward supporting students' development and success (Kuh, 2001; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006, 2007; Kuh et al., 2010; NSSE, 2012e; Wolf-Wendel et al., 2009).

Student engagement has been extensively studied since 2000 through analysis of successive annual administrations of NSSE (Carini, Kuh, & Klein, 2006; Carle, Jaffee, Vaughan, & Eder, 2009; Harper & Quaye, 2009; Henning, 2012; Hu & Kuh, 2002; Hu & Wolniak, 2010; Koljatic & Kuh, 2001; Kuh, 2003a, 2003b, 2007; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Kuh, Kinzie, Cruce, Shoup, & Gonyea, 2006; Pike, 2006a, 2006b; Pike & Kuh, 2005; Pike, Smart, & Ethington, 2012; Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003; Steele & Fullagar, 2009; Zhao & Kuh, 2004). Indiana University's Center for Postsecondary Research (CPR), which has overseen the survey since its inception, publishes a report of findings from the annual administration and contributes to the ongoing research on student engagement in higher education. Major findings from CPR have included the identification of Benchmarks of Effective Educational Practice associated with student engagement (NSSE, 2000, 2012b); recognition of institutional practices for enhancing the delivery of engaging experiences (NSSE, 2002, 2008a); and differences among majors and the levels of engagement students exhibit (NSSE, 2010).

### **Practices Associated with Student Engagement**

Alongside the theories associated with student engagement, related educational practices to support student development and success in higher education have been documented. Five sets of practices are highlighted in the section which follows, each building on the other toward the creation of NSSE's (2012b) Benchmarks of Effective Educational Practice and extending beyond the benchmarks to identified High-Impact Practices (Kuh, 2008) associated with student retention and persistence to degree completion.

**Student involvement.** The NIE Study Group (1984) provided recommended practices for institutions to use in advancing student involvement on campuses, including:



- specialized support services to first and second year students;
- instruction incorporating research, internships, technology, and discussion;
- academic and career advising;
- learning communities; and
- co-curricular activities. (pp. 23-35)

Beyond direct student support, other practices recommended by the NIE Study Group (1984) were institutional funding of full-time, as opposed to part-time, faculty positions (p. 36); making standards, objectives, and learning expectations clear for students (p. 21); and a culture of “assessment and feedback” (pp. 53-61) related to student development and educational delivery.

**Principles for good practice.** In the mid-1980s, Chickering and Gamson, supported by the American Association for Higher Education (AAHE) and The Johnson Foundation, worked with leaders and experts in college student development to create a set of core practices for faculty to apply in undergraduate teaching (Gamson, 1995). *The Seven Principles for Good Practice in Undergraduate Education* (Chickering & Gamson, 1987) was the outcome of their work. Initially distributed through the *AAHE Bulletin*, *The Seven Principles* was made available to educators nationwide through financial support of The Johnson Foundation (Gamson, 1995).

The practices were defined in simple, straightforward language:

1. Encourage contacts between students and faculty;
2. Develop reciprocity and cooperation among students;
3. Use active learning techniques;
4. Give prompt feedback;
5. Emphasize time on task;

6. Communicate high expectations; and
7. Respect diverse talents and ways of learning. (p. 3)

Four years after overseeing the development of *The Seven Principles*, Chickering and Gamson (1991) published *Applying the Seven Principles for Good Practice in Undergraduate Education*, containing a review of the research-based literature supporting the principles; survey findings and case studies on how faculty and institutions had incorporated them in teaching; and inventories to use in applying and evaluating the principles on campuses. Taken together, *The Seven Principles* and *Applying the Seven Principles* have become recognized as essential tools supporting teaching practice and student learning and development in higher education.

**Active learning.** In the same year that *Applying the Seven Principles* (Chickering & Gamson, 1991) appeared in print, the Association for the Study of Higher Education (ASHE) published *Active Learning: Creating Excitement in the Classroom* (Bonwell & Eison, 1991). The NIE Study Group (1984) had made note of active learning practices seven years earlier, and Chickering and Gamson (1987) had emphasized them as one of the seven principles for good practice. Bonwell and Eison compiled known practices and techniques in active learning for the ASHE report. They defined *active learning* as “instructional activities involving students in doing things and thinking about what they are doing” (Bonwell & Eison, 1991, p. iii) and presented close to twenty practices to promote student reflection during educational experiences. Some of the recommended activities were modifications of traditional classroom approaches, such as reframing lectures to include demonstrations and promoting class discussion from student-generated questions. Other activities included problem solving, debate, and role play.

**NSSE benchmarks.** Kuh (2001, 2009) was overt in drawing the historical connections between the NSSE Benchmarks of Effective Educational Practice (NSSE, 2012b) and *The Seven*

*Principles for Good Practice in Undergraduate Education* (Chickering & Gamson, 1987). Like *The Seven Principles*, the NSSE Benchmarks highlight certain key activities that support student development and success without setting minimum standards for student participation. Beyond promoting best practices, the NSSE Benchmarks serve as institutional indicators for delivery of engagement-related activities (Kuh, 2004; McCormick & McClenney, 2012) and support accountability in higher education (Kuh, 2004).

The NSSE Benchmarks focus on specific student engagement experiences organized under five subtypes of engagement:

1. Level of Academic Challenge (LAC);
2. Active and Collaborative Learning (ACL);
3. Student-Faculty Interaction (SFI);
4. Supportive Campus Environment (SCE); and
5. Enriching Educational Experiences (EEE). (Kuh et al., 2010; NSSE, 2012b)

Most benchmarks associate student participation with quality as a measure of time or effort put into activities (NSSE, 2012a)—for example, the amount of time preparing for class in the LAC benchmark or the participation in internships or study abroad in the EEE benchmark (NSSE, 2012b). A few measures focus on quality as a measure of satisfaction with experiences, such as in relationships with peers or faculty in the SCE benchmark (NSSE, 2012b).

**High-impact practices.** Of the sets of practices highlighted as being associated with student engagement, those most recently identified are the high-impact practices promoted by Kuh in a 2008 publication from the Association of American Colleges and Universities (AAC&U). Described by AAC&U President Carol Geary Schneider (2008, p. 9) as a set of

“active learning practices” which research has confirmed are linked to “increase[d] rates of student retention and student engagement,” the ten practices are:

1. First-year seminars and experiences;
2. Common intellectual experiences;
3. Learning communities;
4. Writing-intensive courses;
5. Collaborative assignments and projects;
6. Undergraduate research;
7. Diversity/global learning;
8. Service learning, community-based learning;
9. Internships; and
10. Capstone course and projects. (Schneider, 2008, pp. 9-11)

Kuh has emphasized the importance of the practices as forms of student engagement that “increase the odds that . . . [students] will attain . . . educational and personal objectives . . . with the completion of the baccalaureate degree” (Kuh, 2008, p. 22). Beginning with the 2013 administration of NSSE, the High-Impact Practices will be included as a construct of student engagement assessment (NSSE, 2012d).

### **National Assessments Associated with Student Engagement**

Besides evolving theory development and identification of best practices, a tradition of national assessment within higher education has been associated with student engagement. Approaches to assessment have included analyses of research literature generated from the 1920s through the early 2000s and longitudinal studies of the college student experiences supported by administrations of national surveys from the 1960s to the present.

**Analyses of educational research.** Analyses and syntheses of education research have contributed to the identification of populations, variables, and outcomes associated with student engagement assessment. Three reviews, *The Impact of College on Students* (Feldman & Newcomb, 1970) and *How College Affects Students* (Pascarella & Terenzini, 1991, 2005) have been particularly influential due to the breadth of research incorporated in the examination of the literature. Kuh (2001) acknowledged the contributions of Pascarella and Terenzini (1991) to the framing of student engagement theory, and in turn, Pascarella and Terenzini (2005) acknowledged Feldman and Newcomb (1970) for establishing the approach they took in *How College Affects Students* (Pascarella & Terenzini, 1991, 2005).

***The Impact of College on Students.*** Feldman and Newcomb (1970) are typically credited with undertaking the first in-depth study on the college student experience in American higher education. In 1970, they produced *The Impact of College on Students*, a two volume analysis incorporating review of over 1,500 studies produced between the mid-1920s and the 1960s (Pascarella & Terenzini, 2005, p. xi). They sought to provide answers to a single, four-part research question: “What kinds of students change in what kinds of ways, following what kinds of experiences, mediated by what kinds of institutional arrangements?” (Feldman & Newcomb, 1970, p. 5). They found “basic education practices of American colleges and universities . . . [had] changed little . . . [and] neither . . . their forms of organization” in the close to 50 years of research they reviewed (Feldman & Newcomb, 1970, p. 338). They viewed the stability of the system unfavorably, describing it as a kind of inertia quelling “fresh and imaginative educational ideas” in the academy (Feldman & Newcomb, 1970, p. 338). Their analyses provided a foundation for future assessment of student engagement through the identification of developmental changes between the freshman and senior years of college; differences among

majors of study; the influence of faculty and peers; and classification of student characteristics, backgrounds, and personalities (Feldman & Newcomb, 1970).

***How College Affects Students.*** In the 1980s, Pascarella and Terenzini, with the support of Feldman (1991, p. xi), undertook an analysis of the literature generated since Feldman and Newcomb (1970) had completed their extensive review of education research. They published *How College Affects Students* in 1991, and fourteen years later, extended and updated their analyses (Pascarella & Terenzini, 2005) to provide synthesis of close to 80 years of research on the undergraduate student experience. Among their findings, they determined college grades were likely “the single best predictors of student persistence, degree completion, and graduate school enrollment” and were also “one of the most consistent predictors of these outcomes” (2005, p. 396). Academic advising (2005, p. 404) and contact with faculty outside of class-based experiences (2005, p. 417) were reliable factors influencing student persistence and degree completion. Their analyses revealed that students from “the sciences, mathematics, and engineering . . . business, and health-related professions are more likely to persist and earn bachelor’s degree” than students from other majors (2005, p. 424). Through their research, variables such as faculty contact and student major were shown to be influential in student development, and outcomes such as academic achievement as measured by grade point average (GPA), retention, and persistence to degree completion could be associated with student success (Kuh et al., 2006, 2007).

**Longitudinal studies in American higher education.** As reported by Indiana University’s CPR, “many of the items included on . . . NSSE are derived from . . . the College Student Experiences Questionnaire (CSEQ) . . . [and] the Cooperative Institutional Research Program (CIRP) Freshman and follow-up surveys” (NSSE, 2012e, para. 17). CSEQ, CIRP, and

NSSE and some of the key connections among them are briefly described below. The discussion includes descriptions of some of the major criticisms directed toward NSSE and information on planned revisions for the 2013 NSSE administration.

***Cooperative Institutional Research Program (CIRP).*** In 1966, the American Council of Education established the Cooperative Institutional Research Program, which has been administered by the Higher Education Research Institute (HERI) of the University of California, Los Angeles since the early 1970s (HERI, 2012a). CIRP is “the largest and oldest empirical study of higher education” in the United States (HERI, 2012a), and CIRP surveys have been administered at over 1,900 participating institutions (HERI, 2012a). The various surveys conducted by CIRP have provided assessment data on student involvement in the first and senior years of college (HERI, 2012b). NSSE has utilized CIRP’s approach in collecting data from first and senior year students and has incorporated questions directly from CIRP surveys (NSSE, 2012e).

***College Student Experiences Questionnaire (CSEQ).*** As described in the section on theories associated with student engagement, the CSEQ was developed to measure student effort in higher education (CSEQ Assessment Program, 2012a; Pace, 1980, 1984). Close to 140 universities and colleges from across the United States have administered the survey (CSEQ Assessment Program, 2012c), and the most recent version was co-authored by Pace and Kuh (1998). CSEQ leadership describe the survey as assessing “the *quality of effort* students expend in using institutional resources and opportunities provided for their learning and development” (CSEQ Assessment Program, 2012b, para. 1). The survey predominantly measures effort in terms of time or participation in collegiate experiences, a practice also maintained by NSSE (2012e).

*National Survey of Student Engagement (NSSE)*. The origins of NSSE and the theory of student engagement were highlighted in the section on theories associated with student engagement. In brief, through the support of the Pew Charitable Trusts and educational researchers including Astin, Chickering, Ewell, Kuh, and Pace (Ewell, 2010; Kuh, 2001, 2009; NSSE, 2012e; Pike & Kuh, 2005), NSSE was developed and piloted by Indiana University's CPR in 1999 (NSSE, 2012e). In 2012, the survey was administered for the thirteenth consecutive year to institutions in both the United States and Canada (NSSE, 2012a). To date, more than 1,500 colleges and universities have participated in NSSE, and over 3.7 million students have completed the survey (NSSE, 2012a). NSSE measures are focused on student participation in educationally purposeful activities (NSSE, 2012a), but the survey does not measure actual student persistence or determine retention rates on campuses. NSSE leadership has been careful to emphasize that the survey's measures are "strongly focused on student and faculty behavior" (McCormick & McClenney, 2012, p. 310), and NSSE's national administrators seek to assist "participating institutions [to] make use of their results, converting information to action" (McCormick & McClenney, 2012, p. 310).

While NSSE has been widely administered across the United States and is regularly used in institutional assessment in colleges and universities (NSSE, 2012a), the survey has been criticized by researchers concerned with its psychometric properties (Campbell & Cabrera, 2011) and various aspects of its validity (DiRamio & Shannon, 2011; Gordon, Ludlum, & Hoey, 2008; Korzekwa & Marley, 2011; LaNasa, Cabrera, & Trangsrud, 2009; Lutz & Culver, 2010; Porter, 2011; Porter, Rumann, & Pontius, 2011). In response to research, feedback, and requests for additional data (NSSE, 2012d), NSSE leadership have sought to revise and update the survey beginning with the 2013 administration. With NSSE 2013, student engagement will include new



and refined measures on Engagement Indicators—including academic challenge, learning with peers, experiences with faculty, campus environment, and high-impact practices—and updated language on changing “educational contexts” in the academy (NSSE, 2012d). The report of NSSE findings incorporating the updated constructs of student engagement is anticipated to be published by CPR in fall 2013.

### **Delimitations and Limitations of the Evaluation**

#### **Relationship to WCNR and CSU Strategic Plans**

The program evaluation supported institutional commitments to student engagement as described in the WCNR (2005) and CSU (2010) strategic plans. The study was delimited through a review of those documents to ensure alignment with the university and college policies.

The elements of the WCNR strategic plan identified as being supported by the study were:

Teaching and Learning-Objectives 1 and 2. WCNR will provide the highest quality of instruction and advising to graduate and undergraduate students and continue to lead the nation in educating students who can solve contemporary problems in natural resources using interdisciplinary approaches, [and] WCNR will increase enrollment of high quality undergraduate students through enhanced recruiting and improved student retention and graduation rates. (pp. 4-5)

Research and Discovery-Objective 1/Goal 16. WCNR and the University will be recognized as the premier research institution linking natural resources, the environment, and its human dimensions. [The college will] actively participate in University-wide research initiatives and develop successful models that support University initiatives. (p. 18)

Service and Outreach-Objective 2/Goal 25. WCNR [will be looked to] as a respected and trusted voice for natural resources and environmental issues across Colorado and beyond [and will] develop a communications plan for dissemination of key message to targeted audiences (at all levels) and to position WCNR in the forefront of new CSU environmental/natural resource initiatives. (p. 11)

Specifically, the focus on assessment of undergraduate student engagement and success met

Teaching and Learning-Objectives 1 and 2; the coordination with CSU Student Affairs upheld

Research and Discovery-Objective 1/Goal 16; and the structuring of dissertation chapters as publishable manuscripts on natural resource and environmental education reinforced Service and Outreach-Objective 2/Goal 25.

The objectives upheld in the CSU strategic plan included: (a) Teaching and Learning, assuring excellence in academic programs and undergraduate student engagement outcomes; (b) Research and Discovery, seeking to be an example in college-level research and scholarship and focusing research on institutional strengths; and (c) Outreach and Engagement, supporting the preparation and empowerment of students outside of the campus environment (CSU, 2010).

### **Generalizability of Findings from Surveys of WCNR Engagement**

Findings from the electronic and classroom survey administrations of WCNR student engagement were delimited to WCNR undergraduates. The surveys were designed to assess student engagement and success in the college in relation to specific variables identified through the program evaluation. Because the surveys were designed for a specific academic community at a specific point in time, the generalizability of the survey findings may not extend beyond Colorado State University and the Warner College of Natural Resources.

### **Applicability of the Evaluation in Higher Education**

The applicability of the evaluation may be limited to natural resources and related fields, including environmental and natural sciences education, where the forms of student engagement resemble the ones emphasized and delivered by WCNR (Vincent, 2010). Other colleges and universities seeking to assess their students' engagement may find the questions and practices that guided the evaluation useful in framing their own assessment approaches but insufficient in addressing their specific practices of engagement.

### **Assumptions Framing the Evaluation**

The author served as a quasi-external evaluator, and the evaluation had committed client and stakeholder involvement from the WCNR administration, faculty, and students and from CSU Student Affairs over the course of the study. The following assumptions framed the evaluation:

1. Input from students, faculty, and administrators during the evaluation was based on their personal and/or professional experiences and was true to those experiences;
2. The variables, measures, and outcomes identified for student engagement assessment and used in the design of the electronic and classroom surveys were based on the college's engagement practices;
3. The samples of students participating in the electronic and classroom survey administrations were representative of the population of WCNR undergraduates enrolled during the study period; and
4. All student participating in the electronic and classroom survey administrations responded to questions openly and honestly.

Student participation in the survey administrations was voluntary, and there was no reason to believe anyone took part in the study under conditions except those of a voluntary basis.

### **Significance of the Study**

This study makes a unique contribution to student engagement theory and research through its focus on natural resource students. It adds to the body of research on college-specific (Kinzie, Thomas, Palmer, Umbach, & Kuh, 2007; O'Day & Kuh, 2006) and major-specific (Laird, Shoup, Kuh, & Schwarz, 2008; NSSE, 2010; Pike et al., 2012; Smart, Feldman, & Ethington, 2006) student engagement, which has been associated with Holland's theory and

typology of persons and environment in the academy (Holland 1959, 1968, 1996; Nafziger, Holland, & Gottfredson, 1975). The significance of the study, however, lies not only in the extension of student engagement theory and research but also in its situational context at Colorado State University. The study directly contributes to WCNR (2005) objectives of enhancing student retention and increasing graduation rates and supports similar CSU objectives of increasing students' persistence and success at the university (CSU, 2010; Frank, 2011).

The interest in fostering student success in higher education is not unique to WCNR or CSU. President Obama (2009, para. 66) set a much publicized goal for American higher education to have “the highest proportion of college graduates in the world by 2020.” Many national education and nonprofit organizations—including the American Federation of Teachers (2011), AAC&U (2010), HERI (DeAngelo, Frank, Hurtado, Pryor, & Trans, 2011), the Lumina Foundation (Adelman, Ewell, Gaston, & Schneider, 2011), and the New Leadership Alliance for Student Learning and Accountability (2012)—have issued recommendations to help the nation meet the goal of increasing college graduation rates. While making a modest contribution to these initiatives, this study contributes to the discussion by showcasing one college's approach to evaluation and assessment linked to student engagement and success in the academy. The study also serves an example for others seeking to undertake individualized program assessment to better support the student experience and enhance retention and persistence to degree completion.

### **Researcher's Perspective**

As an educator who holds to both Pragmatic and Progressive educational philosophy, I strongly believe it is the duty and responsibility of higher education to provide students enriching experiences that contribute to their learning and development. As someone who also believes we

live in time of dramatic environmental change affecting all life on earth, I share a position held by many in education (Berry, 1977; Callicott & da Rocha, 1996; Leopold, 1966; Makela, 2003; Millennium Ecosystem Assessment, 2005; Orr, 1992, 2004, 2009; Rolston, 1988, 1996; Speth, 2008; Timpson, et al., 2006; Wilson, 1992, 1998) that we need models of teaching and learning that connect students with lived experiences, so they may reside responsibly on our planetary home.

When I enrolled in CSU's School of Education to undertake an interdisciplinary doctorate in education, sustainability, and student engagement, I was interested in a dissertation project associated with environmental or natural resource education. While taking a WCNR course in survey research and analysis, I was recruited by a faculty member to participate in the administration of the college's spring 2010 pilot study of student engagement. The collaborative nature of the pilot study, with participatory inclusion of undergraduate and graduate students in survey design and analysis, demonstrated to me that the college took seriously its commitment to advancing education connected to students' real-world experiences. When asked by WCNR leadership later that year if I would conduct an evaluation of their student engagement assessment, I readily accepted and made the project the focus of my dissertation.

David Orr, the environmental educator and theorist, has written of the need for education which fosters a "wholeness, . . . the integration of the personhood of the student" with the learning that the student undertakes (1992, p. 100). He has advocated for education that connects learning with experience, encourages social and ecological responsibility, and prepares students for living in community and place (Orr, 1992, pp. 101-103). In my time in WCNR, I found the college provided educational experiences that met Orr's criteria for educating the whole person. I

feel privileged to have worked with the WCNR community, learning with them about their engagement of students.

CHAPTER 2: PARTICIPATORY EVALUATION OF STUDENT  
ENGAGEMENT ASSESSMENT: A CASE STUDY IN NATURAL RESOURCE  
AND INTERDISCIPLINARY ENVIRONMENTAL EDUCATION

**Introduction**

The practice, assessment, and evaluation of student engagement can be traced at least as far back as the Greeks with Socrates' engaging students in the examination of human values and ethics. Rather than tell them what they should think, Socrates asked his students to consider difficult questions of family and civic life and propose answers to the problems he raised. He set outcomes for their exercise of critical thinking and skill with argumentation, and he assessed their ability to achieve outcomes by providing feedback on their logic and reasoning. While evaluation of the Socratic Method by the Athenian Court was punitive, with Socrates sentenced to death for his teaching innovations, in the millennia since Plato (1986) memorialized his teacher, student engagement has become a mainstay in education.

**Student Engagement in Higher Education**

In higher education, student engagement has been associated with theory and research on experiential learning (Chickering, 1977; Dewey, 1938; Kolb, 1984; Kolb & Fry, 1975) and student involvement (Astin, 1977, 1984, 1993, 1996). Engagement has connections to assessment and research on the student experience (Feldman & Newcomb, 1970; Pace, 1984; Pascarella & Terenzini, 1991, 2005) and institutional delivery of experiential curriculum and programming (Chickering & Gamson, 1987; Kuh, Schuh, Whitt, & Associates, 1991). Recently, student engagement has been linked to high-impact practices such as undergraduate research, internships, and capstone courses (Kuh, 2008).

Within the United States (U.S.) and Canada, the National Survey of Student Engagement (NSSE) is commonly used for assessing student engagement in the academy. Administered annually since 2000, the survey has been used by over 1,500 colleges and universities (NSSE, 2012a). Within the NSSE (2012a) framework, student engagement consists of two components: (a) student participation in educationally purposeful activities and (b) institutional resources directed toward supporting students' development and success (Kuh, 2001; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007; Kuh, Kinzie, Schuh, & Whitt, 2005; Kuh, Kinzie, Schuh, Whitt, & Associates, 2010; Wolf-Wendel, Ward, & Kinzie, 2009). The survey measures student participation across classroom and co-curricular experiences as well as in activities such as employment and community service (NSSE, 2008). It includes measures on the quality of relationships with others on campus and satisfaction with academic advising and overall educational delivery (NSSE, 2008). Reporting of NSSE results includes benchmarking for five areas of effective educational practice: academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environment (NSSE, 2012b).

### **Student Engagement in Environmental Education**

Although pedagogies and practices vary across institutions and disciplines, three common goals of environmental education (EE) developed in 1977 at the UNESCO Tbilisi Intergovernmental Conference on Environmental Education are often cited as foundational to EE delivery:

- foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment; [and]
- create new patterns of behaviour of individuals, groups and society as a whole towards the environment. (UNESCO, 1978, p. 26)



Beyond these goals, the findings and recommendations given to United Nations member states in the Tbilisi Declaration (UNESCO, 1978) included:

- provide social groups and individuals with an opportunity to be actively involved . . . in working toward resolution of environmental problems (p. 27);
- help social groups and individuals acquire . . . the motivation for actively participating in environmental improvement and protection (p. 27);
- enable learners to have a role in planning their learning experiences (p. 27);
- develop critical thinking and problem-solving skills (p. 27);
- utilize diverse learning environments and a broad array of educational approaches to teaching/learning . . . with due stress on practical activities and first-hand experiences (p. 27); and
- [be] global, practicable, and useful (p. 40).

The elements highlighted in the declaration bear resemblance to student engagement practices (Kuh et al., 2010; NSSE, 2012b). In emphasizing active learning and participation (Chickering & Gamson, 1987), student involvement in learning experiences (Astin, 1984; Dewey, 1938), critical thinking and problem-solving (NSSE, 2012b), and diversity and global learning (Kuh, 2008), the declaration, in fact, not only valued practices associated with student engagement but also recognized them some twenty years before student engagement theory was framed (NSSE, 2012a).

Commitment to engaging practices in the Tbilisi Declaration has not waned. In the *International Handbook of Research on Environmental Education* (Stevenson, Brody, Dillon, & Wals, 2013), the early themes of engagement in EE practice revealed themselves to be perennial to EE delivery in a variety of disciplines. Lundholm, Hopwood, and Rickinson (2013) described “learners as active agents” (p. 244) and highlighted research on diverse “viewpoints among students and teachers” in environmental learning (p. 248). Holdsworth, Thomas, and Hegarty (2013), in looking at sustainability education within EE tradition, summarized a list of practices in teaching and learning including: “collaborative learning, problem solving skills to deal with complex real-life problems . . . and experiential learning” (p. 353). Separately, in a report from

the U.S. National Council for Science and the Environment, Vincent (2010) identified the use of engagement-related practices ranging from problem-solving and writing to research and community engagement (pp. 19-20) in interdisciplinary EE fields in the humanities, social sciences, natural sciences, and natural resources.

### **Evaluation Questions**

In 2010, a commitment to delivering and assessing engaging practices in undergraduate education became a primary focus of administrators and faculty in Colorado State University's (CSU) Warner College of Natural Resources (WCNR). Although CSU was a NSSE-participating institution, the college found NSSE's data insufficient for meeting its assessment needs. Having undertaken pilot studies of WCNR engagement among the undergraduate population in the previous two years, the college was considering establishing the Milestones Assessment Program of Student Engagement (MAPSE) to regularly collect data on undergraduate engagement not provided by NSSE. With support from CSU's Division of Student Affairs, WCNR initiated a program evaluation to address five questions prior to establishing MAPSE:

1. What are the mission, goals, and objectives of assessing WCNR student engagement?
2. Do the goals and objectives align with CSU's and WCNR's strategic plans?
3. What are the variables, measures, and outcomes of student engagement assessment in natural resources at CSU?
4. How do electronic and classroom survey administrations of WCNR student engagement compare?
5. What are the operational elements required to support MAPSE?

The case study that follows addresses these questions. The findings have implications for the delivery and assessment of student engagement in natural resources and interdisciplinary EE at

the collegiate level. The case is organized in five sections: institutional and evaluation context, focus and design, findings, discussion, and implications for practice.

### **Institutional and Evaluation Context**

#### **Learning, Discovery, and Engagement**

WCNR (2012c) is the largest named and most comprehensive natural resources college in the United States. The college advances “learning, discovery and engagement that guides natural resource conservation, sustainability, and stewardship” (WCNR, 2011a, para. 6). Undergraduate programs are housed in five academic departments: ecosystem science and sustainability; fish, wildlife, and conservation biology; forest and rangeland stewardship; geosciences; and human dimensions of natural resources (WCNR, 2012b). Student engagement is overseen by the Associate Dean of Academic Affairs (ADAA) who works with department chairs, faculty, academic coordinators, a student services director, a career counselor, and undergraduate students of the WCNR College Council to ensure delivery and support of educationally purposeful activities.

The college values educational best practices associated with student engagement, success, and degree completion (Astin, 1977, 1984, 1993; Chickering & Gamson, 1987; Kuh, 1995, 2001; Kuh et al., 2007; Tinto 1997, 2006), including hands-on, field, and research-based experiences and skill development in communication, problem-solving, critical thinking, and teamwork (WCNR, 2011a, 2011b). Most students participate in a summer field experience at Pingree Park, CSU’s mountain campus, before their junior or senior year (WCNR, 2012a). Beyond academic requirements, students may participate in a variety of service, field, and social experiences organized annually by the WCNR College Council and the college’s student clubs (WCNR, 2012c).

## **Assessment and Evaluation of Engagement**

The college's interest in assessing student engagement arose in fall 2008 when a team assembled by the ADAA and comprised of members from the administration, faculty, and student body found the subsample of WCNR students participating in NSSE (2008) too small to support data analyses at the department level. While team members agreed NSSE measured student participation and overall satisfaction at the university, they additionally determined:

- there were practices and milestones in the journey of WCNR student engagement, such as the summer field experience in Pingree Park, which NSSE did not consider;
- NSSE predominantly measured affective behavioral dimensions (Astin & Antonio, 2012) of student participation, typically as time and effort, in educationally purposeful activities (McCormick & McClenney, 2012) and assessed few affective psychological dimensions, such as importance or satisfaction, of activities; and
- NSSE assessment of student retention and success was linked to questions about academic challenge and time spent in challenging activities (NSSE, 2012c). Students were not asked if they felt successful in the college, intended to persist in their majors, or experienced barriers to their success in WCNR.

Team members proposed undertaking assessment of WCNR student engagement to provide data at college and department levels; track the college's engagement practices; measure students' perceived importance and satisfaction with engagement; and provide information on students' sense of success, persistence, and barriers to success in WCNR.

The team sought outside expertise from CSU's Division of Student Affairs which supplied knowledge of student engagement assessment and access to Campus Labs®, a firm that works with higher education institutions and organizations to administer Internet-based surveys.

Graduate and undergraduate team members learned about student engagement theory, identified variables of interest, and coordinated the writing and administration of surveys with Campus Labs®. The team worked collaboratively to analyze results and disseminate findings to the college's administration. On concluding the pilot studies, the team considered what it would take to assess student engagement on a regular basis. With ongoing support from the college's administration and CSU Student Affairs, they decided to evaluate establishing a program of WCNR student engagement assessment.

### **Focus and Design**

#### **Focusing the Inquiry**

The evaluation was conducted following completion of pilot studies in which the clients believed they had established practices for WCNR student engagement assessment. The study was undertaken as a collaborative endeavor between academic and student affairs units (Frost, Strom, Downey, Schultz, & Holland, 2010; Manning, Kinzie, & Schuh, 2006; Whitt, et al., 2008). Based on the culture of shared commitment, collaboration, and individual and organizational learning (Cousins & Earl, 1995; King, 2004) established in the pilot studies, the evaluation was planned as a participatory evaluation (Cousins & Chouinard, 2012; Cousins & Earl, 1992, 1995; Cousins & Whitmore, 1998). It was initiated in fall 2010 and completed in spring 2013.

The lead author of this article was recruited from CSU's School of Education doctoral program to serve as a quasi-external evaluator (Fitzpatrick, Sanders, & Worthen, 2004). The co-authors, who had previously served as the team leaders of the WCNR pilot studies, acted as the clients initiating the evaluation, and the stakeholders included all members of the college community and CSU's Division of Student Affairs. WCNR undergraduate and graduate students

who had worked on the pilot studies were asked by the clients to serve as reviewers during the evaluation.

### **Formative Design**

The clients sought a design that would support formative evaluation (Cousins & Earl, 1995; Fitzpatrick et al., 2004) of the college's assessment processes to improve and enhance practices prior to establishing MAPSE. After consulting the literature on student engagement and student affairs evaluation and assessment (Kuh et al., 2005; Kuh et al. 2007; Kuh et al., 2010; Schuh, Upcraft, & Associates, 2001), the evaluator proposed looking at assessment context, input, and process—three of the four elements in the CIPP Model advanced by Stufflebeam and Shinkfield (2007). Examination of *context* was planned in relation to MAPSE mission, goals, and objectives and the CSU and WCNR strategic plans. *Input* was included to identify variables and measures for use in MAPSE surveys and document outcomes for assessment of WCNR student engagement. As envisioned by the clients, *process* was at the heart of the evaluation and considered in relation to electronic and classroom survey administrations and operational elements required to support MAPSE. To address the specific questions developed to guide the evaluation, the study had five distinct phases.

**Articulating the mission, goals, and objectives.** Using methods in dialogue and deliberation (Heierbacher, 2007), the evaluator met with the clients to help them examine the mission, goals, and objectives for assessing WCNR undergraduate student engagement. Following the meetings, the evaluator prepared a draft statement of the findings and submitted them to the clients for review, editing, and approval.

**Reviewing alignment with CSU and WCNR strategic plans.** The evaluator undertook qualitative document analysis (Altheide, Coyle, DeVriese, & Schneider, 2008) of the university

and college's strategic plans (CSU, 2010; WCNR, 2005) to determine how each described commitments to student engagement. Where student engagement appeared in the documents, language and scope were compared to ensure that the college's plans aligned with those of the university. The mission, goals, and objectives for student engagement assessment were then considered in relation to the strategic plans to ensure alignment.

**Identifying variables, measures, and outcomes.** The evaluator constructed a matrix display (Miles & Huberman, 1994; Nadin & Cassell, 2004) to document practices of WCNR student engagement for use as independent variables in MAPSE surveys. Practices were identified by applying qualitative document analysis (Altheide et al., 2008) and the constant comparative method (Glaser, 1965; Strauss & Corbin, 1998) to a review of the pilot studies and other college materials, such as department guidelines (WCNR, 2011b), prospective student information (WCNR, 2012b), and the WCNR (2005) strategic plan. The clients and reviewers examined the list of practices compiled by the evaluator, and consensus decision-making techniques (Bressen, 2007) were used to refine and organize the list according to MAPSE objectives. Practices missing from the list but known by the clients and reviewers to be consistent with WCNR engagement were added through consensus decision-making and checked against a review of the literature on assessing student engagement and success (Kuh, et al., 2005; Kuh et al., 2007; Kuh et al., 2010). As the evaluation progressed and additional data were gathered from survey administrations, principal component analysis (PCA) of survey data and peer debriefing (Creswell, 2009) were used to further organize and group variables.

