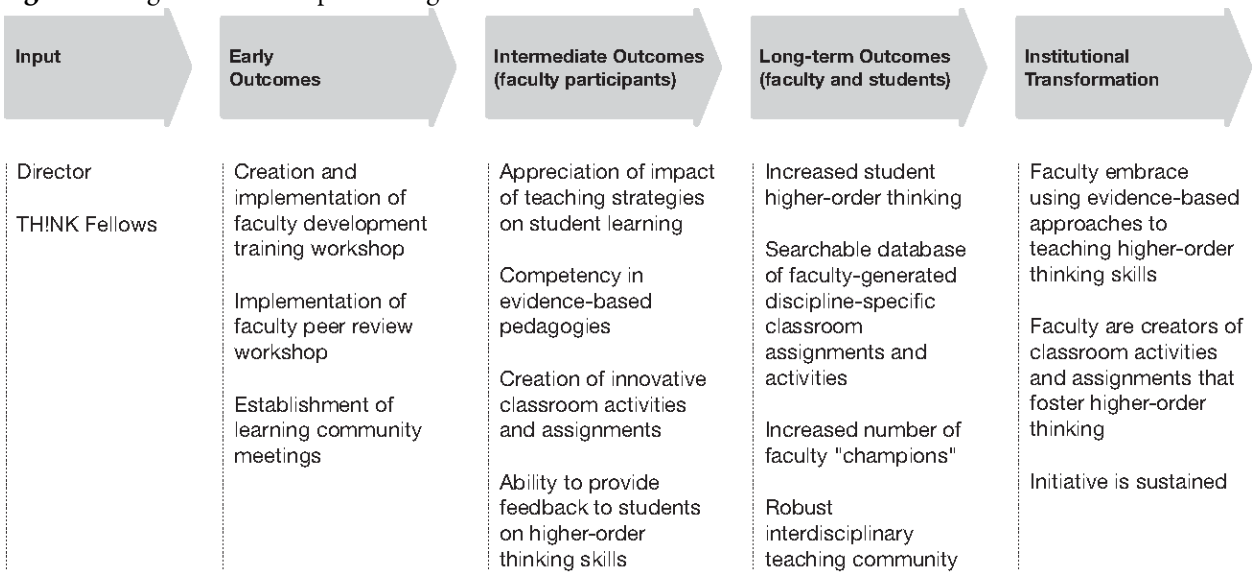
North Carolina State University QEP Impact Report

Section 1: a succinct list of the initial goals and intended outcomes of the Quality Enhancement Plan:
In 2013, SACS approved the North Carolina State University quality enhancement plan (QEP) entitled "TH!NK: Higher-order Skills in Critical and Creative Thinking" as a ten-year plan. This document serves as the SACSCOC QEP Impact Report. TH!NK is a campus-wide initiative that is designed to develop faculty members' abilities in cultivating students' higher order skills in critical and creative thinking and self-reflection. In TH!NK courses, faculty challenge students to explore disciplinary content through a lens of critical and creative thinking. Faculty and courses in a wide variety of disciplines are involved in the initiative, with the ultimate goal of the effort being an institutional transformation in the way that teaching is approached across campus. The logic model in Figure 1 illustrates our process from input through institutional transformation.

Figure 1: Logic Model of input through institutional transformation.



Our original proposal has a high degree of complexity due to a few variables. First, we proposed multiple intertwined faculty and student learning outcomes that required a number of different instruments to assess our outcomes. Second, we proposed two distinct phases. In Phase 1 (year one and two), we proposed to train faculty who were going to implement enhancements in courses that served primarily first semester freshmen. We proposed that we would evaluate student outcomes after two years to determine how to expand in Phase 2 (years three to five).

We used both student and faculty learning outcomes assessment to make continual improvements and adjustments to our faculty development workshops, as well as to guide us in the decision-making process for Phase 2 of our plan.

Faculty Development Outcomes
Faculty Outcome 1: Faculty will develop and use instructional strategies for critical and creative thinking in formulating student assignments, classroom activities and discussions, and student assessments.
Faculty Outcome 2: 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 Outcome 3: 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 Outcome 4: Faculty will reflect on the results of teaching critical and creative thinking in a process of continual improvement.
Faculty Outcome 5: Faculty will share best practices in teaching critical and creative thinking as part of an effort to transform the campus culture.

