



Higher-order Skills in **Critical** and **Creative** Thinking

Improving students' higher-order thinking competencies, including critical evaluation, creative thinking, and reflection on their own thinking.

QUALITY ENHANCEMENT PLAN


for Reaffirmation of Accreditation by the Southern Association
of Colleges and Schools Commission on Colleges

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“ Thinking creatively is taking what is already known and using it as a base to create something entirely new. I like to think of what I do as creative. I work in a lab, coming up with experiments and using the data I’ve collected to accomplish my goal. I expect classes to give me fundamentals that I can use as a foundation to be creative, but I expect in the interactions with faculty to take what I’ve learned and use it in a creative way. If I continue in research after graduation, employers will demand that I take the body of information in new directions. Hopefully my accomplishments will show more than good grades in classes and that I actually participated in activities that required me to use creative thinking. ”

William Crumpler

Sophomore, Materials Science, Engineering

Executive Summary

An Overview of NC State University



1. Executive Summary

The NC State Quality Enhancement Plan focuses on improving students' higher-order thinking competencies, including critical evaluation, creative thinking, and reflection on their own thinking. This focus is consistent with NC State University's 2011-2020 Strategic Plan vision to "emerge as a pre-eminent technological research university recognized around the globe for its innovative education and research addressing the grand challenges of society" and one of five major goals to "enhance student success through educational innovation." The university selected its QEP topic through an inclusive, deliberative process resulting from campus-wide interest in transforming the university culture to one of critical and creative thinking.

The plan identifies six student learning outcomes that recognize critical and creative thinking as distinct but related higher-order thinking skills. The outcomes are hierarchical and articulate a developmental path through which students are likely to acquire skills. The ability to explain intellectual standards for critical and creative thinking is fundamental to the problem-solving work of all disciplines. Students use these standards in evaluating others' work and in developing their own critical analyses and creative solutions to problems. The QEP also expresses interest in students' metacognitive behavior and asks that they reflect on their maturation as thinkers.

Phase I of the plan focuses on first-year students in three types of courses: English 101, a first writing course in the General Education Program; First-year Inquiry courses, a group of inquiry-guided seminars in a variety of disciplines; and large enrollment courses taken by freshmen as requirements in their academic colleges. Phase I studies outcomes resulting from curricular and pedagogical intervention in these three course clusters, while Phase II scales up successful practices based on recommendations arising from the first two years of the plan.

The university chose to target first-year students in these courses following a review of its institutional research and professional literature on students' development of critical and creative thinking skills. The data argue that curricula should ask students to think critically and creatively early and throughout their studies and that some students will excel in domain-general courses while others flourish under domain-specific instruction. Faculty focus groups and the literature also indicate that professors generally need to develop their pedagogy to achieve such outcomes. Therefore, the plan proposes intensive faculty development in new approaches to the first-year curriculum and instruction.

Rigorous and authentic assessment is crucial to analyzing QEP outcomes. The plan includes baseline student assessments; pre- and post-semester use of the scenario-based Critical Thinking Assessment Test; pre- and post-semester use of the Metacognitive Awareness Inventory and Epistemological Beliefs Survey; pre- and post-semester use of a faculty-designed classroom activity scored against a common rubric; student work products; student self-reflection on their own thinking; and post-semester faculty self-assessment. Findings will serve as the foundation for making decisions about best practices that assist the university in meeting its strategic goals for improving student success.



2. An Overview of NC State University

Founded in 1887 to emphasize “liberal and practical education in several pursuits and professions in life,” North Carolina State University (NC State) is a large, comprehensive university in the land-grant tradition. It enrolls more than 34,000 students, 72% of whom are undergraduates. Nearly 75% of undergraduate students earn professional degrees, with many alumni remaining in the state as contributors to the economic vitality of North Carolina. The university mission statement is evidence of its commitments:

As a research-extensive land-grant university, North Carolina State University is dedicated to excellent teaching, the creation and application of knowledge, and engagement with public and private partners. By uniting our strength in science and technology with a commitment to excellence in a comprehensive range of disciplines, NC State promotes an integrated approach to problem solving that transforms lives and provides leadership for social, economic, and technological development across North Carolina and the world. (Approved by the NC State Board of Trustees, 4/22/11; UNC Board of Governors, 6/10/11)

The university implements this mission through its strategic plan, *The Pathway to the Future: North Carolina State University Strategic Plan, 2011-2020*. As stated in the plan, the university vision calls for NC State to “emerge as a pre-eminent technological research university recognized around the globe for its innovative education and research addressing the grand challenges of society.” The plan identifies five specific goals; several are relevant to the focus of a Quality Enhancement Plan on improving student learning:


- Enhance the success of students through educational innovation.
- Enhance scholarship and research by investing in faculty and infrastructure.
- Enhance interdisciplinary scholarship to address the grand challenges of society.
- Enhance organizational excellence by creating a culture of constant improvement.
- Enhance local and global engagement through focused strategic partnerships.

Consideration of the first goal, to enhance the success of students through educational innovation, led to a number of potential NC State QEP topics consistent with

“providing high impact educational learning experiences for undergraduates” and “bolstering students’ critical thinking, communication, and independent learning skills” (*Pathway to the Future*, 2011, p. 5). Likewise, the new strategic plan for the University of North Carolina system — *Our Time, Our Future: The UNC Compact with North Carolina: Strategic Directions for 2013-2018* — reflects concern for these issues and identifies strengthening academic quality as one of its major goals (*Our Time, Our Future*, 2013, p. 11):

We will ensure that our graduates have engaged in core studies to master critical thinking, verbal and written communication, computational confidence, a global awareness, and the ability to work collaboratively.

In the context of these strong commitments to the quality of undergraduate education, NC State chose as the focus of its QEP to improve students’ higher-order thinking competencies, including critical evaluation, creative thinking, and reflection on their own thinking.



“Critical thinkers go beyond memorization of facts. NC State has already prepared me for thinking critically because of the specific professors that I chose. Students have a tendency to try to make their lives easier, but that isn't the way to develop and grow as a person. You need to learn to think differently and apply what you learn. I am interested in combining perspectives from both international studies and economics in order to approach conflicts in a new way. Employers will know that I am a critical thinker through my writing samples because how I articulate myself shows how I think.”

Meera Patel

Senior, Economics, International Studies



Developing the Quality Enhancement Plan at NC State University

- Selecting the QEP Topic
- The Planning Process

Researching the Topic

- National Demand for Critical and Creative Thinking
- Institutional Demand for Critical and Creative Thinking
- Review of Literature



3. Developing the NC State Quality Enhancement Plan

3.1 Selecting the Topic

Selecting critical and creative thinking as the topic of the NC State Quality Enhancement Plan began with the institution's strategic planning effort in 2010-2011. The university charged the Student Success Task Force — one of nine working groups that included students, faculty, and staff — with proposing “game changers” that would have significant impact on NC State undergraduates' academic success. The task force reviewed literature on student success, best practices at other institutions, and university data, including assessments of existing NC State programs (First-year Inquiry courses, Living and Learning Villages, and advising). Following invitations for campus input and a student forum, the task force recommended increasing high-impact educational experiences, such as freshman seminars, undergraduate research, collaborative assignments and projects, study abroad, service/community-based learning, internships and co-ops, writing intensive courses, and capstone projects.

After completing the strategic planning effort, the university formed a SACSCOC Leadership Team to coordinate preparation for the SACSCOC accreditation review, including compiling compliance reports, developing the QEP, and organizing the site visit. The team includes Provost, Warwick Arden, who chaired the Strategic Planning Committee; College of Sciences Associate Dean (formerly the College of Physical and Mathematical Sciences), Jo-Ann Cohen, who co-chaired the Student Success Task Force; Senior Vice Provost for Strategic Initiatives, Duane Larick; Accreditation Liaison, Karen Helm; Chair of the Faculty, Hans Kellner; and Vice Chancellor/Dean of the Division of Academic and Student Affairs, Michael Mullen, who joined NC State in July 2012. The Leadership Team mined the Strategic Plan for possible QEP topics, identifying recurring themes.

Through a consultative process that included faculty, student affairs staff, librarians, and other constituencies, interest coalesced around five specific learning outcomes — critical thinking, creative thinking, information literacy, global awareness, and civic awareness. Broadly representative brainstorming groups of campus experts considered each topic and developed brief analyses for consideration by the SACSCOC Leadership Team. (See summary in Appendix A). Each group addressed:

- Intended student learning outcomes and how they might be assessed;
- Curricular and co-curricular strategies for achieving student learning outcomes;

- University units that might take leadership of the project; and
- Resources required.

In two meetings devoted to debate and review of feedback from campus groups, the Council of Deans recommended a combination of critical and creative thinking as the QEP topic. The Faculty Senate agreed with this recommendation, while the Student Senate and Chancellor's Liaison Committee preferred civic awareness and the Associate Deans prioritized global awareness. In January 2012, the University Council (composed of campus leadership) and the SACSCOC Leadership Team endorsed critical and creative thinking as the QEP topic. Chancellor Woodson approved the topic on February 2, 2012. (See letter of approval in Appendix B).

3.2 The Planning Process

To broaden campus involvement and further develop the critical and creative thinking topic, Provost Arden appointed a QEP Plan to Plan Committee. (See charge and membership in Appendix C). Representing diverse perspectives, the committee recommended strategies to engage various campus constituencies in discussions of critical and creative thinking as learning outcomes for undergraduates. Members also suggested ways to facilitate the intensive work necessary to develop a QEP. They led Faculty Senate and General Faculty Meeting discussions as well as a campus-wide *Dialogue on Critical and Creative Thinking*. The Dialogue attendees included administrators, faculty, student affairs staff, and graduate students. (See results in Appendix D).

The QEP Plan to Plan Committee recommended a faculty-led QEP Steering Committee to oversee development of the plan, under the co-chairmanship of Professor of Physics Stephen Reynolds and Professor of English Chris Anson. Provost Arden, in consultation with the SACSCOC Leadership Team and campus administrators, appointed the committee membership in the summer of 2012. Strong interest in critical and creative thinking, rather than college or department affiliation, was the primary criterion for membership. (See charge and membership in Appendix E). The Steering Committee appointed four faculty working groups, collectively known as the QEP Coordinating Committee — Program Design, Assessment, Faculty Development, and Marketing/Communications. (See Appendix F). Chairs of each working group served on the QEP Steering Committee.

The QEP Steering Committee narrowed the topic and developed the QEP focus in the 2012-2013 academic year. It convened an all-campus QEP Kickoff Meeting in April 2013 for faculty and staff to review a draft concept paper. In addition,

members of the committee met with individual academic and administrative units, campus-wide curriculum committees, and co-curricular leaders. (See Appendix L). The purposes were to broaden awareness of the QEP, to share emerging ideas, and to collect feedback that would shape the final plan. In addition, the committee published summaries of its planning on the web and invited the campus community to respond through a blog and email.

Throughout discussions with students, faculty, and administrators, campus-wide interest in transforming the larger culture of the university to one of critical and creative thinking was clear. Recognizing that a Quality Enhancement Plan needs focus and is a first step in that transformation, faculty debated where to intervene in the curriculum and what actions would produce the greatest impact. The university's previous experience as one of the first institutions to implement a QEP for SACSCOC supported a coordinated initiative that goes deep, rather than a collection of small projects distributed across campus. Faculty asserted that intervention strategies should neither focus exclusively on disciplines in which critical and creative thinking are typical curricular content nor assign responsibility to specialized courses that deal only with these skills outside the core work of the disciplines. The general consensus was that students should not wait to begin developing higher-order thinking skills and that early academic experiences have a disproportionate effect on how students perceive standards for college-level performance. The review of literature on first-year students confirmed these perceptions. (See discussions in sections 4.3.4 and 5.2).

In April 2013, planners also circulated a concept paper for campus-wide comment. The paper established the scope and framework of the project and proposed major strategies. It focused the QEP initially on freshmen and three course types in the first-year curriculum: a General Education requirement taken by all freshmen, small seminar classes that use an inquiry-guided approach, and large enrollment introductory courses that are required by colleges for their majors. Following two years of QEP assessment, planners would decide how to maintain the commitment to freshmen while expanding to other courses that include sophomores and possibly courses within majors.

Campus feedback from a variety of constituencies, including student affairs staff and students, was positive, and comments helped to fine-tune the plan. With general agreement on scope and direction, the Steering Committee recommended that the QEP be housed in the Division of Academic and Student Affairs (DASA), and Provost Arden assigned primary oversight responsibility to Vice Chancellor/Dean Michael Mullen.

In May 2013, the university invited Dr. Barbara Jones, retired QEP mentor and coach, to lead a two-day planning retreat that further narrowed the focus, outcomes, and strategies of the QEP. To increase efficiency following a broadly consultative planning process, the university assigned primary responsibility for working with DASA to further develop the implementation plan to a small writing team. Chaired by Professor of Graphic Design and Steering Committee member Meredith Davis, the writing team included Assistant Accreditation Director, Pat Sparkes; DASA Director of Assessment, Carrie Zelna; Associate Professor of Animal Genomics, Chris Ashwell; and Professor of Nutrition Sciences and Steering Committee member, Sarah Ash. The writing team drafted the plan, with additional faculty consultation as needed.

The first full draft of the NC State plan appeared on the QEP website (qep.ncsu.edu) on the first day of classes in August 2013. A broadcast email from the Faculty Senate alerted faculty to the site, announced the availability of the draft, and invited comment. A three-page “at-a-glance” version of the plan and information about how faculty could become involved in implementation also appeared on the site.

Throughout fall 2013, the writing team made presentations to various campus groups, including 35 academic departments, and ultimately received unanimous endorsement for the plan from the Faculty Senate, Council on Undergraduate Education (which oversees the General Education Program), University Courses and Curriculum Committee (which reviews and approves curriculum changes), Associate Council of Deans, Council of Deans, and Vice Provosts, as well as the SACSCOC Leadership Team, chaired by the Provost. Planners also formed a Student Advisory Group, which meets monthly to discuss implications of the plan for students and to recommend teaching strategies students find effective. The writing team compiled comments from these various constituencies, revising details of the plan at the end of fall 2013. Planners expect approval of the final document by Chancellor Woodson and the trustees prior to the site visit.

The results of the QEP will become part of the university strategic implementation across the next five years and a key strategy for meeting goal #1 to improve student success. Critical and creative thinking are also two components of the five General Education competencies adopted by the university and critical thinking is one of the core competencies assessed by the UNC system in institutions across the state. QEP annual reports from DASA and recommendations to university administration will address how faculty development, class size, and pedagogical strategies for teaching critical and creative thinking contribute to the performance of first-year students. The university will study these factors in relation to its traditional

measures of student success, such as first-year retention rates and persistence rates. The QEP assessment strategy is consistent with reporting mandates from the UNC General Administration and will provide valuable insights for other components of the General Education Program (GEP). Deans will also use QEP assessment data to inform strategic planning at the college level. Some colleges plan to launch new initiatives in critical and creative thinking concurrent with the QEP and will take advantage of the plan's articulation of concepts and assessment data in addressing their strategic goals. DASA has also included expansion of the QEP as a strategic funding priority in the next capital campaign.



4. Researching the Topic

4.1 National Demand for Critical and Creative Thinking

In 1991, the US Department of Labor convened an expert panel to describe what twenty-first century work would require of education. *The Secretary's Commission on Achieving Necessary Skills* produced a report identifying the skills and competencies of productive work, including the ability to think critically and creatively, make decisions, solve problems, and reason (US Department of Labor, 1991, p. 13). Therefore, preparing students to think critically and creatively is essential to a competitive workforce.

Roger Martin, Dean of the Rotman School of Management at the University of Toronto, supports the idea that critical and creative thinking are keys to the future of work and economic prosperity. He describes a long-term statistical trend away from routine-oriented work, which requires people to do the same thing every day, and toward creativity-oriented jobs that ask people to engage in critical analysis and to make judgments (Martin, 2009, p. 5). Martin emphasizes the importance of analytical and social intelligence skills and shows that earnings rise for most graduates who can apply general rules to specific problems and produce solutions that make sense (Martin, p. 12). Wages overall are dramatically higher for people in creativity-oriented occupations, and creative workers experience more stable employment in tough economic times than those in routine-oriented work (Martin, p. 23).

Economist Richard Florida reinforces the importance of an emerging creative class, which he defines as “[p]eople who engage in work whose function it is to create new forms...[including] scientists and engineers, poets and novelists, artists and designers...writers, analysts, and other opinion makers” (Florida, 2002, p. 69). Beyond this group are “creative professionals,” workers in a wide range of knowledge-intensive industries such as high-tech sectors, financial services, healthcare professions, and business management. These professionals draw on complex bodies of knowledge in making critical and creative decisions about specific problems in their fields. Florida argues that global competition for creative talent will be the defining economic issue of the twenty-first century and connects the growth of communities to their ability to translate the underlying potential of the creative class into centers of innovation.

In the twenty-first century, successful universities will be those that educate graduates to contribute to a creative workforce. Further, employers will judge universities by their effectiveness in producing critical and creative thinkers who generate ideas

that are usable, useful, desirable, economically viable, technologically feasible, and sustainable.

4.2 Institutional Demand for Critical and Creative Thinking

4.2.1 Student Survey Data

NC State routinely surveys students regarding their perceptions of critical and creative thinking to inform its strategic planning. The annual incoming *Freshman Survey* asks respondents to rate the importance of various critical and creative thinking skills and to assess their current thinking skills. The triennial *Sophomore* and *Graduating Senior Surveys* ask for the extent to which students believe NC State contributed to developing their critical and creative thinking skills. The *Alumni Survey*, administered triennially to students who graduated 2.5 to 5.5 years earlier, includes questions about the importance of various critical and creative thinking skills and the role NC State played in developing them. Finally, the *National Survey of Student Engagement* (NSSE) targets both freshmen and seniors and asks which coursework emphasized different “levels” of thinking (memorizing, analyzing, synthesizing) as well as the degree to which NC State contributed to their critical and creative thinking.

Overall student and alumni feedback on these surveys indicates that students perceive critical and creative thinking skills as important and NC State as doing well in preparing students in these competencies. Students rank only three items related to their critical and creative thinking below 3.0 on a 4-point scale: writing effectively (freshmen); speaking effectively (freshmen); and the NC State contribution to understanding the present as it relates to the past (alumni). Key survey findings are as follows:

- Incoming freshmen see critical and creative thinking as important and report that they have well-developed skills prior to arrival at NC State.
- Sophomores and seniors give high ratings to the contribution of NC State to developing their critical and creative thinking skills, with ratings becoming more positive as students progress through the curriculum. NSSE results are consistent with these findings.
- Alumni give favorable ratings to the extent to which NC State contributed to developing their critical and creative thinking skills, but their ratings are not

as favorable as those of seniors and are less favorable than they previously reported when they were seniors.

- Alumni rank “importance” higher than “preparation,” suggesting that regardless of perceptions of their current skills, there is room for improvement.
- On the NSSE, freshman and senior ratings of the extent to which the university emphasizes and contributes to developing critical and creative thinking skills exceed those of other Research #1 and select peer institutions. At the same time, improvement is needed in the following areas: 1) including diverse perspectives in class discussions or writing; 2) understanding written and oral information; 3) examining problems from multiple perspectives; 4) defining problems; 5) solving problems; and 6) tolerating different points of view.

These findings suggest a gap between students’ perceptions of their critical and creative thinking skills while in school and their readiness to meet the demands of the workplace. Further, the surveys imply that early and explicit instructional attention to critical and creative thinking under more robust expectations of what constitutes high-level performance may improve student learning.

4.2.2 Faculty and Staff Perceptions of Critical and Creative Thinking

The Assessment working group conducted faculty and staff focus groups in Fall 2012 to explore the critical and creative thinking skills that faculty believe are most important for students. Faculty identified in-depth analysis, synthesis of ideas, and original thought as the highest priorities. They cited problem-solving skills and the ability to support and critique arguments as crucial. In addition, faculty mentioned as important predispositions that support critical and creative thinking — such as knowing when taking intellectual risks is appropriate, being decisive, and learning from failure. Faculty confirmed that writing and speaking skills underpin students’ exchanges with faculty and peers in communicating the outcomes of critical and creative thinking and that leadership skills help students to challenge others appropriately in such interactions. One of these skills is social awareness, which supports interpersonal interactions and multi-cultural engagement.