Dependent variables on student success and persistence were identified through dialogue and deliberation (Heierbacher, 2007) with the clients and a review of the literature on assessing student engagement and success (Kuh et al., 2005; Kuh et al., 2007; Kuh et al., 2010). A list of

barriers to student success was constructed in consultation with the clients and reviewers. In constructing independent and dependent variables, major programs of study were emphasized since it was believed students more readily identified with their majors than their departments.

Finally, demographic variables, measures for the independent and dependent variables, and outcomes for student engagement were determined using consensus decision-making techniques in meetings with the clients.

**Comparing electronic and classroom survey administrations.** Two surveys were developed in collaboration with the clients and reviewers: an electronic survey to be administered to the WCNR undergraduate population in spring 2011 and a classroom survey to be administered to students enrolled in WCNR classrooms in fall 2011. The evaluator facilitated discussions, synthesized information, wrote survey materials, and served as a learning resource (Cousins & Earl, 1995; Patton, 2008) on student engagement theory and assessment. The surveys underwent review by the clients and student reviewers before each was approved for administration. The evaluator administered the surveys, analyzed results, and conducted post-administration survey comparisons using matrix display techniques. Survey categories of comparison included: number of questions, number of variables, estimated minutes to complete, sampling, and statistical analyses supported. Comparisons between participant and population demographics for each survey were also made.

**Evaluating operational elements to support MAPSE.** To evaluate operational elements required to support MAPSE, the evaluator used matrix display techniques to compare electronic and classroom survey administrations. In consultation with the clients, the following operational elements were included in the matrix display: WCNR leadership, support staff, support staff



hours, materials required, and funding sources in the two survey administrations. Duties of support staff and expenses incurred in administration were also documented.

## **Findings**

### **Mission, Goals, and Objectives of Assessing Student Engagement**

WCNR's mission in assessing undergraduate engagement is to ensure student experiences are personally and professionally enriching and contribute to their success and persistence in the college. WCNR's goals in assessing engagement are to gauge students' importance and satisfaction with the college's engagement practices; monitor students' sense of success, persistence, and barriers to success in the college; and produce data to support department-level analyses for engagement. To meet its goals, the college's objectives are to (a) track WCNR engagement in course experiences, experiential learning, faculty advising, community and climate, and professional development; (b) survey students to measure their importance and satisfaction with WCNR engagement, sense of success, persistence, and barriers to success in the college; (c) analyze college-level data produced in the surveys; (d) report findings to college administration and faculty; and (e) provide data to WCNR departments for their students.

### **Alignment with CSU and WCNR Strategic Plans**

WCNR's assessment of undergraduate engagement aligns with CSU (2010) and WCNR (2005) strategic plans. The college's objective to assess engagement in course experiences, experiential learning, faculty advising, community and climate, and professional development aligns with Teaching and Learning emphases in both plans (CSU, 2010, pp. 5, 9-16; WCNR, 2005, pp. 4-6) and the Community emphasis in the college's plan (WCNR, 2005, pp. 15-16). Objectives to assess engagement in relation to students' sense of success and persistence align with emphases in strategic initiatives under Teaching and Learning (CSU, 2010, pp. 13-14;

WCNR, 2005, p. 6). The college's plan supports the objective to identify barriers to student success (WCNR, 2005, p. 6).

### **Variables, Measures, and Outcomes of Engagement**

**Independent variables and measures.** Independent variables for importance and satisfaction used in the electronic survey are displayed in Table 1 as the WCNR Indices and Practices of Student Engagement. A total of 43 practices were identified and organized under five indices corresponding with the college's objective to track engagement in course experiences, experiential learning, faculty advising, community and climate, and professional development.

Following administration of the electronic survey, PCA on satisfaction variables supported construction of eight concept-level WCNR Themes of Student Engagement:

- course opportunities for discussions, presentations, final projects, or group assignments;
- course opportunities for fieldwork, lab work, or service projects;
- experiential learning through undergraduate research, internships, study abroad, or field camps (e.g., Pingree, Geo, or Forestry Field camps);
- faculty advising for college courses, class scheduling, or major requirements;
- faculty advising related to other college opportunities (e.g., research, scholarships, graduate school, or career plans);
- college student clubs, volunteer work, or social events (e.g., picnic or pancake breakfast);

Table 1

*WCNR Indices and Practices of Student Engagement*

Warner Course Experiences	Warner Experiential Learning	Warner Faculty Advising	Warner Community and Climate	Natural Resource Professionalism
discussions	residential learning community	course assignments	friendly community	discuss current issues
writing papers	community service	course grades	supportive community	learn diverse perspectives
final projects	internship	major or minor options	family-like community	explore ethical or social issues
presentations	undergraduate research	planning classes to take	student clubs	write on what is learned
group assignments	undergraduate or honors thesis	registering for classes	social events	apply knowledge to real-world problems
problem-solving	Pingree Park	internships	volunteer work	work cooperatively with diverse people
lab work	study abroad	field placements	welcoming common spaces	develop career-based knowledge and skills
fieldwork		research	feeling valued as a community member	practice conservation, sustainability or stewardship
community service		scholarships or fellowships		
		graduate school		
		career plans		

- welcoming, friendly, or supportive qualities of the college community; and
- development as a natural resource professional as a member of Warner College of Natural Resources.

Satisfaction variables from each of the WCNR Indices of Student Engagement fell in grouped pairs of concepts in the WCNR Themes of Engagement, except for Experiential Learning and Natural Resource Professionalism which could not be subdivided. The concept-level groupings on satisfaction were used in the classroom survey. Concept-level groupings on importance variables were not constructed per the clients' request to limit students' reporting burden in the classroom survey.

To meet the college's objective of measuring importance and satisfaction with WCNR engagement practices, the electronic survey asked students whether they found opportunities to take part in each practice important and satisfying. Importance questions were asked on 5-point scales with response categories ranging from "very unimportant" (-2) to "very important" (2). Satisfaction questions were also asked on 5-point scales that ranged from "very dissatisfied" (-2) to "very satisfied" (2). Comparatively, the classroom survey asked students about their overall satisfaction on each concept-level grouping of practices using a 5-point scale that ranged from "poor" (-2) to "excellent" (2).

**Dependent variables and measures.** Across the two survey formats, dependent variables selected to measure students' sense of success and persistence included:

- sense of overall success in WCNR and their majors;
- intention to continue in their majors;
- sense of being on track to graduate; and
- desire to choose WCNR and their majors if starting college again.

For both the electronic and classroom surveys, questions on the dependent variables were measured on 4-point scales ranging from “definitely no” (1) to “definitely yes” (4), with an optional 5<sup>th</sup> choice of “I don’t know.”

To meet the college’s objective to identify barriers to student success, the electronic survey included the following question: “Are there things you find challenging to your overall success in WCNR?” Survey participants were provided the list of barriers pre-selected by the clients and reviewers and asked to “check all that apply.” The list included: cost of college, not enough financial aid, sequence of class offerings, work issues, health issues, family issues, changed majors, and transferred to CSU. Participants could also write in challenges not listed.

**Demographic variables.** Student demographic variables selected for the study included sex, residency, class standing, enrollment, and department affiliation. Instead of participants providing their demographic data, they wrote their university student identification (ID) numbers on survey materials, and IDs were matched with the CSU Registrar’s student database to obtain demographic information.

**Outcomes for student engagement.** Outcomes for WCNR student engagement assessment were limited by the clients to the establishment of baseline measures of students’ importance and satisfaction with engagement, sense of success and persistence, and barriers to success in the college. The combined findings were to be used in setting future outcomes of student engagement in the college.

An example of baseline measures on satisfaction are reported in Table 2 for students who selected “better than average” to “excellent” on their overall satisfaction with WCNR Themes of Student Engagement in the classroom survey. Except on “course opportunities for fieldwork, lab

Table 2

*Percentage Satisfaction on WCNR Themes of Student Engagement*

Themes	Satisfaction <sup>1</sup> <i>n</i> = 530
Welcoming, friendly, or supportive qualities of the college community	83
Development as a natural resource professional as a member of Warner College of Natural Resources	75
Experiential learning through undergraduate research, internships, study abroad, or field camps (e.g., Pingree, Geo, or Forestry Field camps)	72
Course opportunities for discussions, presentations, final projects, or group assignments	71
College student clubs, volunteer work, or social events (e.g., picnic or pancake breakfast)	71
Faculty advising for college courses, class scheduling, or major requirements	65
Course opportunities for fieldwork, lab work, or service projects	55
Faculty advising related to other college opportunities (e.g., research, scholarships, graduate school, or career plans)	47

<sup>1</sup> Cell entries are the percentage of students reporting “better than average” or “excellent.”

work, or service projects” and “faculty advising related to other college opportunities,” two-thirds or more of students surveyed reported overall satisfaction with engagement in the college.

Students’ agreement with measures of success and persistence in the college appear in Table 3 for both the electronic and classroom surveys. At least 88% of students in the electronic survey and 81% of students in the classroom survey reported a sense of success in their major and the college; an intention to continue in their major in the next semester; being on track to

graduate; and a desire to select WCNR if starting college again. For the electronic survey, 87% of students reported a desire to select their major if starting college again; for the classroom survey, the percentage of students reporting a desire to again select their major was 76%.

Table 3

*Percentage Agreement on Success and Persistence*

Dependent Variables	Electronic Survey <sup>1</sup> <i>n</i> = 279	Classroom Survey <sup>1</sup> <i>n</i> = 530
Overall, I feel successful:		
in my major.	92	81
in WCNR.	94	84
I plan to continue in my current major next semester.	88	89
I am on track to graduate on time.	91	86
If I could start again, I would choose:		
my major.	87	76
WCNR.	92	81

<sup>1</sup> Cell entries are the percentage of students reporting “yes” or “definitely yes.”

Finally, Table 4 presents findings from the electronic survey on the reported barriers to student success in WCNR. Because students were instructed to “check all that apply,” they typically provided more than one response leading to  $n = 621$  overall responses. The most common barrier identified by students was the cost of college. Students also frequently selected the sequence of class offerings and not having enough financial aid as challenges to their success in WCNR.

Table 4

*Percentage of Responses on Barriers to Student Success*

Barriers <sup>1</sup>	Responses $n = 621$
Cost of college	24
Sequence of class offerings	19
Not enough financial aid	16
Transferred to CSU	10
Work issues	10
Changed majors	8
Family issues	7
Health issues	3
Other barriers?	3
<ul style="list-style-type: none"> <li>• advising issues</li> <li>• class scheduling issues</li> <li>• being a student athlete or non-traditional, commuter, or transfer student</li> <li>• difficulty in pursuing minor program studies in other colleges at CSU</li> <li>• social, relational, or personal problems</li> <li>• lack of challenge</li> </ul>	

<sup>1</sup> Items listed under “Other barriers?” were the most common responses, ordered by frequency, that students provided.



## Comparisons between Electronic and Classroom Survey Administrations

Comparisons between electronic and classroom surveys for number of questions, number of variables, estimated time to complete, sampling, and statistical analyses appear in Table 5. Comparative characteristics between survey participants and the WCNR undergraduate population are in Table 6. When looking at Variables and Sampling in Table 5 and all the categories in Table 6, the evaluator created additional sub-categories of comparison for dimension in the analyses.

Table 5

### *Comparative Categories for MAPSE Survey Administrations*

Categories	Electronic Survey	Classroom Survey <sup>1</sup>
Questions	93	14
Variables		
Independent	86	8
Dependent	7	6
Estimated Minutes to Complete	15	5
Sampling		
Type	Population	Purposive
Population <i>N</i>	1,214	1,319
Sample <i>n</i>	279	530
% of Population	23	40
Statistical Analyses	Descriptive Importance-Satisfaction	Descriptive Logistic Regression

<sup>1</sup> The classroom survey was administered in  $n = 30$  WCNR course sections.

Table 6

*Comparative Demographics for the Survey*

Demographic Variables	Electronic Survey						Classroom Survey					
	<i>N</i> 1,214	<i>n</i> 279	$X^2$	<i>df</i>	<i>p</i>	Effect Size <sup>1</sup>	<i>N</i> 1,319	<i>n</i> 530	$X^2$	<i>df</i>	<i>p</i>	Effect Size <sup>1</sup>
Sex			33.67	1	<.001	.17			.95	1	.330	.03
Male	63	48					64	62				
Female	37	52					36	38				
Residency			.03	1	.863	<.00			.92	1	.338	.03
Colorado	75	75					75	76				
Non-Colorado	25	25					25	24				
Class Standing			22.61	3	<.001	.14			22.97	3	<.001	.13
Freshman	13	8					17	13				
Sophomore	23	16					23	20				
Junior	26	29					26	28				
Senior	38	47					34	39				
Enrollment			7.93	1	.005	.08			17.37	1	<.001	.12
Full-time	87	92					92	95				
Part-time	13	8					8	5				
Department			7.42	4	.116	.08			126.04	4	<.001	.31
Ecosystem Science and Sustain	4	5					4	4				
Fish, Wildlife, Conservation Bio	27	27					27	17				
Forestry Rangeland Stewardship	29	26					32	25				
Geosciences	9	6					9	13				
Human Dimensions Natural Res	31	36					28	41				

<sup>1</sup> Phi ( $\Phi$ ) is reported on Sex, Residency, and Enrollment. Cramer's *V* is reported on Class Standing and Department, per Vaske (2008, pp. 322-323).

In comparing MAPSE survey administrations (Table 5), the electronic survey had almost seven times as many questions as the classroom survey and took three times as long to complete. The electronic survey was administered to the WCNR undergraduate population and captured 23% of the students enrolled the college. It supported importance-performance (importance-satisfaction) (Martilla & James, 1977) and descriptive analyses. The classroom survey was administered in 30 WCNR course sections and captured 40% of the students enrolled in the college. Logistic regression and descriptive statistical analyses were supported by the classroom survey administration.

In looking at the demographics of survey participants relative to the WCNR population (Table 6), there were statistically significant differences on “Sex” ( $X^2 = 33.67, p = <.001, \Phi = .17$ ) and “Class Standing” ( $X^2 = 22.61, p = <.001, \text{Cramer's } V = .14$ ) for the electronic survey, although the effect sizes were minimal (Vaske, 2008, p. 108). The classroom survey also had a statistically significant difference on “Class Standing” ( $X^2 = 22.97, p = <.001$ ) and a similar minimal effect size (Cramer’s  $V = .13$ ). For the classroom survey, additional statistically significant differences were found on “Enrollment” ( $X^2 = 17.37, p = <.001$ ) and “Department” ( $X^2 = 126.04, p = <.001$ ). The effect size on “Enrollment” ( $\Phi = .12$ ) was minimal, and the effect size on “Department” (Cramer’s  $V = .31$ ) was typical.

### **Operational Elements to Support MAPSE**

Comparisons between operational elements to support MAPSE appear in Table 7. Two representatives from the WCNR administration and one WCNR faculty member provided leadership for the operations and survey administrations. Support staff included a survey administrator who prepared survey materials, coordinated survey scheduling, managed survey advertising, administered surveys, managed post-survey statistical analyses, and reported

findings. The survey administrator spent about 10 hours in actual administration of the electronic survey and 45 hours in administration of the classroom survey.

Hosting for the electronic survey was performed by Campus Labs® whose representatives spent about two and a half hours educating WCNR staff on formatting and scheduling, preparing the survey for hosting, and supplying reports of data collected. Comparatively, hosting for the classroom survey was provided by WCNR faculty who collectively gave approximately 7 hours in coordinating survey scheduling and providing on-site support to the administrator during the survey administration. For the classroom survey, an undergraduate student assisted with advertising, distributing the survey in classes, and organizing materials. The student provided about 20 hours of support in the actual administration of the survey.

CSU Student Affairs absorbed the cost of hosting the electronic survey with Campus Labs®. There were essentially no direct expenses for WCNR in administering the electronic survey since students accessed it online. For the classroom survey, WCNR incurred direct expenses in photocopying surveys and consent forms and purchasing optical scan forms and pencils.

Table 7

*Comparative Operational Elements Required to Support MAPSE*

Elements	Electronic Survey	Classroom Survey
WCNR Leadership	ADAA Assistant Director Professor	ADAA Assistant Director Professor
Support Staff	Survey Administrator Host: Campus Labs®	Survey Administrator Hosts: WCNR Faculty Student Assistant
Support Staff Hours		
Survey Administrator <sup>1</sup>	10+ hours	45+ hours
Host(s) <sup>2</sup>	2.5 hours	7 hours
Assistant	--	20 hours
Materials Required <sup>3</sup>	Online Survey Internet Connected Device Web Browser	Surveys Consent Forms Optical Scan Forms Pencils
Funding Sources	CSU Student Affairs WCNR	WCNR

<sup>1</sup> Only hours spent in the actual administration of surveys are provided. Hours spent undertaking statistical analyses and reporting findings were not included since those duties were performed in the context of the full evaluation and considered unlikely to represent a reporting cycle under MAPSE.

<sup>2</sup> Host hours for the classroom survey were estimated and based on  $n = 30$  faculty coordinating scheduling with the Survey Administrator by email for 5 minutes and providing survey administration support during 10 minutes of class.

<sup>3</sup> Students took the electronic survey on their own Internet-connected devices or accessed computers in the WCNR Computer Labs.

## **Discussion**

WCNR sought a formative participatory program evaluation to improve and enhance its student engagement assessment practices prior to establishing MAPSE. With strong client and stakeholder participation, the CIPP Model (Stufflebeam & Shinkfield, 2007) was used to evaluate elements of assessment *context*, *input*, and *process*. At the conclusion of the study, the evaluator provided a *product* evaluation through a summary of findings and recommendations on the college's assessment program, thereby completing the CIPP Model cycle (Stufflebeam & Shinkfield, 2007).

### **Establishment of MAPSE**

The evaluator found the college was well-positioned to go forward with establishing MAPSE provided: WCNR leadership remained committed to advancing the college's mission, goals, and objectives for assessment of student engagement; MAPSE remained aligned with CSU and WCNR strategic plans; WCNR Indices, Practices, and Themes of Engagement continued to apply to the actual practices and milestones in student engagement in the college; and the baseline findings from the surveys be used to develop outcomes of WCNR student engagement to be used in assessment.

The commitment of staff and material support from WCNR and CSU's Division of Student Affairs for administration of MAPSE surveys was deemed essential in the establishment of the assessment program. Because data on student achievement by grade point average, retention by semester, and degree completion at CSU could be obtained from the CSU Registrar, the evaluator recommended that MAPSE goals and objectives be expanded to include assessment of these cognitive psychological and behavioral dimensions (Astin & Antonio, 2012) of student academic success and degree attainment. The evaluator noted that with the administration of

MAPSE surveys at regular intervals, the assessment program will have the capacity to include longitudinal study of student engagement in WCNR.

### **Production of Department-Level Data**

The two surveys produced subsamples of students within WCNR departments. In that an original concern with WCNR student engagement assessment had been the lack of available department-level data, the evaluator concluded MAPSE survey formats were capable of producing data for department-level analyses of engagement in the college. The electronic survey provided a representative sample of students by “Department,” and the classroom survey provided a representative sample of students by “Sex.” The evaluator recommended that WCNR consider the practical significance of differences between the electronic and classroom surveys and the college’s goals in producing data on student engagement when considering which format to use in future MAPSE survey administrations.

### **Similarities between MAPSE and NSSE Variables**

WCNR Practices of Engagement bear resemblance to the practices assessed by NSSE. This was not surprising given that NSSE administrators and those associated with the survey have produced a body of literature documenting best practices in student engagement and success and advancing institutional delivery and assessment of engaging practices in the academy (Kuh, 2001; Kuh et al., 1991; Kuh et al., 2005; Kuh et al., 2007; Kuh et al., 2010; Wolf-Wendel et al., 2009). As described in the Findings section of this study, CSU (2010) and WCNR (2005) have included student engagement practices in their strategic plans, and the college has operationalized student engagement in its recruitment, retention, and instruction (WCNR, 2011b, 2012b, 2012c). In identifying WCNR indices and practices for assessment of

student engagement, the goal was not to replicate NSSE benchmarks and variables but to identify practices associated with WCNR engagement and organize them for MAPSE.

It was recommended that MAPSE data be combined with NSSE data on WCNR students to support examination of the relationships between affective psychological and behavioral dimensions (Astin & Antonio, 2012) of student engagement in the college. Further, to encourage participation in MAPSE and support participation in NSSE, the evaluator recommended MAPSE surveys only be administered in years when NSSE is not administered at CSU.

### **MAPSE Student Outcomes as Dashboard Indicators**

The college's evaluation of student engagement assessment produced baseline data to support the establishment of outcomes of student engagement in the college. In establishing student outcomes, the college could develop related dashboard indicators (Terkla, Sharkness, Roscoe, & Wiseman, 2012; Volkwein, 2010) of the affective psychological dimensions of WCNR student engagement (Astin & Antonio, 2012). Combined with the affective behavioral dimensions (McCormick & McClenney, 2012) reported in NSSE's Benchmarks of Effective Educational Practice (NSSE, 2012b), the indicators could support decision-making on the quality and effectiveness of WCNR student engagement (Pike, 2013) and provide direction for student and faculty development in the college (Hersh & Keeling, 2013). It was recommended that, MAPSE surveys contain independent and dependent variables standardized across survey formats if the college seeks to produce dashboard indicators for student engagement.

### **Implications for Practice**

#### **Effective Academic and Student Affairs Collaboration**

This evaluation and the related assessment of WCNR student engagement serve as examples of effective academic and student affairs collaboration advanced by Frost et al. (2010),



Manning et al. (2006), and Whitt et al. (2008). A report from the National Institute for Learning Outcomes Assessment argued for *Changing Institutional Culture to Promote Assessment of Higher Learning* (Hersh & Keeling, 2013) and recommended “tighter coupling of academic and student affairs” (p. 11) to build on established collaboration in the delivery of student engagement and high-impact practices (Kuh, 2008; Kuh et al. 2010), such as learning communities, experiential learning, service learning, advising, and first-year seminars (Hersh & Kelly, 2013, p. 11).

As a testament to the collaborative endeavor undertaken between WCNR and CSU’s Division of Student Affairs, before this evaluation was complete, the findings on outcomes of WCNR student engagement were used to support a budget request to the university to enhance advising in the college. For the classroom survey, students had reported their lowest levels of satisfaction on “faculty advising related to other college opportunities (e.g., research, scholarships, graduate school, or career plans).” Since the findings had been similar to those in the electronic survey, in the 2012-2013 academic year, coordinators of academic advising were funded in each WCNR department to improve advising delivery, make information more readily available to students, and reduce individual faculty loads in advising. Such an operational enhancement might not have been achieved without the collaborative efforts between academic and student affairs to assess and evaluate student engagement in WCNR.

### **Assessment in Natural Resource and Interdisciplinary Environmental Education**

Palmer observed in 1998 that an emerging trend in EE was to connect “empirical research and the improvement of practice” (p. 119). Seven years later, the U.S. National Environmental Education Advisory Council (2005) affirmed the role of research in documenting:

- changes in environmental knowledge, skills, attitudes, and behaviors;
- effectiveness of instructional materials and strategies;

- impact of professional development on formal and nonformal educators;
- effectiveness of environmental education in improving student achievement and meeting education reform goals;
- impact of environmental education on meeting environmental protection goals; and
- overall status of the field. (p. 35)

The Council was blunt in recommending that beyond research on environmental education, “assessment is needed to document . . . outcomes, in turn, [to] point to which programs, products, and services are working—and why” (p. 34).

The evaluation of student engagement assessment advanced in this case study serves as a primer for others interested in developing natural resource and interdisciplinary EE assessment practices in their programs and colleges. Further, because the case study was undertaken in a college of natural resources committed to practices of student engagement, the study’s findings may have immediate utility for others in similar fields (Vincent, 2010) seeking to inform, improve, and enhance their engagement-related educational delivery. The study may also lay foundations for the development of dashboard indicators for interdisciplinary EE engagement practices in the academy at-large.

### **Concluding Remarks**

Orr (1992, p. 90) famously said, “All education is environmental education,” and at the first Rio Earth Summit, Rolston (1996, p. 189) added, “On this planet in crisis . . . university education that is not environmental education is no education at all.” Orr and Rolston’s admonitions to place environmental education at the core of education in our time surely inspire those working in natural resource and interdisciplinary EE to create, promote, and support opportunities that engage all students. In evaluating and assessing practices of engagement, we have the capacity to improve and enhance educational delivery and ensure we are preparing students to be the leaders and professionals our world in crisis urgently needs.

CHAPTER 3: WIDENING THE LENS OF ASSESSMENT  
ON STUDENT ENGAGEMENT IN ENVIRONMENTAL AND  
NATURAL RESOURCE EDUCATION

**Introduction**

Student engagement in higher education is described by Indiana University’s Center for Postsecondary Research (CPR) as focusing on “the amount of time and effort students put into their studies and other educationally purposeful activities” and “how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate” (NSSE, 2012a, para. 1). Engagement theory arose from research on student development and the quality of the undergraduate student experience (Astin, 1984; Dewey, 1938; Kuh, 2001; NSSE, 2012a; Pace, 1980, 1984) and demands for public accountability in American higher education (Ewell, 2010; Kuh, 2001, 2009; NSSE, 2012a; Pike & Kuh, 2005). Student engagement is important because the practices associated with it support student success in higher education (Astin, 1975, 1977, 1984; Kuh, 2003a; Kuh, Kinzie, Schuh, Whitt, & Associates, 2010; Pace, 1980, 1984; Pascarella & Terenzini, 1991, 2005), including student retention and degree completion (Kuh et al., 2010; National Leadership Council for Liberal Education and America’s Promise, 2009; Pascarella & Terenzini, 2005).

Engagement theory was used to construct the National Survey of Student Engagement (NSSE), which has been administered to 3.7 million undergraduates in the United States and Canada since 2000 (NSSE, 2012a). The survey primarily measures affective behavioral dimensions (Astin & Antonio, 2012) of engagement through students’ self-reports of the amount of time or effort they spend in engagement-related activities (McCormick & McClenney, 2012). Because NSSE variables and measures are backed by over four decades of research “related to

persistence and subsequent success in college” (NSSE, 2012e, para. 5), the survey’s findings are conceived as indicators of success in the academy (Kuh, 2004; McCormick & McClenney, 2012). NSSE results allow institutions to check their “investment . . . to proven instructional practices and the kinds of activities, experiences, and outcomes that their students receive” (NSSE, 2012e, para. 5).

Since the establishment of NSSE, certain engagement practices have been shown to be strongly associated with student “learning and personal development” (NSSE, 2012b) leading NSSE administrators to promote them as Benchmarks of Effective Educational Practice (Kuh, 2001, 2003b; NSSE, 2000). NSSE Benchmarks have included “student behaviors and institutional features” (NSSE 2012b, para. 1) organized under five sets of practices related to academic challenge, active and collaborative learning, student-faculty interaction, supportive campus environment, and enriching educational experiences (NSSE, 2012b). High-Impact Practices (Kuh, 2008) positively associated with student retention have been identified through NSSE-related findings: first-year seminars; common intellectual experiences; learning communities; writing-intensive courses; collaborative assignments and projects; undergraduate research; diversity/global, service, and community-based learning; internships; and capstone course and projects.

### **Documenting Engagement in Environmental and Natural Resource Education**

Environmental education (EE) has historically promoted the kinds of practices associated with NSSE Benchmarks and High-Impact Practices. In the Tbilisi Declaration, United Nations representatives recommended EE delivery include problem-solving, working with others, active learning, involvement, and engagement in applied and experiential placements (UNESCO, 1978, p. 27), practices later included in the NSSE Benchmarks (NSSE, 2000). The Tbilisi delegates

were also prescient in emphasizing global education (UNESCO, 1978, pp. 40-41) and advocating for “diverse learning environments” (UNESCO, 1978, p. 27), two practices found among the High-Impact Practices (Kuh, 2008).

At the beginning of the 21<sup>st</sup> century, many student engagement practices appear to have become common place in higher education EE delivery. Vincent (2010, pp. 19-20) identified problem-solving, writing, research, and community engagement as common to interdisciplinary EE in the natural resources, natural sciences, social sciences, and humanities. In the related EE field of sustainability education, Holdsworth, Thomas, and Hegarty (2013, p. 353) described “collaborative learning, problem solving . . . and experiential learning” as key practices of engagement.

### **Assessing Engagement in Environmental and Natural Resource Education**

With growing national interest on student engagement since the first NSSE administration in 2000, CPR has developed relationships with a variety of consortia and system participants (NSSE, 2013a) that have customized NSSE administrations for their members (NSSE, 2013b). A Sustainability Education Consortium was established with CPR in 2011 (NSSE, 2013a). There is no NSSE consortium for EE or natural resources.

Faculty and researchers in environmental and natural resource fields wishing to examine students’ engagement more closely have undertaken a variety of assessments on individual engagement practices including active and collaborative learning (Thompson, Jungst, Colletti, Licklider, & Benna, 2003); cooperative learning (Etchberger, 2011); experiential learning (Millenbah & Millspaugh, 2003; Scott, Turnbull, & Spencer, 2008); fieldwork (Scott et al., 2012); service learning (Newman, Bruyere, & Beh, 2007; Prokopy, 2009); undergraduate research (Kinkel & Henke, 2006); and writing (McLaren & Webber, 2009). These studies

include quantitative, qualitative, and mixed-methods approaches and case-level and longitudinal analyses. The studies have a common focus on undergraduate courses or programs, and study findings support engagement practices to enhance student learning and development.

### **Widening the Lens of Assessment**

To widen the lens of assessment beyond NSSE's primary focus on affective behavioral dimensions and EE-related examinations of individual engagement practices, Colorado State University's (CSU) Warner College of Natural Resources (WCNR) initiated an assessment of student perceptions of importance and satisfaction on variables of engagement in the natural resources. Through the study, WCNR also sought to identify perceived barriers to student success in the college. Three questions guided the assessment:

1. How do WCNR's students perceive the importance of the college's student engagement-related practices?
2. Are WCNR students satisfied with the student engagement-related practices in the college?
3. What barriers to their success do students face in WCNR?

The study was undertaken in spring 2011 using a survey administered online. All undergraduate natural resource students in the college were invited to participate.

### **Institutional Context**

#### **Colorado State University**

CSU is among the universities which have regularly participated in NSSE, having administered the survey on campus eight times since 2001 (CSU, 2012; NSSE, 2012f). The university's strategic plan emphasizes its commitment to engagement (CSU, 2010), and campus decision-makers utilize NSSE as a "primary institutional level tool . . . to measure student

engagement” (CSU, 2012, para. 1). CSU provides access to its NSSE results on its website (CSU, 2012) and through participation in the Voluntary System of Accountability (VSA) (2012a, 2012b) and the College Portrait (2012a, 2012b), websites reporting college costs, student enrollment and persistence, and educational outcomes for American public higher education.

### **Warner College of Natural Resources**

As the largest named and most comprehensive natural resources college in the United States (WCNR, 2012c), WCNR is committed to being a “global leader in learning, discovery, and engagement that guides natural resource conservation, sustainability, and stewardship” (WCNR, 2011a, para. 6). In the college’s commitment to engagement, the WCNR faculty and administration believed NSSE data useful in informing their policy and practices; however, they desired information on engagement NSSE did not provide. In reviewing NSSE, college leaders found (a) an emphasis on behavioral measures and comparative lack of psychological measures related to engagement; (b) a lack of assessment on WCNR-specific variables of engagement; and (c) a lack of reported barriers to student success. To widen the lens of assessment on WCNR student engagement, the college sought to study students’ perceived importance and satisfaction with WCNR-specific practices of engagement. They also wished to determine barriers faced by students. The college-level assessment was to inform the delivery of WCNR student engagement and aid in decision-making on where to direct resources toward engagement-related practices.

### **Conceptual Framing**

#### **WCNR Indices of Student Engagement**

In seeking to conduct assessment on importance and satisfaction with WCNR-specific practices, WCNR Indices of Engagement were conceptualized. Variables and measures from pilot studies of engagement administered by college officials were organized in a matrix display

(Miles & Huberman, 1994; Nadin & Cassell, 2004). Using qualitative document analysis (Altheide, Coyle, DeVriese, & Schneider, 2008) and the constant comparative method (Glaser, 1965; Strauss & Corbin, 1998), additional variables were identified through a review of college materials, including major program guidelines (WCNR, 2011b), prospective student information (WCNR, 2012b), and the WCNR (2005) strategic plan. Principal component analysis of pilot study data guided grouping of variables, and peer debriefing (Creswell, 2009) was used to finalize the organization of variables in five WCNR Indices of Student Engagement:

- Warner Course Experiences;
- Warner Experiential Learning;
- Warner Faculty Advising;
- Warner Community and Climate; and
- Natural Resource Professionalism.

The variables incorporated in the indices were consistent with WCNR practices and supported by the literature associated with student effort, involvement, and engagement in higher education (Astin, 1984; Bonwell & Eison, 1991; Chickering, 1977; Chickering & Gamson, 1987; Feldman & Newcomb, 1970; Kuh, 2008; Kuh et al., 2010; Pace, 1984; Pascarella & Terenzini, 1991, 2005).

### **Barriers to Student Success**

Potential barriers to student success were conceptualized prior to the assessment. Cost of college, not enough financial aid, sequence of class offerings, changing majors, transferring to CSU, and work, health, and family issues were thought to be potential challenges faced by WCNR students. It was agreed the assessment should include a write-in option to give students the opportunity to self-report barriers not listed on the survey.