Student Learning Outcomes
Through success in the above faculty outcomes, NC State will improve students' higher-order thinking competencies, including critical thinking, creative thinking, and reflection on their own thinking.
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 questions 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).
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).

Section 2: a discussion of changes made to the QEP and the reasons for making those changes

The NC State QEP was divided into two phases, where Phase 1 was focused on faculty and courses that primarily served first-semester, first-year students, and where Phase 2 intentionally allowed for flexibility of direction based on student learning outcomes, assessment of faculty development, and faculty and departmental needs. Most of the changes we made during Phase 1 were not major structural or programmatic changes, but incremental adjustments and improvements. In this section, we discuss both changes made, as well as decisions we made in the direction of Phase 2.

The **TH!NK faculty development plan** was structured according to Figure 2. The workshops and summer mentoring was facilitated by the TH!NK Fellows and Director. In Phase 1, all courses were implemented in the Fall semester (serving first-semester freshmen), and beginning in Phase 2, courses were implemented in both Fall and Spring semesters.

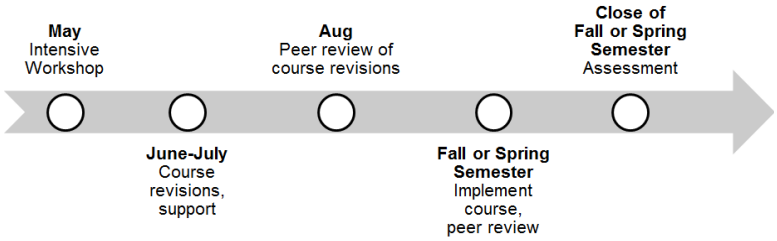


Figure 2. Faculty development annual timeline

For the most part, this structure worked quite well, but we had to make a few adjustments to the faculty development plan.

1. In the original model for faculty development, funding of faculty development in Phase 2 was planned to be reduced and the Fellow model would be replaced by TH!NK Faculty "alumni" giving individual workshops through the Office of Faculty Development. This model would have made for a less cohesive learning experience for new cohorts of TH!NK Faculty, and would not provide the valuable peer mentoring support and feedback provided by the TH!NK Fellows. Because of this, the **Office of the Executive Vice Chancellor and Provost provided additional funds** to maintain the Fellow model. This allowed for new leadership opportunities for TH!NK Faculty, because as Fellows rolled off, past TH!NK Faculty filled the open Fellow roles.
2. It was difficult for the Office of Faculty Development to recruit TH!NK Faculty to engage in focus groups. Because there was greater participation in the faculty surveys, and because we obtained robust data and constructive feedback in the surveys, we decided to discontinue attempts at faculty focus groups.
3. In Phase 1, all TH!NK courses were those primarily serving traditional first-semester, first-year students, and thus all offerings took place in the fall semester. In Phase 2 (discussed later), we broadened the participation, and some of the faculty taught in the spring semester, only. While the May workshop always covers the intellectual standards, the critical and creative thinking process, encouraging intellectual risk taking, and a few other topics, we rotate some evidence-based teaching strategies based on expertise of the Fellows. In addition, we made changes to the workshop each year, especially the first two years, based on participant feedback. We also enhanced the training on using the Common Rubric, because in the first year (2014), we believe faculty were frequently scoring students higher than the students' skill levels.

The **TH!NK assessment plan** for Phase 1 included pre- and post-semester use of the scenario-based Critical Thinking Assessment Test developed by Tennessee Technical University (all TH!NK courses in year 1, sampled from a pool of all TH!NK courses in year 2); pre- and post-semester use of the Metacognitive Awareness Inventory and Epistemological Beliefs Survey; post-semester use of a faculty-designed classroom activity scored against a Common Rubric based on the AAC&U Value Rubrics for Critical Thinking and Creative Thinking; student responses to a reflective survey; and post-semester faculty self-assessment.

There were a few changes implemented in the assessment plan in Phase 1.