Literacy was a common theme among faculty, who see quantitative literacy as equally important to verbal literacy in determining the validity and credibility of information. Faculty believe students need to find and use information to support ar-

guments and to solve problems. Respondents also mentioned metacognitive skills as important to students' self-assessment of strengths and weaknesses.

Focus group participants addressed what NC State could do to build students' critical and creative thinking skills. In particular, they discussed where, within the curriculum, instruction is likely to be most effective. Participants strongly agreed that a culture of critical and creative thinking should define students' curricular and co-curricular experiences at NC State, that this culture should be part of what it means to be an NC State student. While there was consensus that all levels of the curriculum are fertile ground for critical and creative thinking, faculty also agreed that the freshman year is crucial to student development. They cited the Living and Learning Villages and the First-year Inquiry Program as models for nurturing critical and creative thinking in first-year students.

Participants believe critical and creative thinking skills develop over time and advocated an integrated, graduated approach. They advised the university to begin with first-year General Education courses and extend instruction developmentally upward into the majors. Internships, field studies, and study abroad should support upper-level curricular experiences. Faculty viewed NC State students' comfort with technology as a potential leverage point for online learning and the creative use of technology in the classroom.

While acknowledging that faculty play key roles in developing student competencies, participants believe that many faculty have little experience in developing or assessing students' critical and creative thinking. They mentioned using interdisciplinary methods, emphasizing overarching goals, and listening to student concerns about teaching methods as important faculty skills.

4.3 Review of Literature

An extensive review of literature explored:

- How experts define critical and creative thinking;
- How various knowledge domains view critical and creative thinking;
- How critical and creative thinking relate to each other; and
- How critical and creative thinking relate to best learning practices.

4.3.1 *Higher-order Thinking*

Generally, theories of higher-order thinking assert that some types of thinking require greater cognitive processing than other types of thinking. While different taxonomies use different terms to describe these skills, the consensus among scholars is that critical analysis and creative synthesis are at the top of the hierarchy. Bloom's new taxonomy positions the abilities to analyze, evaluate, and create as upper-level skills in the cognitive domain (Anderson, 2001). Marzano (2000) assigns analysis and knowledge utilization to the top of a hierarchy within the cognitive system but further describes a metacognitive system in which the student monitors his/her own thinking and judges the clarity and accuracy of thoughts (Marzano, 2001). Wiggins and McTighe identify six facets of understanding in which the ability to explain, interpret, apply, hold a perspective, empathize, and be self-aware constitute a continuum of skills that require increasing criticality (Wiggins and McTighe, 2006).

Critical and creative thinking, therefore, are specific types of higher-order thinking skills that contrast with the lower-order skills of memorizing and translating. Research indicates that first-year college students frequently struggle with higher-order thinking skills (Erickson and Strommer, 1991, p. 23) and that large enrollment courses rarely ask them to think this way (Spear, 1984, p. 44). These findings guided the selection of courses for the QEP.

4.3.2 *Critical Thinking Definitions*

John Dewey defines critical thinking as, "[a]ctive, persistent, and careful consideration of a belief or supposed form of knowledge in light of the grounds that support it, and the future conclusions to which it tends" (Dewey, 1910, p. 6). *The Delphi Report*, produced in 1990 by a panel of international experts appointed by the American Philosophical Association, expands Dewey's definition as "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based" (Facione, 2010, p. 23). The report further qualifies critical thinking as "habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, [and] fair-minded in evaluation" (Facione, 1990, p. 3).

Halpern suggests that critical thinking is "directed thinking because it focuses on obtaining a desired outcome" (Halpern, 2003, p. 5). She goes on to say that critical thinkers demonstrate willingness to plan; willingness to consider new options, try

things in new ways, and reconsider old problems; persistence; and self-correction (Halpern, 2003, p. 29).

The Foundation for Critical Thinking defines critical thinking in higher education as a self-reflective process that involves elements of reasoning, intellectual standards, methods of assessment, and strategies for professional development (Paul and Elder, 2006, 2007, 2010). Their publications frequently describe critical thinking as:

[t]he intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication as a guide to belief and action in its exemplary form. It is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness (Scriven and Paul, 1987, p. 766).

QEP planners found these definitions useful in developing a working definition for the university plan. They acknowledged the process-oriented nature of critical thinking and, borrowing from Paul and Elder, the intellectual standards for judging its quality.

Critical thinking is the active, persistent, and careful consideration of a belief or form of knowledge, the grounds that support it, and the conclusions that follow. It involves analyzing and evaluating one's own thinking and that of others. In the context of college teaching and learning, critical thinking deliberately and actively engages students in:

- Raising vital questions and problems and formulating these clearly and precisely;
- Gathering and assessing relevant information;
- Reaching well-reasoned conclusions and testing them against appropriate criteria and standards;
- Openly considering alternative systems of thought or points of view; and
- Effectively communicating to others the analysis of and/or proposed solutions to questions or problems.

The intellectual standards for evaluating critical thinking are:

- **Clarity** – being easy to understand and free from confusion or ambiguity; lacking obscurities.

- **Accuracy** – being free from errors, mistakes, or distortions; conforming to fact, truth, or some standard.
- **Precision** – being accurate, definite, and exact.
- **Relevance** – bearing upon or relating to the matter at hand; having a close logical relationship to the matter under consideration.
- **Significance** – having relative importance.
- **Depth** – dealing with the complexities of the issue.
- **Breadth** – recognizing insights in more than one side of a question.
- **Logic** – reasoning correctly within the system of principles, concepts, and assumptions that underlie a discipline, activity, or practice; understanding the set of rational considerations that bear upon the truth/justification of any belief or the settlement of any question(s).
- **Fairness** – treating all sides alike without reference to one's own feelings or interests.

4.3.3 *Creative Thinking Definitions*

In general, experts view creativity as having three components: the knowledge domain, the field of experts who determine the acceptability of new ideas, and the individual who uses the symbols of the domain to express original thinking (Csikszentmihalyi, 1996, pp. 27-28). Within this definition, there is also general agreement that creativity involves more than having eccentric thoughts. Csikszentmihalyi describes the creative process as involving preparation, incubation, insight, evaluation, and elaboration. Sternberg and Lubart (1999, p. 4) argue that judgments about the appropriateness and usefulness of ideas and the ability to be adaptive within task constraints are essential criteria for creative thinking. McKim (1972, p. 2) describes the importance of flexibility that allows creative thinkers to move across vehicles of thought, from numbers to verbal language to visual imagery.

The literature reveals some criticism of creativity tests — for example, the *Torrance Test of Creative Thinking* — that separate creative thinking into discrete, non-judgmental tasks such as fluency of thought, originality of thought, and elaboration of one's own thinking (Swartz and Perkins, 1987). Most experts view creative thinking as a process as well as an ability, and they identify distinct behaviors that distinguish a cycle in which solutions lead a new set of conditions.

Recognizing that a working definition of creativity needs to address the variety of disciplines in a complex university, QEP planners adopted the following description of the creative process and the intellectual standards for judging creative thinking, drawing on Csikszentmihalyi's work for a description of process-related behaviors:

Creative thinking is generating new ideas within or across domains of knowledge, drawing upon or intentionally breaking with established symbolic rules and procedures. In the context of college teaching and learning, creative thinking deliberately and actively engages students in bringing together existing ideas into new configurations, developing new properties or possibilities for something that already exists, and discovering or imagining something entirely new. Creative behaviors include:

- **Analyzing and evaluating information/context in order to frame the problem scope** – involvement in a set of issues that arouse curiosity and come from the specific requirements of the domain in the form of a problem or challenge. Preparation includes framing and articulating the problem scope and collecting and analyzing information.
- **Synthesizing information and generating multiple solutions to the problem** – occurs during a period of time in which ideas percolate relevant and sometimes irrelevant associations, according to patterns established by the thinker's knowledge of the domain. Idea generation requires synthesizing concepts and information, often in original configurations.
- **Exercising insight about alternatives and choosing a solution** – when one of these associations fits the problem so well (i.e., is appropriate) that it springs to consciousness. The thinker monitors developing work, pays attention to goals and feelings, compares ideas to domain knowledge and methods, and interacts with others involved in solving similar problems.
- **Evaluating the worth and consequences of an implemented solution** – critical judgments result in modifications to the original idea.
- **Elaborating** – when the thinker develops convincing modes of presentation that communicate ideas to others (Csikszentmihalyi, 1996).

The intellectual standards for judging creative thinking are:

- **Originality** – constructive imagination and independent thought.
- **Adaptability and flexibility** – the ability to adjust thinking under new or unstable conditions and to move among various vehicles of thought (numerical, linguistic, visual) depending on the situation or context.

- **Appropriateness** – goodness of fit between the constraints of the problem and the properties of the solution.
- **Contribution to the domain** – the accepted worth of new ideas within the discipline.

4.3.4 *Domain-general versus Domain-specific Thinking*

Gelman and Brennenman define a domain as “a given set of principles, the rules of their application, and entities to which they apply” (1994, p. 371). Experts disagree on domain-general versus domain-specific critical thinking, with Ennis (1989, 1991), Halpern (1998), and Smith (2002) supporting transferable skills.

Amabile (1996) concludes that creativity-relevant processes apply to anyone, but domain-relevant skills and task motivation show greater disciplinary specificity. Lubart and Guignard (2006) suggest that creativity is both domain-general and domain-specific and that contextual factors influence definitions and the weight given by different disciplines to novelty and constraint satisfaction. While art tends to assign greater importance to novelty, engineering values the satisfaction of constraints.

This literature guided the selection of both General Education and large enrollment college-level courses for the QEP. Although there is some debate in the literature, the NC State focus on critical and creative thinking assumes that some foundational skills transfer across disciplinary domains. At the same time, the QEP must demonstrate that critical and creative thinking are also important to disciplines on campus.

4.3.5 *The Relationship between Critical and Creative Thinking*

Perspectives on the relationship between critical and creative thinking differ. The dynamic interaction approach argues that critical and creative thinking share many behaviors and are at work throughout problem solving, but that some dominate others at certain points in the process. (See Figure 1). The *Five Colleges of Ohio Creative and Critical Thinking Project* developed assessment tools for critical and creative thinking that are transferable across the curriculum and usable at different skill levels. Based on the work of Puccio, Murdock, and Mance (2005), the project adopted the position that as a student moves through the problem-solving process, specific tasks and contexts activate different cognitive and affective behaviors. The critical and creative thinking traits required at any point, therefore, depend on the nature of the problem.

creative thinking / critical thinking

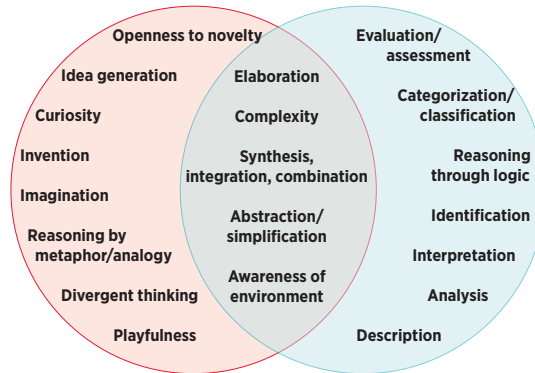


Figure 1: The relationship between critical and creative thinking, from *The Five Colleges of Ohio Creative and Critical Thinking Project*

4.3.6 **Best Practices in Student Learning**

Research on best practices in student learning also informed planning for the QEP. The work of Kuh (2008) and the Association of American Colleges and Universities (AACU) on high-impact educational practices serves as a model for the NC State strategic plan. But while AACU includes critical and creative thinking under its learning outcomes category of intellectual and practical skills, planners still had questions about how critical and creative thinking are best taught, the kind of faculty development that really works, and whether NC State has the capacity to support this work.

1) Can undergraduate students be taught to think critically and/or creatively?

Reliable evidence shows that student gains in critical thinking are higher with practice, especially in terms of transferring skills, solving real-world problems, participating in open-ended discussion, and conducting inquiry-oriented experiments (Miri et al., 2007, van Gelder, 2005).

2) Are there thinking strategies appropriate to teaching critical and creative thinking to freshmen?

QEP planners met with educator and author Stephen Brookfield during his appearance on campus in April 2013. He noted challenges in teaching critical and creative

thinking to first-year students, who are often overly confident of their skills. Upon his recommendation, QEP planners reviewed King and Kitchner's work on reflective judgment (1994).

King and Kitchner explain that first-year students score relatively low on the reflective judgment scale and believe that "absolute truth is only temporarily inaccessible, that knowing is limited to one's personal impressions about a topic, and that most, if not all problems are well structured with a high degree of certainty and completeness." When faced with complex or ill-resolved problems, first-year students "fall back on simply believing what they want to believe" (1994, p. 224). NC State surveys of its students support these findings. King and Kitchner argue that first-year students should wrestle with ambiguous problems, encounter multiple opportunities to examine different points of view, and explain what they believe.

QEP planners, therefore, concluded that developing the critical and creative thinking of first-year students presents particular challenges and that faculty will require some knowledge of freshman predispositions when adopting pedagogical strategies.

3) Is reliable assessment of student gains in critical and creative thinking possible?

There is significant evidence that critical and creative thinking are assessable (Y. Doppelt 2009; R. Ennis, 1993; E. Jones with S. Hoffman et al., 1995; P. Langer and D. Chiszar, 1993; B. Miri, B. David, and Z. Uri, 2007; and S. Wolcott, C. Baril, B. Cunningham, D. Fordham, and K. St. Pierre, 2002). Paul and Nosich reviewed standardized tests and rubrics in 1993 and found many lacking, but since that time, developers have produced more rigorous instruments and more reliable results. The QEP Assessment working group reviewed 10 standardized tests for use in pre- and post-assessment of student learning. The scenario-based *Critical Thinking Assessment Test* (CAT) was compatible with planners' concern for a problem-solving approach and offered the advantages of National Science Foundation endorsement and research support from Tennessee Tech University. (See also Section 5.6.1 / Assessment and Appendix G).

4) Do faculty development programs that focus on teaching critical and creative thinking really work?

QEP planners sought insights from other institutions that focused QEPs on critical and/or creative thinking (University of Louisville, University of Texas Health Science

at Houston, University of Tennessee at Chattanooga, and Clemson University). In addition, they examined critical and creative thinking projects at other public universities around the country, such as the Washington State University *Critical Thinking Project* and the San Francisco State University *Faculty Development Program* (Critical Thinking Web Tutorial and faculty support program). Very few institutions combined critical and creative thinking, making *The Five Colleges of Ohio Creative and Critical Thinking Project* an especially useful resource. Generally, studies of the impact of faculty development on student gains evidence mixed results, but as assessment strategies become more refined, positive results emerge.

5) Does NC State University have the capacity to change?


NC State faculty have a history of institutional and national leadership in curricular transformation. In 1995, the university began an inquiry-guided learning initiative to bridge the teaching and research missions of the institution, documented by Virginia Lee, former Associate Director of the NC State Office of Faculty Development, in her book *Teaching and Learning through Inquiry* (2004). A ten-faculty workshop in critical thinking, led by expert Richard Paul resulted in a successful Hewlett Foundation grant proposal to “Improve General Education at a Research #1 University” through inquiry-guided learning. The university established inquiry-guided Hewlett Principles (sense of independent inquiry, ability to think critically, and capacity to take responsibility for one’s learning). In addition, the project fostered a community of faculty and first-year seminars, now called First-year Inquiry, under these principles.

The university funded the second phase of the Hewlett Project under the Faculty Center for Teaching and Learning to offer seminars, workshops, speakers, and retreats for faculty. The purpose of Phase II was to promote course revisions in ways that were consistent with inquiry-guided learning principles, which had a significant and lasting impact on General Education courses in the university. Hewlett funded a third phase of the project to institutionalize inquiry-guided learning in majors. Funding ended in 2002, but the legacy of faculty leadership and collaboration continues as a strong foundation for the current QEP.

Other examples on campus illustrate curricular and pedagogical innovation. Physics professor Robert Beichner created the *SCALE-UP Project* (Student-Centered Active Learning Environment with Upside-down Pedagogies, Beichner et al., 2007). More than 100 schools across the country now use this approach. The NC State College of Design offers nationally recognized courses in “design thinking” for university students through Interdisciplinary Perspectives courses in *Design Thinking for All Disciplines*.

Additionally, the university's commitment to faculty development is long-standing. In 2008 the institution re-organized the Faculty Center for Teaching and Learning as the Office of Faculty Development under the Office of the Provost. The Office of Faculty Development participated in forming this plan and will support implementation of the QEP.

The campus, therefore, is well positioned to build upon its existing expertise in critical and creative thinking to improve student learning.



“ Thinking critically is not taking things at face value. Critical thinkers are much more engaged with what they're studying. They ask questions, look in depth...they don't just try to find the answer for a test. The university should encourage students to develop a thought process so they can go from one skill set to another skill set and understand the world they're living in. Employers will know I am a critical thinker by how I approach problems. Textbooks work but if I'm more outside of the box in identifying problems, that says I am a critical thinker. ”

Shreye Saxena
Senior, Computer Engineering



The TH!NK Plan: Higher-order Skills in Critical and Creative Thinking

- Definition of Important Terms
- The Importance of the First Year of College
- The Selection of First-year Courses
- Expanding Shared Content in Critical and Creative Thinking
- Learning Objectives and Student Learning Outcomes
- The Plan for Assessing Student Learning Outcomes
- The Faculty Development Plan
- The Implementation Plan



5. The TH!NK Plan: Higher-order Skills in Critical and Creative Thinking

The NC State University **TH!NK** Plan focuses on:

Improving students' higher-order thinking competencies, including critical evaluation, creative thinking, and reflection on their own thinking.

5.1 Definition of Important Terms

A list of terms related to this plan appears in Appendix I. **TH!NK** planners defined terms through the review of literature. They also circulated definitions of critical and creative thinking campus-wide and modified them based on feedback to ensure that faculty recognize parallels between the critical and creative in their disciplines and the definitions. Planners further described relevant behaviors that are evidence of critical and creative thinking. Identifying these behaviors assists faculty in observing student performance and **TH!NK** planners in assessing curricula.

5.2 The Importance of the First Year of College

In discussions of where to launch this transformation, the general consensus within the university was that students' first year in college establishes a critical and creative foundation and is the place to begin and that setting high expectations for students in their earliest academic experiences is essential to ongoing development of their higher-order thinking skills across four years of study and beyond.

In fall 2013, NC State enrolled 3,476 true freshmen who entered the university directly from high school: 84% were North Carolina residents; 13% were from out of state; and 3% were international students. Slightly more than 40% of NC State freshmen were from small towns or rural areas, and 39% were from families with annual incomes less than \$75,000. The average SAT score was 1244, the average grade point average was 4.37, and students averaged in the top 13% in class rank. Compared to its 16 peer institutions and at 49%, NC State is 11th in students admitted from the top 10% of their high school class. Nearly 22% of 2013 freshmen entered the university uncertain about their major and enrolled in the First-Year College, which guides undecided students in their transition to college and the selection of a major.

The American Youth Policy Forum reported in 2010 that rural schools, in general, lack sufficient faculty resources to offer advanced courses and that skilled teachers often leave rural schools for higher paying jobs in urban school districts (American Youth Policy Forum, 2010). In North Carolina, budget cuts disproportionately affect rural schools and often divert funds for specialized programs to the rising cost of transporting students across long distances. Rural students are more likely to live below the poverty line, suggesting that they come from families with less college education than do their suburban and urban peers (American Youth Policy Forum, 2010). These conditions mean that at least 40% of NC State freshmen are unlikely to graduate from high schools that build strong critical and creative thinking skills. In addition to concern about many entering students' readiness to think critically and creatively, there is general agreement among faculty and campus leaders that interventions in the first-year curriculum alone will be insufficient in producing mature thinkers and in bringing about campus-wide curricular and pedagogical change.

For these reasons, the **TH!NK** plan devotes five years to improving first-year students' performance in critical and creative thinking as a springboard for a longer university effort to integrate critical and creative thinking throughout the undergraduate curriculum and co-curricular activities. When designing the QEP, planners made the decision to limit its scope as a necessary first step for campus transformation, but also kept in mind the later goal of vertical curricular integration in the majors. Faculty and staff expressed enthusiasm for developing parallel plans for scaffolded coursework and co-curricular activities that build upon QEP outcomes.