## **Methods**

Following approval from CSU's Institutional Review Board (Appendices A and B), the survey (Appendix C) was administered in spring 2011 in coordination with Campus Labs®, a firm that works with higher education institutions and organizations to administer online surveys. The survey included 87 questions related to importance, satisfaction, and barriers to student success.

### **Sampling Design**

All undergraduates in WCNR were sent a pre-invitation, invitation, and two email reminders to take the survey (Appendices D through G.) Each student was also mailed a postcard invitation (Appendix H), and the survey was advertised on a flyer (Appendix I) posted in WCNR buildings and appearing on screens in WCNR computer labs. Links to the electronic survey were embedded in the email invitation and reminders. By clicking on the link to the survey, students granted consent to participate in it. A total of 279 undergraduates, 23% of the college's undergraduate population, responded to the survey.

### **Collection of Demographic Data**

Following the survey administration, demographic data—including sex, residency, class standing, enrollment status, and department affiliation—were obtained for WCNR undergraduates through the CSU Registrar's Office.

### **Measures**

For the WCNR Indices of Student Engagement, importance questions were asked on 5-point scales with response categories ranging from “very unimportant” (–2) to “very important” (2). For each importance question, there was an associated satisfaction question. The satisfaction questions were asked on 5-point scales that ranged from “very dissatisfied” (–2) to “very

satisfied” (2). A question on barriers to student success was asked, and students were given the option to “check all that apply.” They could also write-in challenges not listed.

## **Analyses**

Comparative descriptive analyses of demographic characteristics of the sample and WCNR population were conducted.

For individual practices of WCNR Student Engagement, percentages were combined for students selecting “important” and “very important” and for those reporting “unimportant” or “very unimportant.” Similarly, percentages were combined for those selecting “satisfied” and “very satisfied.” and those selecting “unsatisfied” and “very unsatisfied.” Mean values and standard deviations for importance and satisfaction on the WCNR Practices of Student Engagement were calculated using the 5-point scales (–2 to +2). Means and standard deviations on importance and satisfaction for each of the five WCNR Indices of Student Engagement were calculated. Internal consistency of the indices was examined using Cronbach’s alpha.

Following conventions in importance-performance or importance-satisfaction analysis (Martilla & James, 1977), the mean values for each pair of practices were graphed on matrices (Figure 1a). Importance was plotted on the y-axis and satisfaction was plotted on the x-axis. The quadrants were labeled based on interpretive models by Havitz, Twyman, and DeLorenzo (1991) and Williams and Neal (1993): “keep up the good work,” “concentrate efforts here,” “low priority,” and “possible overkill.” To provide further interpretation for means falling under “keep up the good work,” a second grid was designed and overlaid on that category (Figure 1b). In considering “building on good work,” the quadrants were labeled: “concentrate here,” “potential to raise satisfaction,” “potential to raise importance,” and “keep up the good work.”

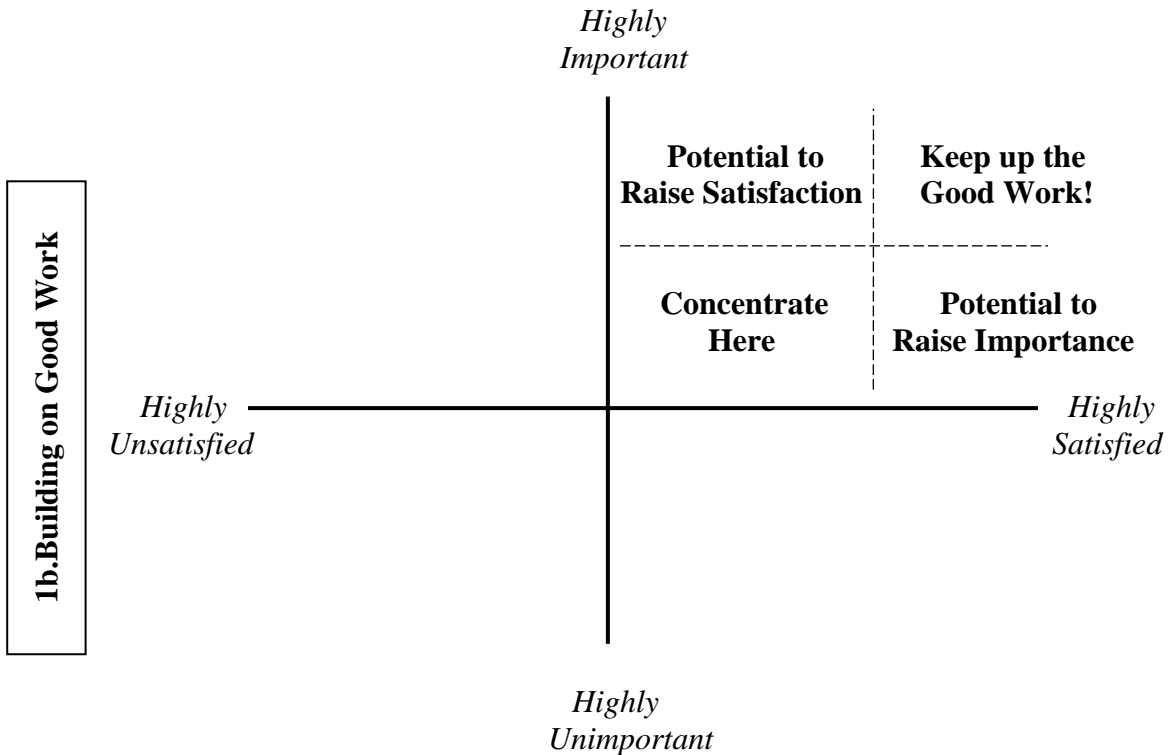
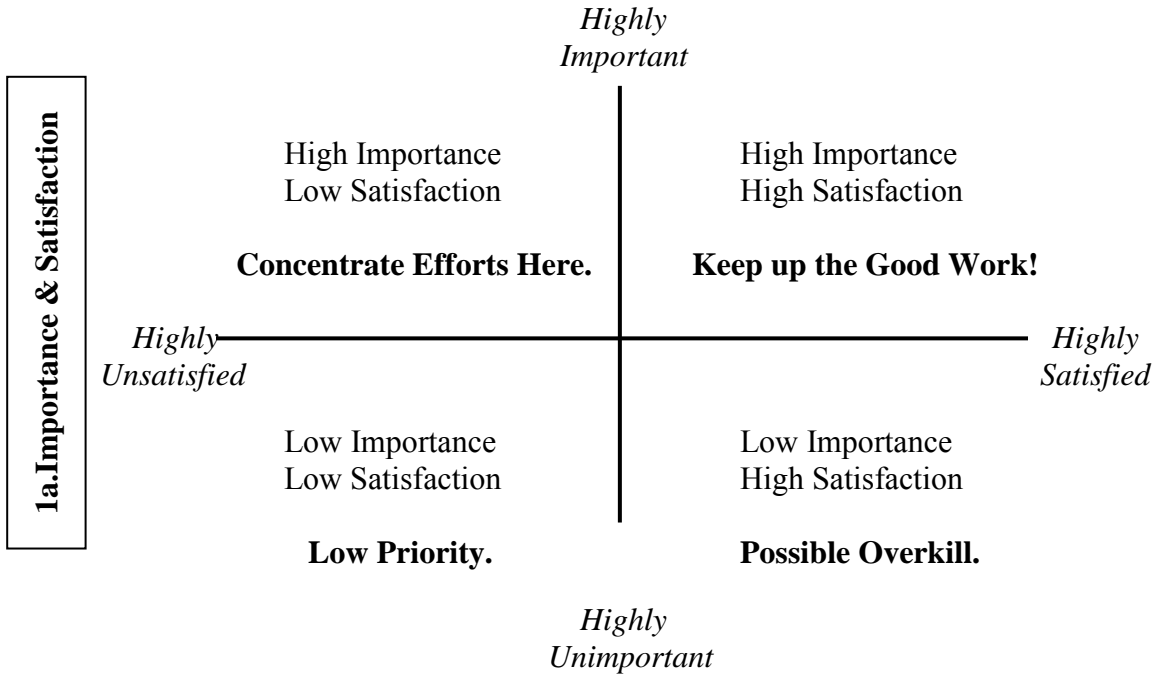


Figure 1. Importance and Satisfaction Measures and Interpretive Grids.

## Results

### Descriptive Analyses

Relative to the WCNR population, the electronic survey provided a sample that overrepresented females by 15% and underrepresented males by 15% (Table 8). Seniors were overrepresented by 9% and sophomores were underrepresented by 7%. For all other demographic variables in the electronic survey administration, the difference between the WCNR population and WCNR sample was 5% or less.

Table 8

*Comparative Percentages for Survey Population and Sample*

Demographics	Population <i>N</i> = 1,214	Sample <i>n</i> = 279
Sex		
Male	63	48
Female	37	52
Resident		
Colorado	75	75
Non-Colorado	25	25
Class Standing		
Freshman	13	8
Sophomore	23	16
Junior	26	29
Senior	38	47
Enrollment Status		
Full-time	87	92
Part-time	13	8
WCNR Department		
Ecosystem Science and Sustainability	4	5
Fish, Wildlife and Conservation Biology	27	27
Forestry and Rangeland Stewardship	29	26
Geosciences	9	6
Human Dimensions of Natural Resources	31	36

## **Importance and Satisfaction Percentages**

In general, students rated the importance of WCNR engagement higher than their satisfaction (Table 9). For Warner Course Experiences, 94% of participants considered fieldwork important, yet 41% were satisfied with fieldwork opportunities. Similarly, 89% saw problem-solving as important yet 65% were satisfied. There were some exceptions to this pattern. Half of the students (50%) believed it was important to do group assignments and 53% were satisfied with such assignments.

Warner Experiential Learning had the largest differences on importance ratings. For example, 86% saw internships as important, while 37% considered residential learning communities important. The percentage of students reporting satisfaction on experiential learning practices was consistently lowest across all indices.

For all eleven practices within Warner Faculty Advising, 75% or more of participants valued the importance of the various forms of advising. Satisfaction with these items, however, was consistently lower than importance. For example, 71% were satisfied with advising for major and minor options, while 95% considered such advising important to their education.

The Warner Community and Climate practices were important to students. High percentages viewed the importance of the WCNR community being friendly (97%) and supportive (95%) and WCNR common spaces being welcoming (89%). Almost as many students (82% or more) were satisfied with these community elements.

For seven of the eight practices in the Natural Resource Professionalism index, 85% or more of students acknowledged their importance. The exception—writing on what is learned—was rated as important by 70% of the students. The percentages of students satisfied with practices in Natural Resource Professionalism were the highest across all five indices. At least

Table 9

*Importance and Satisfaction on WCNR Indices and Practices of Engagement*

WCNR Index Practices Ordered by Importance (%)	<i>Importance</i> <sup>1</sup>				<i>Satisfaction</i> <sup>2</sup>			
	%	<i>m</i>	<i>SD</i>	$\alpha$	%	<i>m</i>	<i>SD</i>	$\alpha$
Warner Course Experiences		.85	.51	.73		.57	.58	.81
Fieldwork	94	1.61	.67		41	.13	1.27	
Problem-solving	89	1.29	.70		65	.72	.85	
Discussions	86	1.21	.81		74	.86	.79	
Lab work	71	.93	.93		58	.59	.95	
Community service	60	.70	1.06		34	.18	1.04	
Final projects	58	.61	.85		65	.75	.75	
Presentations	55	.50	1.02		66	.71	.85	
Writing papers	55	.52	.85		65	.73	.77	
Group assignments	50	.30	1.14		53	.43	1.00	
Warner Experiential Learning		.74	.58	.71		.39	.56	.73
Internship	86	1.32	.86		50	.51	.94	
Undergraduate research	83	1.05	.81		41	.32	.92	
Pingree Park	67	1.04	1.08		55	.79	1.06	
Community service	57	.63	.99		32	.20	.91	
Study abroad	54	.65	1.02		34	.37	.91	
Undergraduate or honors thesis	38	.30	.91		24	.22	.80	
Residential learning community	37	.17	1.07		29	.32	.76	
Warner Faculty Advising		1.31	.51	.87		.50	.73	.92
Major or minor options	95	1.51	.65		71	.79	.99	
Planning classes to take	93	1.50	.66		70	.75	1.08	
Career plans	91	1.50	.71		44	.30	.99	
Internships	89	1.44	.72		49	.39	1.09	
Course assignments	84	1.10	.83		74	.88	.81	

WCNR Index Variables Ordered by Importance (%)	<i>Importance</i> <sup>1</sup>				<i>Satisfaction</i> <sup>2</sup>			
	%	<i>m</i>	<i>SD</i>	$\alpha$	%	<i>m</i>	<i>SD</i>	$\alpha$
Warner Faculty Advising (continued)								
Registering for classes	84	1.18	.90		63	.65	1.08	
Field placements	84	1.39	.76		39	.24	1.02	
Course grades	83	1.10	.84		76	.88	.81	
Research	83	1.28	.81		39	.23	1.03	
Scholarships or fellowships	83	1.32	.79		36	.17	1.06	
Graduate school	75	1.06	.91		33	.18	.87	
Warner Community and Climate		1.07	.58	.85		.88	.67	.91
Friendly community	97	1.57	.56		91	1.29	.70	
Supportive community	95	1.53	.61		87	1.22	.75	
Welcoming common spaces	89	1.31	.72		82	1.12	.89	
Feeling valued as a community member	79	1.16	.82		65	.81	.94	
Family-like community	70	1.02	.99		63	.78	.94	
Social events	61	.69	.98		59	.80	.85	
Student clubs	59	.74	.92		52	.64	.89	
Volunteer work	50	.55	.94		36	.41	.84	
Warner Natural Resource Professionalism		1.39	.51	.85		.89	.64	.89
Develop career-based knowledge and skills	98	1.73	.49		78	1.02	.84	
Apply knowledge to real-world problems	97	1.59	.57		73	.87	.87	
Learn diverse perspectives	93	1.41	.70		73	.87	.87	
Discuss current issues	92	1.44	.67		82	1.01	.82	
Practice conservation, sustainability, or stewardship	91	1.54	.77		67	.96	.87	
Work cooperatively with diverse people	86	1.26	.83		67	.80	.87	
Explore ethical or social issues	85	1.28	.81		66	.78	.86	
Write on what is learned	70	.89	.88		68	.82	.85	

<sup>1</sup> Cell entries are the percentage of students rating items as important or very important.

<sup>2</sup> Cell entries are the percentage of students reporting satisfied or very satisfied.

66% and as many as 82% of students said they were satisfied with their professional development experiences in natural resources.

### **Importance and Satisfaction Means**

As reported in Table 9, all indices and practices had positive mean values. Indices had good reliability ( $\alpha > .70$ ) (Vaske, 2008, p. 518). The index with the highest mean values on importance ( $m = 1.39, SD = .51$ ) and satisfaction ( $m = .89, SD = .64$ ) was Natural Resource Professionalism. The index with the lowest mean values on importance ( $m = .74, SD = .58$ ) and satisfaction ( $m = .39, SD = .56$ ) was Warner Experiential Learning.

### **Importance and Satisfaction Matrices**

As displayed in Figures 2 through 6, plotting the mean values for the practices highlighted the importance-satisfaction relationships in the five indices. For each practice, mean values were positive and fell in the upper right quadrant of the matrix. The results indicated as per Figure 1a, the college should “keep up the good work” because all means represented importance of and satisfaction with WCNR engagement.

When the second grid was overlaid on the “keep up the good work” area as per Figure 1b, each of the five indices had some means which fell outside the smaller upper right hand corner (i.e., “keep up the good work”). All such means indicated opportunities for “building on good work” by raising importance or satisfaction for students. Means that fell in the lower left hand corner of the secondary grid (i.e., “concentrate here”) indicated opportunities for the college to raise both importance and satisfaction in relation to the quality of student engagement. Means that fell in the upper left hand corner of the secondary grid (i.e., “potential to raise satisfaction”) indicated opportunities for the college to increase students’ satisfaction with the



quality of their engagement. No means fell in the lower right hand corner of the secondary grid (i.e., “potential to raise importance”).

For Warner Course Experiences (Figure 2), several means fell within the “concentrate here” category, meaning both importance and satisfaction measures could be raised. There were several means for which the satisfaction alone could be raised (e.g., fieldwork, problem-solving, and discussions). The lowest levels of satisfaction were on fieldwork and community service.

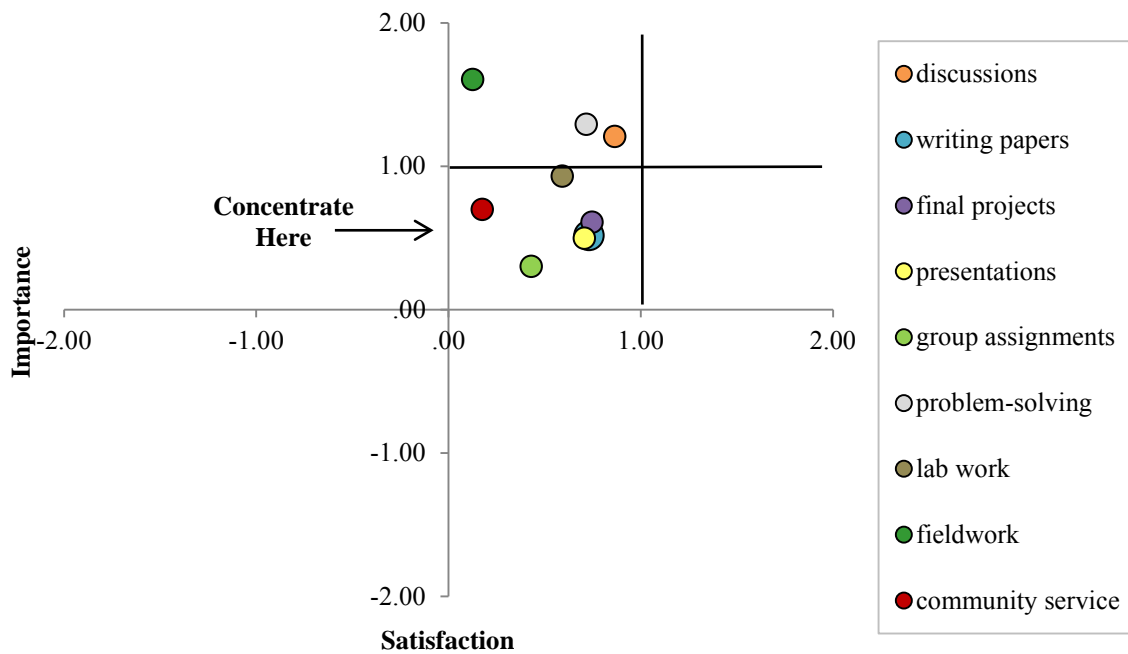


Figure 2. Warner Course Experiences: Importance–Satisfaction Means

As with Warner Course Experiences, many of the means for Warner Experiential Learning fell in the “concentrate here” category (Figure 3). Pingree Park had one of the highest mean values for importance and the highest mean value on satisfaction. Internships and undergraduate research opportunities were similarly noted as important. The lowest levels of importance and satisfaction within a single index, however, occurred within Warner Experiential Learning.

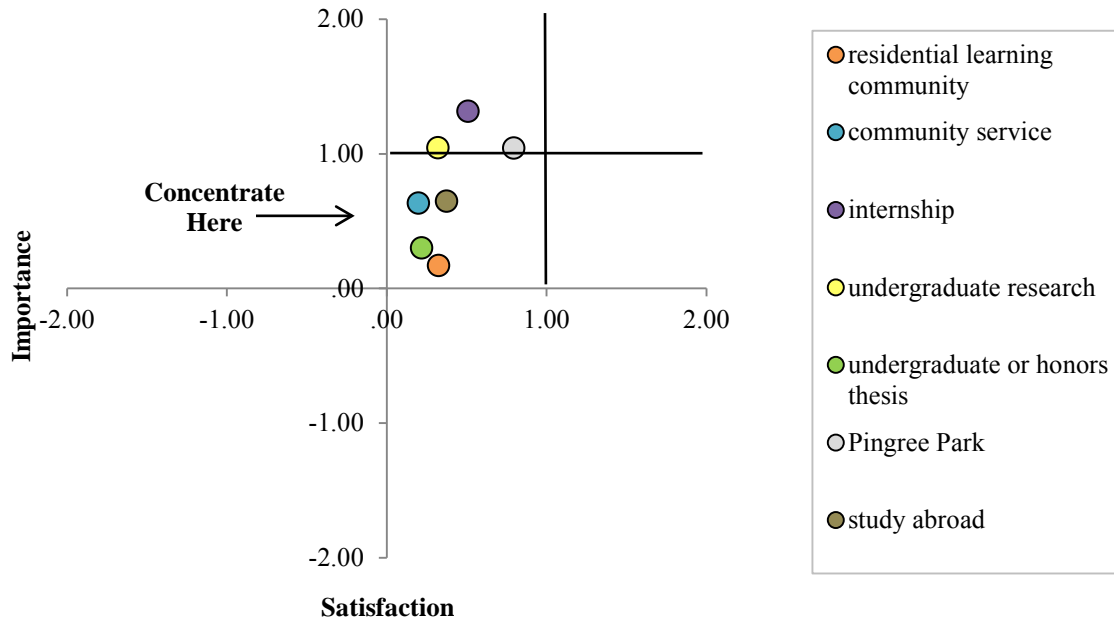


Figure 3. Warner Experiential Learning: Importance–Satisfaction Means

For Warner Faculty Advising, all the means fell under the category of “potential to raise satisfaction,” meaning students placed high levels of importance on the various variables but did not register equally high satisfaction (Figure 4). Students were most satisfied with the advising they received for course assignments and grades, major and minor options, and planning courses to take. They were least satisfied with advising on graduate school, scholarships or fellowships, research, and field placements.

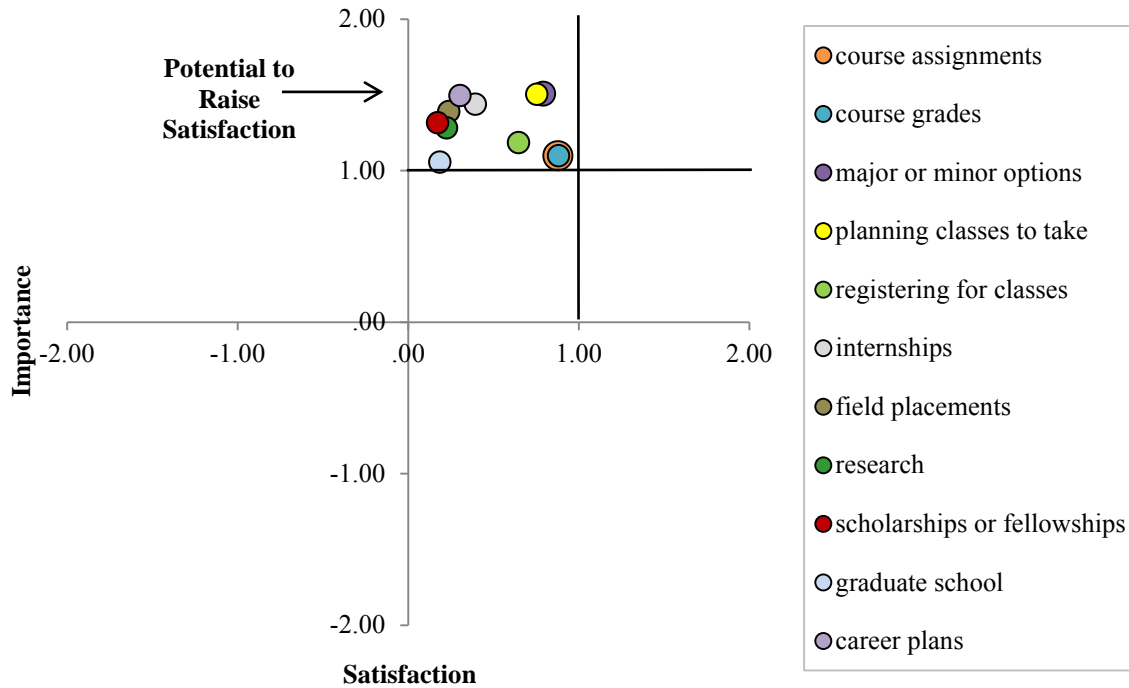


Figure 4. Warner Faculty Advising: Importance–Satisfaction Means

The students placed high importance and satisfaction on the friendly and supportive nature of the WCNR community and their feeling of being welcomed in WCNR common spaces (Figure 5). They also showed high levels of importance and satisfaction with other variables in Warner Community and Climate. This index was the only one of the five to have practices fall in the category of “keep up the good work.” Several of the practices in the index, however, fell in “concentrate here,” indicating opportunities for improving Warner Community and Climate.

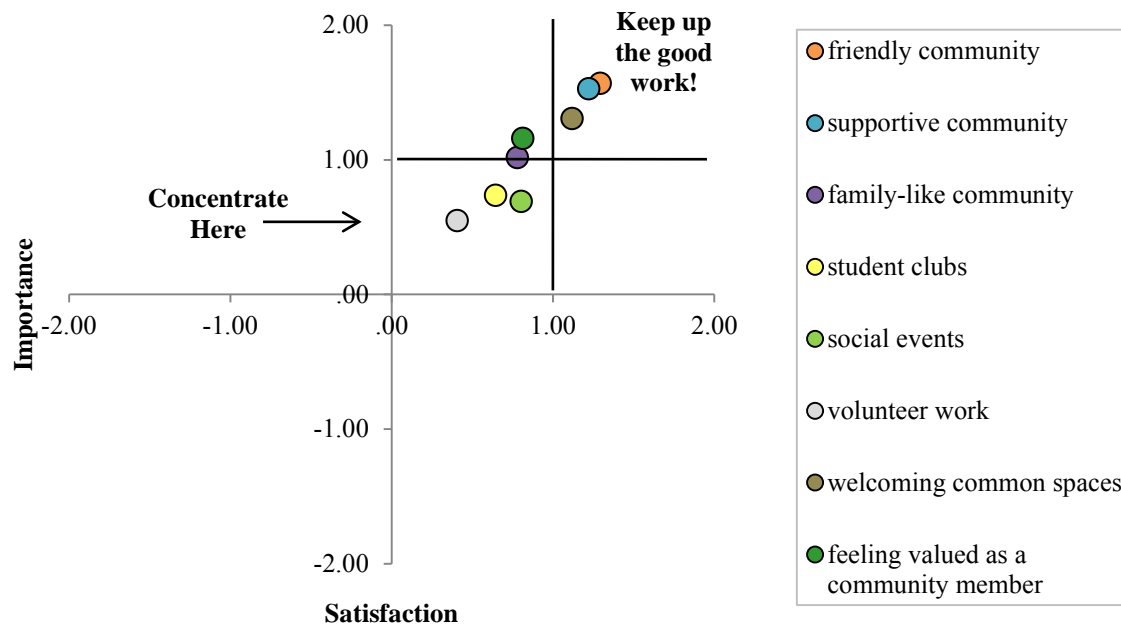


Figure 5. Warner Community and Climate: Importance–Satisfaction Means

Finally, measures of importance on the eight practices related to Natural Resource Professionalism (Figure 6) clustered closely with practices of satisfaction, and almost all fell very near the “keep up the good work” category. One practice, “write on what is learned,” fell outside the cluster. Although it was located in the “concentrate here” quadrant, it was close to being within “keep up the good work.” Overall, Natural Resource Professionalism had the highest mean values on importance and satisfaction for all WCNR Indices of Student Engagement.

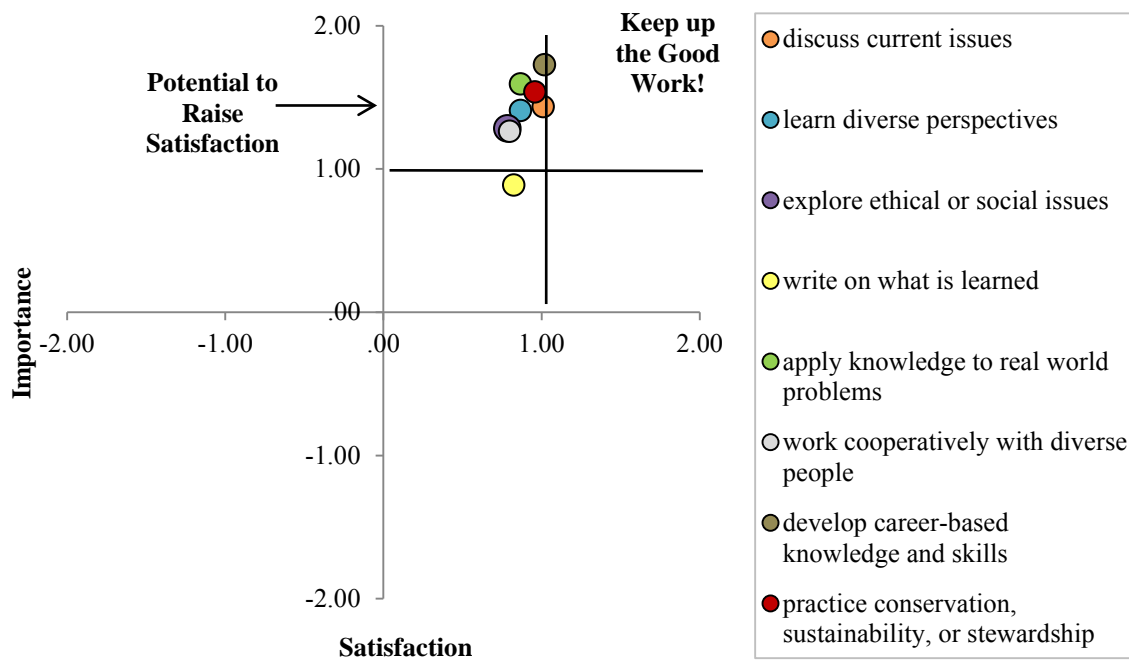


Figure 6. Natural Resource Professionalism: Importance–Satisfaction Means

## Barriers to Student Success

Table 10 displays the reported barriers to WCNR student success. Because students could “check all that apply,” they typically provided more than one response. The most common item identified was the cost of college, with 68% of participants selecting it as a barrier. Roughly half the students reported the sequence of class offerings (53%) and not having enough financial aid (46%) as barriers to their success. Almost one in ten survey participants (9%) identified other barriers: advising; class scheduling; student status (e.g., being an athlete or transfer student); minor program options; social, relational, or personal problems; and feeling unchallenged.

Table 10

*Percentage of Participants Identifying Barriers to Student Success*

Barriers <sup>1</sup>	Participants <i>n</i> = 279
Cost of college	68
Sequence of class offerings	53
Not enough financial aid	46
Transferred to CSU	29
Work issues	29
Changed majors	24
Family issues	19
Health issues	9
Other barriers? <sup>2</sup>	9
<ul style="list-style-type: none"> <li>• advising issues</li> <li>• class scheduling issues</li> <li>• being a student athlete or non-traditional, commuter, or transfer student</li> <li>• difficulty in pursuing minor program studies in other colleges at CSU</li> <li>• social, relational, or personal problems</li> <li>• lack of challenge</li> </ul>	

<sup>1</sup> Items listed under “Other barriers?” were the most common responses, ordered by frequency, provided by participants.

## **Discussion**

### **Summary of Findings on WCNR Student Engagement**

Whereas NSSE primarily focuses on affective behavioral dimensions of engagement (McCormick & McClenney, 2012, p. 310), WCNR looked at affective psychological dimensions (Astin & Antonio, 2012) of engagement in natural resource undergraduates. The assessment of WCNR student engagement augmented data generated from CSU's participation in NSSE to provide a fuller picture of dimensions of engagement in the college.

In widening the lens of assessment, WCNR Indices of Student Engagement were conceptualized to assess students' importance and satisfaction with practices specific to the college's course experiences, experiential learning, faculty advising, community and climate, and development of students as natural resource professionals. Each index had reliable internal consistency, and means for the indices and practices indicated students found WCNR engagement both important and satisfying. Students' highest levels of importance and satisfaction were with Natural Resource Professionalism and their lowest levels of importance and satisfaction were with Warner Experiential Learning. A variety of barriers to student success were identified with the cost of college and the sequence of course offerings commonly perceived as challenges to the majority of students. Transferring to CSU, not having enough financial aid, work issues, and changing majors were also frequently identified as barriers.

### **Implications for Delivery of WCNR Student Engagement**

Findings from the importance-satisfaction analyses on Natural Resource Professionalism and Warner Faculty Advising stood out, because they revealed students understood the importance of professional development and advising practices. In terms of their development as

natural resource professionals, the students were generally satisfied. Comparatively, they had lower levels of satisfaction with advising.

Three WCNR Indices of Engagement had a mix of practices on which the college could concentrate efforts to raise students' perceived importance and satisfaction. Within Warner Experiential Learning, the college identified residential learning communities, undergraduate or honors theses, community service, and study abroad as target areas. For Warner Course Experiences, community service, group assignments, presentations, writing papers, and final projects were noted as areas of concern, and for Warner Community and Climate, volunteering, student clubs, and social events were identified. These findings were used to inform faculty and administrators on students' perceptions of engagement in WCNR.

WCNR leadership believed they had gained sufficient information from the assessment to seek improvement in the delivery of advising in the college. In addition to the lower levels of satisfaction on advising, findings on barriers to student success showed that the sequence of class offerings, major changes, class scheduling, and other non-specific advising issues were challenges students faced. WCNR leaders carried the survey findings to CSU Student Affairs which was weighing similar campus-wide student concerns with advising. When funds were allocated in 2012 to increase the number of professional academic advisors on campus, WCNR was able to hire full-time academic advisors for its departments to better support students and faculty advising loads. Future assessment of WCNR student engagement will help determine whether satisfaction increases and barriers decrease in relation to advising in the college.