1. The Common Rubric continued to be tweaked and improved over time to make the language more clear and inclusive of diverse disciplines, and in some cases, to separate double-barrelled items into separate items. The original version had 13 dimensions to score each piece of student work. Because the Common Rubric is such a valuable tool for both faculty development and for faculty to utilize in framing feedback to students, we felt that it was important to make it more user-friendly and sustainable. Stakeholders, including TH!NK Faculty, Fellows, Advisory Board, and the Office of Assessment provided feedback on revisions. The current version of the Common Rubric has nine dimensions. Since making the changes, we have had increased faculty buy-in and better compliance with scoring student artifacts. The current Common Rubric is available at https://think.dasa.ncsu.edu/wp-content/uploads/sites/20/2018/05/11-Common-Rubric-2018.docx.pdf[1]
2. The QEP proposed the use of the Metacognitive Awareness Inventory[2] and an Epistemological Beliefs Survey[3] (EBS/MAI) s to determine students' reflective self-assessment and their beliefs about the nature of knowledge and learning. Planners hoped to utilize results of these tests to look for correlation between epistemological belief/metacognitive awareness and gains in critical and creative thinking. The results of this analysis are highlighted in Section 3. The Implementation Team decided not to continue with these two surveys after year 3 because these particular assessments were not planned to be used to make ongoing changes to the program (they do not directly measure learning outcomes but rather were supplemental inquiry); we felt we had gathered sufficient data to do the supplemental inquiry.
3. The TH!NK Faculty desired more feedback on the students' thinking relative to our specific learning objectives. Thus, we created a reflective survey that is issued to students in TH!NK courses toward the end

of the semester. The content of this survey is available at https://think.dasa.ncsu.edu/reflection-survey/[4]. Faculty have found responses to this survey extremely valuable in their teaching. In an email from Dr. Julianne Treme on 12/20/2018:
"*I am just blown away by the detail in some of the responses. The comments in that document are more helpful to my future teaching than any student evaluation forms/numbers. I really feel like giving this survey to all of my classes would benefit me in the future, as it has successfully given students a better platform to give more significant feedback to their learning gains rather than what they didn't like about the course or what they enjoyed about the course.*"

4. The Critical Thinking Assessment Test (CAT) continued to be used as planned throughout Phase 1. We changed the model for use of the test in Phase 2 because pre- and post-testing, once we moved to vertical integration, would have exceeded the number of times a student can be given the test. In Phase 2, within each participating major, we took a freshman baseline and a pre-TH!NK senior baseline. In Spring 2020 and 2021, we will be able to test seniors to look for overall gains freshman to senior year, as well as make a comparison between pre-TH!NK seniors and current seniors. More information about the CAT is available at https://www.tntech.edu/cat/about.php[5].

Phase 2 direction

In our submitted QEP, we focused the first two years (Phase 1) on working with faculty to enhance courses that serve primarily first-semester freshmen. The focus of the next three years (Phase 2) was left flexible in the original QEP so that decisions could be made based on assessment data and faculty needs/interests. Some possibilities mentioned in the plan were expansion into more first-year courses, expansion into second-year courses, and vertical integration across all four years in the majors.

Because our freshmen scored on average in the "emerging" range for most skills measured in the TH!NK Common Rubric, we decided to build upon these skills across all undergraduate levels (vertical integration) in select majors. In addition, there was a strong demand for faculty development from faculty who teach all levels of courses, and we felt it was important to embrace enthusiastic faculty in order to help attain widespread institutional change. A stable vertical integration turned out to be complicated in majors due to a variety of confounding factors, including faculty who were trained being assigned to different classes out of necessity, occasionally key faculty leaving the institution, movement of students into and out of majors (e.g. many students in microbiology do not declare until junior year), and the fact that the majority of majors have multiple concentrations and students have a wide variety of courses they may select from, especially in the junior and senior years. The majors that were selected for vertical integration are accounting, communications, design studies, horticulture, microbiology, industrial and systems engineering, and science education. In addition, a number of departments have a large cluster of faculty who were TH!NK trained, including English; Chemistry; Parks, Recreation and Tourism Management; Genetics; and the Life Sciences First Year Program.

The assessment plan for programs involved in vertical integration includes use of the TH!NK Common Rubric in multiple courses throughout the curriculum (minimum first-year and senior year, but in most cases, one course per year), as well as CAT. CAT was issued to first-year students in the vertical integration majors, as well as baseline seniors (prior to vertical integration). This report is due before the first vertical integration cohorts will be seniors, but programs have committed to using senior CAT testing for their programmatic assessment at the end of the first cohort of vertical integration in the major. The first set of majors will test seniors in spring 2020.