5.3 The Selection of First-year Courses

TH!NK planners looked for several conditions in which to study strategies for improving first-year students' critical and creative thinking. Criteria for choosing courses included: 1) courses that enroll a high percentage of first-year students; 2) courses that are part of the General Education Program; 3) courses in the knowledge domain of academic colleges; and 4) distribution of selected courses across the humanities, social sciences, and sciences. The university's intent is to understand the problems and opportunities in these various conditions as a way of informing future expansion of the project. In addition, planners want to work with faculty who are receptive to new teaching strategies, common assessment, and participation in a learning community to ensure a good chance of establishing course exemplars and teaching mentors for future faculty development.

The English 101 course cluster – **TH!NK** planners chose courses that are likely to have high impact on a significant percentage of first-year students. The univer-

sity's General Education Program includes English 101 as a first writing class for all students, and 85% of freshmen take the course in their first year of study at the university. Part-time and non-tenure-track faculty teach many sections and are highly qualified and routinely undergo training for teaching writing to freshmen. Administrators in the campus writing program maintain continuity in instructional goals, conduct faculty development programs, and monitor the success of instruction. Planners debated the inclusion of non-tenure-track faculty in the plan, worried about lasting influence because some faculty may have temporary relationships with the university. However, many of the faculty teaching English 101 are experienced teachers and demonstrate a long-term commitment to the institution. Research also shows that faculty employment status has little influence on student success (Yu, Mendoza, and Campbell, 2013). The first year of Phase I (2014-2015) involves a cluster of six sections of English 101 (120-130 students). The plan adds 10-12 sections in each of the following years through Phase II of the plan, while maintaining previously involved faculty in the study for a second year.

The First-year Inquiry course cluster – Shelpelak et al. (1992) find higher effectiveness in teaching freshmen when faculty explicitly teach the meaning and process of critical thinking in tandem with structured assignments through which students apply their skills. In a study of freshmen and seniors, Giancarlo and Facione (2001) also conclude that first-year seminars can and should develop dispositions toward critical thinking along with skills.

FYI courses employ an active-learning, inquiry-guided approach to small seminars. FYI faculty represent a variety of disciplines and agree to participate in the program's planning and assessment strategies. **TH!NK** planners believe this group of faculty will be receptive to adopting a common language and new teaching strategies for critical and creative thinking. In its strategic plan, the university recommended expanding this program. **TH!NK** planners feel it is valuable, therefore, to affirm its effectiveness in teaching critical and creative thinking. The first year of Phase I (2014-2015) involves six sections of First-year Inquiry (120-130 students). The plan adds more sections in each of the following years through Phase II of the plan, although because the size of this program is limited by funding, it is unlikely that the number of FYI classes will increase across five years at the same rate as other conditions in the study.

The large enrollment course cluster – NC State is 14th among its 16 peer institutions in the percentage of classes with fewer than 20 students per class and tied for second place in the percentage of classes with more than 50 students per class. The College Board reports that 80% of college-bound seniors graduate from high

schools with fewer than 500 students, yet begin their first-year studies in institutions of 10,000 students or more. Research points to the problems of placing first-year students in large enrollment courses that focus on memorization rather than in interactive learning environments with high expectations that help students in their transition to college. Spear warns of the consequences in assigning first-year students to large introductory lecture classes, saying that in such courses students “...learn what it is to be a student, what is required to get by. If students are taught to be passive seekers and transcribers of information, that is what they become. Further, they set their sights accordingly in subsequent courses, often actively resisting our attempts in upper-division courses to get them to go beyond the information we give them” (1984, pp. 6-7).

Although NC State works to pioneer inquiry-guided pedagogies and to redesign large courses to be more effective, many of its students complete many of their General Education requirements and beginning instruction in their major in courses of 50 students or more. Research shows that students are more likely to take additional courses in a discipline when their first experience in that discipline includes discussions with other students (Bruton and Crull, 1982) or instructors who are “facilitators” rather than “authorities” (McKeachie, Lin, Moffet, and Daugherty, 1978). Because 21% of NC State freshmen are undecided in their major and may use first-year courses to determine a future major, their perceptions of various disciplines often result from instruction that offers little insight into critical and creative work in the fields they are considering or the transferability of higher-order thinking skills across disciplines.

THINK planners looked at course enrollments and chose several large enrollment courses from the largest colleges for the first two years of the plan (Phase I). Engineering 101 is the first course taken by students entering the various majors in Engineering and enrolls 65 students per section. Planners believe fostering critical and creative thinking in the largest undergraduate program on campus (4900 undergraduate majors in spring 2013) is important to transforming the campus culture. Management Innovation Entrepreneurship 201 is the first college-level course taken by majors in the College of Management and is also taken by students in other colleges. It is taught to 300 students per semester in sections of 80 students. The reconfigured College of Sciences will teach a new biology course (COS 295A) to first-year students in fall 2014 under recently hired faculty with particular expertise in critical thinking in the sciences. COS 295A will register 200-240 students per semester in sections of 80 or more students. The second year of Phase I will include two additional sections of each of these courses and one section each of other large enrollment courses that enroll freshmen. For example, the College of Human-

ities and Social Sciences has volunteered its HSS 120 introduction to the college for fall 2015. Phase II will likely include 200-level courses taken by freshmen and sophomores and potentially involving upper division instructors. This diversifies the disciplinary content of the plan and offers opportunities for scaffolding studies in critical and creative thinking for majors.

5.4 Expanding Shared Content in Critical and Creative Thinking

TH!NK planners acknowledge that faculty teaching courses selected for intervention will have varying comfort in adapting the delivery of required course content to the demands of teaching critical and creative thinking. The existing syllabi of English 101 and First-year Inquiry courses, for example, already contain content that complements goals for teaching critical and creative thinking. Under pressure to build mastery of foundational concepts and objectivity, however, beginning courses in the sciences may be less explicit in discussing how critical and creative thinking are relevant to science.

Therefore, a goal of the plan is to use a common language for describing critical and creative thinking across domains and to make more evident the curricular territory that disciplines share. The plan asserts that student learning outcomes and rubrics should be the same from class to class and that assessments should determine the degree to which courses deliver and reinforce common critical and creative thinking content through disciplinary perspectives. While courses targeted by the plan may not achieve equal coverage, planners expect that expanding the shared content will reinforce concepts and encourage students to transfer learning from one course to the next. In some instances, implementation may identify productive pairings of courses for interdisciplinary collaboration in later stages of the plan.

5.5 Learning Objectives and Student Learning Outcomes

The **TH!NK** plan defines a focus statement, two objectives, and six outcomes for students' higher-order thinking. The objectives separate critical and creative thinking, but **TH!NK** planners recognize that critical thinking is essential to creative thinking. In support of that belief, two of the six student learning outcomes describe overarching student skills: explaining intellectual standards and reflecting on their own thinking. The six student learning outcomes are compatible with a number of models for describing higher-order thinking skills, most notably Bloom, Marzano, and Wiggins and McTighe. Consistent with these models, **TH!NK** planners view the six outcomes as hierarchical. Faculty will likely address them sequentially in curric-

ula, encouraging students to build increasingly sophisticated competencies across the semester. Because the student learning outcomes address thinking, the plan and faculty development also identify observable behaviors that are evidence of critical and creative thinking. The relationships among these ideas are expressed in Figure 2 on page 29.

Focus statement: NC State University will improve students' higher-order thinking competencies, including critical evaluation, creative thinking, and reflection on their own thinking.

Objective 1: NC State University will improve students' ability to think critically.

Objective 2: NC State University will improve students' ability to think creatively.

Outcome A: Students will explain the intellectual standards for critical and creative thinking.

Outcome B1: Students will evaluate the work of others using the intellectual standards for critical thinking (clarity, accuracy, precision, relevance, depth, breadth, logic, fairness, and significance).

Outcome B2: Students will critique the work of others using the intellectual standards for creative thinking (originality, adaptability and flexibility, appropriateness, and contribution to the domain).

Outcome C1: Students will apply critical thinking skills and intellectual standards in the process of solving problems (raising vital questions and formulating problems clearly and precisely; gathering and assessing relevant information; reaching well-reasoned conclusions and testing them against appropriate criteria and standards; openly considering alternative systems of thought or points of view; and effectively communicating to others the analysis of and/or proposed solutions to question or problems).

Outcome C2: Students will apply creative thinking skills and intellectual standards in the process of solving problems (analyzing and evaluating information and context in order to frame problem scope; synthesizing information and generating multiple solutions to the problem; exercising insight about alternatives and choosing an appropriate solution; evaluating the worth and consequences of the implemented solution; and elaborating through presentation and communication to others).

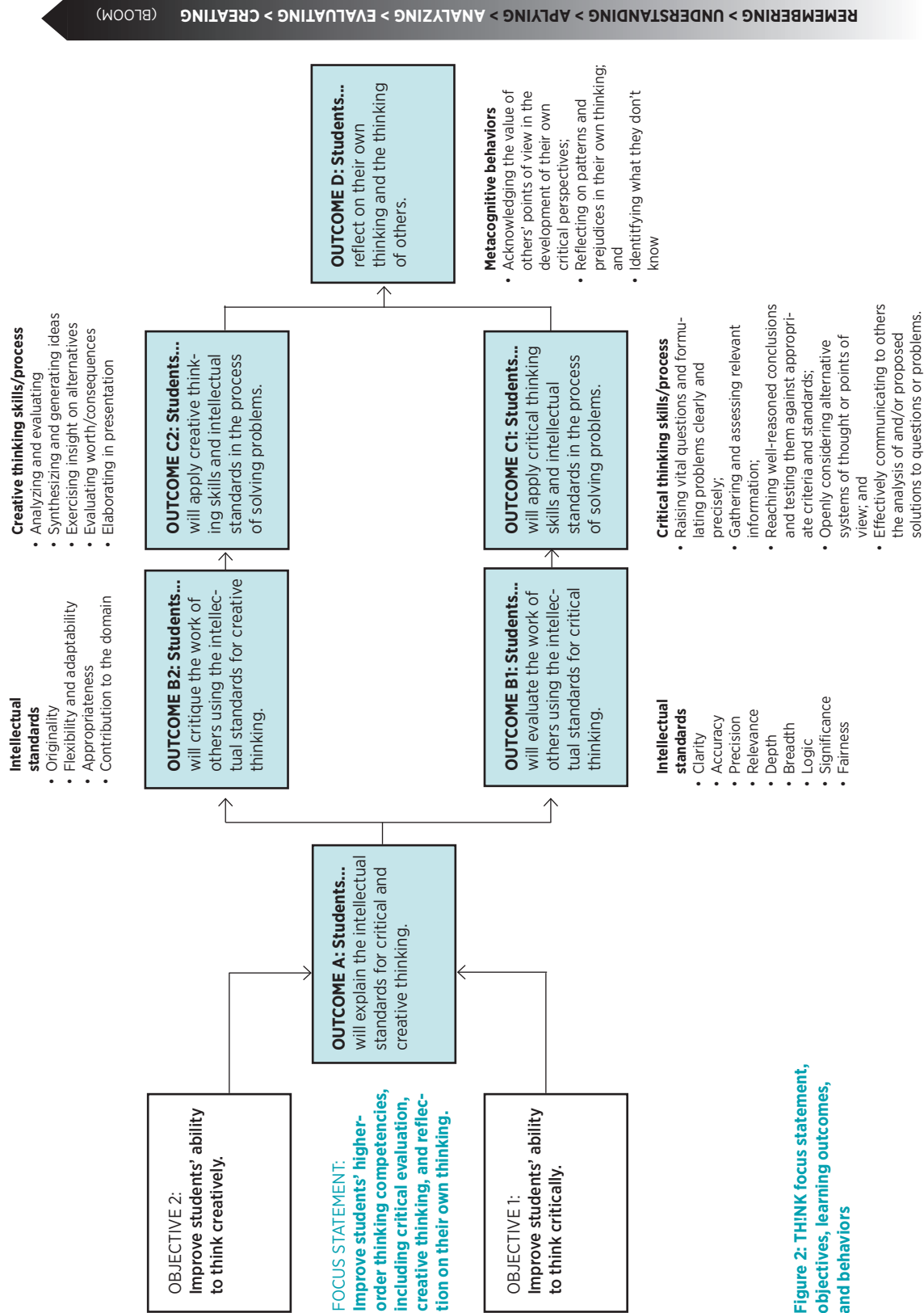


Figure 2: THINK focus statement, objectives, learning outcomes, and behaviors

REMEMBERING > UNDERSTANDING > APPLYING > ANALYZING > EVALUATING > CREATING (BLOOM)

EXPLAIN > INTERPRET > APPLY > HOLD A PERSPECTIVE > EMPATHIZE > BE SELF-AWARE (WIGGINS AND MCTIGHE)

Outcome D: Students will reflect on their own thinking and the thinking of others (acknowledging the value of others' points of view in developing their own critical perspectives; reflecting on patterns and prejudices in their own thinking; and identifying what they don't know).

5.5.1 *Student Achievement of Learning Outcomes*

The plan is realistic about how much freshman students can develop their critical and creative thinking in one semester. Educator Stephen Brookfield advised **TH!NK** planners to consider first-year students as beginning a developmental arc in understanding critical and creative thinking. Therefore, defining first-year student achievement in emergent and attainable terms, while at the same time expecting higher levels of achievement from students in later semesters of the curriculum, is important.

In addition to the CAT, development of a common rubric for assessing creative performance in a faculty-designed classroom activity will take place in spring 2014; the university will provide an updated report on this activity at the time of the SACSCOC site visit. While participating faculty will modify the activity structure slightly to reflect the content of their classes and disciplines, each activity will use the same evaluation criteria, ratings system, and questions on a student reflection. Rather than describe a single metric of student proficiency for this activity, planners will pattern assessment work on the *Critical Thinking and Creative Thinking Value Rubrics* of the Association of American Colleges and Universities and the *Five Colleges of Ohio Creative and Critical Thinking Project* (see Appendix H) and the characteristic behaviors that appear in the university's definitions of critical and creative thinking.

The university will also measure students' awareness of their own thinking, using an Epistemological Beliefs Survey and a Metacognitive Awareness Inventory. (See explanation in section 5.6.1 and Appendix G).

5.6 *The Plan for Assessing Student Learning Outcomes*

A chart of the research design shows the relationship between student learning outcomes and assessment instruments. (See Figure 3 on page 31). Six assessment questions correspond directly to the student learning outcomes that result from curricular and pedagogical intervention in critical and creative thinking.

STUDENT ASSESSMENT INSTRUMENTS >					
QEP OUTCOMES	Questions on Critical Thinking Assessment Test (CAT) (pre and post semester) (scored by assessment staff)	Questions on Meta-cognitive Awareness Inventory (MAI) (pre and post semester) (scored by assessment staff)	Questions on Epistemological Beliefs Survey (EBS) (pre and post semester) (scored by assessment staff)	Faculty-designed activity with common rubric (pre and post semester) (scored by faculty)	Faculty-designed activity reflection with common rubric (pre and post semester) (scored by assessment staff)
Outcome A: Students will explain the intellectual standards for critical and creative thinking . . .	Q3, 9		Q1, 10, 18, 20, 22, 28, 32, 33, 34, 37, 38	X	
Outcome B1: Students will evaluate the work of others using the intellectual standards of critical thinking	Q5, 6, 8, 13	Q2, 6, 13		X	
Outcome B2: Students will critique the work of others using the intellectual standards of creative thinking				X	
Outcome C1: Students will apply critical thinking skills and intellectual standards in the process of solving problems					
Raising questions/formulating problems	Q11	Q1, 4, 5, 6, 10, 12		X	X (describes activity work)
Gathering/assessing relevant information	Q4, 7, 10, 11	Q10, 12, 13, 19, 20		X	X (describes activity work)
Reaching reasoned conclusions	Q1, 2, 13	Q1, 7, 9, 14, 15, 16		X	X (describes activity work)
Testing conclusions against standards	Q1, 2, 13	Q11		X	X (describes activity work)
Considering alternatives/points of view	Q3, 9, 15	Q2, 11, 18		X	X (describes activity work)
Effectively communicating	Q14	Q16, 19			
Outcome C2: Students will apply creative thinking skills and intellectual standards in the process of solving problems					
Analyzing and evaluating	Q4, 7, 10, 11, 15	Q1, 4, 5, 6, 10, 12		X	X (describes activity work)
Synthesizing and generating ideas		Q2, 7, 11, 14, 16, 17, 18		X	X (describes activity work)
Exercising insight		Q1, 7, 9, 12, 13		X	X (describes activity work)
Evaluating solutions and consequences		Q1, 7, 12, 15		X	X (describes activity work)
Elaborating	Q15			X	X (describes activity work)
Outcome D: Students will reflect on their own thinking and the thinking of others					
Acknowledging the value of others' ideas		X	X		X
Reflecting on patterns and prejudices		X	X		X
Identifying what they don't know		X	X		X

Figure 3: QEP research design

Did the curricular intervention improve students' ability to:

- Explain the intellectual standards for critical and creative thinking?
- Evaluate the work of others using the intellectual standards for critical thinking?
- Critique the work of others using the intellectual standards for creative thinking?
- Apply critical thinking skills and intellectual standards in the process of solving problems?
- Apply creative thinking skills and intellectual standards in the process of solving problems?
- Reflect on their own thinking and the thinking of others?

Because the university's interest is building a campus culture of critical and creative thinking, **TH!NK** planners will also collect data that informs later strategies for curricular improvement throughout the institution.

For example, studying relationships between the achievement of student learning outcomes and class size will help the university determine the cost of expanding successful practices to other courses in the first-year curriculum and in majors. Differences in performance between students who encounter critical and creative thinking in a single course and those who experience it in multiple courses will suggest how much exposure is necessary to bring about significant change in students' learning. It may also confirm the importance of reinforcing critical and creative thinking content from course to course and across disciplinary emphases. Because the **TH!NK** project involves courses from different knowledge domains, planners hope to identify aspects of critical and creative thinking that the humanities, social sciences, and sciences have in common and the types of courses in which students experience disciplinary challenges in acquiring and applying new skills.

5.6.1 *Instruments for Assessing Student Learning Outcomes*

The proposed research design uses multiple instruments to collect data about first-year students' learning in critical and creative thinking: 1) the Critical Thinking Assessment Test (CAT), a scenario-based examination developed by Tennessee Tech University and funded by the National Science Foundation; 2) a critical and creative thinking activity and reflection using a rubric authored by **TH!NK** planners in consultation with participating faculty and based on the Association of American Colleges and Universities Value Rubrics for critical and creative thinking; 3) Schraw and Dennison's Metacognitive Awareness Inventory (MAI); and questions from

Wood and Kardash's Epistemological Beliefs Survey (EBS). The combined CAT, MAI, and EBS require 45-60 minutes of testing time. All first-semester students in targeted **TH!NK** courses will participate in each assessment as a requirement for completing the course, although in each case a random sample of the estimated 600-1800 student responses will be scored.

Critical Thinking Assessment Test Procedures

2013-2014: Establish baseline and control group – In fall 2013, new freshmen in 15 non-QEP courses (six sections of English 101, six sections of First-year Inquiry courses, and three sections of large enrollment courses) participated in pre- and post-semester evaluation using the CAT and metacognitive self-assessments. The demographic, metacognitive, and faculty data regarding pedagogies will be used to look for correlations to help explain change, if any, from pre- to post-semester testing of students' higher-order thinking. Assessment staff will use these data to establish a baseline as well as function as control group data for the project. Using the baseline as the control group will mitigate diffusion issues in Phase I as many faculty and staff will implement critical and creative thinking initiatives in 2014-2015, and as the QEP project scales up in Phase II, most freshmen will experience an intervention.

Statisticians in the university and authors of the CAT suggest that a sample of 15 matched pairs per course will be statistically representative of the larger population. The Implementation Team will conduct additional analyses to confirm this decision.