Findings on barriers unrelated to academic advising—such as, the cost of college and financial aid—were used to support college fundraising and scholarship activities on behalf of students. Other findings on barriers informed the administration and faculty on the personal



challenges students face related to work, family, or health issues and their status as student athletes and non-traditional, commuter, or transfer students.

### **Limitations of the Study and Future Directions for Research**

The analysis of data generated in this assessment of WCNR student engagement was limited to importance-satisfaction analysis and identification of barriers to student success. Analyses were not undertaken to examine relationships between students' levels of importance or satisfaction and dependent variables, for example, of student academic achievement or degree completion. Based on the findings from this study, the college planned additional research to examine student satisfaction in relation to student persistence and success.

#### **Further Widening the Lens: Professionally Purposeful Activities**

For the fields of environmental and natural resources education, the results from the study indicated that students found *educationally purposeful* (NSSE, 2012a) and *professionally purposeful* activities important in their collegiate experience.

In decades past, educational leaders like Super (1953) and Harrison (1968) emphasized the obligation of the academy to support students' professional development. More recently, organizations such as the National Research Council (2012) and the New Leadership Alliance for Student Learning and Accountability (2012) have stressed that education must equip students with "skills to success in education [and] work" (National Research Council, 2012, p. 37). In that WCNR students valued practices supporting their development as natural resource professionals, they appeared to understand the connections between their engagement in their education and their future engagement in "the world of work" (Harrison, 1968, p. 667).

Orr (2004) warned that a danger in higher education is that students will "find careers before they find a decent calling. . . . about the use one makes of a career . . . about purpose" (p.

23). In their choice to become watershed scientists, geologists, foresters, wildlife biologists, park rangers, ecotourism managers, and environmental communicators and interpreters, natural resource students have selected majors imbued with purpose and relationship to the natural world (Leopold, 1966; Rolston, 1988). Institutions leading in environmental and natural resource education, such as Colorado State University and the Warner College of Natural Resources, have the opportunity to engage students in *educationally and professionally purposeful activities* that reinforce their sense of calling and prepare them to be leaders in conservation, sustainability, and stewardship.

## CHAPTER 4: STUDENT ENGAGEMENT IN THE NATURAL RESOURCES: THE INFLUENCE OF SATISFACTION ON PERSISTENCE AND SUCCESS

### **Introduction**

Student success in American higher education has been of interest to researchers and educational organizations for more than 80 years. In the period of the Great Depression and World War II, the *Junior College Journal* began publishing reports on student success in two-year colleges (Congdon, 1932; Siemens, 1943). Within five decades, the body of knowledge within the field of higher education had grown large enough for the *Review of Educational Research* to print a 43 page synthesis of research methods and findings associated with student success, attrition, retention, and degree completion in the academy (Pantages & Creedon, 1978). Several prominent educators (Astin, 1975, 1977, 1984, 1993; Kuh 2003a; Kuh, Kinzie, Buckley, Bridges & Hayak, 2006, 2007; Kuh, Kinzie, Schuh, Whitt & Associates, 2010; Kuh, Schuh, Whitt & Associates, 1991; Tinto 1993, 1997, 2006; Tinto & Pusser, 2006) have emphasized student success in their theories and research. Recently, national organizations and foundations—such as, the American Federation of Teachers (2011), the Association of American Colleges and Universities (2010), the Lumina Foundation (Adelman, Ewell, Gaston, & Schneider, 2011), and the Bill and Melinda Gates Foundation (Auguste, Cota, Jayaram, & Laboissière, 2010)—have entered the discussion and made student success a focal point of their initiatives to improve higher education in the United States.

### **Defining Success as Retention and Persistence to Degree Completion**

Success in higher education has been defined in a variety of ways including “academic achievement, engagement in educationally purposeful activities, satisfaction, acquisition of desired knowledge, skills and competencies, persistence; and attainment of education objectives”

(Kuh, et al., 2007, p.10). A common approach is to narrow the focus to student retention and persistence to degree completion (Kuh et al., 2010; National Leadership Council for Liberal Education and America's Promise, 2009; Pascarella & Terenzini, 2005; Tinto, 1993). This perspective was evident in the 2020 Goal (U.S. Department of Education, 2011) set by President Obama in his 2009 address to the Joint Session of Congress in which he asked American citizens to commit to greater participation in post-secondary education and increased rates of graduation for college students.

Student retention is differentiated from student persistence in that *retention* is “the ability of an institution to retain a student from admission through graduation” and *persistence* is “the desire and action of a student to stay within the system of higher education from beginning year through degree completion” (Berger, Ramírez, & Lyons, 2012, p. 12). Because institutions look at persistence through the lens of their ability to retain students, they typically focus on students at one of four levels: *system*, *institution*, *major*, or *course* (Hagedorn, 2012, pp. 91-93). Further, they typically observe a standard time interval of four to six years (Astin & Oseguera, 2012) to track persistence to degree completion. In practice, for four-year institutions such as CSU, the U.S. Department of Education's National Center for Education Statistics reports six year graduation rates for students (Aud et al., 2013, p. 108). Beyond degree completion, when looking at other variables of persistence, measures vary broadly (Astin, 1975, 1993; Bean, 2005; Mortensen, 2012; Tinto, 1993). Mortensen (2012) held that any measurement on persistence must include a “defined group or cohort of students at one point in time, place, and with specific demographic and enrollment characteristics” (p. 37).

## **Defining Success as Student Engagement**

The National Survey of Student Engagement (NSSE), developed in response to national calls for outcomes-based assessment of student development in higher education (Ewell, 2010; Kuh, 2009, 2011; Pike & Kuh, 2005), has focused more broadly on student success as student engagement in the breadth of experiences associated with retention and degree attainment (Astin, 1975, 1977, 1984; Kinzie & Kuh, 2004; Kuh, 2003a, 2003b; Kuh et al., 1991, 2010; NSSE, 2012a; Pace, 1980, 1984; Pascarella & Terenzini, 1991, 2005). NSSE looks at engagement through two lenses: one focused on the “time and effort students put into their studies and other educationally purposeful activities” and the other focused on institutional commitment to “the curriculum and other learning opportunities” provided to students (NSSE, 2012a, para. 1).

With over 3.7 million students having taken the survey since 2000 (NSSE, 2012a), NSSE administrators annually report findings on student participation in engaging experiences in the U.S. and Canada and advance initiatives promoting student success in higher education. They also provide participating institutions reports of their students’ engagement and comparative analyses with peer institutions (NSSE, 2012c) to allow colleges and universities to evaluate the effects of their program delivery. Even with the scope of data collected and range of services provided, one limitation of NSSE is that the survey is “strongly focused on student and faculty behavior . . . [and not on] satisfaction or other attitudes and beliefs” (McCormick & McClenney, 2012, p. 310), which can be additional indicators of student success (Kuh et al., 2006, 2007). The survey seeks responses for satisfaction on a few experiences such as relationships with fellow students and academic advising (NSSE, 2008), but institutions desiring more comprehensive assessment of satisfaction or attitudes related to engagement must assess their students on such outcomes.

## **Purpose and Research Questions**

The purpose of this study was to assess satisfaction with undergraduate student engagement in the Warner College of Natural Resources (WCNR) at Colorado State University (CSU) and determine the extent to which satisfaction with engagement was linked to student persistence and sense of success in the natural resources. Questions guiding the study included:

1. Are students satisfied with engagement in the college?
2. Are students persisting in their major and the college?
3. Do students feel successful in their major and the college?
4. What relationships exist between student satisfaction with engagement and their persistence and sense of success?

The research was undertaken to inform WCNR and CSU leadership on undergraduate engagement, persistence, and success in order to better direct institutional delivery of resources toward natural resource student engagement and retention at the university.

## **Institutional and Study Context**

CSU and WCNR are committed to providing engaging experiences supporting student development and success. The university (CSU, 2010) and college (WCNR, 2005) strategic plans reflect these commitments. The university has been a NSSE-participation institution since 2001 (CSU, 2012; NSSE, 2012f) and has made NSSE the “primary institutional level tool . . . to measure student engagement” on the campus (CSU, 2012).

The study discussed here built on research conducted in WCNR during the three academic years immediately preceding it. WCNR leadership undertook independent assessment of undergraduate engagement after determining they needed information NSSE did not provide including data on student satisfaction with WCNR-specific practices of engagement, student

persistence, and sense of success in the college. As part of the larger frame of research on student engagement, the college created WCNR Indices and Practices Student Engagement; assessed students' importance and satisfaction on the indices and practices; and identified barriers to student success. This study was differentiated from prior studies in the college in that it sought to assess student satisfaction on WCNR Themes of Student Engagement, student persistence, sense of success, and the relationships between them.

### **Conceptual Framing**

#### **Themes of Natural Resource Student Engagement**

WCNR Themes of Student Engagement consisted of eight concept-level groupings of practices of engagement in the college:

- course opportunities for discussions, presentations, final projects, or group assignments;
- course opportunities for fieldwork, lab work, or service projects;
- experiential learning through undergraduate research, internships, study abroad, or field camps (e.g., Pingree, Geo, or Forestry Field camps);
- faculty advising for college courses, class scheduling, or major requirements;
- faculty advising related to other college opportunities (e.g., research, scholarships, graduate school, or career plans);
- college student clubs, volunteer work, or social events (e.g., picnic or pancake breakfast);
- welcoming, friendly, or supportive qualities of the college community; and
- development as a natural resource professional as a member of Warner College of Natural Resources.

The groupings were derived from principal component analysis (PCA) and peer debriefing (Creswell, 2009) on the WCNR Indices and Practices of Student Engagement used in the assessment of importance and satisfaction in the college.

### **Student Persistence**

For the purposes of this study, student persistence was assessed in relation to *goal and institutional commitment* (Tinto, 1993), “the commitment to the institution in which . . . [one] is enrolled. . . [and] the degree to which one is willing to work toward the attainment of one’s goals within a given higher educational institution” (p. 43). To support institutional framing of persistence in relation to retention, persistence was evaluated on *major and institution* (Hagedorn, 2012, pp. 91-93), with the institution being WCNR. For persistence to graduation, a four to six year persistence interval was utilized. The specific variables on persistence selected for the study were:

- planning to continue in the current major in the next semester;
- choosing the same major if starting college over again;
- choosing WCNR if starting over again; and
- being on track to graduate on time—i.e., within four to six years.

The cohort of students for the assessment was WCNR undergraduates enrolled in WCNR courses taught in classrooms on the CSU campus in fall 2011. Demographic characteristics for the undergraduates included sex, residency, class standing, and enrollment.

### **Student Success**

WCNR leadership were interested in assessing students’ overall sense of success in the college, and in keeping with the conceptual framing on persistence, the survey included variables on students’ sense of success in their major and the institution:



- overall feeling of success in the major; and
- overall feeling of success in WCNR.

Additionally, as academic achievement was considered a form of success (Kuh, et al., 2006, 2007), students' cumulative grade point averages (GPAs) were included as variables in the study.

### **Methods**

Following approval from CSU's Institutional Review Board (Appendices J and K), a survey (Appendices L and M) was administered in fall 2011 in WCNR classrooms. The survey included 15 questions.

#### **Sampling Design and Collection of Demographic Data**

All WCNR faculty teaching undergraduate courses during fall 2011 were contacted by email and asked if they would participate. The survey was administered in 30 course sections, and 530 WCNR students (40% of the college's undergraduate population) completed it. Following the survey administration, demographic data on sex, residency, class standing, enrollment status, and CSU cumulative GPAs were obtained from the CSU Registrar for WCNR undergraduates enrolled during the semester. Demographic data were linked to survey data by students providing their CSU IDs on survey forms. Once data were linked and before analysis was undertaken, all personally identifying information for students was removed from the data files.

#### **Measures**

The WCNR Themes of Engagement were captured in eight satisfaction-based questions. The 5-point scales were coded "poor" (-2), "below average" (-1), "average" (0), "better than average" (1), and "excellent" (2). To check the content validity of the eight satisfaction-based questions, students were asked to rate their agreement with the following statement: "Questions

1 – 8 above are representative of my experiences in WCNR.” Ratings were measured on a 4-point scale with response categories of “definitely no” (1), “probably no” (2), “probably yes” (3), “definitely yes” (4), and an optional 5<sup>th</sup> choice of “I don’t know.” Four questions on persistence and two questions on overall sense of success incorporating the persistence and success variables created in the study design were measured on a 4-point scale: “definitely no” (1), “probably no” (2), “probably yes” (3), “definitely yes” (4), and an optional 5<sup>th</sup> choice of “I don’t know.”

### **Analyses**

Distributions of the demographic characteristics of the population and sample were compared, and chi-square analyses were conducted.

For each WCNR Theme of Student Engagement, percentages were combined for participants reporting “better than average” and “excellent” satisfaction and for those reporting “below average” and “poor” satisfaction. Mean values and standard deviations on the eight themes were calculated using the 5-point scales (-2 to +2). The content validity of satisfaction-based questions was checked by calculating the percentage of students reporting “probably yes” and “definitely yes” and those selecting “probably no” and “definitely no.” For questions on persistence and overall sense of success, measures of agreement were calculated by combining percentages for participants reporting “probably yes” and “definitely yes” and those reporting “probably no” and “definitely no.”

Logistic regression was used to predict persistence (0 = no, 1 = yes) and sense of success (0 = no, 1 = yes) based on the themes of satisfaction and CSU GPA. Additional descriptive analyses of student demographic data were undertaken in relation to the findings from the logistic models.

## Results

### Population and Sample Demographics

Population and sample distributions and results of the chi-square analyses are displayed in Table 11. There were no statistically significant differences between the population and sample on “Sex” or “Residency.” There were statistically significant differences on “Class Standing” ( $X^2 = 22.97, p = <.001, \text{Cramer's } V = .13$ ) and “Enrollment” ( $X^2 = 17.37, p = <.001, \Phi = .12$ ); however, the effect sizes were minimal (Vaske, 2008, p. 108).

Table 11

*Comparative Analyses of the Survey Population and Sample Demographics*

Demographics	Population <i>N</i> = 1,319	Sample <i>n</i> = 530	$X^2$	<i>df</i>	<i>p</i>	Effect Size <sup>1</sup>
Sex			.95	1	.330	.03
Male	842	330				
Female	477	200				
Residency			.92	1	.338	.03
Colorado	987	404				
Non-Colorado	332	126				
Class Standing			22.97	3	<.001	.13
Freshman	224	66				
Sophomore	305	107				
Junior	347	151				
Senior	443	206				
Enrollment			17.37	1	<.001	.12
Full-time	1,208	506				
Part-time	111	24				

<sup>1</sup> Phi ( $\Phi$ ) is reported for Sex, Residency, and Enrollment, and Cramer’s *V* is reported for Class Standing, per Vaske (2008, pp. 322-323).

## WCNR Themes of Student Engagement

More than half of survey participants ( $\geq 55\%$ ) reported “better than average” or “excellent” satisfaction on seven of the eight WCNR Themes of Student Engagement (Table 12).

Table 12

*Satisfaction on WCNR Themes of Student Engagement*

Themes	% <sup>1</sup>	<i>m</i>	<i>SD</i>
Course opportunities for discussions, presentations, final projects, or group assignments	71	.95	.80
Course opportunities for fieldwork, lab work, or service projects	55	.61	1.00
Experiential learning through undergraduate research, internships, study abroad, or field camps (e.g., Pingree, Geo or Forestry Field camps)	72	.95	.92
Faculty advising for college courses, class scheduling, or major requirements	65	.84	1.05
Faculty advising related to other college opportunities (e.g., research, scholarships, graduate school, or career plans)	47	.47	.99
College student clubs, volunteer work, or social events (e.g., picnic or pancake breakfast)	71	.93	.79
Welcoming, friendly, or supportive qualities of the college community	83	1.23	.79
Development as a natural resource professional as a member of Warner College of Natural Resources	75	.98	.77

<sup>1</sup> Cell entries are the percentage of students rating items as better than average or excellent.

For five of themes,  $\geq 71\%$  of students reported “better than average” or “excellent” satisfaction. One theme—“faculty advising related to other college opportunities”—had less than half the students (47%) report satisfaction with their experiences in the college. All WCNR Themes of Student Engagement had positive mean values. The theme with the highest mean value was “welcoming, friendly, or supportive qualities of the college community” ( $m = 1.23, SD = .79$ ). The theme with the lowest mean value was “faculty advising related to other college opportunities” ( $m = .47, SD = .99$ ).

A total of 78% of survey participants ( $n = 416$ ) reported “probably yes” or “definitely yes” when asked if the WCNR Themes of Student Engagement were representative of their experiences in the college. Less than 5% of students ( $n = 25$ ) reported “probably no” or “definitely no” on the same question.

### **Student Persistence and Sense of Success**

On student persistence in relation to goals and commitment, 89% of students ( $n = 471$ ) reported they planned to continue in the current major in the next semester. While 76% of participants ( $n = 402$ ) reported they would choose their major if starting college again, 81% ( $n = 429$ ) reported they would choose the college. In terms of being on track to graduate, 86% of students ( $n = 456$ ) reported they thought they would complete their degrees in four to six years. On overall sense of success, 84% of students ( $n = 445$ ) reported they felt successful in WCNR, and 81% ( $n = 429$ ) reported they felt successful in their major.

On all variables of persistence and success,  $\leq 7\%$  of participants reported they were not planning to continue in their current major; would not choose their major or the college if starting over again; were not on track to graduate on time; or did not feel successful in their major or the college.

## **Predicating Persistence and Success**

Logistic regression analyses were conducted to evaluate the predictive ability of students' CSU GPAs and student satisfaction on WCNR Themes of Engagement with their reported persistence. Two persistence models—"planning to continue in the current major in the next semester" and "being on track to graduate on time"—did not fit regression analyses and were discarded. Choosing the same major ("Choose Major") or the college ("Choose WCNR") if starting over again did fit regression analyses, and results are reported in Table 13.

For the "Choose Major" model, two of the themes of engagement were significant predictors. Students who were satisfied with their "faculty advising on college courses, class scheduling, or major requirements" (Odds ratio = 1.60,  $p < .007$ ) and their "development as a natural resource professional" (Odds ratio = 3.01,  $p < .001$ ) said they would choose their major if starting college over again (Table 13). This equation explained about a fifth of the variance and correctly classified 97% of the "no" responses and 24% of the "yes" responses (Table 14). No other themes of satisfaction nor CSU GPA influenced choosing the major.

"Course opportunities for discussions, presentations, final projects, or group assignments" (Odds ratio = 1.82,  $p < .03$ ), "faculty advising on college courses, class scheduling, or major requirements" (Odds ratio = 1.63,  $p < .007$ ), and "development as a natural resource professional" (Odds ratio = 2.25,  $p < .004$ ) were statistically significant predictors on the "Choose WCNR" model (Table 13) and together explained 20% of the variance (Table 14). For this model, 97% of the students who said they would not choose WCNR and 27% of the students who said they would choose WCNR were correctly classified. Similar to the "Choose Major" model, no other themes of engagement nor the CSU GPA influenced choosing WCNR if starting over again.

Table 13

*Logistic Regression Models Predicting Persistence and Sense of Success<sup>1</sup>*

Themes	Choose Major <i>n</i> = 431		Choose WCNR <i>n</i> = 455		Success in Major <i>n</i> = 441		Success in WCNR <i>n</i> = 451	
	Odds	<i>p</i>	Odds	<i>p</i>	Odds	<i>p</i>	Odds	<i>p</i>
Course opportunities for discussions, presentations, final projects, or group assignments	not significant		1.82	.03	not significant		not significant	
Faculty advising for college courses, class scheduling, or major requirements	1.60	.007	1.63	.007	not significant		1.97	.04
Development as a natural resource professional as a member of WCNR	3.01	<.001	2.25	.004	7.92	<.001	6.11	.002
CSU GPA	not significant		not significant		2.96	.02	9.73	<.001

<sup>1</sup> The model includes students who selected definitely yes, probably yes, probably no, or definitely no.

Table 14

*Goodness of Fit Indicators for Persistence and Success Models*<sup>1</sup>

Variables	<i>n</i>	% Correctly Classified	Nagelkerke $R^2$
<b>Choose Major</b>			
No – Choosing major again	33	97	
Yes – Choosing major again	398	24	
Total	431	30	19%
<b>Choose WCNR</b>			
No – Choosing WCNR again	31	97	
Yes – Choosing WCNR again	424	27	
Total	455	32	20%
<b>Success in Major</b>			
No – Feeling success in major	16	94	
Yes – Feeling success in major	425	71	
Total	441	72	32%
<b>Success in WCNR</b>			
No – Feeling success in WCNR	10	80	
Yes – Feeling of success in WCNR	441	84	
Total	451	84	44%

<sup>1</sup> The model includes survey participants who selected definitely yes, probably yes, probably no, or definitely no on the Persistence and Success variables.

In terms of overall sense of success in the major and in WCNR, logistic regression revealed two themes (e.g., “faculty advising for college courses, class scheduling, or major requirements” and “development as a natural resource professional”) and CSU GPA were significant in predicting a sense of success in students (Table 13).



Students who were satisfied with advising were twice as likely to feel successful in the college (Odds ratio = 1.97,  $p < .04$ ). Survey participants who were satisfied with their professional development were six times more likely to feel successful in the college (Odds ratio = 6.11,  $p < .002$ ) and eight times more likely to feel successful in their majors (Odds ratio = 7.92,  $p < .011$ ). As the students' GPAs increased, sense of success in the college (Odds ratio = 9.73,  $p < .001$ ) and the major (Odds ratio = 2.96,  $p < .02$ ) increased. None of the other themes of engagement were significant predictors of sense of success.

For the model on sense of success in the major, 94% of the students who said they did not feel successful in the college and 71% of the students who said they did feel successful in WCNR were correctly classified (Table 14). Together, the variables explained 32% of the variance. On sense of success in the college, the three significant predictors explained 44% of the variability in the model and correctly classified 84% of those who felt successful in WCNR and 80% of those who did not feel successful in the college.

WCNR students who did not feel successful or would not choose WCNR or their major again may be described as lacking goals or commitments (Tinto, 1993) in relation to their enrollment in the college and "at risk" for not being retained in their major or in WCNR. Although the sample size of these students was small (31 of 530 survey participants), the predictive models correctly classified the students 80 to 97% of the time. Table 15 displays demographic characteristics and average GPAs of students "at risk" for leaving WCNR or their major. The students consisted of more males than females (by at least a 3:2 ratio) and more Colorado residents than non-residents (by a least a 2:1 ratio). Sophomores (32%) were most likely not to choose WCNR again, and seniors (44%) were most likely not to choose their major

again. The students were usually enrolled on a full-time basis, and the majority ( $\geq 52\%$ ) of those not choosing the college or their major had below a B average.

Table 15

*Comparative Percentages for Students At-Risk for Leaving*<sup>1</sup>

Demographic Variables and GPA	Not Choose Major <i>n</i> = 33	Not Choose WCNR <i>n</i> = 31
Sex		
Male	59	68
Female	41	32
Resident		
Colorado	74	68
Non-Colorado	26	32
Classification		
Freshman	12	13
Sophomore	21	32
Junior	23	26
Senior	44	29
Enrollment		
Full-time	91	100
Part-time	9	0
Grade Point Average <sup>2</sup>		
A average (3.500 – 4.000)	21	26
B average (3.000 – 3.499)	26	22
< B to C-average (2.000 – 2.999)	44	42
< C-average (< 1.999)	9	10

<sup>1</sup> Cell entries are the percentage of students who selected probably no or definitely no on the Persistence and Success variables.

<sup>2</sup> Per the 2011-2012 CSU General Catalog, section 2.2, page 1: “The minimum cumulative grade point average acceptable for graduation is 2.000 computed only for courses attempted at Colorado State. The CSU GPA calculation is carried to the third decimal place and is not rounded.”

## Discussion

### Summary of Findings

The primary purpose of this study was to assess the influence of satisfaction with engagement on sense of persistence and success among undergraduate natural resource students. Measures of student engagement, persistence, and success were determined, and logistic regression was used to examine relationships among the variables. Descriptive analyses of student demographic data extended findings from the logistic models.

**Assessing satisfaction, persistence, and success.** The assessment utilized eight WCNR Themes of Student Engagement specific to the practices associated with engagement in the college. While mean values on all themes indicated students found them satisfying, some practices of engagement were more satisfying than others including the welcoming, friendly, or supportive qualities of the college community; development as natural resource professionals; experiential learning opportunities; course opportunities for discussions, presentations, final projects, or group assignments; student clubs, volunteer work, or social events; and faculty advising for college courses, class scheduling, or major requirements. The students reported comparatively lower levels of satisfaction on faculty advising on other college opportunities (e.g., research, scholarships, graduate school, or career plans) and course opportunities for fieldwork, lab work, or service projects.

Tinto's (1993) theory of *goal and institutional commitment* guided the framing of variables on students' persistence and success in WCNR and their majors. While the vast majority of students said they planned to continue in their majors in the next semester and were on track to graduate, they reported stronger commitment to WCNR than to their majors when asked whether they would select each if starting college over again. Similarly, when asked if

they felt successful in the college and their majors, more students reported an overall feeling of success in the college than their majors.

**Predicting persistence and success.** Three WCNR Themes of Student Engagement were significant predictors of students' decisions to choose WCNR if starting college over again. The odds of students choosing WCNR increased as their satisfaction increased with course opportunities for discussions, presentations, final projects, or groups assignments; faculty advising for college courses, class scheduling, or major requirements; and development as natural resource professionals. Two WCNR Themes of Engagement—faculty advising for college courses, class scheduling, or major requirements and development as natural resource professionals—were significant predictors of students choosing their major if starting over. The strongest predictor of students selecting WCNR or their major was satisfaction with their development as natural resource professionals.

Two WCNR Themes of Student Engagement were significant predictors of students' overall sense of success in WCNR. The odds of students feeling successful in the college increased as their satisfaction increased with faculty advising for college courses, class scheduling, or major requirements and their development as natural resource professionals. One WCNR Theme of Student Engagement—development as natural resource professionals—was a significant predictor of students feeling an overall sense of success in the majors. Beyond the WCNR Themes of Student Engagement, as students GPAs increased, they were more likely to report an overall sense of success in both the college and their major. GPA was the strongest predictor of students' overall sense of success in WCNR, and their development as natural resources professionals was the strongest predictor of their overall sense of success in their majors.

**Extending the predictive models.** Among study participants, those “at risk” for leaving WCNR or their major were generally male, Colorado residents with sophomore or senior class standing. While they were likely to be enrolled full-time, the majority had GPAs below a B average.

### **Implication for Delivery of WCNR Student Engagement**

Although students generally reported satisfaction on the WCNR Themes of Student Engagement, two themes had comparatively lower levels of satisfaction: faculty advising on other college opportunities (e.g., research, scholarships, graduate school, or career plans) and course opportunities for fieldwork, lab work, or service projects. WCNR utilized the study findings on advising to support a request to university officials to fund full-time professional advisors to better meet student advising needs and support faculty through reduction in their advising loads. The university agreed to the request as part of a campus-wide advising initiative, and professional advisors were funded in each of the five WCNR departments.

Prior assessment on student importance and satisfaction with WCNR Practices of Student Engagement indicated students’ lowest levels of satisfaction were with forms of engagement associated with experiential learning. Comparatively, findings from this study indicated students were as satisfied with experiential learning as they were with course opportunities for discussions, presentations, final projects, or group assignments, yet they were not as satisfied with course opportunities for hands-on experiences in fieldwork, lab work, or service projects. Combined, these mixed results were believed to indicate overall student satisfaction with experiential learning in the college but relative lower satisfaction with the amount of hands-on experiences in courses.

Predictive analyses from the study were used to inform WCNR faculty and administrators on types engagement influencing retention in the college as well as the degree to which course opportunities, faculty advising, and students' development as natural resource professionals supported their persistence and sense of success in WCNR and their majors. Although the subsample of students "at-risk" for not being retained in the college or their majors was small, findings were used to consider appropriate interventions for students in the sophomore and senior years of study (Donhardt, 2013; Gardner, 1999; Gardner, Van der Veer, & Associates, 1998; Hunter et al., 2010).

### **Limitations of the Study and Future Directions for Research**

**Satisfaction on advising.** The study focused exclusively on advising delivered by faculty and did not consider advising from other WCNR staff such as the professional advisors hired as an outcome of this study's findings. Future studies of WCNR student satisfaction could be improved by ensuring questions related to advising emphasize forms of advising delivery and specify who is providing advising to students.

**Satisfaction on experiential learning.** Study findings revealed a need to further examine student satisfaction with WCNR experiential learning. Revising the wording in the WCNR Themes of Student Engagement to differentiate between the types and amount of experiential learning in the college would clarify students' reported satisfaction with such opportunities and allow the college to better target resources toward enhancing student persistence and success through experiential learning.

**Persistence and success.** This study assessed persistence in relation to affective psychological dimensions (Astin & Antonio, 2012) with students self-reporting whether they planned to continue in their majors, were on track to graduate, and would choose the college or

their majors if starting college over again. Success, on the other hand, was assessed in relation to affective and cognitive psychological dimensions (Astin & Antonio, 2012). Students self-reported on whether they felt successful in the college and their majors, and their GPAs were used to assess their academic achievement. Future study on WCNR student persistence and success could include cognitive psychological dimensions on persistence and affective and cognitive behavioral dimensions on both persistence and success. For example, data from the CSU Registrar could be used to track students' semester-to-semester retention and progress toward degree completion as well as their actual degree attainment.

**Identifying students “at-risk” for not being retained.** Although the sample of students in the study represented over 40% of the undergraduate population in the college, there were statistically significant differences between the population and the sample on Enrollment and Class Standing. In that demographic analyses of students “at-risk” for not being retained in the college or their major included differentiation by Enrollment and Class Standing, the related findings may have been skewed by the differences in the sample. Because < 6% of study participants reported they did not feel successful or would not choose WCNR or their major again, findings on students “at-risk” of not being retained also lacked the support of a large subsample of students for whom demographic analyses could be conducted.

A variety of approaches could be taken in future studies to better support identification and analyses of students “at-risk” for leaving. Sampling could be improved to ensure a more representative and larger sample of survey participants. The research design could be expanded to include longitudinal analyses to explore patterns in the data over time. Finally, qualitative research, including student focus groups and interviews, could be conducted to more closely examine student persistence and success in the WCNR undergraduate population.

## **Extending the Study Findings beyond the Natural Resources**

### **Satisfaction with Student Engagement**

Institutions may wish to model WCNR's approach to assess student satisfaction on specific practices of student engagement on their campuses. Because NSSE primarily assesses the amount of time and effort (NSSE, 2012; McCormick & McClenney, 2012) students put into engaging educational experiences, it is more "strongly focused on student and faculty behavior" (McCormick & McClenney, 2012, p. 310) than on satisfaction. Astin and Antonio (2012) describe assessment of satisfaction as a good educational practice in higher education, and Kuh et al., (2007, p. 60) note "student satisfaction with the institution is an important but sometimes overlooked variable in determining the quality of the undergraduate experience." In addition to results from NSSE, findings from studies on satisfaction with student engagement may support fine-tuning of the delivery of educationally purposeful activities and allocation of resources to enhance teaching and learning (Banta, 1985).

### **Professionally Purposeful Activities**

Whereas student engagement theory emphasizes educationally purposeful activities (Kuh et al., 2006, 2007, 2010; NSSE, 2012a) that support student persistence and success, results from this study reveal the influence of *professionally purposeful activities* on student persistence and success in the natural resources. The findings run counter to those from a study of students enrolled in four-year college and university settings from 1990 through 1998 (Hu & Kuh, 2002) where it was found that students who perceived their institutions as emphasizing practical and vocational competence reported lower levels of engagement in educationally purposeful activities (Huh & Kuh, 2002, p. 570).



Where previous studies found weak relationships between student engagement and professional development, stronger relationships may now exist and influence student persistence to degree completion and success in college and in work after graduation. Global realities of the 1990s differ from 21<sup>st</sup> century global realities, and the influences of global commerce, global communication, and global climate change impact all sectors of society including education (Friedman, 2007, 2009; Millennium Ecosystem Assessment, 2005). One longitudinal study of 2001 Gates Millennium Scholars (GMS) and applicants not accepted to the GMS program showed mixed results related to student engagement and early career earnings (Hu & Wolniak, 2010). Although earnings are only one measure of participation in the workforce, the study authors pointed out there has been “little research effort that has addressed whether or not engagement during college imparts social and academic skills of value to the labor market” (Hu & Wolniak, 2010, p. 752).

In the study of undergraduate student engagement in CSU’s Warner College of Natural Resources, students’ satisfaction with their development as natural resource professionals was the *only* theme to consistently influence their persistence and sense of success in the college and their majors. Students were eight time more likely to feel successful in their majors and six times more likely to feel successful in the college if they were satisfied with their professional development. If they were satisfied with their professional development, they were also three times more likely to choose their major and more than twice as likely to choose WCNR if starting college over again. While additional research on actual student persistence to degree completion is required to confirm whether students in this study were retained and completed their degrees, the current findings support a relationship between engagement in *professionally purposeful activities* and student persistence and success in 21<sup>st</sup> century higher education.

## CHAPTER 5: SUMMARY OF KEY FINDINGS, RECOMMENDATIONS, AND DIRECTIONS FOR RESEARCH

### **Introduction**

This study focused on program evaluation of undergraduate student engagement assessment in CSU's Warner College of Natural Resources. The study was undertaken in advance of establishing the college's Milestones Assessment Program of Student Engagement (MAPSE), and study findings were used to provide recommendations on the program's administration. In conducting the evaluation, electronic and classroom surveys of student engagement were administered. For the electronic survey, importance and satisfaction on WCNR Practices and Indices of Student Engagement and barriers to WCNR student success were examined. For the classroom survey, satisfaction was further examined on WCNR Themes of Student Engagement, and relationships between student satisfaction, persistence and success were explored. This chapter summarizes the key findings and recommendations from the evaluation and directions for research.