Section 3: QEP Impact on the Environment and Student Learning

To date, approximately 11,000 students (student enrollments) have been impacted directly in TH!NK courses and over 130 faculty members, representing every undergraduate-serving college on campus, have participated. We know the number of students indirectly impacted to be much greater because TH!NK Faculty survey

responses indicate that the vast majority of TH!NK Faculty made changes to all of their courses after training, not just their designated TH!NK courses. In addition, TH!NK courses are only tracked for two years after instructor training, but faculty report a permanent integration into their courses. Finally, the TH!NK Team has consistently offered stand-alone workshops in the Office of Faculty Development, impacting a greater number of faculty than just those committed to the full TH!NK experience.

TH!NK Faculty Learning Outcomes

In order to meet our student learning outcomes and to transform the culture of teaching on our campus, faculty needed to become adept in creating discipline-specific opportunities for students to practice their critical and creative thinking skills and self-reflection, as well as learn language to provide feedback on students' thinking process and work products.

All TH!NK faculty from cohorts 1-5 were asked to respond to a survey in January 2019. Of the approximately 130 participating faculty, 73 faculty responded.

Faculty adopted evidence-based teaching strategies following their experience in TH!NK training. Figure 3 (page 7) shows overall use and adoption of evidence-based teaching strategies separated by STEM and non-STEM. A caveat of this data is that the STEM courses were skewed toward larger enrollment sizes which could be a factor in strategy adoption and use. Effect size of change was calculated using Cohen's *d*. Effect Size *small=.2 **medium=.5 ***large=.8

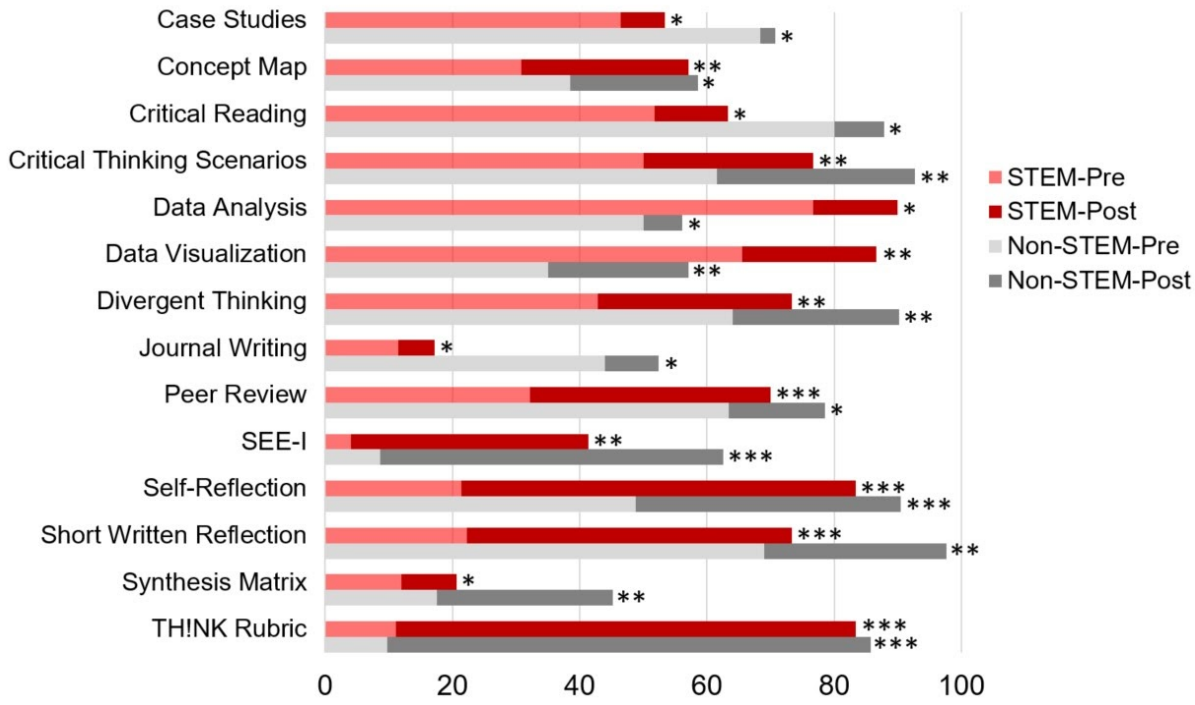
Faculty perceived some features of TH!NK implementation as more valuable to student learning than others.