2014-2016: Test Phase I participants – In fall 2014, students in all **TH!NK** courses will participate in pre- and post-semester testing, and in fall 2015 when the number of **TH!NK** courses doubles, a sample of **TH!NK** students will participate in pre- and post-semester testing. Assessment staff will analyze data at the individual course level, course cluster level, and project level, but will share only data at the course cluster level (English 101, First-year Inquiry courses, and large enrollment courses) so that individual faculty participants are not identifiable. Staff will compare data from 2014-2015 with the control group from 2013, seeking correlations that explain any change from pre- and post-semester testing.

2015-2019: Test Phase II participants – Planners believe the proposed pre- and post-semester testing strategy is sufficiently robust to accommodate changes in the project design. Once the university decides on a scaling strategy for the last three years of the QEP, for example, new assessment sampling methods may be necessary. Assessment staff may ask additional questions of the data or involve

Tennessee Tech in further analyzing patterns in student performance. The CAT currently uses one scenario for its questions, but before completion of the QEP Tennessee Tech will develop additional scenarios. This means NC State students may respond to different but comparable scenarios in their freshman and senior years.

Rubric Development and Implementation

While the CAT does a good job of assessing aspects of critical thinking described in the **TH!NK** student learning outcomes, it is less than comprehensive in evaluating students' creative thinking. Activities developed by **TH!NK** Faculty under the mentorship of Faculty Fellows (see job description on page 58) will use a common rubric for critical and creative thinking, adapted from the *AACU Value Rubrics for Critical and Creative Thinking* and the rubrics developed by the *Five Colleges of Ohio Creative and Critical Thinking Project*.

The content of activities will vary among **TH!NK** courses to reflect issues in the discipline but will be accountable to the same evaluative criteria, rating scales, and questions in a reflective component. For example, all classes may ask students to develop specifications for an exemplar or engage in divergent thinking in solving a creative problem, but the exemplar or creative task may be situated in the sciences, social sciences, or humanities. In all cases, the task will be subject matter sensitive but not require mastery of specific disciplinary content for successful completion. This will allow faculty to assess critical and creative thinking in pre- and post-semester tests without conflating results with factual disciplinary knowledge acquired over the course of study.

Faculty will embed the reflective component in activities, asking a common set of questions about students' thinking in executing the critical and creative task. Where possible, the structure of activities will mirror the instructional strategies imparted to faculty in their training and used in their delivery of the course. For example, case studies or scenarios may frame an assessment activity that asks students to develop exemplars.

Prior to scoring, assessment staff will train **TH!NK** Faculty to use the rubric. As disciplinary experts responsible for grading student performance in their classes, **TH!NK** Faculty will score their own students' work using the common rubric. One goal in using this assessment is to develop the faculty's ability to create appropriate,

rigorous, and sustainable evaluations of students' combined critical and creative thinking. In addition, assessment staff and the full faculty cohort will examine scored examples of student work to evaluate application of the rubric across **TH!NK** courses and overall changes in student learning.

Metacognitive Assessment

The QEP uses the Metacognitive Awareness Inventory and an Epistemological Beliefs Survey to determine students' reflective self-assessment and their beliefs about the nature of knowledge and learning, including the speed of knowledge acquisition, the structure of knowledge, knowledge construction and modification, and the attainability of objective truth. In addition, questions assess students' self-regulation of their critical and creative thinking. Researchers on this topic (Paulesen and Feldman, 1999) note that these beliefs and self-regulation behaviors affect motivational beliefs, cognitive strategies, and learning outcomes (Bruning, Schraw, and Ronning, 1995; Hofer and Pintrich, 1997; Schommer, 1990).

Research found that students who believe in "quick, all or nothing" learning are more likely to reach oversimplified solutions and that beliefs about knowledge and learning vary by academic major. Students in applied fields such as engineering, for example, are more likely to hold naïve epistemological beliefs than students in the basic sciences. If the university does not account for these differences, incoming students who hold more sophisticated beliefs about the nature of knowledge and its acquisition may appear to make smaller gains in developing critical and creative thinking than their peers whose beliefs are more simplistic. The Epistemological Beliefs Survey will account for these differences.

Self-regulating behavior is largely the result of metacognitive processes. Zimmerman (1990), notes that students who demonstrate this behavior "plan, set goals, organize, self-monitor, and self-evaluate at various points during the process of [knowledge] acquisition...[t]hey seek out advice, information, and places where they are most likely to learn" (Zimmerman, p. 5). Because these are also the attributes of critical and creative thinkers, the use of a Metacognitive Awareness Inventory may reveal self-regulating behavior that correlates with gains in critical and creative thinking.

5.6.2 *Schedule for Assessing Student Learning Outcomes*

The schedule for Phase I, 2013-2014 and 2014-2015, assessment-related activities is as follows:

CAT, MAI, EBS pre/post testing for baseline and control groups of first-year students	2013	Assessment staff
Training the trainers to score CAT	November 2013	Assessment staff, QEP Director
Scoring baseline	January 2014	CAT scorers
Developing the classroom activity/common rubric	Fall 2013-Spring 2014	Faculty Fellows, TH!NK Faculty and assessment staff
CAT, MAI, EBS pre-test of first-year students in first year of Phase I	August 2014	Assessment staff
Classroom activity/common rubric pre-test of first-year students in first year of Phase I	August 2014	TH!NK Faculty
CAT, MAI, EBS post-test of first-year students in first year of Phase I	November 2014	Assessment staff
Classroom activity/common rubric post-test of first-year students in first year of Phase I	November 2014	TH!NK Faculty
Collection of student work and scoring of classroom activity/common rubric	November 2014	TH!NK Faculty and assessment staff
Training faculty and scoring the CAT	January-March 2015	Faculty scorers
Analyzing data and interpreting results	January-March 2015	Assessment staff and CAT researchers at Tennessee Tech

In fall 2013, university assessment staff used the CAT, Epistemological Beliefs Survey, and Metacognitive Awareness Inventory to collect baseline data on the critical thinking of first-semester freshmen, before any faculty development or curricular intervention took place. Staff tested 450 students with only 9 eligible students failing to participate. In November 2013, Tennessee Tech University staff trained four NC State “trainers” for scoring the CAT. The faculty attending this training trained 24 faculty to score the test in January 2014.

University assessment staff will administer pre- and post-semester evaluations in each **TH!NK** course at the start and finish of fall 2014, using the CAT, the faculty-authored activities with the common rubric, and the two metacognitive surveys. University assessment staff and researchers at Tennessee Tech will interpret the results of the CAT in spring 2015. Based on findings, **TH!NK** Faculty and planners will make modifications in faculty training, assessment strategies, and/or the courses involved in Phase I and Phase II of the plan.

The university will repeat this cycle for every cohort group of students and faculty in the subsequent three years, unless findings call for changes in the plan.

5.7 The Faculty Development Plan

In an article for the National Academy for Academic Leadership, Gardiner proposes ten questions that help an institution determine its faculty development needs (Gardiner, 2000). **TH!NK** planners found these questions useful in framing a strategy for preparing faculty to teach critical and creative thinking.

1) What are the specific intended learning outcomes [in critical and creative thinking] that the institution defines for students?

The QEP document describes student learning outcomes for critical and creative thinking in detail on page 28. In summary, outcomes call for students to:

- Explain the intellectual standards for critical and creative thinking;
- Evaluate the work of others using the intellectual standards for critical thinking;
- Critique the work of others using the intellectual standards for creative thinking;
- Apply critical thinking skills and intellectual standards in the process of solving problems;
- Apply creative thinking skills and intellectual standards in the process of solving problems; and
- Develop metacognitively by reflecting on their own critical and creative thinking and the thinking of others.

The content of faculty development, therefore, must relate directly to improving students' higher-order thinking skills.

2) What educational processes does current research in higher education suggest can best develop these outcomes with our students?

To answer this question, planners generated an inventory of proven instructional and assessment strategies for developing students' critical and creative thinking skills. (See strategies listed in Figure 4 on page 38). Because **TH!NK** courses address a variety of domains (humanities, social sciences, and sciences) and diverse contexts (seminars and large enrollment classes, general education, and required college-level courses), planners generated a range of instructional strategies for each outcome. Some strategies may be more or less appropriate for a specific **TH!NK** course or faculty teaching style. In preparing the faculty development seminars, Faculty Fellows will offer additional strategies that are useful for teaching

inparticular contexts; they will review pedagogical literature and canvass other faculty on campus who have strong records in teaching critical and creative thinking.

Instructional strategies for helping students to:

Explain the intellectual standards	Evaluate work of others using critical thinking standards	Critique work of others using creative thinking standards	Apply critical thinking skills and standards to problem solving	Apply creative thinking skills and standards to problem solving	Reflect on their own thinking and the thinking of others
Common language	Concept mapping		Case-based scenarios		Journal writing
Student presentations	Graphing, diagramming, and data visualization		Problem-based, inquiry-guided investigations		Discussion
Lectures/demonstrations	Content analysis		Lateral thinking exercises		Portfolio analysis
Comparative analysis	Rhetorical analysis		Simulations, models, and prototypes		
	Analytical reading strategies		Constructing/presenting arguments		
	Case studies		Collaborative problem solving		
	Debate and discussion groups		Combination and mutation of ideas		
	Essential questions		Identification of “first principles”		
	Peer-to-peer reviews		Identification of emergent ideas or new properties		

Assessment strategies for evaluating student achievement:

Demonstration	Oral presentations	Projects	Awareness inventories
Presentation	Writing assignments	Rubrics	
Writing assignments	Visualizations of analyses	Prototype testing	Articulation of beliefs
	Examinations/quizzes	Presentations/demonstrations	Personal development plans
Projections of methods that ensure standards	Projects	Portfolios	
	Peer to peer reviews and juries		

Figure 4: Instructional and assessment strategies

- 3) What specific professional knowledge and skill competencies do faculty need to implement these processes effectively and efficiently?

Beyond considering the general teaching competencies assessed by the university (for example, content knowledge, preparation, communication, feedback to students, and so forth), **TH!NK** planners identified faculty outcomes specifically related to teaching critical and creative thinking:

- Faculty will develop and use instructional strategies for critical and creative thinking in formulating student assignments, classroom activities and discussions, and student assessments;
- Faculty will make instruction in critical and creative thinking explicit and use a common language for referring to related skills and intellectual standards so that students recognize this content across courses and throughout the curriculum;
- Faculty will align their subject matter with critical and creative thinking skills in ways that are appropriate to the domain and to the specific characteristics of first-year students;
- Faculty will reflect on the results of teaching critical and creative thinking in a process of continual improvement; and
- Faculty will share best practices in teaching critical and creative thinking as part of an effort to transform the campus culture.

4) Does each educator now have these competencies appropriate to his/her role? How does the institution know?

Existing English 101 and FYI programs include critical and creative thinking as student learning outcomes and offer some faculty training. While these programs report some success by faculty, participation in the QEP will expand training through a formal curriculum of faculty development, a common language across all courses, a focus on cognitive awareness, and external validation through a common assessment strategy. Planners feel it is important that all **TH!NK** Faculty share a common training experience and language so students recognize concepts as they move from one class to the next. Therefore, a formal approach to faculty development is necessary.

5) What types of activities are best suited for developing these professional competencies with the targeted faculty?

Research supports the belief that faculty development can be successful, especially if programs follow principles of adult learning, such as voluntary participation, collaboratively determined objectives, and low threat assessments of teaching (Behar-Horenstein, L.G. Schneider-Mitchell, and R. Graff, 2009).

In addition, professional socialization and supporting organizational structures are important to faculty vitality; workshops and opportunities to share expertise keep faculty engaged in developing their professional skills. The NC State experience with the Hewlett Initiative showed that a faculty learning community is helpful in supporting faculty in teaching. Faculty recognition and reward also play important roles in building a quality culture of teaching and learning (Boyer, 1990).

The **THINK** plan balances these concerns for self-direction, socialization, and recognition with the need to promote a common language and transferable skills in critical and creative thinking for wider campus adoption.

To achieve **THINK** learning objectives, faculty need several types of information and instructional support:

- Self-directed activities that inform faculty about the skills, intellectual standards, and language of critical and creative thinking;
- Self-directed activities that inform faculty about the challenges of teaching such content to first-year students;
- Spring Faculty Seminar I, which introduces faculty to practical teaching and assessment strategies for classroom use and launches work on curriculum revision;
- Summer Faculty Seminar II, which focuses on reviews of revised curricula with peers and experts;
- Ongoing consultation with Faculty Fellows, who share expertise in teaching related course types;
- Continuing access to resources (online); and
- Ongoing engagement with a Learning Community of critical and creative thinking scholars, who share experiences and solve problems together.

A conceptual framework for **THINK** Faculty development appears in Figure 5 on page 41. Faculty Fellows take the lead in selecting and delivering faculty development content in Phase I and set the stage for a five-year rotation of development activities. By Year 3 planners expect that an experienced group of **THINK** Faculty will work with the Office of Faculty Development in preparing new faculty for participation in the project.

6) Does the faculty development program have the capacity to cultivate these competencies?

Figure 6 on page 43 identifies short-term and long-term outcomes resulting from each faculty development activity.

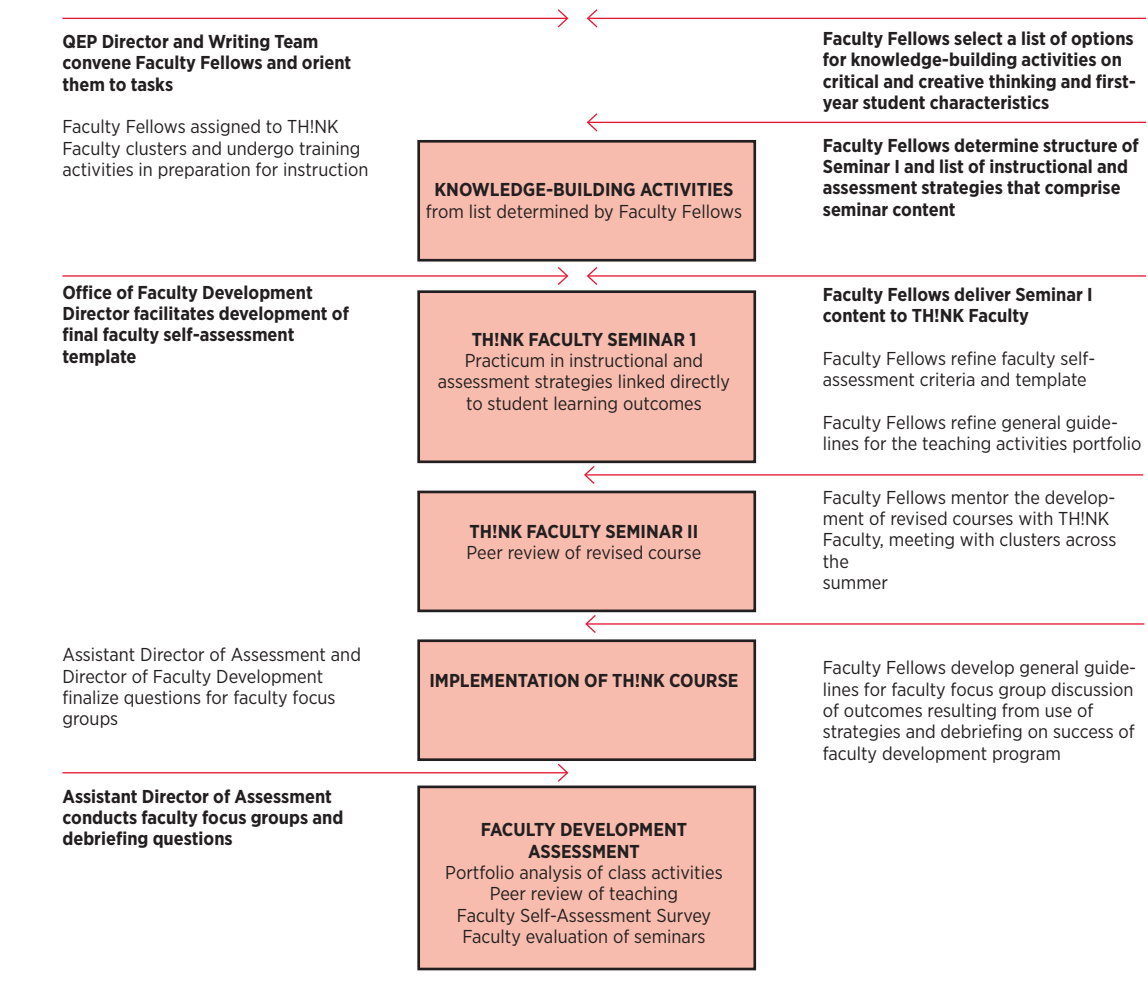


Figure 5: Conceptual framework for faculty development

The QEP budget supports the activities necessary for helping faculty succeed in this work. The schedule for faculty development-related activities is as follows:

Selection of 15 TH!NK Faculty	Spring 2014
TH!NK Faculty submission of current, pre-training student activities	Spring 2014
Faculty completion of two activities on critical and creative thinking and first-year students (independently determined from menu of options)	Spring 2014
Development of content for faculty workshops by Faculty Fellows Select menu of pre-seminar training options Establish seminar materials and training for all groups Establish plan for each faculty cohort Refine faculty development assessment strategies	Spring 2014
TH!NK Faculty Seminar I Orientation, planning, baseline assessment	May 2014
TH!NK Faculty redesign of syllabus and course activities (Faculty Fellow assigned to each group)	Summer 2014
TH!NK Faculty Seminar II Presentation and refinement of course syllabus and classroom activities (workshop format)	August 2014
TH!NK Faculty self-assessment of teaching competencies after training (pre- and post-training)	Fall 2014
Implementation of curriculum/pedagogy redesign (independently with periodic meetings with TH!NK Faculty cohort and Faculty Fellows during fall semester)	Fall 2014
TH!NK Faculty submission of post-teaching student activities (group discussion and survey)	December 2014
TH!NK Faculty cohort discussion of faculty development program effectiveness Review and revision by Faculty Fellows	December 2014
Launch of training for next faculty cohort	January-March

The institution will launch its approach to instruction in critical and creative thinking in fall 2014. Preparation for the Phase I pilot implementation by 15 faculty members will take place in spring and summer 2014.

Across four months and on their own schedule in spring 2014, **TH!NK** Faculty will select at least two development activities: one related to critical and creative thinking and one related to teaching first-year students. The goal of these activities is to build faculty knowledge about the skills and intellectual standards that constitute critical and creative thinking and about the characteristics of first-year college stu-



Figure 6: Short-term and Long-term Outcomes of Faculty Development Activities

dents that shape their development of higher-order thinking skills. Faculty will select activities from among the Office of Faculty Development workshops and lectures, online videos, and readings recommended by **TH!NK** planners. For example, the Office of Faculty Development regularly holds annual Reading Circles, with faculty who choose to participate in the discussions opting to read one of two books related to teaching and learning. In 2012-2013, many faculty chose to read Stephen Brookfield's *Teaching for Critical Thinking*. In 2013-2014, one of the two books is Bruce Nussbaum's *Creative Intelligence*. Faculty participating in the QEP have the option of joining that discussion to meet one of their development requirements. Although all English 101 and First-year Inquiry faculty undergo regular training that addresses critical and creative thinking, **TH!NK** Faculty teaching these courses will also complete the two QEP activities.

In May 2014 after classes end, **TH!NK** Faculty will participate in an intensive workshop (**TH!NK** Faculty Seminar I) that introduces instructional strategies and principles for constructing assignments, activities, and student assessments related to critical and creative thinking. Four Faculty Fellows, in collaboration with the Office of Faculty Development, will develop and teach workshop content and will support faculty throughout the Phase I implementation period. They will also produce instructional materials for the workshop that will be used in subsequent years of the plan and as the university scales practices to the larger university culture. **TH!NK** Faculty will select and modify strategies from the workshop for their courses as they deem appropriate. While all participating faculty will be responsible for teaching the critical and creative thinking processes, related intellectual standards, and self-reflection, individual faculty will determine how best to deliver such instruction in their particular courses and with respect to their knowledge domains.

TH!NK Faculty will exit the spring workshop with the assignment to transform their course over the summer in time for a coordinating meeting in early August 2014. During the summer, faculty will work with one of the four Faculty Fellows with expertise related to their domain and/or teaching context and may meet at their own discretion with **TH!NK** Faculty peers who share common curricular concerns.