### **Key Findings and Recommendations**

#### **WCNR Student Engagement Assessment**

WCNR leadership initiated assessment of undergraduate student engagement because they found (a) the subsample of WCNR students participating in NSSE too small to support department-level analyses of engagement; (b) NSSE lacked assessment of specific practices and milestones in the journey of WCNR student engagement; (c) NSSE predominantly measured student behavior in educationally purposeful activities and assessed little of students' sense of importance or satisfaction with those activities; and (d) NSSE did not include questions about

students' intention to persist in their programs, sense of success, or potential barriers to their persistence and success in college.

The college sought to address each of the perceived shortfalls with student engagement assessment through the development of MAPSE. The electronic and classroom surveys administered during the evaluation captured 23% and 40% of the undergraduate population, respectively, with each providing subsamples large enough to support department level analyses. The WCNR Practices, Indices, and Themes of Student Engagement focused on the college's specific practices and milestones in engagement and were used to assess students' importance and satisfaction with student engagement in the college. Finally, student persistence, sense of success, and barriers to success were assessed through electronic and classroom survey administrations.

It was found that WCNR was well-positioned to go forward with establishing MAPSE provided (a) the college's leadership remained committed to advancing the WCNR mission, goals, and objectives for assessment of student engagement; (b) MAPSE remained aligned with CSU and WCNR strategic plans; (c) WCNR Practices, Indices, and Themes of Engagement continued to apply to actual practices and milestones in student engagement in the college; and (d) baseline findings from the college be used to develop outcomes for WCNR undergraduate engagement.

### **WCNR Practices, Indices, and Themes of Student Engagement**

The study identified WCNR Practices of Student Engagement which were organized in five WCNR Indices of Student Engagement: Warner Course Experiences, Warner Experiential Learning, Warner Faculty Advising, Warner Community and Climate, and Natural Resource Professionalism. After the administration of the electronic survey, principal component analysis

and peer debriefing were used to further organize and group the variables in eight WCNR Themes of Student Engagement.

WCNR's Practices of Student Engagement bore resemblance to practices assessed by NSSE because they drew from a shared tradition on experiential, involved, and engaged learning (Astin, 1984; Bonwell & Eison, 1991; Chickering, 1977; Chickering & Gamson, 1987, 1991; Dewey, 1916, 1938; Feldman & Newcomb, 1970; Kolb, 1984; Kolb & Fry, 1975; Kuh, 2008; Kuh, Kinzie, Schuh, & Whitt, & Associates, 2010; Kuh, Schuh, Whitt, & Associates, 1991; Pace, 1984; Pascarella & Terenzini, 1991, 2005). WCNR practices also bore resemblance to practices promoted in environmental education delivery documented in the Tbilisi Declaration (UNESCO, 1978) and by the National Council for Science and the Environment (Vincent, 2010).

Since the establishment of NSSE, researchers from a variety of natural resource fields have undertaken studies on individual student engagement practices including active and collaborative learning (Thompson, Jungst, Colletti, Licklider, & Benna, 2003); cooperative learning (Etchberger, 2011); experiential learning (Millenbah & Millspaugh, 2003; Scott, Turnbull, & Spencer, 2008); fieldwork (Scott et al., 2012); service learning (Newman, Bruyere, & Beh, 2007; Prokopy, 2009); undergraduate research (Kinkel & Henke, 2006); and writing (McLaren & Webber, 2009). The assessment of WCNR student engagement differed from these studies through the college's efforts to simultaneously assess multiple practices of student engagement common in natural resource education.

### **Importance and Satisfaction with Student Engagement**

In widening the lens of assessment on student engagement in the natural resources, students' importance and satisfaction were assessed on the WCNR Practices and Indices of Student Engagement using an electronic survey format. Mean values on the practices and indices

indicated students found WCNR engagement both important and satisfying. Students' highest levels of importance and satisfaction were with Natural Resource Professionalism and their lowest levels of importance and satisfaction were with Warner Experiential Learning.

A classroom survey format was used to assess student satisfaction on the WCNR Themes of Student Engagement. Mean values on all themes indicated students found engagement in the college satisfying; however, some forms of engagement were more satisfying than others. Students reported comparatively low levels of satisfaction on faculty advising on other college opportunities (e.g., research, scholarships, graduate school, or career plans) and course opportunities for fieldwork, lab work, or service projects.

Findings on importance and satisfaction with faculty advising from the electronic and classroom survey administrations supported a request to CSU Student Affairs to fund full-time professional advisors in the college's academic departments in order to better meet student advising needs and reduce faculty advising loads. The mixed findings on experiential learning across the two surveys were believed to indicate that students were as satisfied with experiential learning as they were with course opportunities for discussions, presentations, final projects, or group assignments, but they desired more opportunities to engage in hands-on experiences in fieldwork, lab work, or service projects. Future assessments of WCNR student engagement will need to differentiate between the type and amount of experiential learning engagement in the college in order to confirm if the interpretation of the data was accurate. Regardless, future findings should prove useful in enhancing experiential learning in the college.

### **Barriers to Student Success**

A variety of barriers to student success were identified. The cost of college and the sequence of course offerings were perceived as challenges to the majority of students surveyed.

Other challenges frequently identified by survey participants included: transferring to CSU, not having enough financial aid, work issues, and changing majors. The findings on barriers to student success were used to inform WCNR faculty and the administration on the challenges students face in relation to work, family, and health issues and their status as student athletes or non-traditional, commuter, or transfer students. Future research could include assessment of interventions designed to address barriers to student success.

### **Relationships between Student Satisfaction, Persistence, and Success**

Predictive analyses of findings generated from the classroom survey were used to inform WCNR faculty and administrators on the practices of engagement influencing undergraduate retention in the college. Three WCNR Themes of Student Engagement were significant predictors of students' decisions to choose WCNR if starting college over again: course opportunities for discussions, presentations, final projects, or groups assignments; faculty advising for college courses, class scheduling, or major requirements; and development as natural resource professionals. Two WCNR Themes of Engagement—faculty advising for college courses, class scheduling, or major requirements and development as natural resource professionals—were significant predictors of students choosing their major if starting over again and their overall sense of success in WCNR. One WCNR Theme of Student Engagement—development as natural resource professionals—was a significant predictor of students feeling an overall sense of success in their majors. Students' satisfaction with their development as natural resource professionals was the *only* variable to consistently influence their persistence and sense of success in the college and their majors.

Survey participants who did not feel successful or would not choose WCNR or their major again were described as lacking goals or commitments (Tinto, 1993) in relation to their

enrollment in the college and “at risk” for not being retained. The “at-risk” students were typically male, Colorado residents with sophomore or senior class standing who were enrolled full-time and had GPAs below a B average. Because the subsample of students “at-risk” for not being retained was small, findings were used only to inform WCNR faculty and administrators of the characteristics of the “at-risk” group and consider potential interventions, for example, through enhancements in sophomore and senior year experiences (Donhardt, 2013; Gardner, 1999; Gardner, Van der Veer, & Associates, 1998; Hunter et al., 2010) in the college. Future studies of WCNR student engagement assessment could ensure more representative sampling and incorporate longitudinal analyses to better discern patterns within the student population “at risk” for not being retained.

### **Directions for Research**

#### **MAPSE Outcomes and Milestones Dashboard Indicators**

The college’s evaluation of student engagement assessment produced baseline data to develop outcomes of WCNR student engagement. Once established, the college could use the outcomes to develop dashboard indicators (Terkla, Sharkness, Roscoe, & Wiseman, 2012; Volkwein, 2010) for Milestones in WCNR Student Engagement. Such indicators could be used to monitor student retention in the college as well as advise students on significant milestones of engagement known to contribute to student persistence and success. Future research could include evaluation of the use of Milestones indicators to advance student retention and development. Additionally, as MAPSE evolves and matures, additional outcomes on student learning could be developed in relation to the college’s policies and practices on student engagement.

## **Academic and Student Affairs Collaboration**

This dissertation serves as a case study for effective academic and student affairs collaboration as advanced by Frost et al. (2010), Hersh and Keeling (2013), Manning et al. (2006), and Whitt et al. (2008). Some of the dynamic interactions among faculty, staff, and students in the study could be attributed to a *learning organization model* (Kezar, 2013; Senge, 2006) in higher education. Future research could include expanding this case study to examine other shared initiatives of CSU's Divisions of Academic and Student Affairs to better understand the culture of collaboration on the campus, the kinds of projects in which faculty, staff, and students have worked together, and whether CSU is a higher education model for a learning organization (Senge, 2006). NILOA appears to believe CSU has something to teach others in higher education. In 2011, the organization published a case study titled *Colorado State University: A Comprehensive Continuous Improvement System* (Kinzie, 2011) to highlight the shared work between Academic and Student Affairs in creating the university's Plan for Researching Improvement and Supporting Mission (PRISM) at CSU. Findings from the study of WCNR student engagement will be incorporated in PRISM to assist others on the campus undertaking similar assessments.

## **Professionally Purposeful Activities**

As noted at the conclusion of Chapter 4, the results from this study reveal the influence of *professionally purposeful activities* on undergraduate student persistence and success in the natural resources. Student engagement theory has emphasized *educationally purposeful activities* (Kuh et al., 2006, 2007, 2010; NSSE, 2012a) supporting student persistence and success, but with global changes in commerce, communication, and climate (Friedman, 2007, 2009; Gardner,



1999; Millennium Ecosystem Assessment, 2005), ongoing research is needed to examine additional dimensions of engagement that may be evolving to meet 21<sup>st</sup> century realities.

In the study of undergraduate student engagement in CSU's Warner College of Natural Resources, students' satisfaction with their development as natural resource professionals was the *only* variable to consistently influence their persistence and sense of success in the college and their majors. While additional research on student persistence to degree completion is required to confirm whether students in this study were retained and completed their degrees, the findings in the evaluation of student engagement assessment in CSU's Warner College of Natural Resources support a relationship between engagement in *professionally purposeful activities* and student persistence and success in 21<sup>st</sup> century higher education.

## REFERENCES

- Adelman, C., Ewell, P., Gaston, P., & Schneider, C. G. (2011). *The degree qualifications profile: Defining degrees*. Indianapolis, IN: Lumina Foundation.
- Altheide, D., Coyle, M., DeVriese, K., & Schneider, C. (2008). Emergent qualitative document analysis. In S. N. Hesse-Biber & P. Leavy (Eds.), *Handbook of emergent methods* (pp. 127-151). New York, NY: Guilford Press
- American Federation of Teachers. (2011). *Student success in higher education*. Washington, DC: Author.
- Association of American Colleges and Universities. (2010). *The quality imperative: Match ambitious goals for college attainment with an ambitious vision for learning*. Washington, DC: Author.
- Astin, A. W. (1975). *Preventing students from dropping out*. San Francisco, CA: Jossey-Bass.
- Astin, A. W. (1977). *Four critical years*. San Francisco, CA: Jossey-Bass.
- Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, 25, 297-308.
- Astin, A. W. (1993). *What matters in college? Four critical years revisited*. San Francisco, CA: Jossey-Bass.
- Astin, A. W. (1996). Involvement in learning revisited: Lessons we have learned. *Journal of College Student Development*, 37(2), 123-134.
- Astin, A. W. (1999). Involvement in learning revisited: Lessons we have learned. *Journal of College Student Development*, 50(5), 587-598. Reprinted from *Journal of College Student Development*, 37(2), 1996, 123-134.
- Astin, A. W. & Antonio, A. L. (2012). *Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education* (2nd ed.). Lanham, MD: Rowman & Littlefield Publishers.
- Astin, A. W., & Oseguera, L. (2012). Pre-college and institutional influences on degree attainment. In A. Seidman (Ed.), *College student retention: Formula for student success* (2nd ed., pp. 119-145). Lanham, MD: Rowman & Littlefield.
- Aud, S., Hussar, W., Johnson, F., Kena, G., Roth, E., Manning, E., Wang, X., & Zhang, J. (2012). *The conditions of education 2012 (NCES 2012-045)*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

- Auguste, B. G., Cota, A., Jayaram, K., & Laboissière, M. C. A. (2010). *Winning by degrees: The strategies of highly productive higher-education institutions*. New York, NY: McKinsey & Company.
- Banta, T. W. (1985). Use of outcomes information at the University of Tennessee, Knoxville. *New Directions for Institutional Research*, 1985(47), 19-32. doi: 10.1002/ir.37019854704
- Bean, J. P. (2005). Nine themes of college student retention. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 214-243). Westport, CT: Praeger.
- Berger, J. B., Ramírez, G. B., & Lyons, S. (2012). Past to present: A historical look at retention. In A. Seidman (Ed.), *College student retention: Formula for student success* (2nd ed., pp. 7-34). Lanham, MD: Rowman & Littlefield.
- Berry, W. (1977). *The unsettling of America: Culture and agriculture*. New York, NY: Avon.
- Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom*. Washington, DC: George Washington University.
- Bressen, T. (2007). Consensus decision making. In P. Holman, T. Devane & S. Cady (Eds.), *The change handbook: The definitive resource on today's best methods for engaging whole systems* (pp. 212-217). San Francisco, CA: Berrett-Koehler.
- Callicott, J. B., & da Rocha, F. J. R. (Eds.). (1996). *Earth summit ethics: Toward a reconstructive postmodern philosophy of environmental education*. Albany, NY: State University of New York Press.
- Campbell, C. M., & Cabrera, A. F. (2011). How sound is NSSE? Investigating the psychometric properties of NSSE at a public, research-extensive institution. *The Review of Higher Education*, 35(1), 77-103.
- Carini, R., Kuh, G., & Klein, S. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education*, 47(1), 1-32. doi: 10.1007/s11162-005-8150-9
- Carle, A. C., Jaffee, D., Vaughan, N. W., & Eder, D. (2009). Psychometric properties of three new National Survey of Student Engagement based engagement scales: An item response theory analysis. *Research in Higher Education*, 50(8), 775-794. doi: 10.1007/s11162-009-9141-z
- Chickering, A. W. (1977). *Experience and learning: An introduction to experiential learning*. New Rochelle, NY: Change Magazine Press.
- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 39(7), 3-7.
- Chickering, A. W., & Gamson, Z. F. (Eds.). (1991). *Applying the seven principles for good practice in undergraduate education*. San Francisco, CA: Jossey-Bass.

- College Portrait of Undergraduate Education. (2012a, November 21). About the College Portrait. Retrieved from <http://www.collegeportraits.org/about>
- College Portrait of Undergraduate Education. (2012b, November 21). Institutions in Colorado. Retrieved from <http://www.collegeportraits.org/CO>
- College Student Experiences Questionnaire Assessment Program. (2012a, April 29). CSEQ: At a glance. Retrieved from [http://cseq.iub.edu/cseq\\_glance.cfm](http://cseq.iub.edu/cseq_glance.cfm)
- College Student Experiences Questionnaire Assessment Program. (2012b, April 29). CSEQ: General info. Retrieved from [http://cseq.iub.edu/cseq\\_generalinfo.cfm](http://cseq.iub.edu/cseq_generalinfo.cfm)
- College Student Experiences Questionnaire Assessment Program. (2012c, April 29). CSEQ: Participating institutions. Retrieved from [http://cseq.iub.edu/cseq\\_recentusers.cfm](http://cseq.iub.edu/cseq_recentusers.cfm)
- Colorado State University. (2010). *Strategic directions: Colorado State University strategic plan 2006-2015 (2009-10 update based on SPARC refresh in previous year)*. Fort Collins, CO: Author.
- Colorado State University. (2011). *2011-2012 General Catalog*. Retrieved April, 20, 2012, from [www.catalog.colostate.edu](http://www.catalog.colostate.edu)
- Colorado State University. (2012, November 21). Student engagement. Retrieved from <http://www.ir.colostate.edu/engagement.aspx>
- Congdon, W. H. (1932). Do junior college transfers succeed? *Junior College Journal*, 2, 209-215.
- Cousins, J. B., & Chouinard, J. A. (2012). *Participatory evaluation up close: An integration of research-based knowledge*. Charlotte, NC: Information Age Publishing.
- Cousins, J. B., & Earl, L. M. (1992). The case for participatory evaluation. *Educational Evaluation and Policy Analysis*, 14(4), 397-418.
- Cousins, J. B., & Earl, L. M. (Eds.). (1995). *Participatory evaluation in education: Studies of evaluation use and organizational learning*. London, UK: Falmer.
- Cousins, J. B., & Whitmore, E. (1998). Framing participatory evaluation. *New Directions for Evaluation*, 1998(80), 5-23. doi: 10.1002/ev.1114
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.

- DeAngelo, L., Franke, R., Hurtado, S., Pryor, J. H., & Tran, S. (2011). *Completing college: Assessing graduation rates at four-year institutions*. Los Angeles, CA: Higher Education Research Institute.
- Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York, NY: Macmillan.
- Dewey, J. (1938). *Experience and education*. New York, NY: Touchstone.
- DiRamio, D., & Shannon, D. (2011, April). *Is the National Survey of Student Engagement (NSSE) messy? An analysis of predictive validity*. Paper presented at the American Educational Research Association, New Orleans, LA. Retrieved from <http://www.aera.net/Publications/OnlinePaperRepository/AERAOnlinePaperRepository/tabid/12720/Owner/254399/Default.aspx>
- Donhardt, G. L. (2013). The fourth-year experience: Impediments to degree completion. *Innovative Higher Education*, 38(3), 207-221. doi: 10.1007/s10755-012-9234-z
- Etchberger, R. C. (2011). Assessment of cooperative learning in natural resources education. *Journal of Forestry*, 109(7), 397-401.
- Ewell, P. T. (2010). The US National Survey of Student Engagement (NSSE). In D. D. Dill & M. Beerkens (Eds.), *Higher education dynamics: Public policy for academic quality--Analyses of innovative policy instruments* (Vol. 30, pp. 83-97). New York, NY: Springer.
- Feldman, K. A. (1991). In E. T. Pascarella, E. T. & P. T. Terenzini, *How college affects students: Findings and insights from twenty years of research* (pp. xi-xiii). San Francisco, CA: Jossey-Bass.
- Feldman, K. A., & Newcomb, T. M. (1970). *The impact of college on students: An analysis of four decades of research* (Vol. 1). San Francisco, CA: Jossey-Bass.
- Fitzpatrick, J. L., Sanders, J. R., & Worthen, B. R. (2004). *Program evaluation: Alternative approaches and practical guidelines*. Boston, MA: Pearson Education.
- Frank, T. (2011, September 15). Fall address to the university. Retrieved from <http://www.president.colostate.edu/pdf/2011-fall-address.pdf>
- Friedman, T. L. (2007). *The world is flat: A brief history of the twenty-first century* (3rd ed.). New York, NY: Picador.
- Friedman, T. L. (2009). *Hot, flat, and crowded: Why we need a green revolution--and how it can renew America* (2nd ed.). New York, NY: Picador.

- Frost, R. A., Strom, S. L., Downey, J., Schultz, D. D., & Holland, T. A. (2010). Enhancing student learning with academic and student affairs collaboration. *The Community College Enterprise*, 16(1), 37-51.
- Gamson, Z. F. (1995). The seven principles for good practice in undergraduate education: A historical perspective. In S. R. Hatfield (Ed.), *The seven principles in action: Improving undergraduate education* (pp. 1-8). Bolton, MA: Anker.
- Gardner, J. N. (1999). The senior year experience. *About Campus*, 4(1), 5-11.
- Gardner, J. N., Van der Veer, G., & Associates. (1998). *The senior year experience: Facilitating integration, reflection, closure, and transition*. San Francisco, CA: Jossey-Bass.
- Glaser, B. G. (1965). The constant comparative method of qualitative analysis. *Social problems*, 12(4), 436-445.
- Gordon, J., Ludlum, J., & Hoey, J. J. (2008). Validating NSSE against student outcomes: Are they related? *Research in Higher Education*, 49(1), 19-39. doi: 10.1007/s11162-007-9061-8
- Hagedorn, L. S. (2012). How to define retention: A new look at an old problem. In A. Seidman (Ed.), *College student retention: Formula for student success* (2nd ed., pp. 81-99). Lanham, MD: Rowman & Littlefield.
- Harper, S. R., & Quaye, S. J. (Eds.). (2009). *Student engagement in higher education: Theoretical perspectives and practical approaches for diverse populations*. New York, NY: Routledge.
- Harrison, E. C. (1968). College and the world of work. *Educational Leadership*, 25(7), 667-673.
- Havitz, M. E., Twyman, G. D., & DeLorenzo, J. M. (1991). Important-performance analysis as a staff evaluation tool. *Journal of Parks and Recreation Administration*, 9(1), 43-54.
- Heierbacher, S. (2007). Dialogue and deliberation. In P. Holman, T. Devane, & S. Cady (Eds.), *The change handbook: The definitive resource on today's best methods for engaging whole systems* (pp. 102-117). San Francisco, CA: Berrett-Koehler.
- Henning, G. W. (2012). Leveraging student engagement for student and institutional success. *About Campus*, 17(4), 15-18. doi: 10.1002/abc.21088
- Henson, K. T. (2006). *Curriculum planning: Integrating multiculturalism, constructivism, and education reform* (3rd ed.). Long Grove, IL: Waveland Press.
- Hersh, R. H., & Keeling, R. P. (2013). *Changing institutional culture to promote assessment of higher learning*. Champaign, IL: National Institute for Learning Outcomes Assessment.

- Higher Education Research Institute. (2012a, April 29). About CIRP. Retrieved from <http://www.heri.ucla.edu/abtcirp.php>
- Higher Education Research Institute. (2012b, April 29). CIRP surveys. Retrieved from <http://www.heri.ucla.edu/herisurveys.php>
- Holdsworth, S., Thomas, I., & Hegarty, K. (2013). Sustainability education: Theory and practice. In R. B. Stevenson, M. Brody, J. Dillon & A. E. J. Wals (Eds.), *International handbook of research on environmental education* (pp. 349-358). New York, NY: Routledge.
- Holland, J. L. (1959). A theory of vocational choice. *Journal of Counseling Psychology*, 6(1), 35-45.
- Holland, J. L. (1968). Explorations of a theory of vocational choice: VI. A longitudinal study using a sample of typical college students. *Journal of Applied Psychology*, 52(1, Pt 2), 1-37. doi: 10.1037/h0025350
- Holland, J. L. (1996). Exploring careers with a typology: What we have learned and some new directions. *American Psychologist*, 51(4), 397-406. doi: 10.1037/0003-066x.51.4.397
- Hu, S., & Kuh, G. D. (2002). Being (dis)engaged in educationally purposeful activities: The influences of student and institutional characteristics. *Research in Higher Education*, 43(5), 555-575.
- Hu, S., & Wolniak, G. (2010). Initial evidence on the influence of college student engagement on early career earnings. *Research in Higher Education*, 51(8), 750-766. doi: 10.1007/s11162-010-9176-1
- Hunter, M. S., Tobolowsky, B. F., Gardner, J. N., Evenbeck, S. E., Pattengale, J. A., Schaller, M. A., Schreiner, L. A., & Associates (Eds.). (2010). *Helping sophomores succeed: Understanding and improving the second year experience*. San Francisco, CA: John Wiley & Sons.
- Kezar, A. (2013). Institutionalizing student outcomes assessment: The need for better research to inform practice. *Innovative Higher Education*, 38(3), 189-206.
- King, J. A. (2004). Tikkun Olam: The roots of participatory evaluation. In M. C. Alkin (Ed.), *Evaluation roots: Tracing theorists' views and influences* (pp. 331-342). Thousand Oaks, CA: Sage.
- Kinkel, D. H., & Henke, S. E. (2006). Impact of undergraduate research on academic performance, educational planning, and career development. *Journal of Natural Resources & Life Sciences Education*, 35(1), 194-201.

- Kinzie, J. (2011). Colorado State University: A comprehensive continuous improvement system. *NILOA Case Studies*. Champaign, IL: National Institute for Learning Outcomes Assessment.
- Kinzie, J., & Kuh, G. D. (2004). Going deep: Learning from campuses that share responsibility for student success. *About Campus*, 9(5), 2-8. doi: 10.1002/abc.105
- Kinzie, J., Thomas, A. D., Palmer, M. M., Umbach, P. D., & Kuh, G. D. (2007). Women students at coeducational and women's colleges: How do their experiences compare? *Journal of College Student Development*, 48(2), 145-165.
- Kolb, D. A. (1981). Learning styles and disciplinary differences. In A. W. Chickering (Ed.), *The modern American college: Responding to the new realities of diverse students and a changing society* (pp. 232-255). San Francisco, CA: Jossey-Bass.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.
- Kolb, D. A., & Fry, R. E. (1975). Toward an applied theory of experiential learning. In C. Cooper (Ed.), *Theories of group processes* (pp. 33-57). New York, NY: John Wiley & Sons.
- Koljatic, M., & Kuh, G. D. (2001). A longitudinal assessment of college student engagement in good practices in undergraduate education. *Higher Education*, 42(3), 351-371.
- Korzekwa, A. M., & Marley, S. C. (2011, April). *An examination of the predictive validity of the National Survey of Student Engagement benchmarks and scalelets*. Paper presented at the American Educational Research Association, New Orleans, LA. Retrieved from <http://www.aera.net/Publications/OnlinePaperRepository/AERAOnlinePaperRepository/tabid/12720/Owner/254399/Default.aspx>
- Kuh, G. D. (1995). The other curriculum: Out-of-class experiences associated with student learning and personal development. *Journal of Higher Education*, 66(2), 123-155.
- Kuh, G. D. (2001). Assessing what really matters to student learning: Inside the National Survey of Student Engagement. *Change*, 33(3), 10-17, 66.
- Kuh, G. D. (2003a). How are we doing at engaging students? Charles Schroeder talks to George Kuh. *About Campus*, 8(1), 9-16.
- Kuh, G. D. (2003b). What we're learning about student engagement from NSSE: Benchmarks for effective educational practices. *Change*, 35(2), 24-32.
- Kuh, G. D. (2004) *The National Survey of Student Engagement: Conceptual framework and overview of psychometric properties*. Bloomington, IN: Indiana University Center for Postsecondary Research.



- Kuh, G. D. (2007). What student engagement data tell us about college readiness. *Peer Review*, 9(1), 4-8.
- Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.
- Kuh, G. D. (2009). The National Survey of Student Engagement: Conceptual and empirical foundations. *New Directions for Institutional Research*, 141, 5-20.
- Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *Journal of Higher Education*, 79(5), 540-563.
- Kuh, G. D., Kinzie, J., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature*. Washington, DC: National Postsecondary Education Cooperative.
- Kuh, G. D., Kinzie, J., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2007). *Piecing together the student success puzzle: Research, propositions, and recommendations*. San Francisco, CA: Jossey-Bass.
- Kuh, G. D., Kinzie, J., Cruce, T., Shoup, R., & Gonyea, R. M. (2006). *Connecting the dots: Multi-faceted analyses of the relationship between student engagement results from the NSSE, and institutional practices and conditions that foster student success - Final report prepared for the Lumina Foundation for Education Grant# 2518*. Bloomington, IN: Center for Postsecondary Research.
- Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2005). *Assessing conditions to enhance educational effectiveness: The inventory for student engagement and success*. San Francisco, CA: Jossey-Bass.
- Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J., & Associates (2010). *Student success in college: Creating conditions that matter*. San Francisco, CA: Jossey-Bass.
- Kuh, G. D., Schuh, J. S., Whitt, E. J., & Associates. (1991). *Involving colleges: Successful approaches to fostering student learning and development outside the classroom*. San Francisco, CA: Jossey-Bass.
- Laird, T. F. N., Shoup, R., Kuh, G. D., & Schwarz, M. J. (2008). The effects of discipline on deep approaches to student learning and college outcomes. *Research in Higher Education*, 49(6), 469-494. doi: 10.1007/s11162-008-9088-5
- LaNasa, S. M., Cabrera, A. F., & Trangsrud, H. (2009). The construct validity of student engagement: A confirmatory factor analysis approach. *Research in Higher Education*, 50(4), 315-332. doi: 10.1007/s11162-009-9123-1

- Leopold, A. (1966). *A Sand County almanac: With essays on conservation from Round River*. New York, NY: Ballantine Books.
- Lundholm, C., Hopwood, N., & Rickinson, M. (2013). Environmental learning: Insights from research into the student experience. In R. B. Stevenson, M. Brody, J. Dillon & A. E. J. Wals (Eds.), *International handbook of research on environmental education* (pp. 243-252). New York, NY: Routledge.
- Lutz, M. E., & Culver, S. (2010). The National Survey of Student Engagement: A university-level analysis. *Tertiary Education and Management*, 16(1), 35-44.
- Makela, C. J. (2003). Sharing the sky: The role of family and consumer sciences in sustainability. *The Journal of Family & Consumer Sciences*, 95(2), 4-10.
- Manning, K., Kinzie, J., & Schuh, J. (2006). *One size does not fit all: Traditional and innovative models of student affairs practice*. New York, NY: Routledge.
- McCormick, A. C., & McClenney, K. (2012). Will these trees ever bear fruit? A response to the special issue on student engagement. *The Review of Higher Education*, 35(2), 307-333.
- McLaren, I. A. M., & Webber, D. (2009). Writing right: Enhancing student engagement and performance in an ecology course. *International Journal of Environmental & Science Education*, 4(4), 365-380.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.
- Millenbah, K. F., & Millspaugh, J. J. (2003). Using experiential learning in wildlife courses to improve retention, problem solving, and decision-making. *Wildlife Society Bulletin*, 31(1), 127-137.
- Millennium Ecosystem Assessment. (2005). *Ecosystems and human well-being: Synthesis*. Washington, DC: Island Press.
- Mortenson, T. G. (2012). Measurements of persistence. In A. Seidman (Ed.), *College student retention: Formula for student success* (2nd ed., pp. 35-60). Lanham, MD: Rowman & Littlefield.
- Nadin, S., & Cassell, C. (2004). Using data matrices. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research* (pp. 271-287). London, UK: Sage.
- Nafziger, D. H., Holland, J. L., & Gottfredson, G. D. (1975). Student-college congruency as a predictor of satisfaction. *Journal of Counseling Psychology*, 22(2), 132-139.

- National Environmental Education Advisory Council. (2005). *Setting the standard, measuring results, celebrating successes: A report to Congress on the status of environmental education in the United States*. Washington, DC: Environmental Protection Agency.
- National Institute of Education Study Group on the Conditions of Excellence in American Higher Education. (1984). *Involvement in learning: Realizing the potential of American higher education*. Washington, DC: National Institute of Education.
- National Leadership Council for Liberal Education and America's Promise. (2009). *College learning for the new global century*. Washington, DC: Association of American Colleges and Universities.
- National Research Council. (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st Century - Committee on Defining Deeper Learning and 21st Century Skills*. Washington, DC: National Academies Press.
- National Survey of Student Engagement. (2000). *The NSSE 2000 report: National benchmarks of effective educational practice*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- National Survey of Student Engagement. (2002). *From promise to progress: How colleges and universities are using student engagement results to improve collegiate quality*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- National Survey of Student Engagement. (2008a). *Promoting engagement for all students: The imperative to look within*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- National Survey of Student Engagement. (2008b). *The National Survey of Student Engagement 2008: U.S. English web version*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- National Survey of Student Engagement. (2010). *Major differences: Examining student engagement by field of study*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- National Survey of Student Engagement. (2012a, October 15). About NSSE. Retrieved from <http://nsse.iub.edu/html/about.cfm>
- National Survey of Student Engagement. (2012b, October 15). Benchmarks of effective educational practice. Retrieved from [http://nsse.iub.edu/pdf/nsse\\_benchmarks.pdf](http://nsse.iub.edu/pdf/nsse_benchmarks.pdf)
- National Survey of Student Engagement. (2012c, October 15). Institutional reporting. Retrieved from [http://nsse.iub.edu/\\_/?cid=217](http://nsse.iub.edu/_/?cid=217)

- National Survey of Student Engagement. (2012d, October 15). Introducing the updated NSSE survey. Retrieved from <http://nsse.iub.edu/nsse2013/>
- National Survey of Student Engagement. (2012e, October 15). Our origins and potential. Retrieved from <http://nsse.iub.edu/html/origins.cfm>
- National Survey of Student Engagement. (2012f, October 15). Participating institution search. Retrieved from <http://www.nsse.iub.edu/html/participants.cfm>
- National Survey of Student Engagement. (2013a, April 8). Consortium and system participation. Retrieved from [http://nsse.iub.edu/html/consortium\\_participation.cfm](http://nsse.iub.edu/html/consortium_participation.cfm)
- National Survey of Student Engagement. (2013b, April 8). Customization options. Retrieved from <http://nsse.iub.edu/html/customizationOptions.cfm>
- New Leadership Alliance for Student Learning and Accountability. (2012). *Committing to quality: Guidelines for assessment and accountability in higher education*. Washington, DC: Author.
- Newman, P., Bruyere, B. L., & Beh, A. (2007). Service-learning and natural resource leadership. *Journal of Experiential Education*, 30(1), 54-69.
- Obama, B. (2009, February 24). *Remarks of President Barack Obama –As prepared for delivery address to Joint Session of Congress: Tuesday, February 24th, 2009*. Address to the Joint Session of Congress, Washington, DC. Retrieved from <http://www.whitehouse.gov/the-press-office/remarks-president-barack-obama-address-joint-session-congress>
- O'Day, P. T., & Kuh, G. D. (2006). Assessing what matters in law school: The law school survey of student engagement. [Proceedings Paper]. *Indiana Law Journal*, 81(1), 401-409.
- Orr, D. W. (1992). *Ecological literacy: Education and the transition to a postmodern world*. Albany, NY: State University of New York Press.
- Orr, D. W. (2004). *Earth in mind: On education, environment, and the human prospect*. Washington, DC: Island Press.
- Orr, D. W. (2009). *Down to the wire: Confronting climate collapse*. New York, NY: Oxford University Press.
- Pace, C. R. (1980). Measuring the quality of student effort. *Current Issues in Higher Education*, 2(1), 10-16.
- Pace, C. R. (1984). *Measuring the quality of college student experiences: An account of the development and use of the College Student Experiences Questionnaire*. Los Angeles, CA: Higher Education Research Institute.