- 95 % perceived a positive impact by the use of assignments/activities to develop critical thinking
- 89% perceived a positive impact by the use of assignments/activities to develop creative thinking
- 83% perceived a positive impact by the use of self-reflection/metacognitive activities
- 68% perceived a positive impact by the use of of Intellectual Standards to evaluate the work of others

Of respondents who teach more than one section of their TH!NK course, 92% reported implementing changes across sections. Of respondents who teach additional different courses, 100% report implementing changes to additional courses based on their learning in the TH!NK program.

TH!NK Faculty also reported sharing TH!NK ideas, assignments, or activities both inside their own departments and outside their own departments. Approximately 84% reported sharing inside their own departments and approximately 40% reported sharing outside of their own departments. This not only indicates a snowball effect of these ideas throughout campus, but also indicates that TH!NK has encouraged interdisciplinary interactions in the realm of teaching and learning.

Figure 3. Strategy adoption by STEM and non-STEM courses with effect size. For each pedagogical strategy, a stacked bar is shown for STEM courses (red) and non-STEM courses (gray). Statistically significant gains in strategy usage are demarcated by effect size Effect Size *small=.2 **medium=.5 ***large=.8. In both cases, the lighter shade indicates percent of instructors who implemented the strategy prior to TH!NK training, and the extended darker shade indicates percent of instructors who implemented the strategy post TH!NK training.



Faculty scholarship

Over time, a number of TH!NK Faculty have published their scholarship of teaching and learning related to TH!NK, or have presented their work at national and international conferences. In order to encourage this kind of scholarship and sharing, we added a new initiative called the TH!NK Researchers. In academic year 2018/2019, fifteen TH!NK Faculty (or 'alumni') had the opportunity to engage in a community that provided them with support to present and publish their work. TH!NK Researchers met five times over the academic year. Each session provides guidance and information on getting started with SOTL work, as well as a deliverable due at each meeting. TH!NK Researchers received a $2,000 travel/professional development award, with the expectation that over the course of the year, they will continue to develop their research plan. By the end of the academic year, all faculty were required to submitt at least three activities or assignments to the searchable TH!NK database, present their work at the NC State Symposium of Teaching and Learning, submit an abstract to a national or international conference, and have a plan for preparing the work for publication. We continued this program in 2019/2020.

In addition to workshops, the TH!NK team and TH!NK Faculty have disseminated resources in a variety of ways, including:

- A listing of **TH!NK-related publications and conference proceedings** is available at https://think.dasa.ncsu.edu/publications-and-conference-proceedings/[6].
- A searchable **TH!NK database** containing activities and assignments created by TH!NK Faculty that target critical and creative thinking skills and self-reflection. The database is searchable by skill(s) practiced, discipline, time-frame of activity/assignment, and keywords. The database can be accessed at https://apps.dasa.ncsu.edu/think/public/index.php[7].
- **TH!NK resource sheets** aimed to provide faculty (participating TH!NK Faculty or others) with helpful teaching strategies and activities for implementing more critical and creative thinking into the curriculum and classroom. Many of the resources included align with multiple stages of the critical and

creative process, and the alignments are explicitly shown on each sheet. These sheets are available at https://think.dasa.ncsu.edu/teaching-strategies-2/[8].

- **Workshop slides** from the May TH!NK Institute are available at https://think.dasa.ncsu.edu/workshop-resources/[9]. While we make these available, the TH!NK Institute is a dynamic event requiring participant engagement and so the workshop slides do not fully contain the experience and message of each session.
- A **digital animation illustrating the critical and creative thinking process** available at https://www.aacu.org/node/16265[10] and https://www.youtube.com/watch?v=b5QyOX1u7kA&feature=youtu.be[11].

Student Learning Outcomes

Student learning outcomes assessment is important not only in demonstrating impact, but also in providing data to guide decision-making and to allow for a continuous cycle of improvement in our programs. We relied on student-learning outcome data to guide us in how we would focus Phase 2 of our QEP and to help provide insight into the way our students think to the faculty who teach them.