In August 2014, all **TH!NK** Faculty and Faculty Fellows will meet as a Learning Community to share and critique revised syllabi, student activities, and classroom assessment strategies in preparation for implementation when classes start on August 21, 2014 (**TH!NK** Faculty Seminar II). Throughout fall semester implementation, **TH!NK** Faculty will check in with Faculty Fellows and peers for recommendations and resources to support their teaching.

Subsequent **TH!NK** Faculty cohorts will undergo similar faculty development on the same academic schedule, with experienced **TH!NK** Faculty eventually serving as mentors and replacing Faculty Fellows in workshop training as the university progresses in implementing the five-year plan. The university will modify seminars and support strategies upon feedback from faculty participants.

7) How does the institution know if the faculty development program is effective?

The Implementation Team will conduct faculty development program assessment with respect to the outcomes listed above and in consultation with participating faculty. An evidence-based assessment model will follow established principles for faculty improvement (Martensson, Roxa, and Olsson, 2011):

- Sustainable change must be “owned” by teachers;
- Informed discussion and documentation is paramount for achieving a mature culture of teaching and learning;
- The driving force for change is peer review among teachers; and
- Clear vision and careful timing are crucial.

Assessment activities related to faculty include the self-assessment of teaching, Faculty Fellows’ observation of classroom instruction, faculty portfolios of student activities, and two focus groups in which **TH!NK** Faculty discuss 1) the effectiveness of various instructional and assessment strategies in teaching critical and creative thinking and 2) the contribution of faculty development activities in achieving faculty and student outcomes.

The self-assessment by faculty asks faculty to rate their competencies in teaching critical and creative thinking “before and after” faculty development activities and to link the use of specific instructional and assessment strategies to the six QEP student learning outcomes (See Figure 7 on pages 47-49). Assessment experience shows that a post-experience survey with reflection on “before and after” skills typically yields more accurate and informed comparisons than pre- and post-experience surveys (McLeod, Steinert, and Snell, 2008). A focus group discussion will elaborate on faculty perceptions of effectiveness. The Office of Faculty Development and assessment staff will lead these discussions and look for patterns in faculty self-assessments; results will serve as a basis for revising faculty development activities, as needed.

8) Do participants in the faculty development program use their new knowledge and skills effectively in their teaching?

Faculty will also submit pre- and post-semester portfolios of classroom activities undertaken by students (before participating in faculty development activities and after completing the course implementation semester). Portfolios will include 3-4 classroom activities that address critical and/or creative thinking, accompanied by “best and worst” examples of student performance on these activities. Faculty Fellows will compare pre- and post-semester portfolios and faculty answers to accompanying questions (See Figure 8 on page 51) to determine the extent of curriculum change; talk with faculty to determine exactly what strategies were and were not implemented from their plan; determine whether faculty found useful relationships between particular strategies and their course type in achieving student learning outcomes; and, if appropriate, observe classes to gain better understanding of how instruction and classroom activities unfold.

Faculty will engage in peer-to-peer discussions throughout the program. A second faculty focus group discussion will address the appropriateness and usefulness of faculty development seminars in an effort to improve preparation over time.

9) To what extent are actual student learning outcomes affected by the faculty development program and how does the institution know?

As explained in Section 5.6, the university will use a number of assessment instruments to determine achievement of student learning outcomes. Having compiled baseline data from first-year students who did not experience **TH!NK** versions of these courses and comparing pre- and post-semester performance of students who do enroll in **TH!NK** courses, the institution should be able to attribute changes in student learning to the approaches learned and applied by **TH!NK** Faculty. In particular, the activity with a common rubric (pre and post) and faculty self-assessment surveys are likely to be useful in linking student performance to specific teaching strategies. Because faculty will customize the activity for their content domain and integrate it into the work of the classroom, reflection should provide qualitative feedback on how comfortable students are with less conventional forms of assessment and about their perceptions of critical and creative tasks.

The Implementation Team, QEP Advisory Board, and SACSCOC Leadership Team will review results of student performance as aggregate data, not as reflections of individual faculty teaching performance. Although it will be possible to correlate student success with the use of particular instructional strategies as reported by

THiNK Faculty Self-Assessment

For the following instructional and assessment strategies, you are asked to 1) rate your level of proficiency in using the strategy before faculty development training and after use in your fall semester THiNK class; 2) estimate the frequency of use of each strategy; 3) rate how effective the strategy was in teaching or assessing student performance in your discipline; and 4) link the strategy to the achievement of one or more of the specific student learning outcome(s). You need not have used all strategies.

Check the purpose for which you used the strategy		I am proficient in the knowledge to use this teaching and/or assessment strategy.	How often did you use this strategy in your class?	This strategy works well in teaching critical and creative thinking in my discipline.	Across the six student learning outcomes (see numbers), for which outcomes was this strategy effective?
		1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree	1 = never 2 = once 3 = more than once	1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree	
		Before faculty development training	Before faculty development training	Before faculty development training	
		After use in my fall semester THiNK class	Use in my fall semester THiNK class	After use in my fall semester THiNK class	
Use of a common language	INSTRUCTION				
	ASSESSMENT				
Student presentations	INSTRUCTION				
	ASSESSMENT				
Lectures/demonstrations	INSTRUCTION				
	ASSESSMENT				
Concept mapping	INSTRUCTION				
	ASSESSMENT				
Graphing, diagramming, and data visualizations	INSTRUCTION				
	ASSESSMENT				
Content analysis	INSTRUCTION				
	ASSESSMENT				
Rhetorical analysis	INSTRUCTION				
	ASSESSMENT				

Figure 7: Faculty self-assessment

	I am proficient in the knowledge to use this teaching and/or assessment strategy.	How often did you use this strategy in your class?		This strategy works well in teaching critical and creative thinking in my discipline.		Across the six student learning outcomes (see numbers), for which outcomes was this strategy effective?
		1 = never 2 = once 3 = more than once	Before faculty development training Use in my fall semester THINK class	1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree	Before faculty development training After use in my fall semester THINK class	
Check the purpose for which you used the strategy		1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree	Before faculty development training After use in my fall semester THINK class			
Journal/critical writing	INSTRUCTION ASSESSMENT					
Essential questions	INSTRUCTION ASSESSMENT					
Scenarios	INSTRUCTION ASSESSMENT					
Problem-based, inquiry-guided investigations	INSTRUCTION ASSESSMENT					
Lateral thinking exercises	INSTRUCTION ASSESSMENT					
Simulations, models, and prototypes	INSTRUCTION ASSESSMENT					
Identification of "first principles"	INSTRUCTION ASSESSMENT					
Synecdotes and metaphor	INSTRUCTION ASSESSMENT					
Discussion	INSTRUCTION ASSESSMENT					

		I am proficient in the knowledge to use this teaching and/or assessment strategy.	How often did you use this strategy in your class?	This strategy works well in teaching critical and creative thinking in my discipline.	Across the six student learning outcomes (see numbers), for which outcomes was this strategy effective?
		1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree	1 = never 2 = once 3 = more than once	1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree	
Check the purpose for which you used the strategy		Before faculty development training	Use in my fall semester THINK class	Before faculty development training	After use in my fall semester THINK class
Analytical reading strategies	INSTRUCTION				
	ASSESSMENT				
Case studies	INSTRUCTION				
	ASSESSMENT				
Portfolio analysis	INSTRUCTION				
	ASSESSMENT				
Projects	INSTRUCTION				
	ASSESSMENT				
Peer-to-peer reviews	INSTRUCTION				
	ASSESSMENT				
Rubrics	INSTRUCTION				
	ASSESSMENT				
Awareness inventories	INSTRUCTION				
	ASSESSMENT				
Articulations of beliefs	INSTRUCTION				
	ASSESSMENT				
Personal development plans	INSTRUCTION				
	ASSESSMENT				

faculty, assessment staff will not report publicly or to department heads on individual class or faculty performance, and student outcomes will not influence decisions about reappointment, promotion, or tenure.

10) How should the institution modify the program so that its actual outcomes more closely approach its intended outcomes?

Faculty Fellows will compile a summary evaluation of teaching. In addition to assessing the achievement of general faculty development outcomes, listed previously, the purposes of the assessment are to 1) determine the value of specific faculty development activities in helping teachers to improve students' critical and creative thinking; 2) identify best practices in teaching and the relationship to course type and discipline; and 3) provide relevant data that informs the faculty's self-improvement of teaching.

As the institution ramps up its efforts to improve students' critical and creative thinking in Phase II of the QEP, data and perceptions collected in the first two years of the program will be essential in making decisions about expanding the program. For example, if the university decides to pair first-year **TH!NK** courses for interdisciplinary understanding, expand to upper-division courses, or focus on vertical integration in specific college majors, then faculty development may need to change.

In Phase II of the program, the university will also share outcomes of faculty development with the campus through an online site containing resources and descriptions of best practices gleaned from the first two years of the plan. Participating faculty will be encouraged to make presentations of successful work, and some will take an increasingly important role in the Office of Faculty Development, which assumes responsibility for managing the program in Phase II.

Portfolio of Student Assignments (completed by faculty)

Please select four (4) assignments related to critical and/or creative thinking that you use in your class. Submit the assignment in writing, including all directions and guidelines given to students.

Submit any rubrics or assessment tools used to grade the assignments. If you do not use a rubric or assessment tool, describe in writing how you evaluate student performance on the assignment.

For each assignment, write a reflection that responds to each of the following questions:

- 1) How do you use this assignment in your course? Describe at what point in the course you introduce the assignment and how you implement it with instruction.
- 2) How does the assignment promote the development of critical and/or creative thinking skills in students?
- 3) Which specific student learning outcomes with respect to critical and /or creative thinking does the assignment foster?
- 4) How well does the assignment work in achieving these outcomes?
- 5) What did you learn about teaching critical and/or creative thinking from using this assignment and what might you change about the assignment if you use it again?
- 6) How might other faculty learn from your experiences in using this assignment?

Submit what you consider to be “best and worst” examples of student performance on each assignment.

Figure 8: Portfolio of student assignments

5.8 The Implementation Plan

The plan divides implementation into a year of preliminary planning activity, a two-year Phase I faculty development, curricular intervention, and assessment strategy, and a three-year Phase II followthrough strategy based on findings from Phase I. A timeline of the implementation plan appears in Figure 9 on page 53.

5.8.1 *Planning (2013-2014)*

In the year preceding implementation of the Phase I plan (2013-2014) and in preparation for the March 2014 SACSCOC site visit, the university built the QEP infrastructure, broadened communication with the campus community, pilot-ed assessment strategies, collected pre- and post-semester baseline data from 450 students, and discussed the design of faculty development programs. The SACSCOC site visit provides an opportunity to review and strengthen the plan prior to implementation in May 2014.

The five-member QEP Writing Team will guide planning through the March site visit and follow-up with SACSCOC and will hand off leadership responsibility to the Implementation Team in May, although the two teams will meet and work together throughout spring 2014. The Implementation Team is composed of the QEP Director, four Faculty Fellows, Director and Assistant Director for Assessment, and the Office of Faculty Development Director. A QEP Advisory Board will monitor implementation and provide feedback, meeting at least twice a year. It will be chaired by the QEP Director and include the original **THINK** planners from the Writing Team, one representative from the University Faculty Senate, co-chairs of the former QEP Steering Committee, a representative from Student Affairs, two students, one dean, and one representative from the Council on Undergraduate Education. In Phase II, one representative from the Undergraduate Courses and Curriculum Committee will join the QEP Advisory Board with the ability to address permanent course changes that require curricular action by the university. All groups report to Dr. Michael Mullen, Vice Chancellor/Dean of the Division of Academic and Student Affairs.

While students participated in the work of the Steering Committee and many provided feedback on the plan, there is now a formal QEP Student Advisory Group, which meets monthly to discuss issues of importance to students and implementation of the plan. On behalf of the Division of Academic and Student Affairs, University Housing Director Susan Grant organizes students from the Living and Learning Villages in discussions of critical and creative thinking and recruits student participants for plan activities.



Figure 9: Timeline of key actions

Formal assessment activities began in fall 2013 with the pre- and post-semester collection of baseline data from 450 students, using the CAT, Metacognitive Awareness Inventory (MAI), and Epistemological Belief Survey (EBS) (See discussion in Section 5.6.1 on pages 33-35). Faculty will score the results during the first week in January 2014 and will share findings with the visiting team in March.

Planners and the Vice Chancellor/Dean for the Division of Academic and Student Affairs – in consultation with associate deans and program directors – selected participating **TH!NK** courses in fall 2013. The QEP Director, in consultation with these individuals, will identify the first-year faculty cohort teaching these courses after the site visit in spring 2014. Training efforts will begin in late spring 2014 with the self-directed, knowledge-building activities in critical and creative thinking and in teaching first-year students. Faculty Seminar I will take place in May 2014 after classes conclude (May 13, 14, and 15), and faculty will spend the remainder of the summer revising course plans with the support of Faculty Fellows. Faculty will share revised syllabi and class activities in Seminar II in August 2014.

5.8.2 *Phase I (2014-2016)*

Phase I of the plan is a two-year study of student improvement resulting from faculty development, curriculum intervention, and assessment strategies in three course clusters: English 101 of the General Education Plan, First-year Inquiry seminars in a variety of disciplines, and large enrollment college-level courses. It will involve 15 faculty and approximately 600 students in the first year (faculty continue active involvement in the study through the second year) and 26-30 additional faculty and approximately 1800 students in the second year.

In fall 2014, the first student cohort will enroll in **TH!NK** classes. Students will take the CAT, MAI, and EBS and complete the assessment activity with a common rubric as pre-semester assessment in six sections of English 101, six First-year Inquiry courses, one section of Engineering 101, one section of College of Science 295A (Biology), and one section of Management Innovation Entrepreneurship 201. The same instruments will be used in post-semester assessment. Assessments will appear in syllabi as requirements for completing **TH!NK** courses and will be given during regular class time or in announced out-of-class sessions to ensure full participation.

Throughout fall 2014, all **TH!NK** Faculty and Faculty Fellows will meet together as a learning community to check progress, share experiences, and report outcomes. Individual faculty self-assessment on the use of instructional strategies will take place

at the end of the fall semester, and the faculty cohort will discuss the effectiveness of faculty development activities in a session facilitated by the Office of Faculty Development and assessment staff. The QEP Director, with consultation, will recruit the second faculty cohort during spring 2015, and they will complete self-directed, knowledge-building activities before the end of spring 2015, with faculty development seminars again held in May and August.

Assessment staff and paid faculty volunteers will score results of the CAT. Adoption of the CAT includes access to researchers at Tennessee Tech, allowing assessment staff to ask specific questions about the data. The Implementation Team, Faculty Fellows, QEP Advisory Board, and Vice Chancellor/Dean Mullen will review results and determine if implementation, faculty development, or assessment strategies require adjustment.

Year 2 of the plan repeats these implementation activities on the same schedule with particular attention to aspects of the plan for which Year 1 data raise concerns. The first faculty cohort continues in the original 15 courses, and the plan adds 10-12 additional sections of English 101, 10-12 additional First-year Inquiry courses, one additional section of Engineering 101, and one section each of 2-3 courses with freshman enrollments of 50% or more. The goal is to maintain a broad and diverse sample of courses from the sciences, social sciences, and humanities.

TH!NK planners believe that two years of implementation will be necessary to trust the reliability of assessment data and that faculty teaching their courses twice will offer important perspectives on the program.

5.8.3 *Phase II (2016-2019)*

To a large extent, how the university proceeds in Years 3-5 depends on the assessment of outcomes from Years 1-2. While the plan calls for faculty training in additional first-year courses to continue, it also projects adding 200-level courses (which include sophomores) in Year 3. The QEP Advisory Board and university leadership will explore a number of questions about Phase I outcomes that will determine how many and which first-year courses will be included in Phase II.

- How did intervention in the fall 2014/fall 2015 first-year courses improve students' critical and creative thinking?
- Were there differences in student learning between small classes and large classes, and what do these differences mean for scaling practices within the

university? How well did strategies taught in faculty development seminars serve faculty in teaching these differently-sized courses?

- How did student learning relate to enrollment in required college-level versus General Education courses, one versus multiple **THINK** courses, and 1- to 2-credit versus 3-credit courses?
- Was integration of critical and creative thinking easier or more difficult in particular subject areas?
- What changes did faculty report in their teaching and perception of student learning outcomes?
- Did assessment strategies yield useful data in determining future curricular decisions or faculty development activities? Are changes in the assessment strategies called for?

Answers to these questions will inform the Phase II strategy. The university could head in a number of possible directions.

- Results could show student improvement, and the university would proceed by expanding the number of sections in all three types of courses in each successive year, reaching a significant number of the nearly 4,000 first-year students by the end of the fifth year.
- Results could support offering a second semester of exposure for first-year students, and the university would expand the program to second-semester offerings in the first-year curriculum. This strategy would require some control over the spring enrollment of students who participated in fall **THINK** classes.
- Results could encourage course pairings as instructors in the humanities, social sciences, and sciences expand shared content in critical and creative thinking. Under a paired-course strategy, students would enroll in two **THINK** classes in the same semester. For example, a freshman's section of English 101 might work with College of Sciences 295A to focus critical and creative writing assignments around case studies presented in Biology.
- Results could support existing campus interest in incorporating critical and creative thinking instruction in upper-level curricula. Results might suggest that the university maintain its Phase I strategy, but expand its faculty devel-

opment and assessment strategies to colleges that want to integrate critical and creative thinking across their curricula.

Building paired courses, developing a vertical integration strategy, and ensuring an appropriate approach to assessment would require further planning and faculty development. During Phase I, the Implementation Team will solicit faculty input and explore options for expanding the influence of the plan outside of the Phase I designated courses.

Some colleges already have an interest in developing a sequence of critical and creative thinking experiences for majors. The College of Management will adopt the critical and creative thinking framework of the QEP in its revised M 101 courses in spring 2014. The Park Scholars program adopted the language of the QEP and now introduces critical and creative thinking to their students in freshman seminars. University Housing introduced the QEP language of critical and creative thinking to students in the Living and Learning Villages and encouraged participation in QEP activities among its resident advisors. These parallel activities are outside the scope of the QEP. Leaders of non-QEP initiatives will manage any assessment of outcomes; while the QEP Implementation Team will be interested in outcomes, it will not include data from non-QEP courses in its reporting.

5.8.4 *Personnel*

Through an open, on-campus call for applicants in fall 2013, the Vice Chancellor/Dean for Academic and Student Affairs recruited a number of highly qualified personnel to implement the **TH!NK** plan.

QEP Director – QEP Director Susan Carson reports to Vice Chancellor/Dean Michael Mullen in the Division of Academic and Student Affairs, supervises the staff positions that report to the Director, and organizes and monitors the work of the Implementation Team. She maintains knowledge of best practices in teaching critical and creative thinking, provides leadership for faculty selection and development activities, and coordinates assessment activities with the Assistant Director of QEP Assessment. The QEP Director convenes the **TH!NK** Advisory Board at least twice a year, makes progress reports and recommendations to the Vice Chancellor/Dean and Provost, and prepares annual reports and the fifth-year report to SACSCOC. She also maintains communication with various constituencies on campus.

Carson earned her PhD in Microbiology/Immunology from the University of North Carolina/Chapel Hill and has taught in and served as Academic Coordinator for the

Biotechnology Program at NC State since 2001. She received Outstanding Teacher Awards in 2009 and 2010, and many of her publications and professional presentations address teaching science to undergraduate students. She served as mentor to 15 undergraduate students in independent research, 67 first-year students through the Phage Hunters and Phage Genomics courses, and 51 undergraduate researchers in the National Science Foundation-Research Experiences for Undergraduates Program in Synthetic Biology, for which she also serves as a Leadership Council member and panel member. Carson also serves on the University Undergraduate Courses and Curriculum Committee and college-level teaching effectiveness committees.

Assistant Director for QEP Assessment – Assistant Director of Assessment Deborah Moore supports the QEP assessment effort, analyzes assessment data, prepares the assessment components of reports, and serves as liaison with the assessment community. She is a member of the Implementation Team and reports to Assessment Director, Carrie Zelna. She also works with Office of Faculty Development Director Diane Chapman to conduct the assessment portion of faculty training and with the Faculty Fellows to help faculty develop assessment strategies for their classrooms.