- Pace, C. R., & Kuh, G. D. (1998). *College Student Experiences Questionnaire: Paper version (4th ed.)*. The College Student Experience Questionnaire Assessment Program. Bloomington, IN. Retrieved from [http://cseq.iub.edu/pdf/cseq\\_whole.pdf](http://cseq.iub.edu/pdf/cseq_whole.pdf)
- Palmer, J. A. (1998). *Environmental education in the 21st century: Theory, practice, progress and promise*. London, UK: Routledge.
- Pantages, T. J., & Creedon, C. F. (1978). Studies of college attrition: 1950-1975. *Review of Educational Research*, 48(1), 49-101.
- Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research*. San Francisco, CA: Jossey-Bass.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research* (Vol. 2). San Francisco, CA: Jossey-Bass.
- Patton, M. Q. (2008). *Utilization-focused evaluation* (4th ed.). Los Angeles, CA: Sage.
- Pike, G. R. (2006a). The convergent and discriminant validity of NSSE scalelet scores. *Journal of College Student Development*, 47(5), 550-563.
- Pike, G. R. (2006b). The dependability of NSSE scalelets for college- and department-level assessment. *Research in Higher Education*, 47(2), 177-195.
- Pike, G. R. (2013). NSSE Benchmarks and institutional outcomes: A note on the importance of considering the intended uses of a measure in validity studies. *Research in Higher Education*, 54(2), 149-170.
- Pike, G. R., & Kuh, G. D. (2005). A typology of student engagement for American colleges and universities. *Research in Higher Education*, 46(2), 185-209. doi: 10.1007/s11162-004-1599-0
- Pike, G. R., Smart, J., & Ethington, C. (2012). The mediating effects of student engagement on the relationships between academic disciplines and learning outcomes: An extension of Holland's Theory. *Research in Higher Education*, 53(5), 550-575. doi: 10.1007/s11162-011-9239-y
- Plato. (1986). *The dialogues of Plato*. New York, NY: Bantam Books.
- Porter, S. R. (2011). Do college student surveys have any validity? *The Review of Higher Education*, 35(1), 45-76.
- Porter, S. R., Rumann, C., & Pontius, J. (2011). The validity of student engagement survey questions: Can we accurately measure academic challenge? *New Directions for Institutional Research*, 2011(150), 87-98. doi: 10.1002/ir.391

- Prokopy, L. S. (2009). Looking at the big picture: Engaging natural resource students in landscape level planning through a capstone course. *Journal of Forestry*, 107(2), 90-94.
- Rolston III, H. (1988). *Environmental ethics: Duties and values in the natural world*. Philadelphia, PA: Temple University Press.
- Rolston III, H. (1996). Earth ethics: A challenge to liberal education. In J. B. Callicott & F. J. R. da Rocha (Eds.), *Earth summit ethics: Toward a reconstructive postmodern philosophy of environmental education* (pp. 161-192). Albany, NY: State University of New York Press.
- Schneider, C. G. (2008). Introduction: Liberal education and high-impact practices, making excellence—once and for all—inclusive. In G. D. Kuh (Ed.), *High-impact educational practices: What they are, who has access to them, and why they matter* (pp. 1-8). Washington, DC: Association of American Colleges and Universities.
- Schuh, J. H., Upcraft, M. L., & Associates. (2001). *Assessment practice in student affairs An applications manual*. San Francisco, CA: Jossey-Bass.
- Scott, G., Goulder, R., Wheeler, P., Scott, L., Tobin, M., & Marsham, S. (2012). The value of fieldwork in life and environmental sciences in the context of higher education: A case study in learning about biodiversity. *Journal of Science Education and Technology*, 21(1), 11-21. doi: 10.1007/s10956-010-9276-x
- Scott, G. W., Turnbull, S., & Spencer, J. (2008). Promoting engagement: Using species action plans to bring together students and conservation professionals. *Bioscience Education*, 12. doi: 10.3108/beej.12.5
- Senge, P. M. (2006). *The fifth discipline: The art and practice of the learning organization*. New York, NY: Doubleday.
- Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly*, 18(2), 158-176.
- Siemens, C. H. (1943). Predicting success of transfer students. *Junior College Journal*, 14, 24-28.
- Smart, J. C., Feldman, K. A., & Ethington, C. A. (2006). *Holland's theory of patterns of college student success*. Washington, DC: National Postsecondary Education Cooperative.
- Speth, J. G. (2008). Toward a new consciousness: Values to sustain human and natural communities. *The Leopold Outlook*, 8(2), 4-7.
- Steele, J. P., & Fullagar, C. J. (2009). Facilitators and outcomes of student engagement in a college setting. *The Journal of Psychology*, 143(1), 5-27.

- Stevenson, R. B., Brody, M., Dillon, J., & Wals, A. E. J. (Eds.). (2013). *International handbook of research on environmental education*. New York, NY: Routledge.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.
- Stufflebeam, D. L., & Shinkfield, A. J. (2007). *Evaluation theory, models, and applications*. San Francisco, CA: Jossey-Bass.
- Super, D. E. (1953). A theory of vocational development. *American Psychologist*, 8(5), 185-190.
- Terkla, D. G., Sharkness, J., Cohen, M., Roscoe, H. S., & Wiseman, M. (2012). *AIR Professional File: Institutional dashboards—Navigational tool for colleges and universities*. Tallahassee, FL: Association for Institutional Research.
- Thompson, J., Jungst, S., Colletti, J., Licklider, B., & Benna, J. (2003). Experiences in developing a learning-centered natural resources curriculum. *Journal of Natural Resources and Life Sciences Education*, 32, 23-31.
- Timpson, W. M., Dunbar, B., Kimmel, G., Bruyere, B., Newman, P., & Mizia, H. (2006). *147 practical tips for teaching sustainability: Connecting the environment, the economy, and society*. Madison, WI: Atwood.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago, IL: University of Chicago Press.
- Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. *The Journal of Higher Education*, 68(6), 599-623.
- Tinto, V. (2006). Research and practice of student retention: What's next? *Journal of College Student Retention*, 8(1), 1-19.
- Tinto, V., & Pusser, B. (2006). *Moving from theory to action: Building a model of institutional action for student success - Executive summary*. Washington, DC: National Postsecondary Education Cooperative.
- UNESCO. (1978). *Intergovernmental Conference on Environmental Education Tbilisi (USSR) 14-26 October 1977: Final report*. Paris, FR: United Nations.
- U.S. Department of Education. (2011). Meeting the nation's 2020 Goal: State targets for increasing the number and percentage of college graduates with degrees. Retrieved November 7, 2012, from [http://www.whitehouse.gov/sites/default/files/completion\\_state\\_by\\_state.pdf](http://www.whitehouse.gov/sites/default/files/completion_state_by_state.pdf)
- Vaske, J. J. (2008). *Survey research and analysis: Applications in parks, recreation and human dimensions*. State College, PA: Venture.

- Vincent, S. (2010). *Interdisciplinary environmental education on the nation's campuses elements of field identity and curriculum design*. Washington, DC: National Council for Science and the Environment.
- Volkwein, J. F. (2010). A model for assessing institutional effectiveness. *New Directions for Institutional Research*, 2010(S1), 13-28. doi: 10.1002/ir.328
- Voluntary System of Accountability. (2012a, November 21). About VSA. Retrieved from <http://www.voluntarysystem.org/about>
- Voluntary System of Accountability. (2012b, November 21). College Portrait participants by state. Retrieved from <http://www.voluntarysystem.org/participants>
- Warner College of Natural Resources. (2005). *Warner College of Natural Resources 2005-2010 strategic plan: Executive summary*. Fort Collins, CO: Colorado State University.
- Warner College of Natural Resources. (2011a, March 7). College overview. Retrieved from <http://warnercnr.colostate.edu/about-wcnr/college-overview.html>
- Warner College of Natural Resources. (2011b, March 7). Fields of study. Retrieved from <http://warnercnr.colostate.edu/about-wcnr/fields-of-study.html>
- Warner College of Natural Resources. (2011c, March 7). Majors and minors. Retrieved from <http://warnercnr.colostate.edu/wcnr-undergraduate-degrees/>
- Warner College of Natural Resources. (2012a, October 20). Pingree Park. Retrieved from <http://warnercnr.colostate.edu/home/resources/pingree-park>
- Warner College of Natural Resources. (2012b, October 20). Prospective undergraduate students. Retrieved from <http://warnercnr.colostate.edu/students/prospective-students>
- Warner College of Natural Resources. (2012c, October 20). Welcome from the dean. Retrieved from <http://warnercnr.colostate.edu/home/about-wcnr/deans-message>
- Whitt, E. J., Nesheim, B. E., Guentzel, M. J., Kellogg, A. H., McDonald, W. M., & Wells, C. A. (2008). "Principles of good practice" for academic and student affairs partnership programs. *Journal of College Student Development*, 49(3), 235-249.
- Williams, A. E., & Neal, L. L. (1993). Motivational assessment in organizations: An application of importance-performance analysis. *Journal of Parks and Recreation Administration*, 11(2), 60-71.
- Wilson, E. O. (1992). *The diversity of life*. Cambridge, MA: Belknap Press.
- Wilson, E. O. (1998). *Consilience: The unity of knowledge*. New York, NY: Vintage.



Wolf-Wendel, L., Ward, K., & Kinzie, J. (2009). A tangled web of terms: The overlap and unique contribution of involvement, engagement, and integration to understanding college student success. *Journal of College Student Development*, 50(4), 407-428. doi: 10.1353/csd.0.0077

Zhao, C.-M., & Kuh, G. D. (2004). Adding value: Learning communities and student engagement. *Research in Higher Education*, 45(2), 115-138.

APPENDIX A:

CSU IRB 11-2603H – ELECTRONIC SURVEY

**Protocol Title:** ASSESSMENT OF STUDENT ENGAGEMENT AND SUCCESS IN COLORADO STATE UNIVERSITY'S WARNER COLLEGE OF NATURAL RESOURCES

**Protocol Type:** Social, Behavioral & Education Research

**Approval Period:** 04/29/2011-04/27/2012

**Important Note:** This Print View may not reflect all comments and contingencies for approval. Please check the comments section of the online protocol.

**\*\*\* Personnel Information \*\*\***

**IMPORTANT NOTE:** Mandatory Personnel on a protocol are: Principal Investigator and Department Head. Only the Principal Investigator can submit the protocol; although other personnel listed on the protocol can create the protocol. Human Subjects Protection Training is mandatory for Principal Investigator, Co-Principal Investigator, and Key Personnel (as defined by NIH). Training must be updated every three (3) years.

**Principal Investigator Mandatory**

<b>Name of Principal Investigator (Faculty, Degree Staff or Postdoc)</b>	<b>Degree</b>	<b>Title</b>
Newman, Peter	Doctorate	Associate Dean for Academics
<b>Email</b>	<b>Phone</b>	<b>Fax</b>
Peter.Newman@ColoState.EDU	(970) 491-2839	970-491-0279
<b>Department Name</b>	<b>Campus Delivery Code</b>	
Natural Resources	1401	
<b>Human Subjects Training Completed? (3) years</b>	<b>PIs must complete Training every three (3) years.</b>	<b>Y</b>

**Co-Principal Investigator**

<b>Name of Co-Principal Investigator (This can include Master's or Ph.D. students)</b>	<b>Degree</b>	<b>Title</b>
Vaske, Jerry	Doctorate	Professor
<b>Email</b>	<b>Phone</b>	<b>Fax</b>
Jerry.Vaske@colostate.edu	(970) 491-2360	970-491-2255
<b>Department Name</b>	<b>Campus Delivery Code</b>	
Human Dimensions of Nat Res	1480	
<b>Human Subjects Training Completed? three (3) years.</b>	<b>Co-PIs must complete Training every three (3) years.</b>	<b>Y</b>

No training data is available.

**Additional Co-Principal Investigator**

<b>Name of Additional Co-Principal Investigator</b>	<b>Degree</b>	<b>Title</b>
---	---------------	--------------



**Investigator**

██████████ dkholman

Master's

PhD Student

**Email**

Kaye.Holman@colostate.edu

**Phone**

██████████

**Fax**

**Department Name**

School of Education

**Campus Delivery Code (CSU) or off-campus mailing address**

██████████  
██████████

**Human Subjects Training Completed? Co-PIs must complete Training every three (3) years.** Y

No training data is available.

**Department Head Mandatory**

**Name of Department Head**

Manfredo, Michael

**Degree**

Doctorate

**Title**

Professor

**Email**

Michael.Manfredo@ColoState.EDU

**Phone**

(970) 491-6591

**Fax**

97-491-2255

**Department Name**

Human Dimensions of Nat Res

**Campus Delivery Code**

1480

**Human Subjects Training Completed?? Training is not required for Department Heads. Select "No" if you do not know if your Department Head has completed training or not.** Y

**Other Researcher or Key Personnel**

**Name of Other Research Personnel**

Lyon, Katie

**Degree**

Masters

**Title**

Graduate Assistant

**Email**

Katie.Lyon@ColoState.EDU

**Phone**

970-██████████

**Fax**

**Department Name**

Human Dimensions of Nat Res

**Campus Delivery Code (CSU) or Off-campus Mailing Address**

1480

**Human Subjects Training Completed? Training is required for all Key Personnel on NIH grants.** Y

**Name of Other Research Personnel**

Billingsley, Ethan

**Degree**

Masters

**Title**

Coordinator

**Email**

ETHAN.BILLINGSLEY@colostate.edu

**Phone**

(970) 491-4994

**Fax**

970-491-0279

**Department Name**

Natural Resources

**Campus Delivery Code (CSU) or Off-campus Mailing Address**

1401

**Human Subjects Training Completed? Training is required for all Key Personnel on NIH grants.** Y

██████████

**\*\*\* Subject Population \*\*\***

**Subject Population(s) Checklist**

Select All That Apply :

Adult Volunteers

Elderly

Employees

Mentally Disabled or Decisionally Challenged

Minors (under 18)

Pregnant Women

Prisoners

Soldiers

X Students

Other (i.e., non-English speaking or any population that is not specified above)

-----



\*\*\* Study Location \*\*\*

Study Location(s) Checklist

Select All That Apply - Note: Check "Other" and input text: 1. If your location is not listed, or 2) If you would like to list details of your already-checked location (e.g., specific school within a school district)

- Aims Community College
- Colorado Department of Public Health & Environment
- X Colorado State University
- Colorado State University - Pueblo Campus
- Denver Public Schools
- Poudre School District
- Poudre Valley Health System (PVHS)
- Rocky Mountain National Park
- Thompson School District
- University of Colorado - Boulder
- University of Colorado - Colorado Springs
- University of Colorado - Denver
- University of Colorado Health Sciences Center
- University of Northern Colorado

Other (In the box below, list your study location if not checked above. You may also list details of your already-checked location (e.g., specific school within a school district))

-----



\*\*\* General Checklist \*\*\*

General Checklist

Select All That Apply :

Cooperating/Collaborating Institution(s) -Institution where recruitment will occur OR Institution where Collaborating PI will conduct associated research.

Federally Sponsored Project

Training Grant

Project is associated with the Colorado School of Public Health

Program Project Grant

Subjects will be compensated for participation

Behavioral observation

Deception

Human blood, cells, tissues, or body fluids. If checked, is IBC approval needed? List PARF approval date and number.

Interview

X Study of existing data

X Survey/questionnaire

Thesis or Dissertation Project (Attach Methodology chapter in the Attachment section)

Waiver of consent

Other (clarify in text box to the right)

-----



\*\*\* Funding \*\*\*

Funding Checklist

X NONE

NOTE: If applicable, Grant Application must be attached in the Attachment Section (#11).

Funding - Grants/Contracts

Funding - Fellowships

Funding - Other

Gift Funding

Dept. Funding

Other Funding

-----





\* \* \* Expedited Paragraphs \* \* \*

PLEASE READ: The criteria for expedited review are listed below. Please review these criteria to evaluate if your protocol meets the expedited-review criteria. For expedited review, a protocol must be no more than minimal risk (i.e., "not greater than those ordinarily encountered in daily life") AND must only involve human subjects in one or more of the following numbered paragraphs. If none of the expedited criteria are appropriate for your project, please move to the next screen without selecting any of these criteria; your protocol will be reviewed by the full IRB. Note: The IRB will make the final determination if your protocol is eligible for expedited review.

Expedite Criteria:

1. Clinical studies of drugs and medical devices only when condition (a) or (b) is met.
  - a) Research on drugs for which an investigational new drug application (21 CFR Part 312) is not required. (Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risks associated with the use of the product is not eligible for expedited review.)
  - b) Research on medical devices for which
    - i) An investigational device exemption application (21 CFR Part 812) is not required; or
    - ii) The medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.
2. Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows:
  - a) From healthy, nonpregnant adults who weigh at least 110 pounds. For these subjects, the amounts drawn may not exceed 550 ml in an 8-week period and collection may not occur more frequently than 2 times per week; or
  - b) From other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8-week period and collection may not occur more frequently than 2 times per week.
3. Prospective collection of biological specimens for research purposes by non- invasive means.
4. Collection of data through non-invasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications.)

Examples:

- a) Physical sensors that are applied either to the surface of the body or at a distance and do not involve input of significant amounts of energy into the subject or an invasion of the subject's privacy;
- b) Weighing or testing sensory acuity;
- c) Magnetic resonance imaging;
- d) Electrocardiography, electroencephalography, thermography, detection of naturally occurring radioactivity, electroretinography, ultrasound, diagnostic infrared imaging, doppler blood flow, and echocardiography;
- e) Moderate exercise, muscular strength testing, body composition assessment, and flexibility testing where appropriate given the age, weight, and health of the individual.

- X 5. Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis). (NOTE: Some research in this paragraph may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(4). This listing refers only to research that is not exempt.)
  - 6. Collection of data from voice, video, digital, or image recordings made for research purposes.
  - X 7. Research on individual or group characteristics or behavior(including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.)
- 



\*\*\* Purpose, Study Procedures, Background \*\*\*

Original Protocol Number (e.g., 07-226H)

Title (Please indicate if the protocol title is different from the proposal title)

ASSESSMENT OF STUDENT ENGAGEMENT AND SUCCESS IN COLORADO STATE UNIVERSITY'S WARNER COLLEGE OF NATURAL RESOURCES

Complete Sections 1 - 11. Specify N/A as appropriate. Do not leave any sections blank.

1. Purpose of the study

- a) Provide a brief lay summary of the project in < 200 words. The lay summary should be readily understandable to the general public.

The purpose of this study is to assess student engagement and success, as defined by student persistence and retention, in the Warner College of Natural Resources (WCNR). An online survey will be sent to all undergraduates in WCNR through StudentVoice, a third party vendor, which has a contract to provide assessment services to Colorado State University, and in coordination with CSU's office of the Vice President for Student Affairs. The survey will evaluate students' participation, importance, and satisfaction with the college's (a) course experiences, (b) experiential learning, (c) faculty advising, (d) community and climate and with activities related to (e) natural resources professional development. The survey will also evaluate (f) student perceptions on their persistence and retention at CSU. Comparative assessment—by age, gender, ethnicity, residency, class standing, enrollment status, classification at the time of admission to CSU, CSU grade point average, CSU credits completed, and majors and departments—will also be undertaken to determine patterns of engagement and persistence among the student population.

- b) What does the Investigator(s) hope to learn from the study?

The investigators hope to learn which measure of student engagement identified through the study are supporting student success (i.e., persistence and retention) in the college. Because the investigation aligns with WCNR Strategic Planning elements and CSU Stretch Goals on Teaching and Learning, Research and Discovery, and Service and Outreach, findings will be reported to the college administration and faculty and shared with the CSU administration, including the office of the Vice President for Student Affairs. Ultimately, the findings are intended for use by the college administration and faculty to support and enhance student learning and success in WCNR.

2. Study Procedures

- a) Describe all study procedures here (please do not respond "See Attachment Section"). The box below is for text only. If you would like to add tables, charts, etc., attach those files in the Attachment section (#11).

An online survey will be sent to all undergraduates in WCNR through StudentVoice, a third party vendor, which has a contract to provide assessment services to Colorado State University, and in coordination with CSU's office of the Vice President for Student Affairs. The survey will be open for approximately two weeks. An email announcement about the survey will be sent to all students in the college in advance of the survey administration. In addition, email and postcard invitations and two email reminders will be sent to students during the period of the administration. The survey will be advertised on flyers posted in WCNR and appear upon login in WCNR computer labs. Survey completion is estimated at no more than 15 minutes, although some students may require additional time to complete the survey.

Following the survey administration, limited demographic information contained in the CSU ARIES database—date of birth, gender, ethnicity, residency, class standing, enrollment status, classification at the time of admission to CSU, CSU grade point average, CSU credits completed, and majors and departments—will be accessed by the WCNR Dean's Office staff and matched to participants in the online survey through their unique StudentVoice identifiers and email addresses on record in CSU ARIES. To protect student identities and retain their anonymity for the survey answers, student names, RamIDs, and other identifying variables will NOT be incorporated into the data records for the study.

Data will be statistically analyzed using programs such as SPSS and LISREL.

- b) State if audio or video taping will occur. Describe how the tapes will be maintained during and upon completion of the project. Describe what will become of the tapes after use (e.g., shown at scientific meetings, erased, etc.).

Audio or video taping will not be used for this study.

- c) State if deception will be used. If so, provide a rationale and describe debriefing procedures. Submit a debriefing script in the Attachment section (#11).

Deception will not be used in this study.

### 3. Background/Rationale

- a) Briefly describe past findings leading to the formulation of the study, if applicable.

The Warner College of Natural Resources (WCNR, 2011) promotes itself as a global leader in learning, discovery and engagement that guides natural resource conservation, sustainability and stewardship. The student experience in learning and engagement is described on the college's website as being hands-on, field and research-based, and focused on skill development in communication, problem-solving, critical thinking, and teamwork—the kinds of activities promoted as educational best practices to ensure student persistence and success. Students in higher education are classically deemed successful if they persist at the university and leave having earned their bachelor's degree (Kuh, Kinzie, Schuh, & Whitt, 2005). Some universities and colleges, such as Colorado State University (CSU), participate in the National Survey of Student Engagement (NSSE, 2011) to evaluate student participation in educationally purposeful activities while students are still in school. CSU's participation in NSSE is one way the university demonstrates its commitment to enhancing undergraduate education and student success campus-wide (Kuk et al., 2006). While the University assesses institutional student engagement through its participation in NSSE, there has been no systematic evaluation of educational best practices supporting student success in WCNR. This study intends to fill that gap, providing information on student engagement and persistence to the college administration and faculty as a means of supporting and enhancing student learning and success in WCNR.

#### References

Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2005). Student success in college: Creating conditions that matter. San Francisco, CA: Jossey-Bass.

Kuk, L., Lamborn, A., Hughes, B., McKelfresh, D., Schmidt, B., & Thayer, P. (2006). A plan for excellence: Enhancing undergraduate education and student success. Colorado State University. Fort Collins, CO. Retrieved from <http://www.president.colostate.edu/pdf/RetentionReportDraft4.pdf>

National Survey of Student Engagement. (2011, February 20). About NSSE. Retrieved from <http://nsse.iub.edu/html/about.cfm>

Warner College of Natural Resources. (2011, February 20). About WCNR. Retrieved from <http://warnercnr.colostate.edu/about-wcnr/>

\* \* \* Subject Population \* \* \*

4. Subject Population - In the space below, please describe the participants that you are requesting to recruit (include requested participant number and description of each group requested).

- a) Requested Participant Description (Include number that you plan to study and description of each group requested, if applicable).

Undergraduate students enrolled in the Warner College of Natural Resources (N = ~1,300).

- b) What is the rationale for studying the requested group(s) of participants?

While CSU assesses institutional student engagement through its participation in NSSE, there has been no systematic evaluation of educational best practices supporting student success in WCNR. This study intends to fill that gap, providing information on student engagement and persistence to the college administration and faculty as a means of supporting and enhancing student learning and success in WCNR.

- c) If applicable, state the rationale for involvement of potentially vulnerable subjects to be entered into the study, including minors, pregnant women, economically and educationally disadvantaged, and decisionally impaired people. Specify the measures being taken to minimize the risks and the chance of harm to the potentially vulnerable subjects.

There are no known risks to participating in this study. Additionally, participation is voluntary.

- d) If women, minorities, or minors are not included, a clear compelling rationale must be provided. Examples for not including minors: participant must be a registered voter; the drug or device being studied would interfere with normal growth and development; etc.

The pool of participants will be drawn from the CSU ARIES database, and communications with the subjects will be coordinated through StudentVoice. All students having their primary major at CSU in the Warner College of Natural Resources will be sent an email to their @rams.colostate.edu email address and invited to take the online survey. Online survey processes do not allow for parents of minor-age students to be sent the email invitation nor approve consent to participate on behalf of their children. All subject will themselves be required to affirm they are legally of age to participate in the survey.

- e) State if any of the subjects are students, employees, or laboratory personnel. They should be presented with the same written informed consent. If compensation is allowed, they should also receive it.

All subjects are undergraduate students in CSU's Warner College of Natural Resources.

- f) Describe how potential subjects will be identified for recruitment. Examples include: class rosters, group membership, individuals answering an advertisement, organization position titles (i.e., Presidents, web designers, etc.). How will potential participants learn about the research and how will they be recruited (e.g., flyer, email, web posting, telephone, etc.)? Attach recruitment materials in the Attachment section (#11). Important to remember: subjects cannot be contacted before IRB approval.

The pool of participants will be drawn from the CSU ARIES database, with students listed as having their primary major at CSU in the Warner College of Natural Resources invited to participate in the study. Communication with the subjects will primarily be managed through StudentVoice, although an email pre-survey invitation and mailed postcard reminder will be sent to students directly from the WCNR Dean's Office. In coordination with StudentVoice, students will receive an email invitation and two email reminders on their @rams.colostate.edu email address during the period of the survey administration. The survey will also be advertised on flyers posted in WCNR and will appear upon login in WCNR computer labs.

\* \* \* Subject Population \* \* \*

4. Subject Population (continued)

g) Identify the inclusion and exclusion criteria.

The pool of participants will be drawn from the CSU ARIES database, with students listed as having their primary major at CSU in the Warner College of Natural Resources invited to participate in the study. Graduate students in the college will be excluded from the study.

h) Compensation. Explain the amount and schedule of compensation, if any, that will be paid for participation in the study. Include provisions for prorating payment.

Subjects will not be compensated for their participation in the study. However, respondents will be offered the opportunity to have their name entered into a drawing for one of five WCNR hoodies.

i) Estimate the probable duration of the entire study. This estimate should include the total time each subject is to be involved and the duration the data about the subject is to be collected (e.g., This is a 2-year study. Participants will be interviewed 3 times per year; each interview will last approximately 2 hours. Total approximate time commitment for participants is 12 hours.)

The survey will be available through CSU Student Voice for approximately 2 weeks. The survey will take approximately 15 minutes to complete, although some students may require additional time to finish the survey.

-----



\*\*\* Risks \*\*\*

5. Risks (Input N/A if not applicable)

US Department of Health & Human Services (HHS) Regulations define a subject at risk as follows: "...any individual who may be exposed to the possibility of injury, including physical, psychological, or social injury, as a consequence of participation as a subject in any research, development, or related activity which departs from the application of those accepted methods necessary to meet his needs, or which increases the ordinary risks of daily life, including the recognized risks inherent in a chosen occupation or field of service."

a)

For the following categories, include an estimate of the potential risk. Input N/A if not applicable.

Physical well-being.

N/A

Psychological well-being.

N/A

Political well-being.

N/A

Economic well-being.

N/A

Social well-being.

N/A

b) In case of overseas research, describe qualifications/preparations that enable you to evaluate cultural appropriateness and estimate/minimize risks to subjects.

N/A

c) Discuss plans for ensuring necessary medical or professional intervention in the event of a distressed subject.

In the event an adverse event were to occur during the course of this research, the PI will notify the HRC through RICRO as soon as communication is available and report the event.

d) If audio/video taping will be used, state if it could increase potential risk to subject's confidentiality.

N/A

\*\*\* Benefits, Procedures to Maintain Confidentiality \*\*\*

6. Benefits

- a) Describe the potential benefit(s) to be gained by the subjects or how the results of the study may benefit future subjects. Indicate if there is no direct benefit to the participants.

The potential benefits for current and future subjects of this study include improved and enhanced student experiences in WCNR in courses experiential learning, faculty advising, community and social programming, and professional development activities in natural resources. The results of the study are also intended to benefit future subjects through improved recruitment and retention practices in WCNR.

7. Procedures to Maintain Confidentiality

- a) Describe the procedures in place that will protect the privacy of the subjects and maintain the confidentiality of the data. If a linked list is used, explain when the linked list will be destroyed. Provide a sample of the code that will be used, if applicable.

StudentVoice will be used for the survey administration, with unique student identifiers created and matched to student email addresses on record in CSU ARIES. Following the survey administration, limited demographic information contained in the CSU ARIES database—date of birth, gender, ethnicity, residency, class standing, enrollment status, classification at the time of admission to CSU, CSU grade point average, CSU credits completed, and majors and departments—will be accessed by WCNR Dean's Office staff and matched to participants in the online survey through their unique StudentVoice identifiers and email addresses on record in CSU ARIES

To protect student identities and retain their anonymity for the survey answers, student names, RamIDs, and other identifying variables will NOT be incorporated into the data files used for statistical analyses and evaluation in this study. Data files used in statistical analyses (i.e., the files stripped of personally identifying information) will be supplied to members of the research team and retained on their computers, all of which require password-based log-ons.

- b) If information derived from the study will be provided to the subject's personal physician, a government agency, or any other person or group, describe to whom the information will be given and the nature of the information.

For students receiving a hoodie, their name and RamID but not their survey data will be reported to CSU officials to comply with the university's reporting and financial audit requirements.

- c) Specify where and under what conditions study data will be kept, how samples will be labeled, who has access to the data, and what will be available and to whom. Federal Regulations require that study data and consent documents be kept for a minimum of three (3) years after the completion of the study by the PI. For longitudinal projects, the PI may be required to keep the data and documents for a longer time period.

The information (electronic file) with participants' email addresses will be kept for the three year period and then destroyed and deleted from the server.

Complete survey and profile data will be stored on the StudentVoice reporting site and will only be accessible through unique user names and passwords supplied to the investigators. StudentVoice has implemented various security measures at the application, network, and physical level to ensure that data will not be compromised. At the application level, several security measures and coding standards are in place such as code to guard against common hacking techniques, rules related to strength of passwords, and staying up-to-date on all security and release updates. Protection at the network level includes features such as dual firewalls, SSL encryption and 24/7 monitoring. StudentVoice servers are housed within a Class A Data Center, compliant with TIA standards. The servers are always staffed, have three-tiered access points, and 24/7 camera surveillance.

Data files used in statistical analyses (i.e., the files stripped of personally identifying information) will be supplied to members of the research team and retained on their computers, all of which require password-based log-ons.



**\*\*\* Potential Conflict of Interest \*\*\***

**8. Potential Conflict of Interest**

Although you have already submitted CSU's official Conflict of Interest form (COI/COC) to the University, it is the IRB's responsibility to ensure that conflicting interests related to submitted protocols do not adversely affect the protection of participants or the credibility of the human research protection program at CSU. Please answer questions a-d below. Please note that if you indicate that you have a potential conflict of interest in relation to this protocol, your CSU COI/COC Reporting Form must reflect this potential conflict. Link to CSU's Conflict of Interest policy: <http://www.provost.colostate.edu/print/coirev.pdf>.

- a)        N        In connection with this protocol, do you or any of the protocol investigators or their immediate family members (i.e., spouse and legal dependents, as determined by the IRS) have a potential conflict of interest?
- b)        N/A        If you do have a potential conflict of interest, is this reported in your current COI/COC?
- c)        N/A        If you do have a potential conflict of interest, is there a management plan in place to manage this potential conflict?
- d)        N/A        If you do have a potential conflict of interest, is this potential conflict of interest included in your consent document (as required in the Management Plan)?

If you have reported a possible conflict of interest, the IRB will forward the title of this protocol to your Research Associate Dean to complete your COI file.

For more information on CSU's policy on Conflict of Interest, please see the Colorado State University Academic Faculty and Administrative Professional Manual Sections D.7.6 & D.7.7: <http://www.facultycouncil.colostate.edu/files/manual/sectiond.htm#D.7.6>.

Link to CSU's Conflict of Interest policy: <http://www.provost.colostate.edu/print/coirev.pdf> .

-----




\*\*\* Informed Consent \*\*\*

9. Informed Consent See sample consent forms at <http://web.research.colostate.edu/ricro/hrc/forms.aspx>

NOTE: In order to complete this protocol, you must upload either a Consent Form or an Alteration of Consent Form (i.e., Cover Letter or Verbal Script) OR (if neither of those apply to your project) you must complete the Waiver of consent information.

In the space below, provide consent process background information, for each Consent Form, Alteration of Consent Form (i.e., Cover Letter or Verbal Script), or Waiver of consent. You will not be able to submit this protocol without completing this information.

**Informed Consent**

Title	Email Invitation
Consent Information Type	Alteration of Consent
Consent Form Template	X Attachment 

Who is obtaining consent? The person obtaining consent must be knowledgeable about the study and authorized by the PI to consent human subjects.