Table 2, beginning on page 9, summarizes some of the key findings of our student learning outcomes assessment from Phase 1 (first-semester freshmen) of the QEP. Because of the vast amount of student learning outcome data generated, we are only able to show a subset in this ten page report. We have chosen to focus the table on pages 9-10 on outcomes C1 and C2 because we felt that the application of critical and creative thinking skills is a higher order skill than those described in outcomes A and B, and also that many features of outcome D are closely intertwined with the C outcomes. The full analysis of all outcomes is available here[12]. In addition, we have already collected first-year student data (CAT, Common Rubric, and reflective survey) in the vertical integration majors. Senior data will be collected in spring 2020, as that will be the first cohort of students who will be graduating.

The Critical Thinking Assessment Test (CAT) data represents testing of first semester first-year students at the beginning and end of the fall semester, combining fall 2015 and fall 2016, compared to the baseline testing prior to implementation of TH!NK in fall 2013. The Common Rubric data represent scores of first-semester first-year students assigned based on discipline-specific, instructor created assignments, combining fall semesters 2015, 2016, and 2017. Data from the reflective survey was gathered in 2015.

A bird's-eye view of the data points to gains in a greater number of unique critical thinking skill areas as assessed on the CAT in 2015 and 2016 compared to the 2013 pre-TH!NK baseline year. Prior to implementation, planners of the QEP targeted the "emerging" level on the Common Rubric as the level we hope to bring our students to over the course of their first semester. On average, we hit that benchmark for most rubric dimensions. The dimensions of "intellectual risk taking" and "recognizing assumptions" appear to be the areas where our students have the most room for improvement. Regardless, our students have room to grow in all skills identified in the Common Rubric, and that is one reason why we decided to expand TH!NK into upper-level courses.

Analyses looking at correlation between students' level of epistemological development, as measured by the Epistemological Beliefs Survey (EBS), and ability to make gains in critical thinking, as measured by the Critical thinking Assessment Test revealed, not surprisingly, that students who arrive on campus with more highly developed epistemological beliefs were able to make greater gains in critical thinking in the first semester compared to students arriving at a lower level of epistemological development. This points to a need to explore ways that we can help students develop epistemologically. An unexpected phenomenon we observed is that individual students' EBS scores decreased from the beginning to the end of the semester, possibly indicating that the challenges of the first semester in college decreased students' confidence in their abilities. This phenomenon

underscores the need for faculty and advisors to set realistic expectations regarding the challenges of college-level work and that it is normal to struggle in the beginning.

Section 4: a reflection on what the institution has learned as a result of the QEP experience

First and foremost, we learned about the way our students think. We identified what skills they have that are strong when they arrive to us and the skills they need the most support in building. This has led to a lot of reflection on the part of participating faculty on what aspects of critical and creative thinking they were already offering students practice and feedback in, and which skills we/they need to focus on more. Participating faculty also have focused on providing feedback on students' thinking and work *process*, rather than simply their final work *product*.

We learned that our undergraduate student body arrives on our campus with exceptional critical thinking skills in many areas. Our first-year students, on average, score higher on the Critical Thinking Assessment Test than seniors nationally. However, the kind of thinking that the CAT measures is mostly convergent thinking where one can arrive at a correct answer. Through the use of our TH!NK Common Rubric, we recognize that our students are at emerging stages in many aspects of creative thinking, and also aspects of critical thinking where there may not be a "correct answer." Notably, the skills that our students struggled the most with were recognizing assumptions and intellectual risk taking. In addition, we learned that regardless of course, students at a higher level of epistemological development are more likely to make gains in critical thinking.

We learned that our faculty are eager to help students increase their critical and creative thinking skills, but most were not aware of the diverse array of evidence-based pedagogical strategies to do so, nor did they have tools to understand students' thinking process, or language to aid in providing feedback. This was especially true in areas of creative thinking. TH!NK faculty embraced the critical and creative thinking process and implemented those pedagogical strategies that fit best in their own courses. TH!NK Faculty overwhelmingly report a permanent adoption of these teaching methods, and have integrated them not only into their TH!NK courses, but all of their courses. Our faculty are willing to take intellectual risks in their own classroom to benefit students.
We learned that our faculty respond very well to peer mentors. If our next QEP requires faculty development, we should strongly consider the use of the Faculty Fellow model again. Below is some feedback about the Faculty Fellows/Peer Mentors from the faculty participant survey.