Moore holds degrees in Educational Psychology from the University of Richmond and Purdue University. She served as Assessment Director at Christopher Newport University and the University of Kentucky and managed an assessment working group at the University of Maryland/College Park. She was Assistant Director in the Office of Institutional Research and Assessment at Ball State University, where she administered the General Studies testing program.

Faculty Fellows – Four Faculty Fellows represent content expertise in critical and creative thinking as it relates to the three course clusters in the plan. They are Maxine Atkinson, Professor of Sociology, responsible for mentoring faculty who teach large enrollment courses; Anne Auten, Lecturer in English, responsible for mentoring faculty who teach English 101; Jason Flores, Teaching Associate Professor in the College of Sciences, responsible for mentoring faculty who teach First-year Inquiry courses; and Santiago Piedrafita, Associate Professor of Graphic Design, responsible for mentoring all faculty in creative thinking strategies. Working as a team under the QEP Director and with the Office of Faculty Development, Faculty Fellows will design and deliver the faculty development seminars. They will also participate in scoring assessments. Following Faculty Seminar I, each fellow will work with a small group of faculty in revising course outlines and will provide ongoing

ing support of faculty instruction. Faculty Fellows receive one-course release time from their teaching schedules each semester and a summer stipend.

Atkinson holds a PhD in Sociology from Washington State University. Teaching at NC State since 1986, she served as Department Head of Sociology from 2008-2013, Director of the First-year Inquiry Program from 2004-2008, and founding Director of the Service Learning Program from 2000-2001. Atkinson received the American Sociological Association's Distinguished Contributions to Teaching Award, Carla B. Howery Award for Developing Teachers-Scholars, and Hans O. Mauksch Award for Distinguished Contributions to Undergraduate Sociology; the UNC Board of Governors' Award for Excellence in Teaching; and the NC State Outstanding Teacher Award, First-Year Student Advocate Award, Outstanding Advisor Award, and Gary D. Hill Students' Choice Teaching Excellence Award. She is the author of numerous articles on teaching and served on the editorial board of *Teaching Sociology*.

Flores earned degrees in Marine Biology and Biology from San Francisco State University and Penn State University. He was on the faculty of UNC/Charlotte, where he also coordinated first-year lecture and lab instruction for 1000 undergraduate biology majors and trained graduate teaching assistants. He is a National Academies of Science Education Mentor and Fellow. Since coming to NC State in summer 2013, Flores has developed a course on *Critical and Creative Thinking in the Life Sciences* as part of a revised first-year curriculum in the newly formed College of Sciences.

Auten completed her degrees in English Language Literature at NC State and is currently a Lecturer in the English Department. She previously held an appointment at Elon College and has taught first-year writing and literature courses at both universities. She served as part of the NC State First-year Writing Council and shared responsibility for curriculum decisions related to English 100 (Introduction to Academic Writing), English 101 (Academic Writing and Research), and the annual North Carolina Symposium on Teaching Writing.

Piedrafita holds degrees in Industrial Design and Graphic Design from Universidade Estadual do Rio de Janeiro and Pratt Institute. He served as Department Head of Graphic and Industrial Design at NC State from 2006-2012 and as Chair of the Design Department at Minneapolis College of Art and Design from 2004-2006. He was a Fellow of the Design Institute at the University of Minnesota for five years following a distinguished career as a design professional at the Walker Art Center, Museum of Modern Art, and a number of influential New York design firms. He

teaches first-year students in the College of Design and high school students in the summer and weekend Design Camp programs, as well as upper-level undergraduates in collaborative projects with industry. Piedrafita served on the QEP Coordinating Committee and is a member of the Faculty Senate and the University Undergraduate Courses and Curriculum Committee.

Following the second year of the plan, the Office of Faculty Development and faculty mentors — chosen on the basis of expertise from **THINK** Faculty participants in the first two years of the plan — will take over the workshop training. These faculty mentors will receive a \$2500 award in recognition of their achievement in teaching **THINK** courses.

THINK Faculty – Faculty from three course clusters — six sections of English 101, six sections of First-Year Inquiry, and three large enrollment courses — will participate in the first year of the plan. In the second year, 26-30 additional faculty in the same clusters will join the original 15 faculty from the first year of the study. Every year, the number of actively participating **THINK** Faculty will increase by 26-30. However, in years 3-5 some faculty will likely represent 200-level courses taken by sophomores. The QEP will also offer faculty development for instructors in upper-division courses in majors in Phase II of the plan. **THINK** Faculty will receive stipends for their summer commitment to development activities and for continuing work in the first fall semester of implementation.

Through QEP faculty development activities, **THINK** Faculty will become familiar with instructional and classroom assessment strategies that improve students' critical and creative thinking and will work with peers and Faculty Fellows to adapt these strategies to their QEP courses. They will teach the revised courses in at least two sequential years and will submit portfolios of student activities, engage in a peer review process, and participate in assessments of student performance.

Faculty Scorers – Consistent with practices related to administering the CAT, faculty will score the tests. CAT developers suggest that the scoring process reveals much about teaching critical thinking, so this will be an informative activity for those who participate. The initial call for faculty to score the fall 2013 baseline testing yielded 120 applicants for the 24 required positions. Upon the recommendation of CAT developers, a number of the initial 24 scorers will continue to the second round of scoring and assessment staff will add new scorers to each subsequent session as the plan unfolds. Doctoral students also indicated interest in scoring the test. Therefore, planners believe there will be no difficulty in recruiting scorers throughout the five years of the QEP.

Office of Faculty Development – Diane Chapman, Director of the Office of Faculty Development, contributes to planning and delivering faculty seminars but will not assume primary responsibility for coordinating faculty development seminars until after the first two years of the plan. She plays a critical role in developing and administering faculty self-assessment. After the second year, previously trained faculty will work with the Office of Faculty Development to deliver training to the third, fourth, and fifth faculty cohorts.

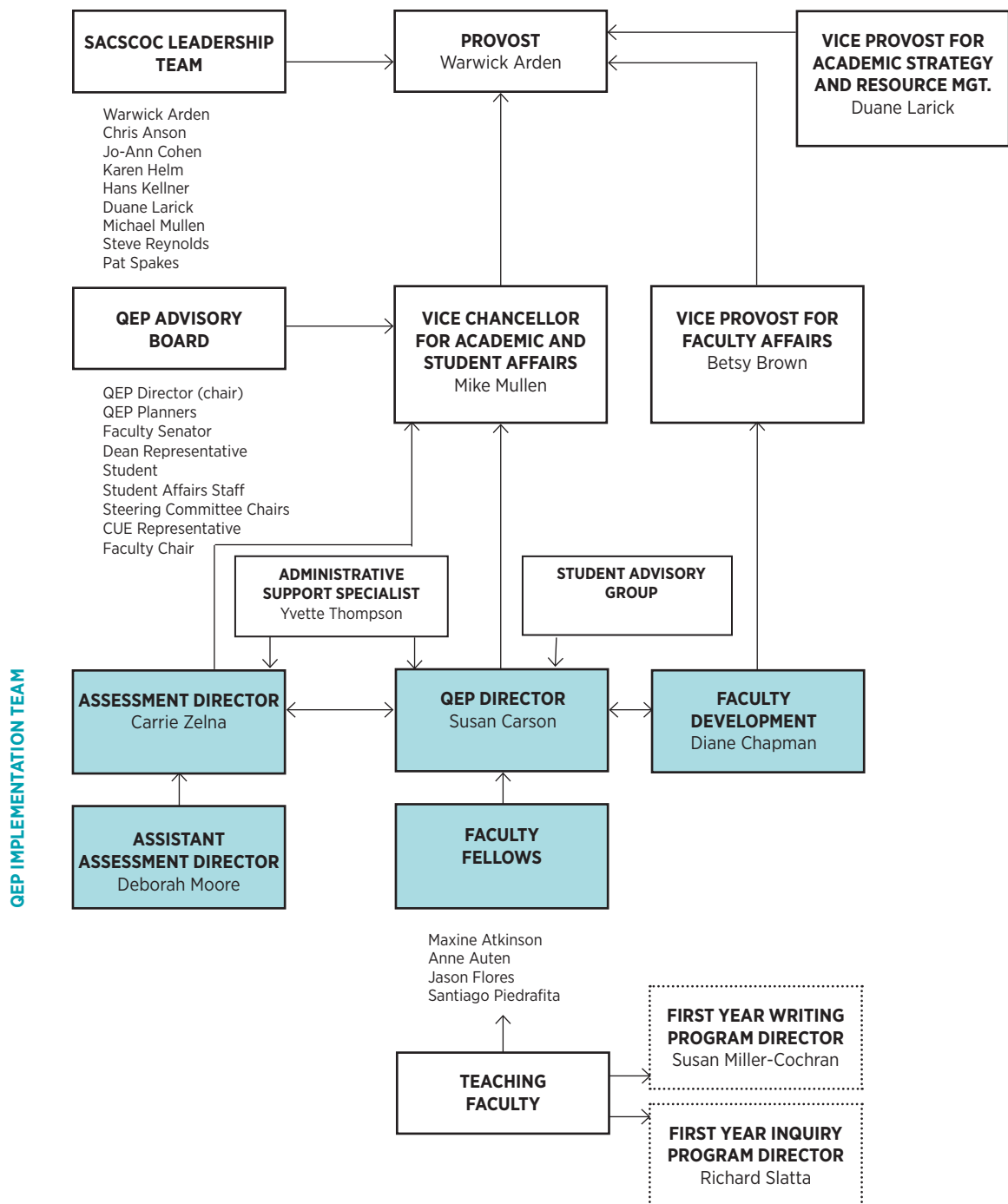



Figure 10: QEP organization chart



“ Thinking creatively is considering things that haven’t been done before and how we can connect things in new ways. Creative students ask “How can I get involved in research with a professor?” Creativity isn’t something you are born with, it is something you can be taught. I expect NC State to hone these creative talents. Freshmen should be taught the tools and prepped for applying creative thinking later on. I want to go into amusement ride development...I know employers will demand that I stay ahead of the industry. I will show them that I’m a creative thinker by the things I did as an undergraduate, taking projects through the creative process from start to finish. ”

Michelle Phillips
Senior, Mechanical Engineering



The Financial Plan

- Budget
- Budget Rationale

Engagement Strategies

Additional Information Provided at the Site Visit

Works Cited



6. Financial Plan

6.1 Five-year QEP Budget Proposal

	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
Personnel	287,881	395,715	395,715	283,715	283,715	283,715
Assessment						
CAT Tests	10,000	10,000	20,000	20,000	20,000	20,000
CAT Scoring	18,000	18,000	21,600	21,600	21,600	21,600
CAT Training	4,600	4,600	4,600	4,600	0	0
Total	32,600	32,600	46,200	46,200	41,200	41,600
Faculty Development						
Faculty Stipends	18,750	62,500	125,000	125,000	125,000	125,000
Summer Seminars	10,000	4,000	4,000	6,000	6,000	6,000
Training/consultation	6,000	6,000	0	5,000	0	0
Awards/mentors	0	0	0	10,000	10,000	10,000
Total	34,750	72,500	129,000	146,000	141,000	141,000
Operational Support	35,500	59,500	59,500	11,500	11,500	11,500
Travel	25,000	10,000	6,000	6,000	3,000	3,000
Marketing and Communication	0	4,000	3,000	3,000	0	0
Column Total	415,731	574,315	639,415	496,415	480,815	480,815

Five-year QEP Budget Request Grand Total: \$2,671,775

Project Grand Total (including 2013-2014): \$3,087,506

6.2 Budget Rationale

The university has already provided funds in the amount of \$415,731 to support the QEP during the planning/transition year (2013-2014) as part of an established QEP budget. A letter of commitment appears in Appendix J for the five-year QEP budget, beginning in July, 2014, and totaling \$2,671,775. Altogether, the NC State commitment of support for this project is \$3,087,506. The Provost's letter notes that while the university made recent budget reductions, both the Chancellor and the Provost are excited by and committed to the QEP. They pledge continuing support of the priorities identified in the strategic plan, including the contribution of the QEP to enhancing student success.

Personnel – To ensure adequate administrative and direct program support, the budget includes several positions. The university completed the recruitment process in anticipation of a Fall 2014 implementation, with the start of all positions being no later than January 2014. The personnel budget on page 60 includes salaries and benefits for the following positions:

- **The QEP Director** is a 12-month, .75 faculty appointment that begins January 1, 2014, and continues throughout the project. Through an open, on-campus search process in October 2013, the university chose Dr. Susan Carson, a well-respected, highly qualified member of the faculty. Previously a member of the teaching faculty (non-tenured), Carson will move to a tenure-track position, effective Fall 2014. The projected compensation as QEP Director includes an administrative stipend of \$15,000 a year and summer salary calculated at a rate of .75 for three months. She reports directly to Vice Chancellor/Dean Michael Mullen for her QEP work.
- **The Assistant Director of Assessment** is a full-time, 12-month administrative position that supports both the QEP and general education assessment. Critical and creative thinking appear as learning outcomes of general education at NC State, as well as the focus of the QEP. Through an open recruitment process, the university hired Deborah Moore for this position and she began working with the QEP Writing and Implementation teams in October 2013. She reports to Assessment Director Carrie Zelna, who serves as a member of the QEP Implementation Team and Advisory Board.
- **The Administrative Support Specialist** is a 12-month staff support position that reports to the QEP Director and the DASA Assessment Director. She provides direct support for all aspects of the QEP and budget support for the

Office of Assessment. Through an open recruitment process, Yvette Thompson filled this position in December, 2013.

- Four Faculty Fellows appear in the budget. Each Fellow receives a teaching reduction of one course per semester (Fall and Spring) plus a \$5,000 stipend for his/her work on faculty development throughout the year. In Fall 2013, a faculty search committee recruited four well-qualified Faculty Fellows with diverse experience and skills: Maxine Atkinson, Professor of Sociology; Anne Auten, Lecturer of English; Jason Flores, Teaching Associate Professor of Biology; and Santiago Piedrafita, Associate Professor of Graphic Design. All begin their work on January 1, 2014. During the first two and a half years of the project, the four Fellows work with the QEP Director and the Office of Faculty Development Director to further develop and evaluate the program for faculty training, faculty development assessment, and faculty mentoring. The budget reflects this work in the first two years of the QEP and then shifts responsibility for on-going training and assessment to the Office of Faculty Development in the third year, eliminating the continuing need for these positions.

Student Learning Assessment – The assessment of student learning began in Fall 2013 with pre-intervention baseline testing of first-year students in classes similar to those in Phase I of the project. Costs associated with testing and scoring appear in the “transition planning year” budget for 2013-2014. The total QEP budget includes continuous support for the assessment of student learning outcomes throughout the five years of the study.

- **CAT tests.** QEP planners determined that the CAT test of critical and creative thinking was most appropriate to the assessment of this project. NSF support for the ongoing development of this test reduces costs somewhat; however, the QEP requires baseline testing in 2013-2014, followed by Phase I in which staff test all students in the impacted classes. Testing will involve about 600 students in Year 1 and 1800 in Year 2. While the project expands even further in Years 3-5, a sampling method will allow the university to keep the number of tests administered at approximately 1800, thus controlling the cost of tests and the number of scorers required to compile results.
- **CAT training and scoring.** An advantage of the CAT test over other instruments is that resident faculty score the test. Scoring serves as its own faculty development process for participants. Cost projections assume a “train-the-trainer” approach in which several faculty are funded in each of the first four

years to attend CAT training offered by Tennessee Tech. These faculty will, in turn, provide on-campus training and facilitation for the scoring sessions. Scoring sessions will last three days, with faculty receiving compensation of \$250 for each day of scoring, as recommended by Tennessee Tech.

Faculty Training and Development – The QEP Director, four Faculty Fellows, and Office of Faculty Development Director will comprise the faculty development team. Together, they will undergo their own training in Spring 2014 and will share responsibility for further developing the Phase I faculty seminars and assessment. After Phase I, responsibility for on-going faculty development and assessment will move to the Office of Faculty Development and experienced **TH!NK** Faculty. **TH!NK** Faculty Mentors will receive a monetary award recognizing their excellent performance but, consistent with Office of Faculty Development practices, will not be paid to conduct seminars.

- **TH!NK Faculty stipends.** The budget allocates a \$2500 stipend for **TH!NK** Faculty participation in training, mentoring, and assessment. It supports an initial group of 15 faculty and subsequently supports the training of up to 30 new faculty per year. A total of 135 faculty will be trained with stipends provided through the QEP, although after Phase I, the project will also offer unfunded training opportunities for faculty seeking to implement critical and creative thinking in other courses.
- **Summer seminars.** Each cohort of faculty participants will participate in the formal QEP Faculty Development Program, which involves two 3-day summer seminars. Expenses for the seminars include development of training materials, purchase of books and materials from sources such as the Foundation for Critical Thinking, compensation for speakers, and direct administrative costs such as space rental, if needed.
- **Faculty training/consultants and speakers.** In addition to travel funding, the budget includes special funding during the critical “start-up” phase for training the faculty development team. These funds will support participation in on-line training, consultants, materials, and other initial training costs not covered elsewhere. As the project expands in the third year, additional funds will support training related to disciplinary or other needs.
- **Awards/mentors.** In Years 3-5 of the project, the QEP will recognize four successful **TH!NK** Faculty who have made outstanding contributions to the program. These **TH!NK** Faculty will receive a \$2500 award in recognition of

their performance and will make a commitment to train and mentor future faculty, as the responsibility for summer seminars shifts to the Office of Faculty Development.

Operational support – The QEP Director’s office requires on-going operational support throughout the project. During the intensive first two years, the budget also provides operational support for the Office of Faculty Development. .

Travel – The budget supports travel in each year of the project; however, the heaviest investment is in the first two years when training project leaders on critical and creative thinking, working with first-year students, mentoring, curriculum development, and assessment are the most intensive. The QEP Director must develop a thorough understanding of SACSCOC expectations for QEPs and strategies for successful implementation. The budget anticipates conferences, visits to other programs, and participation in workshops and training events for the QEP Director and Faculty Fellows. As implementation proceeds, travel will be limited to the QEP Director.

Marketing and Communications – The campus will take advantage of many existing marketing and communication tools to increase awareness of the QEP among faculty and the broader community. In addition, a communication plan by Student Affairs piggybacks on existing strategies, such as dedicating time for discussing critical and creative thinking during the orientation program for first-year students. Student Affairs routinely provides many gifts and prizes for students, and will adapt the messages on some of these items in support of the QEP. Additional spending will be minimal, with a small amount of funding in the crucial start-up and expansion years.



7. Engagement Strategies

Planners have been broadly consultative, meeting regularly throughout 2013-2014 with various constituencies (see Appendix L) and establishing a QEP website for campus communication (qep.ncsu.edu). The QEP Director will continue to inform campus groups throughout the project — including the two university curriculum committees responsible for monitoring general education competencies — using the open lines of communication already established in the planning stages.

Two Student Government representatives and a number of other students participated in the QEP planning process. They served on committees and attended events designed to obtain campus input. In fall 2013, planners formed a QEP Student Advisory Group to acquire deeper understanding of student opinions and to develop ambassadors for spreading news of the QEP. Campus Housing Director Susan Grant assembled residents from the Living and Learning Villages to serve as a sounding board for the Implementation Team, and several colleges added their majors to the group. (See Appendix K). Planners meet monthly with students to hear their ideas regarding critical and creative thinking and to discuss details of the plan.

University Housing will use electronic bulletin boards and “Bulletin Boards in a Bag” (through which Resident Assistants assemble communication for dormitories) to make students aware of the QEP and the importance of critical and creative thinking. New Student Orientations and Parent Orientations will include discussions of the QEP topic, and *Wolf’s Den*, the official University Housing e-newsletter for parents, will provide QEP updates for both constituencies. Co-curricular units will use the critical and creative language of the QEP where appropriate in their programming and integrate **THINK** messages with existing communication channels.

The Chancellor’s annual State of NC State presentation and the fall Academic Convocation will be opportunities to communicate the importance of critical and creative thinking to the campus and to tie it to the QEP.