The survey is being administered online through StudentVoice, a third party vendor contracted by CSU for survey administration.

How is consent being obtained?

The pool of participants will be drawn from the CSU ARIES database, with students listed as having their primary major at CSU in the Warner College of Natural Resources invited to participate in the study. Subjects will receive email invitations and consent to participate forms on their @rams.colostate.edu email address and be invited to take the online survey. All subject will themselves be required to affirm the are legally of age to participate in the survey.

What steps are you taking to determine that potential subjects are competent to participate in the decision-making process?

All subjects will be drawn from CSU ARIES records of currently enrolled students in the Warner College of Natural Resources.



Y The research involves no more than minimal risk to the subjects. There are no known risks for taking part in this study. Additionally, participation is voluntary. In the event an adverse event were to occur during the course of this research, the PI will notify the HRC through RICRO as soon as communication is available and report the event.


Y The waiver or alteration will not adversely affect the rights and welfare of the subjects. The Alteration of Consent affirms that all participants must be at least 18 years of age and that their responses are confidential. Additionally, the alteration of consent affirms the voluntary nature of the students' participation.

Whether a student decides to take the survey or not, the potential benefits to students from the study include improved and enhanced student experiences in WCNR courses, experiential learning, faculty advising, and other areas, such as events and professional development opportunities.

Y The research could not practicably be carried out without the waiver or alteration. The survey is being administered in an online format through Student Voice. The Alteration of Consent will be made part of the email-based invitation and two email reminders to participate sent by StudentVoice in coordination with the WCNR Dean's Office. By clicking on the link to the survey provided in the emails, the students' will be consenting to participate in the study and will be immediately redirected to the StudentVoice online survey to take it.

Y Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

The Alteration of Consent invitation and reminder emails include information on how to contact the PI and RICRO if they have survey-related questions or concerns. Additionally, the closing screen for the online survey will include a thank you and statement reminding students how to contact the PI if they have post-survey questions or concerns.

Title	First Reminder
Consent Information Type	Alteration of Consent
Consent Form Template	X Attachment 

Who is obtaining consent? The person obtaining consent must be knowledgeable about the study and authorized by the PI to consent human subjects.

The survey is being administered online through StudentVoice, a third party vendor contracted by CSU for survey administration.

How is consent being obtained?

The pool of participants will be drawn from the CSU ARIES database, with students listed as having their primary major at CSU in the Warner College of Natural Resources invited to participate in the study. Subjects will receive email invitations and consent to participate forms on their @rams.colostate.edu email address and be invited to take the online survey. All subject will themselves be required to affirm the are legally of age to participate in the survey.

What steps are you taking to determine that potential subjects are competent to participate in the decision-making process?

All subjects will be drawn from CSU ARIES records of currently enrolled students in the Warner College of Natural Resources.



Y The research involves no more than minimal risk to the subjects.

There are no known risks for taking part in this study. Additionally, participation is voluntary. In the event an adverse event were to occur during the course of this research, the PI will notify the HRC through RICRO as soon as communication is available and report the event.

Y The waiver or alteration will not adversely affect the rights and welfare of the subjects.

The Alteration of Consent affirms that all participants must be at least 18 years of age and that their responses are confidential. Additionally, the alteration of consent affirms the voluntary nature of the students' participation.

Whether a student decides to take the survey or not, the potential benefits to students from the study include improved and enhanced student experiences in WCNR courses, experiential learning, faculty advising, and other areas, such as events and professional development opportunities.

Y The research could not practicably be carried out without the waiver or alteration.

The survey is being administered in an online format through Student Voice. The Alteration of Consent will be made part of the email-based invitation and two email reminders to participate sent by StudentVoice in coordination with the WCNR Dean's Office. By clicking on the link to the survey provided in the emails, the students' will be consenting to participate in the study and will be immediately redirected to the StudentVoice online survey to take it.

Y Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

The Alternation of Consent invitation and reminder emails include information on how to contact the PI and RICRO if they have survey-related questions or concerns. Additionally, the closing screen for the online survey will include a thank you and statement reminding students how to contact the PI if they have post-survey questions or concerns.

Title	Second Reminder
Consent Information Type	Alteration of Consent
Consent Form Template	X Attachment



Who is obtaining consent? The person obtaining consent must be knowledgeable about the study and authorized by the PI to consent human subjects.

The survey is being administered online through StudentVoice, a third party vendor contracted by CSU for survey administration.

How is consent being obtained?

The pool of participants will be drawn from the CSU ARIES database, with students listed as having their primary major at CSU in the Warner College of Natural Resources invited to participate in the study. Subjects will receive email invitations and consent to participate forms on their @rams.colostate.edu email address and be invited to take the online survey. All subject will themselves be required to affirm the are legally of age to participate in the survey.

What steps are you taking to determine that potential subjects are competent to participate in the decision-making process?

All subjects will be drawn from CSU ARIES records of currently enrolled students in the Warner College of Natural Resources.



Y The research involves no more than minimal risk to the subjects.

There are no known risks for taking part in this study. Additionally, participation is voluntary. In the event an adverse event were to occur during the course of this research, the PI will notify the HRC through RICRO as soon as communication is available and report the event.

Y The waiver or alteration will not adversely affect the rights and welfare of the subjects.

The Alteration of Consent affirms that all participants must be at least 18 years of age and that their responses are confidential. Additionally, the alteration of consent affirms the voluntary nature of the students' participation.

Whether a student decides to take the survey or not, the potential benefits to students from the study include improved and enhanced student experiences in WCNR courses, experiential learning, faculty advising, and other areas, such as events and professional development opportunities.

Y The research could not practicably be carried out without the waiver or alteration.

The survey is being administered in an online format through Student Voice. The Alteration of Consent will be made part of the email-based invitation and two email reminders to participate sent by StudentVoice in coordination with the WCNR Dean's Office. By clicking on the link to the survey provided in the emails, the students' will be consenting to participate in the study and will be immediately redirected to the StudentVoice online survey to take it.

Y Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

The Alteration of Consent invitation and reminder emails include information on how to contact the PI and RICRO if they have survey-related questions or concerns. Additionally, the closing screen for the online survey will include a thank you and statement reminding students how to contact the PI if they have post-survey questions or concerns.

---



**\*\*\* Assent Background \*\*\***

**10. Assent Background**

All minors must provide an affirmative consent to participate by signing a simplified assent form, unless the Investigator(s) provides evidence to the IRB that the minor subjects are not capable of assenting because of age, maturity, psychological state, or other factors.

See sample assent/consent forms at <http://web.research.colostate.edu/ricro/hrc/forms.aspx>

If applicable, provide assent process background information for each Assent Form, Alteration of Assent Form (i.e., Cover Letter or Verbal Script), or Waiver.

**Assent Background**

---



\*\*\* Attachments \*\*\*

11. Attachments

Attach relevant documents here. These could include: Collaborating Investigator's IRB approval and approved documents; Conflict of Interest information; Debriefing Script; Grant/Sub-contract; HIPAA Authorization or Waiver Form from HIPAA-covered entity; Interview/Focus Group Questions; Investigator's Brochure; Letters of Agreement/Cooperation from organizations who will help with recruitment; Methodology section of associated Thesis or Dissertation project; Questionnaires; Radiation Control Office approval material; Recruitment Material (e.g., flyers, email text, verbal scripts); Sponsor 's Protocol; Surveys; Other files associated with protocol (can upload most standard file formats: xls, pdf, jpg, tif, etc.) Please be sure to attach all documents associated with your protocol. Failure to attach the files associated with the protocol may result in this protocol being returned to you for completion prior to being reviewed. Students: Be sure to attach the Methods Section of your thesis or dissertation proposal. All PIs: If this protocol is associated with a grant proposal, please remember to attach your grant.

To update or revise any attachments, please delete the existing attachment and upload the revised document to replace it.

Document Type	Recruitment Material (e.g., flyers, email text, verbal scripts)
Attachment	3 Postcard_Invitation_2011
Document Name	3 Postcard_Invitation_2011

Document Type	Questionnaire/Survey
Attachment	IWCNR Student Engagement Survey 2011 (110411-ALT)
Document Name	IWCNR Student Engagement Survey 2011 (110411-ALT)

Document Type	Recruitment Material (e.g., flyers, email text, verbal scripts)
Attachment	6 Flyer for WCNR
Document Name	6 Flyer for WCNR

Document Type	Email Correspondence
Attachment	1_Email_Pre-Invitation_2011.final
Document Name	1_Email_Pre-Invitation_2011.final

-----



\* \* \* Obligations \* \* \*

Obligations (Researcher's Responsibilities)

The Principal Investigator is ultimately responsible for the conduct of the project. Obligations of the Principal Investigator are:

Conduct the research involving human subjects as presented in the protocol, including modifications, as approved by the Department and Institutional Review Board. Changes in any aspect of the study (for example project design, procedures, consent forms, advertising materials, additional key personnel or subject population) will be submitted to the IRB for approval before instituting the changes (PI will submit the "Amendment/Revision" form);

Provide all subjects a copy of the signed consent form, if applicable. Investigators are required to retain signed consent documents for three (3) years after close of the study;

Maintain an approved status for Human Subjects Protection training. Training must be updated every three (3) years (Contact RICRO to check your current approval/renewal dates). For more information: Human Subjects Training Completed?

Submit either the "Protocol Deviation Form" or the "Report Form" to report protocol Deviations/Violations, Unanticipated Problems and Adverse Events that occur in the course of the protocol. Any of these events must be reported to the IRB as soon as possible, but not later than five (5) working days;

Submit the "Continuing Review" Form in order to maintain active status of the approved protocol. The form must be submitted annually at least four (4) weeks prior to expiration, five (5) weeks for protocols that require full review. If the protocol is not renewed before expiration, all activities must cease until the protocol has been re-reviewed;

Notify the IRB that the study is complete by submitting the "Final Report" form.

X The Principal Investigator has read and agrees to abide by the above obligations.

-----





APPENDIX B:

CSU IRB 11-2603H – APPROVAL

**NOTICE OF APPROVAL FOR HUMAN RESEARCH**

**DATE:** April 29, 2011  
**TO:** Newman, Peter, Natural Resources  
dkholman, dkholman, School of Education, Vaske, Jerry, Human Dimensions of Nat Res, Manfredo, Michael, Human Dimensions of Nat Res  
**FROM:** Barker, Janell, , CSU IRB 1  
**PROTOCOL TITLE:** ASSESSMENT OF STUDENT ENGAGEMENT AND SUCCESS IN COLORADO STATE UNIVERSITY&#8217;S WARNER COLLEGE OF NATURAL RESOURCES  
**FUNDING SOURCE:** NONE  
**PROTOCOL NUMBER:** 11-2603H  
**APPROVAL PERIOD:** Approval Date: April 29, 2011 Expiration Date: April 27, 2012

The CSU Institutional Review Board (IRB) for the protection of human subjects has reviewed the protocol entitled: ASSESSMENT OF STUDENT ENGAGEMENT AND SUCCESS IN COLORADO STATE UNIVERSITY&#8217;S WARNER COLLEGE OF NATURAL RESOURCES. The project has been approved for the procedures and subjects described in the protocol. This protocol must be reviewed for renewal on a yearly basis for as long as the research remains active. Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

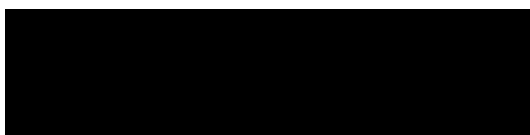
If approval did not accompany a proposal when it was submitted to a sponsor, it is the PI's responsibility to provide the sponsor with the approval notice.

This approval is issued under Colorado State University's Federal Wide Assurance 00000647 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under CSU's Assurance, please do not hesitate to contact us.

Please direct any questions about the IRB's actions on this project to:

Janell Barker, Senior IRB Coordinator - (970) 491-1655 [Janell.Barker@Colostate.edu](mailto:Janell.Barker@Colostate.edu)  
Evelyn Swiss, IRB Coordinator - (970) 491-1381 [Evelyn.Swiss@Colostate.edu](mailto:Evelyn.Swiss@Colostate.edu)

Barker, Janell



Barker, Janell

Includes:

11-2603H



*Knowledge to Go Places*

Research Integrity & Compliance Review Office  
Office of the Vice President for Research  
321 General Services Building - Campus Delivery 2011  
Fort Collins, CO  
TEL: (970) 491-1553  
FAX: (970) 491-2293

Approval is to recruit up to 1,300 participants with the approved cover letter. Because of the nature of this research, it will not be necessary to obtain a signed consent form. However, all subjects must be consented with the approved electronic cover letter. The requirement of documentation of a consent form is waived under .117(c)(2).

---

<b>Approval Period:</b>	April 29, 2011 through April 27, 2012
<b>Review Type:</b>	EXPEDITED
<b>IRB Number:</b>	00000202



APPENDIX C:  
ELECTRONIC SURVEY



**Warner College of Natural Resources**

**Student Engagement Survey**

**There are six sections of this survey.**

# Section 1: Warner Course Experiences

	Overall, how <i>important</i> is it to you to have opportunities to do each of the following in your WCNR courses?	Overall, how <i>satisfied</i> are you with opportunities to do each of the following in your WCNR courses?
Discussions	Very Unimportant - 1 Unimportant - 2 Neutral - 3 Important - 4 Very Important - 5	Very Dissatisfied - 1 Dissatisfied - 2 Neutral - 3 Satisfied - 4 Very Satisfied - 5
Writing papers		
Final projects		
Presentations		
Group assignments		
Problem solving		
Lab work		
Fieldwork		
Community service		

## Section 2: Warner Experiential Learning

	Overall, how <i>important</i> is it to you to have opportunities to do each of the following in your WCNR experiences?	Overall, how <i>satisfied</i> are you with opportunities to do each of the following in your WCNR experiences?
<b>Residential learning community</b>	Very Unimportant - 1 Unimportant - 2 Neutral - 3 Important - 4 Very Important - 5	Very Dissatisfied - 1 Dissatisfied - 2 Neutral - 3 Satisfied - 4 Very Satisfied - 5
<b>Community service</b>		
<b>Internship</b>		
<b>Undergraduate research</b>		
<b>Undergraduate or honors thesis</b>		
<b>Pingree Park</b>		
<b>Study abroad</b>		

## Section 3: Warner Faculty Advising

	Overall, how <i>important</i> is it to you to have opportunities to be advised by WCNR faculty on each of the following?	Overall, how <i>satisfied</i> are you with opportunities to be advised by WCNR faculty on each of the following?
Course assignments	Very Unimportant - 1 Unimportant - 2 Neutral - 3 Important - 4 Very Important - 5	Very Dissatisfied - 1 Dissatisfied - 2 Neutral - 3 Satisfied - 4 Very Satisfied - 5
Course grades		
Major or minor options		
Planning classes to take		
Registering for classes		
Internships		
Field experience placements		
Research		
Scholarships or fellowships		
Graduate school		
Career plans		



# Section 4: Warner Community and Climate

	How <i>important</i> is each of the following statements in relation to your experiences in WCNR?	How <i>satisfied</i> are you with each of the following statements in relation to your experiences in WCNR?
<b>The WCNR community is friendly.</b>	Very Unimportant - 1 Unimportant - 2 Neutral - 3 Important - 4 Very Important - 5	Very Dissatisfied - 1 Dissatisfied - 2 Neutral - 3 Satisfied - 4 Very Satisfied - 5
<b>The WCNR community is supportive.</b>		
<b>The WCNR community is like family.</b>		
<b>I take part in WCNR student clubs.</b>		
<b>I attend WCNR social events (e.g., picnic or pancake breakfast).</b>		
<b>I do volunteer work as a student in WCNR.</b>		
<b>I feel welcome in WCNR common spaces (e.g., the atrium).</b>		
<b>I am a valued member of WCNR.</b>		

## Section 5: Natural Resource Professionalism

	How <i>important</i> are each of the following statements in relation to your development as a natural resource professional through your education in WCNR?	How <i>satisfied</i> are you with each of the following statements in relation to your development as a natural resource professional through your education in WCNR?
<b>I discuss current issues.</b>	Very Unimportant - 1 Unimportant - 2 Neutral - 3 Important - 4 Very Important - 5	Very Dissatisfied - 1 Dissatisfied - 2 Neutral - 3 Satisfied - 4 Very Satisfied - 5
<b>I learn about diverse perspectives.</b>		
<b>I explore ethical or social issues.</b>		
<b>I write on what I have learned.</b>		
<b>I apply knowledge to real-world problems.</b>		
<b>I work cooperatively with diverse people.</b>		
<b>I gain knowledge or skills that will support me in my career.</b>		
<b>I practice conservation, sustainability, or stewardship.</b>		

# Section 6: Overall Engagement, Persistence and Success

**Overall, do you feel successful in:**

**your major?**  Definitely Yes  Probably Yes  Probably No  Definitely No  I don't know.

**WCNR?**  Definitely Yes  Probably Yes  Probably No  Definitely No  I don't know.

**Do you plan to continue in your current major in WCNR next year?**

Definitely Yes

Probably Yes

Probably No

Definitely No

I don't know.

**Are you on track to graduate on time (i.e., completing your degree in 4 to 6 years)?**

Definitely Yes  Probably Yes  Probably No  Definitely No  I don't know.

**If you could start over again, would you choose:**

**your major?**  Definitely Yes  Probably Yes  Probably No  Definitely No  I don't know.

**WCNR?**  Definitely Yes  Probably Yes  Probably No  Definitely No  I don't know.

**Are there things you find challenging to your overall success in WCNR? (Check all that apply.)**

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Cost of college             | <input type="checkbox"/> Work issues   | <input type="checkbox"/> Changed majors                      |
| <input type="checkbox"/> Not enough financial aid    | <input type="checkbox"/> Health issues | <input type="checkbox"/> Transferred into CSU                |
| <input type="checkbox"/> Sequence of class offerings | <input type="checkbox"/> Family issues | <input type="checkbox"/> Other things? Please specify: _____ |
- 

**Drawing Instructions**

If you would like to be entered in the drawing for one (1) of five (5) WCNR hoodies, please provide your name and a phone number or email address where we can reach you this summer. *We will only contact you if you have won.*

Name: \_\_\_\_\_

Summer Phone Number: \_\_\_\_\_

Summer Email Address: \_\_\_\_\_

**Thank You for participating in this survey!**

If you have any questions or concerns related to the survey or drawing, please contact the WCNR Associate Dean for Academics, through the WCNR Student Services office at 970-491-4994.

APPENDIX D:

ELECTRONIC SURVEY – EMAIL PRE-INVITATION

{MONTH} {YEAR}

Dear {FIRSTNAME},

I am emailing to ask your help with an important study we are conducting in the Warner College of Natural Resources (WCNR).

In the next few days, you will receive an email invitation at your @rams.colostate.edu to take part in an online 15-minute survey on student engagement. By participating in the survey, you will help us improve and enhance experiences for students in WCNR. Please be assured that your answers are confidential. No individual's answers will ever be identified in any report. When we write about the findings from the survey, we will report the data in aggregate only. In addition, your participation is voluntary, though I hope you will respond.

Students taking the survey may enter a drawing to receive one of five WCNR hoodies. To enter the drawing without taking the survey or to ask questions about the study, please contact me through the WCNR Student Services office at 970-491-4994.

Your opinion counts, and I hope you'll take the time to share it. Watch your email for the invitation.

Sincerely,

Peter Newman  
Associate Dean for Academics



Warner College of Natural Resources  
101 Natural Resources Building  
Campus Delivery 1401  
Fort Collins, CO 80523-1401

APPENDIX E:  
ELECTRONIC SURVEY – EMAIL INVITATION

{MONTH} {YEAR}

Dear {FIRSTNAME},

**The Warner College of Natural Resources (WCNR) is conducting a study to assess student engagement and success in the college. You are invited to take part in this research as a WCNR student.** Completion of the survey requires approximately 15 minutes, after which you may enter a drawing for one (1) of five (5) WCNR hoodies to be given away after the survey closes.

There are no foreseen risks or discomforts to you by involving yourself in this study. Your participation is voluntary, and you may withdraw at any time without penalty. If you decide not to complete the survey, just close your browser. If you want to complete the survey at a later time, use the link below to return to the survey. The survey will remain open for approximately two weeks after this email is sent.

The information gathered in the study will be used for research purposes only. We will keep private all research records that identify you, to the extent allowed by law. Your information will be combined with information from other people taking part in the study, and when we write about the study, we will write about the combined information we have gathered. You will not be identified in these written materials.

***Authorization: I certify that I am at least 18 years of age and that I have read the information herein. I voluntarily agree to participate in the study. I am aware that my responses will remain confidential and that I may decline to participate at any time.***

**By clicking the [link to the study](#), you are consenting to participate in this study.**

Any questions or concerns about your rights as a participant in the study, the survey, or the drawing should be directed to me through the WCNR Student Services office at 970-491-4994. If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator at 970-491-1655.

**Your opinion counts, and I hope you will take the time to share it. Thank you and best wishes during your upcoming final exams!**

Peter Newman  
Associate Dean for Academics



Warner College of Natural Resources  
101 Natural Resources Building  
Campus Delivery 1401  
Fort Collins, CO 80523-1401

APPENDIX F:  
ELECTRONIC SURVEY – EMAIL 1ST REMINDER



{MONTH} {YEAR}

Dear {FIRSTNAME},

**This is a second email to invite you to take part in a study the Warner College of Natural Resources (WCNR) is conducting to assess student engagement and success in the college. You are invited to take part in this research as a WCNR student.** Completion of the survey requires approximately 15 minutes, after which you may enter a drawing for one (1) of five (5) WCNR hoodies to be given away after the survey closes. *If you have already taken the online survey, thank you!*

There are no foreseen risks or discomforts to you by involving yourself in this study. Your participation is voluntary, and you may withdraw at any time without penalty. If you decide not to complete the survey, just close your browser. If you want to complete the survey at a later time, use the link below to return to the survey. The survey will remain open for approximately two weeks after this email is sent.

The information gathered in the study will be used for research purposes only. We will keep private all research records that identify you, to the extent allowed by law. Your information will be combined with information from other people taking part in the study, and when we write about the study, we will write about the combined information we have gathered. You will not be identified in these written materials.

***Authorization: I certify that I am at least 18 years of age and that I have read the information herein. I voluntarily agree to participate in the study. I am aware that my responses will remain confidential and that I may decline to participate at any time.***

**By clicking the [link to the study](#), you are consenting to participate in this study.**

Any questions or concerns about your rights as a participant in the study, the survey, or the drawing should be directed to me through the WCNR Student Services office at 970-491-4994. If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator at 970-491-1655.

**Don't delay! The survey closes soon. Please take it today.**

Peter Newman  
Associate Dean for Academics



Warner College of Natural Resources  
101 Natural Resources Building  
Campus Delivery 1401  
Fort Collins, CO 80523-1401

APPENDIX G:  
ELECTRONIC SURVEY – EMAIL 2ND REMINDER

{MONTH} {YEAR}

Dear {FIRSTNAME},

**This is a final reminder to encourage you to take part in a study the Warner College of Natural Resources (WCNR) is conducting to assess student engagement and success in the college. You are invited to take part in this research as a WCNR student.** Completion of the survey requires approximately 15 minutes, after which you may enter a drawing for one (1) of five (5) WCNR hoodies to be given away after the survey closes. ***If you have already taken the online survey, thank you!***

There are no foreseen risks or discomforts to you by involving yourself in this study. Your participation is voluntary, and you may withdraw at any time without penalty. If you decide not to complete the survey, just close your browser. If you want to complete the survey at a later time, use the link below to return to the survey. The survey will remain open for approximately two weeks after this email is sent.

The information gathered in the study will be used for research purposes only. We will keep private all research records that identify you, to the extent allowed by law. Your information will be combined with information from other people taking part in the study, and when we write about the study, we will write about the combined information we have gathered. You will not be identified in these written materials.

***Authorization: I certify that I am at least 18 years of age and that I have read the information herein. I voluntarily agree to participate in the study. I am aware that my responses will remain confidential and that I may decline to participate at any time.***

**By clicking the [link to the study](#), you are consenting to participate in this study.**

Any questions or concerns about your rights as a participant in the study, the survey, or the drawing should be directed to me through the WCNR Student Services office at 970-491-4994. If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator at 970-491-1655.

**The survey closes soon. Don't delay! Please share your thoughts with us by taking the survey today!**

Peter Newman  
Associate Dean for Academics



Warner College of Natural Resources  
101 Natural Resources Building  
Campus Delivery 1401  
Fort Collins, CO 80523-1401

APPENDIX H:  
ELECTRONIC SURVEY – POSTCARD INVITATION



Warner College of Natural Resources  
101 Natural Resources Building  
Campus Delivery 1401  
Fort Collins, CO 80523-1401

Student Name

Student Address

City, State Zip code

{MONTH} {YEAR}

I am writing to ask your help with an important study we are conducting in the Warner College of Natural Resources (WCNR).

In recent days, you should have received an email invitation on your @rams.colostate.edu account to take part in an online survey on student engagement. By participating in the survey, you will help us improve and enhance experiences for students in WCNR.

Students taking the survey may enter a drawing to receive one of five WCNR hoodies. To enter the drawing without taking the survey or to ask questions about the study, please contact me through the WCNR Student Services office at 970-491-4994.

I hope you take this opportunity to make your opinion known. We are listening!

Sincerely,

Peter Newman, Associate Dean for Academics

APPENDIX I:  
ELECTRONIC SURVEY – FLYER



## Have you taken the WCNR Student Engagement survey yet?

It's your chance to tell us  
what you really think.

Make your opinion  
count.

Go on! We're listening.

Check your [@rams.colostate.edu](mailto:@rams.colostate.edu) email  
for a message from Peter Newman  
and a link to the survey.

Help make WCNR a better place.  
Thanks!

APPENDIX J:

CSU IRB 11-2603H AMENDMENT – CLASSROOM SURVEY



Protocol Title: ASSESSMENT OF STUDENT ENGAGEMENT AND SUCCESS IN COLORADO STATE UNIVERSITY'S WARNER COLLEGE OF NATURAL RESOURCES  
Protocol Type: Social, Behavioral & Education Research  
Date Submitted: Draft  
Approval Period: Draft  
Important Note: This Print View may not reflect all comments and contingencies for approval. Please check the comments section of the online protocol. Questions that appear to not have been answered may not have been required for this submission. Please see the system application for more details.

\*\*\* Amendment \*\*\*

Amendment (Please note: Input N/A if not applicable)

1. Summarize the proposed changes to the protocol in lay terms.

The electronic survey instrument developed in WCNR in SP11 and supported by StudentVoice is being converted to a print survey instrument for administration "in house" in WCNR classrooms. The revised instrument format and data collection procedures will allow for more targeted distribution of the survey to students in the college, helping ensure better representation of students by major and by class standing and providing broader representation of student perspectives in relation to engagement and success in WCNR.

The questions on the FA11 print survey instrument, attached with this amendment, have been formatted based on statistical reliabilities and factor analyses conducted on SP11 electronic survey data and questions..

Findings from the FA11 print survey administration will be analyzed in relation with findings from FA11 focus groups and interviews (IRB 11-2994H currently under review) to determine if additional refinement to the survey instrument is needed. The goal is to develop a survey format which will support regular examination of student engagement and success in WCNR, allowing the college to better understand and be responsive to student needs and to support student persistence to degree attainment.

Proceed to the appropriate section(s) in the protocol and make your changes.

Make necessary changes in the Consent Form(s) or Alteration of Consent Form(s) (i.e., Cover Letter or Verbal Script), or other attachments, if applicable.

2. Indicate Level of Risk involved with the changes proposed. (If level of risk has changed, please update the "Risks" section in the protocol form.)

No  
Change

3. List of Protocol Sections (and questions) that have been changed/modified

**\*\*\* Personnel Information \*\*\***

**IMPORTANT NOTE:** Mandatory Personnel on a protocol are: Principal Investigator and Department Head. Only the Principal Investigator can submit the protocol; although other personnel listed on the protocol can create the protocol. Human Subjects Protection Training is mandatory for Principal Investigator, Co-Principal Investigator, and Key Personnel (as defined by NIH). Training must be updated every three (3) years.

**Principal Investigator Mandatory**

<b>Name of Principal Investigator (Faculty, Staff or Postdoc)</b>	<b>Degree</b>	<b>Title</b>
Newman, Peter	Doctorate	Associate Dean for Academics
<b>Email</b>	<b>Phone</b>	<b>Fax</b>
Peter.Newman@ColoState.EDU	(970) 491-2839	970-491-0279
<b>Department Name</b>	<b>Campus Delivery Code</b>	
Natural Resources	1401	
<b>Human Subjects Training Completed? three (3) years</b>	<b>PIs must complete Training every</b>	<b>Y</b>

**Co-Principal Investigator**

<b>Name of Co-Principal Investigator (This can include Master's or Ph.D. students)</b>	<b>Degree</b>	<b>Title</b>
Vaske, Jerry	Doctorate	Professor
<b>Email</b>	<b>Phone</b>	<b>Fax</b>
Jerry.Vaske@colostate.edu	(970) 491-2360	970-491-2255
<b>Department Name</b>	<b>Campus Delivery Code</b>	
Human Dimensions of Nat Res	1480	
<b>Human Subjects Training Completed? three (3) years.</b>	<b>Co-PIs must complete Training every</b>	<b>Y</b>

No training data is available.

**Additional Co-Principal Investigator**

<b>Name of Additional Co-Principal Investigator</b>	<b>Degree</b>	<b>Title</b>
██████████ dkholman	Master's	PhD Student
<b>Email</b>	<b>Phone</b>	<b>Fax</b>
Kaye.Holman@colostate.edu	██████████	
<b>Department Name</b>	<b>Campus Delivery Code (CSU) or off-campus mailing address</b>	
School of Education	██████████	

**Human Subjects Training Completed? Co-PIs must complete Training every three (3) years.** **Y**

No training data is available.

**Department Head Mandatory**

██████████

<b>Name of Department Head</b>	<b>Degree</b>	<b>Title</b>
Manfredo, Michael	Doctorate	Professor
<b>Email</b>	<b>Phone</b>	<b>Fax</b>
Michael.Manfredo@ColoState.EDU	(970) 491-6591	97-491-2255
<b>Department Name</b>	<b>Campus Delivery Code</b>	
Human Dimensions of Nat Res	1480	
<b>Human Subjects Training Completed?? Training is not required for Department Heads. Select "No" if you do not know if your Department Head has completed training or not.</b>		Y

**Other Researcher or Key Personnel**

<b>Name of Other Research Personnel</b>	<b>Degree</b>	<b>Title</b>
Lyon, Katie	Masters	Graduate Assistant
<b>Email</b>	<b>Phone</b>	<b>Fax</b>
Katie.Lyon@ColoState.EDU	[REDACTED]	
<b>Department Name</b>	<b>Campus Delivery Code (CSU) or Off-campus Mailing Address</b>	
Human Dimensions of Nat Res	1480	
<b>Human Subjects Training Completed? Training is required for all Key Personnel on NIH grants.</b>		Y

<b>Name of Other Research Personnel</b>	<b>Degree</b>	<b>Title</b>
Billingsley, Ethan	Masters	Coordinator
<b>Email</b>	<b>Phone</b>	<b>Fax</b>
ETHAN.BILLINGSLEY@colostate.edu	(970) 491-4994	970-491-0279
<b>Department Name</b>	<b>Campus Delivery Code (CSU) or Off-campus Mailing Address</b>	
Natural Resources	1401	
<b>Human Subjects Training Completed? Training is required for all Key Personnel on NIH grants.</b>		Y

-----

[REDACTED]

\*\*\* Subject Population \*\*\*

Subject Population(s) Checklist

Select All That Apply :

Adult Volunteers

Elderly

Employees

Mentally Disabled or Decisionally Challenged

Minors (under 18)

Pregnant Women

Prisoners

Soldiers

X Students

Other (i.e., non-English speaking or any population that is not specified above)

-----



\*\*\* Study Location \*\*\*

Study Location(s) Checklist

Select All That Apply - Note: Check "Other" and input text: 1. If your location is not listed, or 2) If you would like to list details of your already-checked location (e.g., specific school within a school district)

- Aims Community College
- Colorado Department of Public Health & Environment
- X Colorado State University
- Colorado State University - Pueblo Campus
- Denver Public Schools
- Poudre School District
- Poudre Valley Health System (PVHS)
- Rocky Mountain National Park
- Thompson School District
- University of Colorado - Boulder
- University of Colorado - Colorado Springs
- University of Colorado - Denver
- University of Colorado Health Sciences Center
- University of Northern Colorado

Other (In the box below, list your study location if not checked above. You may also list details of your already-checked location (e.g., specific school within a school district))

---



\*\*\* General Checklist \*\*\*

General Checklist

Select All That Apply :

Cooperating/Collaborating Institution(s) -Institution where recruitment will occur OR Institution where Collaborating PI will conduct associated research.

Federally Sponsored Project

Training Grant

Project is associated with the Colorado School of Public Health

Program Project Grant

Subjects will be compensated for participation

Behavioral observation

Deception

Human blood, cells, tissues, or body fluids. If checked, is IBC approval needed? List PARF approval date and number.

Interview

X Study of existing data

X Survey/questionnaire

Thesis or Dissertation Project (Attach Methodology chapter in the Attachment section)

Waiver of consent

Other (clarify in text box to the right)

-----



\*\*\* Funding \*\*\*

Funding Checklist

X NONE

NOTE: If applicable, Grant Application must be attached in the Attachment Section (#11).  
Funding - Grants/Contracts

Funding - Fellowships

Funding - Other

Gift Funding

Dept. Funding

Other Funding

-----



\*\*\* Expedited Paragraphs \*\*\*

PLEASE READ: The criteria for expedited review are listed below. Please review these criteria to evaluate if your protocol meets the expedited-review criteria. For expedited review, a protocol must be no more than minimal risk (i.e., "not greater than those ordinarily encountered in daily life") AND must only involve human subjects in one or more of the following numbered paragraphs. If none of the expedited criteria are appropriate for your project, please move to the next screen without selecting any of these criteria; your protocol will be reviewed by the full IRB. Note: The IRB will make the final determination if your protocol is eligible for expedited review.