"Having peer mentors was very encouraging. I love to hear the great ideas of others and ask how to implement strategies that did not go as well as desired. This was a great selling point in encouraging others in my department to join TH!NK."

"I highly value the relationship of THINK fellows in the enhancement of my THINK course. Forming these relationships in the THINK training has enabled me to meet other members of the faculty from different colleges and disciplines, and I have learned from their different perspectives and approaches to critical and creative instruction."

To summarize, the TH!NK QEP has resulted in a significant transformation of the culture of teaching on our campus. As evidence of institutionalization, the Provost has committed continued funding of faculty development related to enhancing students' critical and creative thinking skills. Beginning July 2020, TH!NK will transition to being integrated into the Office of Faculty Development (OFD). The TH!NK Director will work closely with staff in the OFD to put together a proposal by November 2020.

Key Findings				
QEP Outcome	**Sub-Outcome**	**Instruments**	**Results**	**Summary**
C1. Students will apply critical thinking skills and intellectual standards in the process of solving problems and addressing questions.	Gathering and Assessing Relevant Information	Reflective Survey, 2015 (N=2,082 first year students enrolled in TH!NK courses)	•68% of first year students reported "moderate" or "great" gains in their thinking behaviors related to gathering information and evaluating it for accuracy, relevance, and bias.	Throughout the semester, small gains were observed in first year students' abilities to gather and evaluate relevant information. Post-mean scores were higher in fall 2015 and fall 2016 than our fall 2013 baseline across all relevant CAT questions for this outcome.
		Critical Thinking Assessment Test, fall 2015 and fall 2016 (Implementation) (N=766 first year students enrolled in TH!NK courses) Pre- and post-testing was conducted within the same semester. Question: 10	•Q10: A small positive effect size (+.15) was observed between the pre- (mean=3.33) and post-mean (mean=3.46) scores.* The average post-mean was higher for 2015-2016 (mean=3.46) than for our baseline in 2013 (N=248, mean=3.35).	
		Common Rubric Dimensions, 2015-2017 Selecting & Analyzing Information (N=964 first year students enrolled in TH!NK courses)	•On a scale of 1-4 where 4 is capstone, the mean score for students in this dimension was 1.90; 45% of first year students received a score of 2/"emerging" in this dimension. 2 was the most frequently awarded score.	
	Reaching Reasoned Conclusions and Testing Conclusions Against Standards	Reflective Survey, 2015 (N=2,079 first year students enrolled in TH!NK courses)	•68% of first year students reported "moderate" or "great" gains in their thinking behaviors related to checking that conclusions are logical and follow from evidence; 27% of first year students reported "great" gains in this area. This is the highest percentage of self-reported "great" gains for any dimension.	Throughout the semester, small gains were observed in first year students' abilities to reach reasoned conclusions. First year students made greater gains in more areas in fall 2015 and fall 2016 than in our fall 2013 baseline. Additionally, first year students made greater gains in more areas in fall 2015 and fall 2016 than our fall 2014 pilot year for relevant CAT questions.
		Critical Thinking Assessment Test, fall 2015 and fall 2016 (Implementation) (N=766 first year students enrolled in TH!NK courses) Pre- and post-testing was conducted within the same semester. Questions: 2, 11, 13, 14, 15	•Q2: A small positive effect size (+.28) was observed between pre- (mean=1.25) and post-mean (mean=1.54) scores.* •Q11: A small positive effect size (+.27) was observed between the pre- (mean=0.82) and post-mean (mean=0.99) scores.* •Q13: Post-mean scores (mean=1.34) were higher than pre-mean scores (mean=1.28). •Q14: A small effect size (+.20) was observed between the pre- (mean=2.59) and post-mean (mean=2.94) scores.* The average post-mean was higher for 2015-2016 (mean =2.94) than for our baseline in 2013 (N=248, mean=2.36). •Q15: Post-mean scores (mean=1.17) were higher than pre-mean scores (mean=1.07).	
	Effective Communication	Common Rubric Dimensions, 2015-2017 Effective Communication (N=943 first year students enrolled in TH!NK courses)	•On a scale of 1-4 where 4 is capstone, the mean score for students in this dimension was 2.24. This was the highest mean score across all rubric dimensions; 47% of first year students received a score of 2/"emerging" in this dimension. 2 was the most frequently awarded score.	First year students demonstrated "emerging" skills in their ability to effectively communicate.
C2. Students will apply creative thinking skills and intellectual standards in the process of solving problems and addressing questions.	Synthesizing and Generating Ideas	Critical Thinking Assessment Test, fall 2015 and fall 2016 (Implementation) (N=766 first year students enrolled in TH!NK courses) Pre- and post-testing was conducted within the same semester. Questions: 3, 4, 6, 9, 15	•Q3: A small positive effect size (+.12) was observed between the pre- (mean=1.31) and post-mean (mean=1.43) scores.* •Q4: Pre-mean scores (mean=1.20) were higher than post-mean scores (mean=1.17). •Q6: Pre-mean scores (mean=1.84) were higher than post-mean scores (mean=1.83). •Q9: Post-mean scores (mean=0.92) were higher than pre-mean scores (mean=0.89). •Q15: Post-mean scores (mean=1.17) were higher than pre-mean scores (mean=1.07).	Throughout the semester, small gains were observed in first year students' abilities to synthesize and generate ideas. First year students demonstrated "emerging" skills in their ability to synthesize and generate ideas. First year students demonstrated weaker skills in risk taking.