8. Additional information that will be provided at the site visit in March 2014

The Pathway to the Future: North Carolina State University Strategic Plan, 2011-2020
Our Time, Our Future: The UNC Compact with North Carolina, Strategic Directions for 2013-2018
Baseline data collection on freshmen
Baseline data collection on faculty
Common assessment activity and rubric
Faculty development seminar content



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“Critical thinking is seeing the why, more than the facts. When I approach a problem, I try to think about where it is coming from and why I am being asked. I try to understand the whole concept rather than focusing on just getting the answer. I hope to learn at NC State how everything connects. I want to be a veterinarian, and It requires a lot of deeper thinking skills. In an interview I would expect to be asked a number of scenario-based questions that show my thinking processes.”

Sarah Bloomer

Sophomore, Animal Science & Agricultural Business Management

Appendices

- Analysis of possible topics for the QEP
- Chancellor's approval
- QEP Plan to Plan Committee charge and membership
- Summary of campus-wide *Dialogue on Critical and Creative Thinking*
- QEP Steering Committee charge and membership
- QEP Coordinating Committee charge and membership
- Critical Thinking Assessment Test, Metacognitive Awareness Inventory, and Epistemological Beliefs Survey
- Definition of terms
- AACU Critical Thinking and Creative Thinking Value Rubrics
- Budget commitment letter
- Student Advisory Group membership
- Record of consultation

Appendix A: Analysis of possible topics for the QEP

Alternative Quality Enhancement Plans					Draft 12/14/12	
Learning Outcomes	Global Awareness	Civic Awareness	Information Literacy	Critical Thinking		Creative Thinking
	Interact successfully with someone from a different culture	Integrate and apply knowledge and skills learned in the classroom to community issues	Ability to identify and locate information related to a problem at hand	Habits of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion"		Combine or synthesize ideas, images or expertise in original ways
	Understand different world view	Leadership and teamwork skills	Evaluate strength and value of information	Problem solving using analytical tools		Problem solving in innovative ways; divergent thinking
	Communicate effectively in a different culture	Expanded geographic perspective	Effectively and responsibly use information			
	Global perspective on contemporary local or global issues					
Learning Strategies	Study abroad	Service learning courses	Focus freshman courses on information literacy skills	First-year seminars		First-year seminars
	Minors, certificates	Refocus freshman courses	Embed in identified degree requirements	Refocus freshman courses		Refocus upper division and/or senior capstone courses
	Stronger QEP requirement	Refocus senior capstones		Refocus senior capstones		
Co-Curricular Strategies	Degree requirements	Certificate programs				
	Expand CSLEPS	Expand CSLEPS		Learning communities		Learning communities
	Interactions with foreign students and faculty	Required public service		Undergraduate research		Undergraduate research
		Experiential learning, community internships				
Service Requirements	Advisors	Advisors	Teaching positions	Teaching positions		Teaching positions
	Programming staff	Coordinators and supervisors for community service and activities	Faculty release time for course redesign	Faculty release time for course redesign		Faculty release time for course redesign
	Scholarships	Scholarships				
Local Units	DASA, OIA	DASA	Libraries, DASA	DASA, Faculty Development		DASA, Faculty Development

Appendix B: Chancellor's approval

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grant university and a public-use institution
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Office of the Provost and
Executive Vice Chancellor

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NC STATE UNIVERSITY

Date: January 31, 2012

To: Chancellor Randy Woodson

From: Warwick Arden, Chair, SACS Leadership Team *Warwick Arden*

Subject: Focus for NC State's Quality Enhancement Plan

On behalf of the SACS Leadership Team, I recommend that we choose critical and creative thinking as the focus for NC State's next Quality Enhancement Plan. While no formal votes were taken, we believe this recommendation has enthusiastic support from the Deans Council, Faculty Senate, and University Council.


As you know, consideration was given to three other ideas: information literacy, global awareness, and civic awareness (summary attached). While all of these were also excellent ideas, we believe that our students will be best served by a plan to improve students' critical and creative thinking skills.

We believe that this focus is consistent with our strategic plan and its first goal: improving student success through educational innovation. It leads naturally to high impact educational experiences such as first-year seminars and learning communities. Furthermore, it is likely that the resource needs associated with this plan will include additional faculty positions, which you have identified as a prerequisite for achieving our vision.

If you concur with the choice of this focus, I will work with the SACS Leadership Team to recommend an appropriate committee to develop the Quality Enhancement Plan.

cc: SACS Leadership Team

Approved 2/2/12
W. L. Woodson



Appendix C: QEP Plan to Plan Committee charge and membership

Email message from Provost Arden to:

Sarah Ash
David Zonderman
Leda Lunardi
Dan Solomon
Marvin Malecha
Jennifer Capps
Ethan Harrelson

cc:
Christopher Daubert
Jonthan Ocko
Dan Stancil
Tom Miller
Pat Spakes
Karen Helm
Jo-Ann Cohen
Hans Kellner
Duane Larick

Thank you for agreeing to serve on the “QEP Plan to Plan” Committee, whose task will be to consider how best to prepare a QEP Plan on the topic of “Critical/Creative Thinking” for the Southern Association of Colleges and Schools (SACSCOC) and our reaffirmation in 2013-2014.

The “QEP Plan to Plan” Committee is charged with recommending appropriate strategies to involve the campus in defining the concept of “critical/creative thinking” and in considering how such a project can significantly and positively impact student learning at NC State. The Plan to Plan Committee is also asked to advise on strategies and leadership structures that will facilitate the intensive work that must take place next year to refine the topic, clarify objectives, and develop an implementation and assessment plan, while continuing to encourage broad faculty, staff, and student engagement and support throughout the project.

Professor Sarah Ash has agreed to chair this Committee, and staff support will be coordinated by SACSCOC Accreditation Liaison Karen Helm and Assistant Director for Accreditation, Pat Spakes.

I appreciate your willingness to dedicate your time to this very critical task and thank you, in advance, for your advice.

Appendix D: Summary of campus-wide *Dialogue on Critical and Creative Thinking***NC STATE DIALOGUE ON CRITICAL AND CREATIVE THINKING****April 12, 2012****Summary of Recommendations**

Note: Working in small groups, respondents answered eight questions posted on charts around the room. After all responses were recorded, participants used colored dots to indicate the responses that each believed to be the most important. While many excellent suggestions were made, only those responses gaining three or more votes (dots) are recorded here, in the order of voting, beginning with the response that garnered the highest number of votes.

Question 1: Over the next five years, how could this Critical and Creative Thinking QEP be deeply curriculum-transformative? (What do we need to do differently at NCSU to improve students' critical and creative thinking?)

1. Project-based learning, multiple semesters (undergraduate research) – 9 dots
2. Use of capstones, portfolios, and externships/internships oriented toward critical and creative thinking (5 dots)
3. Engage students in answering this question. (Hold a Critical and Creative Thinking Day. Start with Marshall [Brain's] talk.) (4 dots)
4. Seed grants for student-led research (4 dots)
5. Teaching, in context, a problem with multiple solutions (3 dots)

Question 2. How can we bring the co-curriculum into this Critical and Creative Thinking QEP in a way that is transformative?

1. Stronger partnerships between departments (Ex. Student Affairs partnering with Academic Affairs) (11 dots)
2. Living and learning villages – conquer real world problems within LLC theme (11 dots)
3. Service based learning (4 dots)
4. Student designed co-curricular activities, born from their interests (intrinsic motivation)
5. Global certificate, visionary leadership through CSLEPS – supporting programs like this; perhaps expanding (3 dots)

Question 3. What are the similarities and differences between critical thinking and creative thinking?

1. A synergy between both – can't do one without the other (13 dots)
2. Creativity expands way of understanding problem solutions (6 dots)

Question 4. How does technology open up possibilities for how we engage students in critical and creative thinking?

1. Technology can eliminate boundaries (and create them) (21 dots)
2. Students can engage with each other and can construct new knowledge (7 dots)
3. Poor use is worse than no use (5 dots)
4. Entrepreneurship is/should be encouraged! (See Caine's Arcade on YouTube.)
5. Enables global connections/global classes and student projects (3 dots)
6. Share new ideas to a broader audience and get their feedback (3 dots)

Question 5. How do we attract people from different disciplines to get involved?

1. Create infrastructures that allow them [faculty] to spend time together. (Ex.: tenure and promotion) (9 dots)
2. Money – resources and incentives (8 dots)
3. Make it fun! (Free form, engaging, relaxed, productive) (8 dots)
4. More collaborative spaces (6 dots)

Question 6. How do we show students different ways of thinking across the disciplines?

1. Begin with incoming students (and all levels) with interdisciplinary challenges/courses/problems/opportunities. Begin where they are, and teach them as soon as possible to view from interdisciplinary perspectives, to consider interdisciplinary perspectives, to learn to think critically and creatively. (13 dots)
2. Big, ongoing, grand problems that all students can sign up to work on – no boundaries (9 dots)
3. Teach courses led by team of interdisciplinary facilitators (5 dots)
4. Co-taught courses – faculty across disciplines (4 dots)

Question 7. What do you do now to encourage critical and/or creative thinking?

1. Design projects, practicum with problem identification (7 dots)
2. Instructor has to say what he/she does and do what he/she says. Model this thinking. (5 dots)
3. Modeling by instructor (5 dots)
4. Embrace wrongness; accept what students bring to the table. Model through case studies. (4 dots)

Question 8. What types of faculty supports would be needed to stimulate critical and creative thinking?

1. Release time and reward/incentive structure. Exploration time for faculty. (7 dots)
2. Time! Release time! Freedom from “administrivia” (7 dots)
3. Embed critical thinking and creative thinking in university culture. (5 dots)
4. Critical and creative thinking thread throughout the whole curriculum. (5 dots)
5. Training, benchmarking, best practices (3 dots)
6. Time/space: to collaborate together; to process individually (incubating ideas); faculty lunch room (3 dots)

Appendix E: QEP Steering Committee charge and membership

North Carolina State University is a leading university and a national institution of The University of North Carolina

NC STATE UNIVERSITY

Office of the Provost and Executive Vice Chancellor

Campus Box 7701 / 118 Holladay Hall
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MEMORANDUM

FROM: Warwick Arden, Provost

TO: Chris Anson (Co-chair)
Stephen Reynolds (Co-chair)
Meredith Davis
Leda Lunardi
Adrianna Kirkman
Sarah Ash
David McConnell
David Zonderman
Vice Chancellor of Academic and Student Affairs (TBA)
Student representatives (TBA)
Pat Spakes (ex officio)

RE: Appointment to QEP Steering Committee

DATE: May 25, 2012

I would like to thank each of you for agreeing to serve on the Steering Committee for our next Quality Enhancement Plan (QEP), which will focus on the topic of Critical and Creative Thinking. This project is central to the success of our 2014 reaffirmation of accreditation by the Southern Association of Colleges and Schools – Commission on Colleges (SACS-COC). More importantly, I expect that it will significantly transform and strengthen the learning experiences of our students over the coming years.

The Steering Committee has primary responsibility for developing our QEP and for ensuring that it meets the standards and expectations of SACS-COC.

The Quality Enhancement Plan (QEP), submitted four to six weeks in advance of the on-site review by the Commission, is a document developed by the institution that (1) includes a process identifying key issues emerging from institutional assessment, (2) focuses on learning outcomes and/or the environment supporting student learning and accomplishing the mission of the institution, (3) demonstrates institutional capability for the initiation, implementation, and completion of the QEP, (4) includes broad-based involvement of institutional constituencies in the development and proposed implementation of the QEP, and (5) identifies goals and a plan to assess their achievement. The QEP should be focused and succinct (no more than seventy-five pages of narrative text and no more than twenty-five pages of supporting documentation or charts, graphs, and tables). (SACS Principles of Accreditation, p. 7.8)

In executing your charge, you will be expected to establish and manage the timeline for development of the Quality Enhancement Plan; establish an organizational structure for accomplishing the work; appoint a broad, representative QEP Coordinating Committee; guide and oversee development of the plan; and ensure that the campus is fully engaged throughout the process.

Again, I very much appreciate your support of this project that is so important for NCSU and our students.

cc: Chancellor Randy Woodson
SACS Leadership Team

Appendix F: QEP Coordinating Committee charge and membership

MEMORANDUM

DATE: October 3, 2012
RE: Appointment to the QEP Coordinating Committee
FROM: Chris Anson and Steve Reynolds, Co-Chairs, QEP Steering Committee
TO: QEP Coordinating Committee Members:

Chris Ashwell, Assoc. Prof, Dir. Undergraduate Research
 Bob Beichner, Physics, Director of STEM
 Gary Blank, Director, Undergraduate programs, Forestry
 Marshall Brain, Visiting Lecturer, Engineering
 Betsy Brown, Vice Provost, Faculty Affairs
 Roger Callanan, Assist Vice Provost, Academic Affairs
 Jennifer Capps, Entrepreneurship Program, Assoc Director
 Pinar Ceyhan, College of Design (graduate student)
 Kim Duckett, Librarian
 Joy Gayles, Associate Professor, Adult & Higher Education
 Mike Giancola, Associate Vice Provost
 Susan Grant, Director, University Housing
 Fred Hartman, Director, Public Relations
 Margaret Heil, Assoc. Dir, Sr. Design Center, Engineering
 Barbi Honeycutt, Director of Graduate Teaching Program
 Monica Leach, Associate Professor, Social Work
 Jane Lubischer, Director of Undergraduate Programs, Biology

Chris Mayhorn, Associate Professor, Psychology
 Carrie McLean, Executive Director, First Year College
 Susan Miller-Cochran, Director, First Year Writing
 Kelsey Mills, Engineering (undergraduate student)
 John Nietfeld, Assoc Prof, Curriculum and Instruction
 Santiago Piedrafita, Assoc Prof, Graphic/Ind Design
 Ruie Pritchard, Professor, Curr, Inst, & Counselor Ed
 Tracey Ray, Assist. Vice Provost, Equal Opportunity
 Mark Searce, Associate Professor, Music
 Laura Severin, Prof, English & Special Asst to Provost
 Rich Slatta, Director, Transition Program, History
 Sandy Stallings, Lecturer, Communications
 Julia Storberg-Walker, Assoc Professor, Education
 Nancy Wheelchel, Associate Director, Survey Research
 Liza Zapata, Assistant V Chancellor, Student Affairs
 Carrie Zelna, Director, Undergraduate Assessment

Thank you for agreeing to serve on the QEP Coordinating Committee. As members of this committee, you will have responsibility for generating and recommending to the QEP Steering Committee a plan for the improvement of critical and creative thinking of undergraduates at NCSU. The majority of the work for this project must be completed by the end of the 2012/13 academic year.

The Steering Committee has established an overall Project Plan and Timeline for completion of this work. Each Coordinating Committee member has been assigned to a Working Group. One or more members of the Steering Committee will also serve on each Working Group. The Working Groups will be responsible for determining how best to organize their time and resources in order to complete their assigned tasks.

We anticipate that the Steering Committee and the Working Groups will come together in November and again in mid-March in a retreat format. At these times, the Working Groups will present the results of their efforts and their recommendations to their colleagues.

Attached is a list of Working Group assignments. Specific requests from members were honored, where those were made. Other attachments include the Project Plan Timeline, Project Plan and Working Group charges.

Please note that since the first deadline is November 9, 2012, it will be necessary to move quickly to arrange your first, organizational meeting. To assist in this, we have asked a member of the Steering Committee to serve on each Working Group and convene the initial meeting. The University Planning and Analysis Office is supporting this project, and two graduate research assistants will assist committees. Claire Kohler, a Graduate Research Assistant from the College of Design, will support the Assessment and Marketing/Communications Committees. Megan Sherrell, a Graduate Research Assistant from the College of Education, will support the Program Planning and Faculty Development Committees. Pat Spakes, Assistant Director for Accreditation, is providing overall support for the QEP project and supervises the graduate research assistants in their work.

Jan Henderson, in UPA, will be in touch shortly to request your schedule and organize your first meeting. Given the very short time frame for completing this work, we hope you will be as accommodating as possible in regard to scheduling, especially for the initial meeting.

As co-chairs of this effort, we will be available to assist you, as needed. We thank you again for your willingness to be involved in this effort and for the time and energy you will put toward it.

Cc: Provost Warwick Arden
 QEP Steering Committee

Appendix G: Critical Thinking Assessment Test, Metacognitive Awareness Inventory, and Epistemological Beliefs Survey

Critical Thinking Assessment Text

The CAT Instrument is designed to assess a broad range of skills that faculty across the country feel are important components of critical thinking and real world problem solving. The test was designed to be interesting and engaging for students. All of the questions are derived from real world situations. The CAT Instrument is scored by the institution's own faculty using the detailed scoring guide. Training is provided to prepare institutions for this activity. During the scoring process faculty are able to see their students' weaknesses and understand areas that need improvement. Faculty are encouraged to use the CAT instrument as a model for developing authentic assessments and learning activities in their own discipline that improve students' critical thinking and real-world problem skills.

General Features of the CAT Test

The CAT instrument is a mostly short-answer essay exam that includes 15 questions. It can be completed by most students at community colleges and 4-year institutions in less than an hour (although it is not a timed test). Most students find the test interesting and engaging.

The test involves two parts. In Part I, a series of questions about different real world topics is presented that probe students' ability to think critically on each of those topics. The topics cover a broad range of issues and students are prompted over successive questions to think about each of these issues in more depth. The questions require students to evaluate hypotheses and claims, provide alternative explanations for observations, and describe additional information that might be needed to more fully evaluate ideas. A very detailed and refined scoring guide is used to guide the evaluation of student responses to each question. The scoring guide includes numerous examples of student responses.

In Part II, students are given a real-world problem to solve. This problem requires students to first identify relevant pieces of information based on article titles (simulating the experience of searching a database for information that might be needed to solve a real-world problem). Students are then instructed to open a packet of 8 short readings (4 relevant, 4 irrelevant) that contains the articles. The subsequent questions require students to integrate and apply the information in the relevant articles to solve the real-world problem. Students must not only identify safe solutions, but also the best solution given the constraints of the problem and explain their reasons for this choice. Students are also asked to explain how significant changes to the problem situation/constraints would alter their recommended solution.

Skills Assessed by CAT Instrument

Evaluating Information

- Separate factual information from inferences.
- Interpret numerical relationships in graphs.
- Understand the limitations of correlational data.
- Evaluate evidence and identify inappropriate conclusions.

Learning and Problem Solving

- Separate relevant from irrelevant information.
- Integrate information to solve problems.
- Learn and apply new information.
- Use mathematical skills to solve real-world problems.

Communication

- Communicate ideas effectively.
1. Summarize the pattern of results in a graph without making inappropriate inferences.
 2. Evaluate how strongly correlational-type data supports a hypothesis.
 3. Provide alternative explanations for a pattern of results that has many possible causes.
 4. Identify additional information needed to evaluate a hypothesis.
 5. Evaluate whether spurious information strongly supports a hypothesis.
 6. Provide alternative explanations for spurious associations.
 7. Identify additional information needed to evaluate a hypothesis.
 8. Determine whether an invalid inference is supported by specific information.
 9. Provide relevant alternative interpretations for a specific set of results.
 10. Separate relevant from irrelevant information when solving a real-world problem.
 11. Use and apply relevant information to evaluate a problem.
 12. Use basic mathematical skills to help solve a real-world problem.
 13. Identify suitable solutions for a real-world problem using relevant information.
 14. Identify and explain the best solution for a real-world problem using relevant information.
 15. Explain how changes in the real-world problem might affect the solution.

Metacognitive Awareness Inventory (MAI)

1. I ask myself periodically if I am meeting my goals.
2. I consider several alternatives to a problem before I answer.
3. I pace myself while learning in order to have enough time.
4. I think about what I really need to learn before I begin a task.
5. I set specific goals before I begin a task.
6. I slow down when I encounter important information.
7. I ask myself if I have considered all options when solving a problem.
8. I consciously focus my attention on important information.
9. I periodically review to help me understand important relationships.
10. I ask myself questions about the material before I begin.
11. I think of several ways to solve a problem and choose the best one.
12. I find myself analyzing the usefulness of strategies while I study.
13. I focus on the meaning and significance of new information.
14. I create my own examples to make information more meaningful.
15. I find myself pausing regularly to check my comprehension.
16. I draw pictures or diagrams to help me understand while learning.
17. I have a specific purpose for each strategy I use.
18. I use different learning strategies depending on the situation.

19. I ask others for help when I don't understand something.
20. I ask myself if what I'm reading is related to what I already know.