Expedite Criteria:

1. Clinical studies of drugs and medical devices only when condition (a) or (b) is met.
  - a) Research on drugs for which an investigational new drug application (21 CFR Part 312) is not required. (Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risks associated with the use of the product is not eligible for expedited review.)
  - b) Research on medical devices for which
    - i) An investigational device exemption application (21 CFR Part 812) is not required; or
    - ii) The medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.
2. Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows:
  - a) From healthy, nonpregnant adults who weigh at least 110 pounds. For these subjects, the amounts drawn may not exceed 550 ml in an 8-week period and collection may not occur more frequently than 2 times per week; or
  - b) From other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8-week period and collection may not occur more frequently than 2 times per week.
3. Prospective collection of biological specimens for research purposes by non-invasive means.
4. Collection of data through non-invasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications.)

Examples:

- a) Physical sensors that are applied either to the surface of the body or at a distance and do not involve input of significant amounts of energy into the subject or an invasion of the subject's privacy;
- b) Weighing or testing sensory acuity;
- c) Magnetic resonance imaging;
- d) Electrocardiography, electroencephalography, thermography, detection of naturally occurring radioactivity, electroretinography, ultrasound, diagnostic infrared imaging, doppler blood flow, and echocardiography;
- e) Moderate exercise, muscular strength testing, body composition assessment, and flexibility testing where appropriate given the age, weight, and health of the individual.



- X 5. Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis). (NOTE: Some research in this paragraph may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(4). This listing refers only to research that is not exempt.)
- 6. Collection of data from voice, video, digital, or image recordings made for research purposes.
- X 7. Research on individual or group characteristics or behavior(including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.)

-----



\*\*\* Purpose, Study Procedures, Background \*\*\*

Original Protocol Number (e.g., 07-226H)

Title (Please indicate if the protocol title is different from the proposal title)

ASSESSMENT OF STUDENT ENGAGEMENT AND SUCCESS IN COLORADO STATE UNIVERSITY'S WARNER COLLEGE OF NATURAL RESOURCES

Complete Sections 1 - 11. Specify N/A as appropriate. Do not leave any sections blank.

1. Purpose of the study

- a) Provide a brief lay summary of the project in < 200 words. The lay summary should be readily understandable to the general public.

The purpose of this study is to assess student engagement and success, as defined by student persistence and retention, in the Warner College of Natural Resources (WCNR). A print survey will be distributed in undergraduate classrooms in WCNR in coordination with the WCNR Dean's Office, the Director of Student Engagement, and faculty. The survey will evaluate students' satisfaction with the college's (a) course experiences, (b) experiential learning, (c) faculty advising, (d) community and climate and with activities related to (e) natural resources professional development. The survey will also evaluate (f) student perceptions on their persistence and retention at CSU. Comparative assessment—by age, gender, ethnicity, residency, class standing, enrollment status, classification at the time of admission to CSU, CSU grade point average, CSU credits completed, and majors and departments—will also be undertaken to determine patterns of engagement and persistence among the student population.

- b) What does the investigator(s) hope to learn from the study?

The investigators hope to learn which measure of student engagement identified through the study are supporting student success (i.e., persistence and retention) in the college. Because the investigation aligns with WCNR Strategic Planning elements and CSU Stretch Goals on Teaching and Learning, Research and Discovery, and Service and Outreach, findings will be reported to the college administration and faculty and shared with the CSU administration, including the office of the Vice President for Student Affairs. Ultimately, the findings are intended for use by the college administration and faculty to support and enhance student learning and success in WCNR.

2. Study Procedures

- a) Describe all study procedures here (please do not respond "See Attachment Section"). The box below is for text only. If you would like to add tables, charts, etc., attach those files in the Attachment section (#11).

A print survey will distributed in undergraduate classrooms in WCNR in coordination with the WCNR Dean's Office, the Director of Student Engagement, and faculty. Students will be asked to voluntarily take part in the survey and will be required to sign a consent form if they do participate. Students agreeing to participate will additionally be required to provide their 9-digit CSU RamiD number and to "bubble in" their answers to the survey questions on a scantron-type Answer Sheet. Survey completion is estimated at no more than 10minutes, although some students may require additional time to complete the survey.

Following the survey administration, limited demographic information contained in the CSU ARIES database—date of birth, gender, ethnicity, residency, class standing, enrollment status, classification at the time of admission to CSU, CSU grade point average, CSU credits completed, and majors and departments—will be accessed by the WCNR Dean's Office staff and matched to participants CSU RamiD's. To protect student identities and retain their anonymity for the survey answers, student names will NOT be incorporated into the data records for the study.

Data will be statistically analyzed using programs such as SPSS, HLM, and LISREL.

- b) State if audio or video taping will occur. Describe how the tapes will be maintained during and upon completion of the project. Describe what will become of the tapes after use (e.g., shown at scientific meetings, erased, etc.).

Audio or video taping will not be used for this study.

- c) **State if deception will be used. If so, provide a rationale and describe debriefing procedures. Submit a debriefing script in the Attachment section (#11).**

Deception will not be used in this study.

### 3. Background/Rationale

- a) **Briefly describe past findings leading to the formulation of the study, if applicable.**

The Warner College of Natural Resources (WCNR, 2011) promotes itself as a global leader in learning, discovery and engagement that guides natural resource conservation, sustainability and stewardship. The student experience in learning and engagement is described on the college's website as being hands-on, field and research-based, and focused on skill development in communication, problem-solving, critical thinking, and teamwork—the kinds of activities promoted as educational best practices to ensure student persistence and success. Students in higher education are classically deemed successful if they persist at the university and leave having earned their bachelor's degree (Kuh, Kinzie, Schuh, & Whitt, 2005). Some universities and colleges, such as Colorado State University (CSU), participate in the National Survey of Student Engagement (NSSE, 2011) to evaluate student participation in educationally purposeful activities while students are still in school. CSU's participation in NSSE is one way the university demonstrates its commitment to enhancing undergraduate education and student success campus-wide (Kuk et al., 2006). While the University assesses institutional student engagement through its participation in NSSE, there has been no systematic evaluation of educational best practices supporting student success in WCNR. This study intends to fill that gap, providing information on student engagement and persistence to the college administration and faculty as a means of supporting and enhancing student learning and success in WCNR.

#### References

Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2005). Student success in college: Creating conditions that matter. San Francisco, CA: Jossey-Bass.

Kuk, L., Lamborn, A., Hughes, B., McKelfresh, D., Schmidt, B., & Thayer, P. (2006). A plan for excellence: Enhancing undergraduate education and student success. Colorado State University. Fort Collins, CO. Retrieved from <http://www.president.colostate.edu/pdf/RetentionReportDraft4.pdf>

National Survey of Student Engagement. (2011, February 20). About NSSE. Retrieved from <http://nsse.iub.edu/html/about.cfm>

Warner College of Natural Resources. (2011, February 20). About WCNR. Retrieved from <http://warnercnr.colostate.edu/about-wcnr/>

\*\*\* Subject Population \*\*\*

4. Subject Population - In the space below, please describe the participants that you are requesting to recruit (include requested participant number and description of each group requested).

- a) Requested Participant Description (Include number that you plan to study and description of each group requested, if applicable).

Undergraduate students enrolled in courses in the Warner College of Natural Resources (N = ~1,300).

- b) What is the rationale for studying the requested group(s) of participants?

While CSU assesses institutional student engagement through its participation in NSSE, there has been no systematic evaluation of educational best practices supporting student success in WCNR. This study intends to fill that gap, providing information on student engagement and persistence to the college administration and faculty as a means of supporting and enhancing student learning and success in WCNR.

- c) If applicable, state the rationale for involvement of potentially vulnerable subjects to be entered into the study, including minors, pregnant women, economically and educationally disadvantaged, and decisionally impaired people. Specify the measures being taken to minimize the risks and the chance of harm to the potentially vulnerable subjects.

There are no known risks to participating in this study. Additionally, participation is voluntary.

- d) If women, minorities, or minors are not included, a clear compelling rationale must be provided. Examples for not including minors: participant must be a registered voter; the drug or device being studied would interfere with normal growth and development; etc.

The pool of participants will be drawn from the CSU students enrolled in WCNR courses. All subject will themselves be required to affirm the are legally of age to participate in the survey.

- e) State if any of the subjects are students, employees, or laboratory personnel. They should be presented with the same written informed consent. If compensation is allowed, they should also receive it.

All subjects are undergraduate students in courses in CSU's Warner College of Natural Resources.

- f) Describe how potential subjects will be identified for recruitment. Examples include: class rosters, group membership, individuals answering an advertisement, organization position titles (i.e., Presidents, web designers, etc.). How will potential participants learn about the research and how will they be recruited (e.g., flyer, email, web posting, telephone, etc.)? Attach recruitment materials in the Attachment section (#11). Important to remember: subjects cannot be contacted before IRB approval.

The pool of participants will be drawn from undergraduate students enrolled in classes in CSU's Warner College of Natural Resources. A print survey will be distributed in classrooms in WCNR in coordination with the WCNR Dean's Office, Director of Student Engagement, and faculty. Students will be asked to voluntarily take part in the survey and will be required to sign a consent form if they do participate.

-----

\*\*\* Subject Population \*\*\*

4. Subject Population (continued)

g) Identify the inclusion and exclusion criteria.

The pool of participants will be drawn from undergraduate students enrolled in classes in CSU's Warner College of Natural Resources. Graduate students in the college will be excluded from the study.

h) Compensation. Explain the amount and schedule of compensation, if any, that will be paid for participation in the study. Include provisions for prorating payment.

Subjects will not be compensated for their participation in the study.

i) Estimate the probable duration of the entire study. This estimate should include the total time each subject is to be involved and the duration the data about the subject is to be collected (e.g., This is a 2-year study. Participants will be interviewed 3 times per year; each interview will last approximately 2 hours. Total approximate time commitment for participants is 12 hours.)

The survey will be available in classrooms at the end of the semester in coordination with the WCNR Dean's Office, Director of Student Engagement, and faculty. Survey completion is estimated at no more than 10 minutes, although some students may require additional time to complete the survey.

-----



\*\*\* Risks \*\*\*

5. Risks (Input N/A if not applicable)

US Department of Health & Human Services (HHS) Regulations define a subject at risk as follows: "...any individual who may be exposed to the possibility of injury, including physical, psychological, or social injury, as a consequence of participation as a subject in any research, development, or related activity which departs from the application of those accepted methods necessary to meet his needs, or which increases the ordinary risks of daily life, including the recognized risks inherent in a chosen occupation or field of service."

a)

For the following categories, include an estimate of the potential risk. Input N/A if not applicable.

Physical well-being.

N/A

Psychological well-being.

N/A

Political well-being.

N/A

Economic well-being.

N/A

Social well-being.

N/A

b) In case of overseas research, describe qualifications/preparations that enable you to evaluate cultural appropriateness and estimate/minimize risks to subjects.

N/A

c) Discuss plans for ensuring necessary medical or professional intervention in the event of a distressed subject.

In the event an adverse event were to occur during the course of this research, the PI will notify the HRC through RICRO as soon as communication is available and report the event.

d) If audio/video taping will be used, state if it could increase potential risk to subject's confidentiality.

N/A

-----



\* \* \* Benefits, Procedures to Maintain Confidentiality \* \* \*

6. Benefits

- a) Describe the potential benefit(s) to be gained by the subjects or how the results of the study may benefit future subjects. Indicate if there is no direct benefit to the participants.

The potential benefits for current and future subjects of this study include improved and enhanced student experiences in WCNR in courses experiential learning, faculty advising, community and social programming, and professional development activities in natural resources. The results of the study are also intended to benefit future subjects through improved recruitment and retention practices in WCNR.

7. Procedures to Maintain Confidentiality

- a) Describe the procedures in place that will protect the privacy of the subjects and maintain the confidentiality of the data. If a linked list is used, explain when the linked list will be destroyed. Provide a sample of the code that will be used, if applicable.

We will make every effort to prevent anyone who is not on the research team from knowing that participants gave us information or what that information was. Participant consent forms will be kept separate from electronic data files. Additionally, consent forms will be secured in the researchers' locked office files, and all electronic files will be password protected.

Participant information—both from the scantron-type Answer Sheets and from the limited demographic data accessed from CSU ARIES--will be analyzed in relation to all those taking part in the study. To protect student identities and retain their anonymity for the survey answers, student names will NOT be incorporated into the data records for the study.

When the investigators write about the study to share it with other researchers, we will write about the combined information we have gathered. Participants will not be personally identified in written materials. We may publish the results of this study; however, we will keep the names and other identifying information of participants private.

Data may be analyzed using NVivo, SPSS, and Microsoft-related software. Electronic files used to analyze data will be password protected.

- b) If information derived from the study will be provided to the subject's personal physician, a government agency, or any other person or group, describe to whom the information will be given and the nature of the information.

N/A

- c) Specify where and under what conditions study data will be kept, how samples will be labeled, who has access to the data, and what will be available and to whom. Federal Regulations require that study data and consent documents be kept for a minimum of three (3) years after the completion of the study by the PI. For longitudinal projects, the PI may be required to keep the data and documents for a longer time period.

We will make every effort to prevent anyone who is not on the research team from knowing that participants gave us information or what that information was. Participant consent forms will be kept separate from electronic data files. Additionally, consent forms will be secured in the researchers' locked office files, and all electronic files will be password protected.

Participant information—both from the scantron-type Answer Sheets and from the limited demographic data accessed from CSU ARIES--will be analyzed in relation to all those taking part in the study. To protect student identities and retain their anonymity for the survey answers, student names will NOT be incorporated into the data records for the study.

When the investigators write about the study to share it with other researchers, we will write about the combined information we have gathered. Participants will not be personally identified in written materials. We may publish the results of this study; however, we will keep the names and other identifying information of participants private.

Data may be analyzed using NVivo, SPSS, and Microsoft-related software. Electronic files used to analyze data will be password protected.

---





\*\*\* Potential Conflict of Interest \*\*\*

8. Potential Conflict of Interest

Although you have already submitted CSU's official Conflict of Interest form (COI/COC) to the University, it is the IRB's responsibility to ensure that conflicting interests related to submitted protocols do not adversely affect the protection of participants or the credibility of the human research protection program at CSU. Please answer questions a-d below. Please note that if you indicate that you have a potential conflict of interest in relation to this protocol, your CSU COI/COC Reporting Form must reflect this potential conflict. Link to CSU's Conflict of Interest policy: <http://www.provost.colostate.edu/print/coirev.pdf>.

- a)        N            In connection with this protocol, do you or any of the protocol investigators or their immediate family members (i.e., spouse and legal dependents, as determined by the IRS) have a potential conflict of interest?
- b)        N/A          If you do have a potential conflict of interest, is this reported in your current COI/COC?
- c)        N/A          If you do have a potential conflict of interest, is there a management plan in place to manage this potential conflict?
- d)        N/A          If you do have a potential conflict of interest, is this potential conflict of interest included in your consent document (as required in the Management Plan)?

If you have reported a possible conflict of interest, the IRB will forward the title of this protocol to your Research Associate Dean to complete your COI file.

For more information on CSU's policy on Conflict of Interest, please see the Colorado State University Academic Faculty and Administrative Professional Manual Sections D.7.6 & D.7.7:  
<http://www.facultycouncil.colostate.edu/files/manual/sectiond.htm#D.7.6>.

Link to CSU's Conflict of Interest policy: <http://www.provost.colostate.edu/print/coirev.pdf> .

---



\*\*\* Informed Consent \*\*\*

9. Informed Consent See sample consent forms at <http://web.research.colostate.edu/ricro/hrc/forms.aspx>

NOTE: In order to complete this protocol, you must upload either a Consent Form or an Alteration of Consent Form (i.e., Cover Letter or Verbal Script) OR (if neither of those apply to your project) you must complete the Waiver of consent information.

In the space below, provide consent process background information, for each Consent Form, Alteration of Consent Form (i.e., Cover Letter or Verbal Script), or Waiver of consent. You will not be able to submit this protocol without completing this information.

**Informed Consent**

Title	Email Invitation
Consent Information Type	Alteration of Consent
Consent Form Template	X Attachment



Who is obtaining consent? The person obtaining consent must be knowledgeable about the study and authorized by the PI to consent human subjects.

The survey is being administered online through StudentVoice, a third party vendor contracted by CSU for survey administration.

How is consent being obtained?

The pool of participants will be drawn from the CSU ARIES database, with students listed as having their primary major at CSU in the Warner College of Natural Resources invited to participate in the study. Subjects will receive email invitations and consent to participate forms on their @rams.colostate.edu email address and be invited to take the online survey. All subject will themselves be required to affirm the are legally of age to participate in the survey.

What steps are you taking to determine that potential subjects are competent to participate in the decision-making process?

All subjects will be drawn from CSU ARIES records of currently enrolled students in the Warner College of Natural Resources.

Address the following four points. A Yes/No response is not adequate.



Y The research involves no more than minimal risk to the subjects.

There are no known risks for taking part in this study. Additionally, participation is voluntary. In the event an adverse event were to occur during the course of this research, the PI will notify the HRC through RICRO as soon as communication is available and report the event.

Y The waiver or alteration will not adversely affect the rights and welfare of the subjects.

The Alteration of Consent affirms that all participants must be at least 18 years of age and that their responses are confidential. Additionally, the alteration of consent affirms the voluntary nature of the students' participation.

Whether a student decides to take the survey or not, the potential benefits to students from the study include improved and enhanced student experiences in WCNR courses, experiential learning, faculty advising, and other areas, such as events and professional development opportunities.

Y The research could not practicably be carried out without the waiver or alteration.

The survey is being administered in an online format through Student Voice. The Alteration of Consent will be made part of the email-based invitation and two email reminders to participate sent by StudentVoice in coordination with the WCNR Dean's Office. By clicking on the link to the survey provided in the emails, the students' will be consenting to participate in the study and will be immediately redirected to the StudentVoice online survey to take it.

Y Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

The Alternation of Consent invitation and reminder emails include information on how to contact the PI and RICRO if they have survey-related questions or concerns. Additionally, the closing screen for the online survey will include a thank you and statement reminding students how to contact the PI if they have post-survey questions or concerns.

Title	First Reminder
Consent Information Type	Alteration of Consent
Consent Form Template	X Attachment



Who is obtaining consent? The person obtaining consent must be knowledgeable about the study and authorized by the PI to consent human subjects.

The survey is being administered online through StudentVoice, a third party vendor contracted by CSU for survey administration.

How is consent being obtained?

The pool of participants will be drawn from the CSU ARIES database, with students listed as having their primary major at CSU in the Warner College of Natural Resources invited to participate in the study. Subjects will receive email invitations and consent to participate forms on their @rams.colostate.edu email address and be invited to take the online survey. All subject will themselves be required to affirm the are legally of age to participate in the survey.

What steps are you taking to determine that potential subjects are competent to participate in the decision-making process?

All subjects will be drawn from CSU ARIES records of currently enrolled students in the Warner College of Natural Resources.

**Address the following four points. A Yes/No response is not adequate.**



Y The research involves no more than minimal risk to the subjects.

There are no known risks for taking part in this study. Additionally, participation is voluntary. In the event an adverse event were to occur during the course of this research, the PI will notify the HRC through RICRO as soon as communication is available and report the event.

Y The waiver or alteration will not adversely affect the rights and welfare of the subjects.

The Alteration of Consent affirms that all participants must be at least 18 years of age and that their responses are confidential. Additionally, the alteration of consent affirms the voluntary nature of the students' participation.

Whether a student decides to take the survey or not, the potential benefits to students from the study include improved and enhanced student experiences in WCNR courses, experiential learning, faculty advising, and other areas, such as events and professional development opportunities.

Y The research could not practicably be carried out without the waiver or alteration.

The survey is being administered in an online format through Student Voice. The Alteration of Consent will be made part of the email-based invitation and two email reminders to participate sent by StudentVoice in coordination with the WCNR Dean's Office. By clicking on the link to the survey provided in the emails, the students' will be consenting to participate in the study and will be immediately redirected to the StudentVoice online survey to take it.

Y Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

The Alternation of Consent invitation and reminder emails include information on how to contact the PI and RICRO if they have survey-related questions or concerns. Additionally, the closing screen for the online survey will include a thank you and statement reminding students how to contact the PI if they have post-survey questions or concerns.

Title	Second Reminder
Consent Information Type	Alteration of Consent
Consent Form Template	X Attachment



Who is obtaining consent? The person obtaining consent must be knowledgeable about the study and authorized by the PI to consent human subjects.

The survey is being administered online through StudentVoice, a third party vendor contracted by CSU for survey administration.

How is consent being obtained?

The pool of participants will be drawn from the CSU ARIES database, with students listed as having their primary major at CSU in the Warner College of Natural Resources invited to participate in the study. Subjects will receive email invitations and consent to participate forms on their @rams.colostate.edu email address and be invited to take the online survey. All subject will themselves be required to affirm the are legally of age to participate in the survey.

What steps are you taking to determine that potential subjects are competent to participate in the decision-making process?

All subjects will be drawn from CSU ARIES records of currently enrolled students in the Warner College of Natural Resources.

**Address the following four points. A Yes/No response is not adequate.**



Y The research involves no more than minimal risk to the subjects.

There are no known risks for taking part in this study. Additionally, participation is voluntary. In the event an adverse event were to occur during the course of this research, the PI will notify the HRC through RICRO as soon as communication is available and report the event.

Y The waiver or alteration will not adversely affect the rights and welfare of the subjects.

The Alteration of Consent affirms that all participants must be at least 18 years of age and that their responses are confidential. Additionally, the alteration of consent affirms the voluntary nature of the students' participation.


Whether a student decides to take the survey or not, the potential benefits to students from the study include improved and enhanced student experiences in WCNR courses, experiential learning, faculty advising, and other areas, such as events and professional development opportunities.

Y The research could not practicably be carried out without the waiver or alteration.

The survey is being administered in an online format through Student Voice. The Alteration of Consent will be made part of the email-based invitation and two email reminders to participate sent by StudentVoice in coordination with the WCNR Dean's Office. By clicking on the link to the survey provided in the emails, the students' will be consenting to participate in the study and will be immediately redirected to the StudentVoice online survey to take it.

Y Whenever appropriate, the subjects will be provided with additional pertinent information after participation.

The Alternation of Consent invitation and reminder emails include information on how to contact the PI and RICRO if they have survey-related questions or concerns. Additionally, the closing screen for the online survey will include a thank you and statement reminding students how to contact the PI if they have post-survey questions or concerns.

Title	Consent Form for Print (Class) Survey
Consent Information Type	Consent
Consent Form Template	X Attachment 

Who is obtaining consent? The person obtaining consent must be knowledgeable about the study and authorized by the PI to consent human subjects.

WCNR faculty or the PIs themselves if invited by faculty to directly visit classrooms to administer the survey

How is consent being obtained?

In a classroom, consent forms will be handed out by the faculty member or a PI, along with a copy of the survey, and a scantron-type Answer Sheet. The faculty member or PI will invite students to participate in the survey and explain that participation is voluntarily. All students wishing to participate in the survey will be required to sign the consent form. At the end of the survey administration in a classroom, all documents--consent forms, surveys, and Answer Sheets--will be collected and placed in a sealed envelope to be delivered to the WCNR Dean's Office and Director of Student Engagement.

What steps are you taking to determine that potential subjects are competent to participate in the decision-making process?

All participants are currently enrolled CSU undergraduate students.

-----



**\*\*\* Assent Background \*\*\***

**10. Assent Background**

All minors must provide an affirmative consent to participate by signing a simplified assent form, unless the investigator(s) provides evidence to the IRB that the minor subjects are not capable of assenting because of age, maturity, psychological state, or other factors.

See sample assent/consent forms at <http://web.research.colostate.edu/ricro/hrc/forms.aspx>

If applicable, provide assent process background information for each Assent Form, Alteration of Assent Form (i.e., Cover Letter or Verbal Script), or Waiver.

**Assent Background**

---



\*\*\* Attachments \*\*\*

11. Attachments

Attach relevant documents here. These could include: Collaborating Investigator's IRB approval and approved documents; Conflict of Interest information; Debriefing Script; Grant/Sub-contract; HIPAA Authorization or Waiver Form from HIPAA-covered entity; Interview/Focus Group Questions; Investigator's Brochure; Letters of Agreement/Cooperation from organizations who will help with recruitment; Methodology section of associated Thesis or Dissertation project; Questionnaires; Radiation Control Office approval material; Recruitment Material (e.g., flyers, email text, verbal scripts); Sponsor's Protocol; Surveys; Other files associated with protocol (can upload most standard file formats: xls, pdf, jpg, tif, etc.) Please be sure to attach all documents associated with your protocol. Failure to attach the files associated with the protocol may result in this protocol being returned to you for completion prior to being reviewed. Students: Be sure to attach the Methods Section of your thesis or dissertation proposal. All PIs: If this protocol is associated with a grant proposal, please remember to attach your grant.

To update or revise any attachments, please delete the existing attachment and upload the revised document to replace it.

Document Type	Recruitment Material (e.g., flyers, email text, verbal scripts)
Attachment	3 Postcard_Invitation_2011
Document Name	3 Postcard_Invitation_2011

Document Type	Questionnaire/Survey
Attachment	!WCNR Student Engagement Survey 2011 (110411-ALT)
Document Name	!WCNR Student Engagement Survey 2011 (110411-ALT)

Document Type	Recruitment Material (e.g., flyers, email text, verbal scripts)
Attachment	6 Flyer for WCNR
Document Name	6 Flyer for WCNR

Document Type	Email Correspondence
Attachment	1_Email_Pre-Invitation_2011.final
Document Name	1_Email_Pre-Invitation_2011.final

Document Type	Questionnaire/Survey
Attachment	WCNR Print Survey 2011 2-PRINT SURVEY
Document Name	WCNR Print Survey 2011 2-PRINT SURVEY

-----



\* \* \* Obligations \* \* \*

Obligations (Researcher's Responsibilities)

The Principal Investigator is ultimately responsible for the conduct of the project. Obligations of the Principal Investigator are:

Conduct the research involving human subjects as presented in the protocol, including modifications, as approved by the Department and Institutional Review Board. Changes in any aspect of the study (for example project design, procedures, consent forms, advertising materials, additional key personnel or subject population) will be submitted to the IRB for approval before instituting the changes (PI will submit the "Amendment/Revision" form);

Provide all subjects a copy of the signed consent form, if applicable. Investigators are required to retain signed consent documents for three (3) years after close of the study;

Maintain an approved status for Human Subjects Protection training. Training must be updated every three (3) years (Contact RICRO to check your current approval/renewal dates). For more information: Human Subjects Training Completed?

Submit either the "Protocol Deviation Form" or the "Report Form" to report protocol Deviations/Violations, Unanticipated Problems and Adverse Events that occur in the course of the protocol. Any of these events must be reported to the IRB as soon as possible, but not later than five (5) working days;

Submit the "Continuing Review" Form in order to maintain active status of the approved protocol. The form must be submitted annually at least four (4) weeks prior to expiration, five (5) weeks for protocols that require full review. If the protocol is not renewed before expiration, all activities must cease until the protocol has been re-reviewed;

Notify the IRB that the study is complete by submitting the "Final Report" form.

The Principal Investigator has read and agrees to abide by the above obligations.

-----



APPENDIX K:

CSU IRB 11-2603H AMENDMENT – APPROVAL

NOTICE OF APPROVAL FOR HUMAN RESEARCH

DATE: October 28, 2011  
TO: Newman, Peter, Natural Resources  
dkholman, dkholman, School of Education, Vaske, Jerry, Human Dimensions of Nat Res, Manfredo, Michael,  
Human Dimensions of Nat Res  
FROM: Barker, Janell, , CSU IRB 1  
PROTOCOL TITLE: ASSESSMENT OF STUDENT ENGAGEMENT AND SUCCESS IN COLORADO STATE UNIVERSITY'S  
WARNER COLLEGE OF NATURAL RESOURCES  
FUNDING SOURCE: NONE  
PROTOCOL NUMBER: 11-2603H  
APPROVAL PERIOD: Approval Date: October 28, 2011 Expiration Date: April 27, 2012

The CSU Institutional Review Board (IRB) for the protection of human subjects has reviewed the protocol entitled: ASSESSMENT OF STUDENT ENGAGEMENT AND SUCCESS IN COLORADO STATE UNIVERSITY'S WARNER COLLEGE OF NATURAL RESOURCES. The project has been approved for the procedures and subjects described in the protocol. This protocol must be reviewed for renewal on a yearly basis for as long as the research remains active. Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

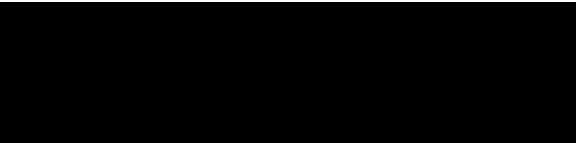
If approval did not accompany a proposal when it was submitted to a sponsor, it is the PI's responsibility to provide the sponsor with the approval notice.

This approval is issued under Colorado State University's Federal Wide Assurance 00000647 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under CSU's Assurance, please do not hesitate to contact us.

Please direct any questions about the IRB's actions on this project to:

Janell Barker, Senior IRB Coordinator - (970) 491-1655 [Janell.Barker@Colostate.edu](mailto:Janell.Barker@Colostate.edu)  
Evelyn Swiss, IRB Coordinator - (970) 491-1381 [Evelyn.Swiss@Colostate.edu](mailto:Evelyn.Swiss@Colostate.edu)

Barker, Janell

  
Barker, Janell

Includes:

Amendment approval is to add an option of taking the survey via paper for classroom dissemination and using the approved consent form reflecting this





Research Integrity & Compliance Review Office  
Office of the Vice President for Research  
321 General Services Building - Campus Delivery 2011 Fort Collins, CO  
TEL: (970) 491-1553  
FAX: (970) 491-2293

change.

---

Approval Period:	October 28, 2011 through April 27, 2012
Review Type:	EXPEDITED
IRB Number:	00000202



APPENDIX L:  
CLASSROOM SURVEY

**Questions 1-8: In your college experiences, how would you grade your overall satisfaction on each of the following?**

**The Answer Sheet bubbles for these questions correspond to the following grading scale:**

- A**     **Excellent**
- B**     **Better than Average**
- C**     **Average**
- D**     **Below Average**
- E**     **Poor**

1. Course opportunities for discussions, presentations, final projects, or group assignments.
2. Course opportunities for fieldwork, lab work, or service projects.
3. Experiential learning through undergraduate research, internships, study abroad, or field camps (e.g., Pingree, Geo, or Forestry Field camps).
4. Faculty advising for college courses, class scheduling, or major requirements.
5. Faculty advising related to other college opportunities (e.g., research, scholarships, graduate school, or career plans).
6. College student clubs, volunteer work, or social events (e.g., picnic or pancake breakfast).
7. Welcoming, friendly, or supportive qualities of the college community.
8. My development as a natural resource professional as a member of Warner College of Natural Resources.

**Questions 9-16: How would you rate your agreement with each of the following statements?**

**The Answer Sheet bubbles for these questions correspond to the following rating scale:**

- A**     **Definitely Yes**
- B**     **Yes**
- C**     **I don't know.**
- D**     **No**
- E**     **Definitely No**

9. Questions 1 - 8 above are representative of my experiences in WCNR.
10. Overall, I feel successful in my major.
11. Overall, I feel successful in WCNR.
12. I plan to continue in my current major next semester.
13. I am on track to graduate on time—i.e., completing my degree in 4 to 6 years.
14. If I could start over again, I would choose my major.
15. If I could start over again, I would choose WCNR.

APPENDIX M:  
CLASSROOM SURVEY - CONSENT FORM

**The Warner College of Natural Resources (WCNR) is conducting a study to assess student engagement and success in the college. You are invited to take part in this research as a WCNR student.** Completion of the survey requires approximately 5 minutes.

There are no foreseen risks or discomforts to you by involving yourself in this study. You may withdraw at any time without penalty. Your participation is voluntary, but you will need to provide your RamID on the Answer Sheet for your answers to be counted. If you decide not to complete the survey, do not fill out an Answer Sheet.

The information gathered in the study will be used for research purposes only. We will keep private all research records that identify you, to the extent allowed by law. Your information will be combined with information from other people taking part in the study, and when we write about the study, we will write about the combined information we have gathered. You will not be identified in these written materials.

The potential benefits from this research include improved and enhanced experiences in WCNR courses, faculty advising, community and event programming, and professional development activities in natural resources.

Any questions or concerns about your rights as a participant in the study, should be directed to Peter Newman, the WCNR Associate Dean for Academics, through the WCNR Student Services office at 970-491-4994. If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator at 970-491-1655.

This consent form was approved by the CSU Institutional Review Board for the protection of human subjects in research on October 28, 2011.

***Authorization: I certify that I am at least 18 years of age and that I have read the information herein. I voluntarily agree to participate in the study, and I understand that I must give my RamID on the Answer Sheet in order for my answers to be counted. I am aware that my responses will remain confidential and that I may decline to participate at any time.***

\_\_\_\_\_  
Signature of person agreeing to take part in the study

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed name of person agreeing to take part in the study



Warner College of Natural Resources  
101 Natural Resources Building  
Campus Delivery 1401  
Fort Collins, CO 80523-1401

**If you have any comments on student engagement and success in WCNR,  
please share your thoughts on the back of the Answer Sheet.  
Thank you for participating!**