		Common Rubric Dimensions, 2015-2017 Originality of Thought (N=962 first year students enrolled in TH!NK courses) Risk Taking (N=748 first year students enrolled in TH!NK courses)	•Originality: On a scale of 1-4 where 4 is capstone, the mean score for students in this dimension was 2.01; 45% of first year students received a score of 2/"emerging" in this dimension. 2 was the most frequently awarded score. •Risks: On a scale of 1-4 where 4 is capstone, the mean score for students in this dimension was 1.85; 41% of first year students received a score of 1/"little or no evidence" in this dimension. 1 was the most frequently awarded score.	
	Evaluating Solutions and Consequences	Reflective Survey, 2015 (N=2,079 first year students enrolled in TH!NK courses)	•61% of first year students reported "moderate" or "great" gains in their thinking behaviors related to thinking through the implications/consequences of one alternative over another.	Throughout the semester, some small gains were observed in first year students' abilities to evaluate solutions and consequences. First year students made greater gains in more areas in fall 2015 and fall 2016 than our fall 2014 pilot year for relevant CAT questions. First year students demonstrated "emerging" skills in abstract thinking and their ability to judge appropriateness.
		Critical Thinking Assessment Test, fall 2015 and fall 2016 (Implementation) (N=766 first year students enrolled in TH!NK courses) Pre- and post-testing was conducted within the same semester. Questions: 3, 4, 6, 9, 15	•Q3: A small positive effect size (+.12) was observed between the pre- (mean=1.31) and post-mean (mean=1.43) scores.* •Q4: Pre-mean scores (mean=1.20) were higher than post-mean scores (mean=1.17). •Q6: Pre-mean scores (mean=1.84) were higher than post-mean scores (mean=1.83). •Q9: Post-mean scores (mean=0.92) were higher than pre-mean scores (mean=0.89). •Q15: Post-mean scores (mean=1.17) were higher than pre-mean scores (mean=1.07).	
		Common Rubric Dimensions, 2015-2017 Abstract Thinking (N=850 first year students) Judging Appropriateness (N=960 first year students enrolled in TH!NK courses)	•Abstract Thinking: On a scale of 1-4 where 4 is capstone, the mean score for students in this dimension was 1.97; 42% of first year students received a score of 2/"emerging" in this dimension. 2 was the most frequently awarded score. •Appropriateness: On a scale of 1-4 where 4 is capstone, the mean score for students in this dimension was 1.94; 45% of first year students received a score of 2/"emerging" in this dimension. 2 was the most frequently awarded score.	
Notes	*Denotes a statistically significant difference between pre/post CAT scores. Effect size is calculated by dividing the mean difference by the pooled group standard deviation. (0.1-0.3=small effect; 0.3-0.5=moderate effect; >0.5=large effect). N refers to first year students enrolled in a TH!NK course.			

Reference List

1. Common Rubric [PDF]
2. Metacognitive Awareness Inventory [PDF]
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