Schraw, G. & Dennison, R.S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, 19, 460-475.

Epistemological Beliefs Survey

Please indicate how strongly you agree or disagree with each of the statements listed below. Please circle the number that best corresponds to the strength of your belief.

All items are scored by the student on the scale shown below:

strongly disagree	disagree	unsure	agree	strongly agree
1	2	3	4	5

1. You can believe most things you read.
2. The only thing that is certain is uncertainty itself.
3. If something can be learned, it will be learned immediately.
4. I like information to be presented in a straightforward fashion; I don't like having to read between the lines.
5. It is difficult to learn from a textbook unless you start at the beginning and master one section at a time.
6. Forming your own ideas is more important than learning what the textbooks say.
7. Almost all the information you can understand from a textbook you will get during the first reading.
8. A really good way to understand a textbook is to reorganize the information according to your own personal scheme.
9. If scientists try hard enough, they can find the answer to almost every question.
10. You should evaluate the accuracy of information in textbooks if you are familiar with the topic.
11. You will just get confused if you try to integrate new ideas in a textbook with knowledge you already have about a topic.
12. When I study, I look for specific facts.
13. If professors would stick more to the facts and do less theorizing, one could get more out of college.
14. Being a good student generally involves memorizing a lot of facts.
15. Wisdom is not knowing the answers, but knowing how to find the answers.
16. Working on a difficult problem for an extended period of time only pays off for really smart students.
17. Some people are born good learners; others are just stuck with a limited ability.
18. Usually, if you are ever going to understand something, it will make sense to you the first time.
19. Successful students understand things quickly.
20. Today's facts may be tomorrow's fiction.
21. I really appreciate instructors who organize their lectures carefully and then stick to their plan.
22. The most important part of scientific work is original thinking.
23. Even advice from experts should be questioned.
24. If I can't understand something quickly, it usually means I will never understand it.

25. I try my best to combine information across chapters or even across classes.
26. I don't like movies that don't have a clear-cut ending.
27. Scientists can ultimately get to the truth.
28. It's a waste of time to work on problems that have no possibility of coming out with a clear-cut answer.
29. Understanding main ideas is easy for good students.
30. It is annoying to listen to lecturers who cannot seem to make their mind up as to what they really believe.
31. A good teacher's job is to keep students from wandering from the right track.
32. A sentence has little meaning unless you know the situation in which it was spoken.
33. The best thing about science courses is that most problems have only one right answer.
34. Most words have one clear meaning.
35. The really smart students don't have to work hard to do well in school.
36. When I learn, I prefer to make things, as simple as possible.
37. I find it refreshing to think about issues that experts can't agree on.
38. The information we learn in school is certain and unchanging.

Wood, P., & Kardash, C.M. (2002). Critical Elements in the Design and Analysis of Studies of Epistemology. In: Hofer, B.K., Pintrich, Paul R. (Eds.), *Personal epistemology: The psychology of beliefs about knowledge and knowing*, Erlbaum, Mahwah, NJ. pp. 231-260.

Appendix H: Definition of terms

Critical thinking –

Critical thinking is the active, persistent, and careful consideration of a belief or form of knowledge, the grounds that support it, and the conclusions that follow. It involves analyzing and evaluating one's own thinking and that of others. In the context of college teaching and learning, critical thinking deliberately and actively engages students in:

- Raising vital questions and problems and formulating these clearly and precisely;
- Gathering and assessing relevant information and using abstract ideas to interpret it effectively;
- Reaching well-reasoned conclusions and solutions and testing them against relevant criteria and standards;
- Openly considering alternative systems of thought; and
- Effectively communicating to others the analysis of and proposed solutions to complex challenges.

Intellectual standards for critical thinking (Paul and Elder)

- **Clarity** – being easy to understand, free from confusion or ambiguity, and lacking in obscurities.
- **Accuracy** – being free from errors, mistakes, or distortions; conforming to fact, truth, or some standard.
- **Precision** – being accurate, definite, and exact.
- **Relevance** – bearing upon or relating to the matter at hand; having a close logical relationship to the matter under consideration.
- **Significance** – having relative importance
- **Depth** – dealing with the complexities of the issue.
- **Breadth** – recognizing of insights in more than one side of a question.
- **Logic** – reasoning correctly within the system of principles, concepts, and assumptions that underlie a discipline, activity, or practice; understanding the set of rational considerations that bear upon the truth/justification of any belief or the settlement of any question(s).
- **Fairness** – treating all sides alike without reference to one's own feelings or interests.

Creative thinking -

Creative thinking is generating new ideas within or across domains of knowledge, drawing upon or intentionally breaking with established symbolic rules and procedures. In the context of college teaching and learning, creative thinking deliberately and actively engages students in bringing together existing ideas into new configurations, developing new properties or possibilities for something that already exists, and discovering or imagining something entirely new. Creative behaviors include:

- **Analyzing and evaluating information/context in order to frame the problem scope** – involvement in a set of issues that arouse curiosity and come from the specific requirements of the domain in the form of a problem or challenge. Preparation includes articulating the problem scope and collecting and analyzing information.

- **Synthesizing information and generating multiple solutions to the problem** – occurs during a period of time in which ideas percolate relevant and sometimes irrelevant associations, according to patterns established by the thinker's knowledge of the domain. Idea generation requires synthesizing concepts and information, often in original configurations.
- **Exercising insight about alternatives and choosing a solution** – when one of these associations fits the problem so well (i.e. is appropriate) that it springs to consciousness. The thinker monitors developing work, pays attention to goals and feelings, compares ideas to domain knowledge and methods, and interacts with others involved in solving of similar problems.
- **Evaluating the worth and consequences of an implemented solution** – critical judgments result in modifications to the original idea.
- **Elaborating** – when the thinker develops convincing modes of presentation that communicate ideas to others.

Intellectual standards for creative thinking:

- **Originality** – constructive imagination and independent thought
- **Adaptability and flexibility** – the ability to adjust thinking under new or unstable conditions and to move among various vehicles of thought (numerical, linguistic, visual) depending on the situation or context.
- **Appropriateness** – the goodness of fit between the constraints of the problem and the properties of the solution.
- **Contribution to the domain** – the accepted worth of new ideas within the discipline.

Reflection on their own thinking –

Students' reflection on their own thinking involves knowledge about themselves as learners. It is also the set of behaviors students use to regulate or adjust their learning based on the efficiency and effectiveness of particular thinking strategies. Such reflection also involves selecting appropriate thinking strategies (the right tool for the right task); allocating effort to particular tasks; and being aware of their own performance and the performance of others.

- **Critical perspectives** – a way of regarding situations, ideas, or facts and their interrelationships and for judging their relevance.

CAT Test (Critical Thinking Assessment Test) – a scenario-based, standardized test of critical thinking developed by Tennessee Technological University under support from the National Science Foundation.

College-level requirements – courses required by the academic colleges as introductory to the majors offered by the college.

English 101 – the required 4-credit writing course taken by 85% of first-year students.

Faculty cluster - faculty who teach the same course type (for example, English 101, First-Year Inquiry, and large lectures introductory to the major are clusters).

Faculty cohort - faculty who train and implement TH!NK courses in the same year.

First-year Inquiry courses – General Education courses for first-year students, taught in 20-student classrooms through an active learning, inquiry-guided pedagogy (i.e., based on questions, scenarios, or problems).

First-year students – students admitted to NC State University for their first year of college.

Large enrollment courses – first-year courses taken by students who will major in the discipline or for whom the course is a requirement for advancement to the discipline. Students in these courses are likely to be cohorts in the major rather than General Education students.

Knowledge domain – the content of a particular field or discipline.

Learning objectives – what the institution hopes to achieve with regard to student learning and as a result of pedagogical intervention.

Rubrics – standards of performance in student achievement of learning outcomes within a defined population (see rubrics document).

Student learning outcomes – observable and measurable descriptions of the knowledge, skills, attitudes, and/or behaviors that students should demonstrate as a result of specific instructional strategies.

Thinking competencies – the skills, knowledge, attitudes, and values needed to meet the demands of a task. Competencies are performance based and manifested in the actions of an individual in a particular context, but are also needed across a variety of different life demands and challenges (Brewerton, 2004, p. 2.)

		Milestones		Benchmark
Capstone		3	2	1
Explanation of issues	4	Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue/problem to be considered critically is stated without clarification or description.
		Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.
		Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and other's assumptions and several relevant contexts when presenting a position.	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
		Specific position (perspective, thesis/hypothesis) imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious.
		Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Appendix I: AACU Critical Thinking Value Rubric

Capstone 4

3

Milestones

2

Benchmark 1

Acquiring competencies	Reflect: Evaluates creative process and product using domain-appropriate criteria.	Create: Creates an entirely new object, solution, or idea that is appropriate to the domain.	Adapt: Successfully adapts an appropriate exemplar to his/her own specification.	Model: Successfully reproduces an appropriate exemplar.
This step refers to acquiring strategies and skills within a particular domain.				
Taking risks	Actively seeks out and follows through on untested and potentially risky directions or approaches to the assignments in the final product.	Incorporates new directions or approaches to the assignment in the final product.	Considers new directions or approaches without going beyond the guidelines of the assignment.	Stays strictly within the guidelines of the assignment.
May include personal risk (fear of embarrassment or rejection) or risk of failure in successfully completing assignment, i.e. going beyond original parameters of assignment, introducing new materials and forms, tackling controversial topics, advocating unpopular ideas or solutions.				
Solving problems	Not only develops a logical, consistent plan to solve problems, but recognizes consequences of solution and can articulate reason for choosing solution.	Having selected from alternatives, develops a logical, consistent plan to solve the problem.	Considers and rejects less acceptable approaches to solving problems.	Only a single approach is considered and is used to solve the problem.
Embracing contradictions	Integrates alternate, divergent, or contradictory perspectives or ideas fully.	Incorporates alternative, divergent, or contradictory perspectives or ideas in an exploratory way.	Includes (recognizes the value of) alternate, divergent, or contradictory perspectives or ideas in a small way.	Acknowledges (Mentions in passing) alternate, divergent, or contradictory perspectives or ideas.
Innovative thinking	Extends novel or unique idea, question, format, or product to create new knowledge or knowledge that crosses boundaries.	Creates novel or unique idea, question, format, or product.	Experiments with creating a novel or unique idea, question, format, or product.	Reformulates a collection of available ideas.
Novelty of uniqueness (of idea, claim, question, form, etc.)				
Connecting, synthesizing, transforming	Transforms ideas or solutions into entirely new forms	Synthesizes ideas or solutions into a coherent whole.	Connects ideas or solutions in novel ways.	Recognizes existing connections among ideas or solutions.

Appendix I: AACU Creative Thinking Value Rubric

Appendix J: Budget commitment letter

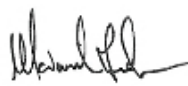
<p style="text-align: right; font-size: small;">North Carolina State University is a leading research university and a constituent institution of The University of North Carolina</p>	<p style="text-align: right; font-size: small;">Office of the Provost and Executive Vice Chancellor</p>
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<p>NC STATE UNIVERSITY</p>	<p style="text-align: right; font-size: small;">Campus Box 7101 / 138 Holladay Hall Raleigh, NC 27695-7101 919.515.7145 919.515.5921 (fax)</p>
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October 29, 2013

MEMORANDUM

TO: Michael Mullen, Vice Chancellor and Dean, Division of Academic and Student Affairs

FROM: Warwick Arden, Provost and Executive Vice Chancellor 

SUB: Commitment of Funding for NC State's Proposed Quality Enhancement Plan

As you know, both Chancellor Woodson and I are extremely pleased with the selection of NC State's Quality Enhancement Plan (QEP), **TH!NK: Higher-order Skills in Critical and Creative Thinking**. The plan's focus on improving students' higher-order thinking competencies, including critical evaluation, creative thinking, and reflection on their own thinking, is well-aligned with our 2011-2020 Strategic Plan vision, particularly our goal of enhancing student success.

I have previously approved your 2013-14 budget request for \$415,731 toward start-up costs to initiate the planning and implementation of the QEP. I am now approving your current request to fund the remainder of the QEP budget, totaling \$2,671,775 over five years, beginning July 1, 2014 and ending June 30, 2019. This brings my overall financial commitment to the QEP to \$3,087,506.

As I have indicated above, both the chancellor and I view implementation of this QEP as a critical step towards accomplishing our strategic goals relative to student success. While recent state budget cuts have resulted in significant reductions in state appropriated dollars distributed to the UNC system and thus NC State, we have consistently implemented those cuts in ways that minimize the impact on our academic core and we will continue to do so in the future. We believe that the full-funding of the **TH!NK** initiative now and throughout the next five years is a necessary and crucial investment in the academic success of NC State's undergraduates.

cc: Vicki Pennington, Assistant Vice Provost for Administration

Appendix K: Student Advisory Group

NAME/YEAR/MAJOR IN 2013-2014

Sarah Bloomer, Sophomore, Animal Science

Nakita Chintalapudi, Freshman, Biological Sciences

Megan Dunton, Sophomore, Genetics and English

Chris Elias, Freshman, First Year College

Molly Graham, Senior, Communications

Alexandra Hadley, Senior, Design

Aruna Iyer, Freshman, Biology

Amanda Lilley, Freshman, Anthropology

Neel Mandavilli, Junior, Political Science

Halle Mangrum, Sophomore, English

Rachael McCarthy, Senior, Design

Michael Moravec, Freshman, Engineering

Jacqueline Murillo, Senior, International Stds

Sara Riley, Freshman, Engineering

Laura Orland, Senior, Communication

Meera Patel, Senior, Economics/Int'l Studies

PROJECT PHASE	STUDENTS	FACULTY	STAFF	ADMINISTRATION	TRUSTEES	EXTERNAL
Strategic planning and data review July 2010-April 2011	<ul style="list-style-type: none"> Served on Steering Committee and task forces Provided input through email, committees, and Student Forum on Strategic Planning (2/16/11) 	<ul style="list-style-type: none"> Served on and chaired Steering Committee and task forces Provided input through email, committees, pre-planning retreat (7/10) General Faculty Meeting (10/5/10) Town Hall Meeting (10/26/10) Chancellor's Forum on Strategic Planning (1/27/11) University Council Planning Retreat (1/10/11) 	<ul style="list-style-type: none"> Served on Steering Committee and task forces Provided input through email, committees, pre-planning retreat (7/10) Town Hall Meeting (10/26/10) Chancellor's Forum on Strategic Planning (1/27/11) University Council Planning Retreat (1/10/11) 	<ul style="list-style-type: none"> Served on Steering Committee and task forces Provided input through email, committees, pre-planning retreat (7/10) Town Hall Meeting (10/26/10) Chancellor's Forum on Strategic Planning (1/27/11) University Council Planning (1/10/11) 	<ul style="list-style-type: none"> Served on Steering Committee Provided input through pre-planning retreat (7/10) Provided input through regular board meetings Approved final plan (4/22/11) 	<ul style="list-style-type: none"> Board of Visitors consultation during regular meetings (2010-2011)
Selecting the topic based on strategic plan goals October 2011-February 2012	<ul style="list-style-type: none"> Provided input through Chancellor's Liaison (1/25/12) Student Senate (2/1/12) 	<ul style="list-style-type: none"> Focus groups explored five topics; provided input through Faculty Senate (2/21/12) University Council (1/9/12) 	<ul style="list-style-type: none"> Focus groups explored five topics; provided input through Staff Senate (2/1/12) University Council (1/9/12) 	<ul style="list-style-type: none"> Focus groups explored five topics; provided input through Deans Council mini-retreat (1/3/12) Regular Associate Deans and Vice Provosts meetings University Council (1/9/12) 	<ul style="list-style-type: none"> Received reports at scheduled meetings 	
Planning to plan by generating support for "critical and creative thinking" February 2012-May 2012	<ul style="list-style-type: none"> Participated in Campus Dialogue (4/12/12) 	<ul style="list-style-type: none"> Served on Plan to Plan Committee General Faculty Meeting (3/13/12) Participated in Campus Dialogue (4/12/12) 	<ul style="list-style-type: none"> Served on Plan to Plan Committee Participated in Campus Dialogue (4/12/12) 	<ul style="list-style-type: none"> Served on Plan to Plan Committee General Faculty meeting (3/1/12) Participated in Campus Dialogue (4/12/12) 	<ul style="list-style-type: none"> Received reports at scheduled meetings 	
Developing the plan by sharpening the focus, developing strategies May 2012-March 2013	<ul style="list-style-type: none"> Served on Steering Committee Served on and co-chaired working groups Participated in three planning retreats 	<ul style="list-style-type: none"> Served on Steering Committee Served on and co-chaired working groups Participated in three planning retreats Steering Committee presentations at 35 department meetings Surveys of faculty about related projects and campus resource needs 	<ul style="list-style-type: none"> Served on Steering Committee Served on and co-chaired working groups Participated in three planning retreats 	<ul style="list-style-type: none"> Served on Steering Committee Served on and co-chaired working groups Participated in three planning retreats 	<ul style="list-style-type: none"> Received reports at scheduled meetings 	<ul style="list-style-type: none"> Visit by Ben Knapp, Institute for Creativity, Virginia Tech (2/8/13)

Appendix L: Record of consultation

PROJECT PHASE	STUDENTS	FACULTY	STAFF	ADMINISTRATION	TRUSTEES	EXTERNAL
Reviewing preliminary concepts March 2013-May 2013	<ul style="list-style-type: none"> Participated in planning retreats Survey of University Graduate Student Association's Teaching Effectiveness Committee 	<ul style="list-style-type: none"> Participated in Campus Roll-out Event (3/26/13) Participated in planning retreats Reviewed at Faculty Senate (3/19/13) Reviewed at University Courses and Curriculum Committee and Council on Undergraduate Education Presentations to Writing and Music faculties Provided individual and departmental responses to open call for comments 	<ul style="list-style-type: none"> Participated in Campus Roll-out Event (3/26/13) Participated in planning retreats Reviewed with Staff Senate (4/3/13) Reviewed with DASA staff (3/27/13) Reviewed with academic advisors (5/2/13) Reviewed with student housing staff Provided individual and unit responses to open call for comments 	<ul style="list-style-type: none"> Participated in Campus Roll-out Event (3/26/13) Participated in planning retreats Provided input through Deans Council and Associate Deans meetings 	<ul style="list-style-type: none"> Received reports at scheduled meetings 	<ul style="list-style-type: none"> Visit from Stephen Brookfield, critical thinking consultant (4/11/13) Barbara Jones, QEP consultant (5/14-15/13) Board of Visitors received reports at scheduled meetings
Revising the plan May 2013-August 2013	<ul style="list-style-type: none"> Participated in planning retreat (8/26/13) 	<ul style="list-style-type: none"> Led Writing Team Participated in planning retreat (8/26/13) 	<ul style="list-style-type: none"> Participated in planning retreat (8/26/13) 	<ul style="list-style-type: none"> Served on Writing Team Participated in planning retreat (8/26/13) 		
Reviewing the draft plan August 2013-November 2013	<ul style="list-style-type: none"> Participated in planning retreat (8/26/13) Student Interviews (10/13) THINK Student Advisory Group established (10/25/13) with monthly meetings 	<ul style="list-style-type: none"> THINK plan endorsed by Faculty Senate (9/10/13) Plan endorsed by Council on Undergraduate Education (9/20/13) Plan endorsed by University Courses and Curriculum Committee (10/9/13) Responded to open call for comments 	<ul style="list-style-type: none"> Resident Life and other DASA staff provided input Responded to open call for comments 	<ul style="list-style-type: none"> THINK plan endorsed by Deans Council (9/12/13) Plan endorsed by Vice Provosts 	<ul style="list-style-type: none"> Preliminary presentation (11/21/13) 	<ul style="list-style-type: none"> Review by consultant Barbara Jones (October 2013)
Approving the final plan December 2013-April 2014	<ul style="list-style-type: none"> Review by student government (1/14) 			<ul style="list-style-type: none"> Recommended by SACSOC Leadership Team (12/16/13) University Council review and endorsement (1/13/14) 	<ul style="list-style-type: none"> Scheduled for approval by Chancellor and by Board of Trustees (2/21/14) 	<ul style="list-style-type: none"> Review of SACSOC (March 2014)

