Critical and Creative Thinking at the University of Wyoming: Do We Know It When We See It?

A Report for the Ellbogen Center for Teaching & Learning
University of Wyoming

by
Martha McCaughey

March 2023

Table of Contents

Executive Summary……2

The Purpose of this Project……..…..…...3

The Context of the University of Wyoming……3

The Meaning of CCT……..... 6

The Value of CCT…..…….……11

Where and How CCT is Taught at UW…….……..…13

Where and How CCT is Assessed at UW……..……..…21

Conclusions and Recommendations……..……..24

Faculty Development…….……..25

Assessment…….…..28

Communication Strategies……...……..……..29

EXECUTIVE SUMMARY

This report is based on an examination of the status of critical and creative thinking (CCT) in teaching and assessment at the University of Wyoming UW. This information was assembled with the goal of providing recommendations for fulfilling the promise of CCT on campus. While CCT is deemed a key student learning objective by a variety of higher education organizations and stakeholders, and most faculty members believe it is important, faculty members lack a common understanding of and language for CCT and often are not purposeful in teaching or assessing it. CCT has not been assessed systematically on campus since 2017, the final year of the Critical Thinking Assessment (CAT Test) project on campus. While the Ellbogen Center for Teaching and Learning's CCT Division has helped many faculty members incorporate CCT into their pedagogy, and CCT is expressly part of the University's current general education curriculum (referred to locally as the University Studies Program 2015 or USP), the university has many untapped opportunities to engage in faculty development and assessment that will ultimately improve students' development of CCT skills. In addition, individual faculty members and the university as a whole have many opportunities to improve their communication about CCT—what it is and why it's valuable—to students, faculty, and outside stakeholders. This is particularly important in the current climate in which many people question what takes place in college classrooms and the value of a college education. The current USP is undergoing revision, assessment efforts are being renewed, and the university has new leadership, all of which offer the possibility to position CCT as the backbone of student learning outcomes and the teaching and assessment of CCT on the frontstage not only in faculty and curricular development but in university communications as well.

THE PURPOSE OF THIS PROJECT

The purpose of this project, undertaken February-June, 2022, was to determine what the University of Wyoming is doing to teach and assess critical and creative thinking (CCT), including what constraints faculty and academic units face, and assemble this information along with any recommendations for fulfilling the promise of CCT on campus. Data gathering for this project included conversations with faculty and staff in the ECTL, participation in an interdisciplinary faculty reading group on CCT, interviews with various members of the USP 2015 revision task force (Next Generation General Education Committee, NGGE), an examination of academic units' public-facing online materials pertaining to their undergraduate degree programs, and reviewing the local and national conversations about CCT, curricular reform, and student learning objectives. This report will ideally help the ECTL to assess institutional readiness, consider the campus context, and identify needs and potential pathways for planning and implementing professional development around CCT. This can inform the steps for planning actions that help the faculty enhance high-impact learning practices for students to develop CCT skills.

CONTEXT OF THE UNIVERSITY OF WYOMING

As of 2019, 27.3% of the workforce in Wyoming has a college degree. By comparison, Montana is at 33.6%, Nebraska is at 34.1%, and Colorado is at 42.5%. And yet, Wyoming has a greater proportion of high science, engineering, and technology employment establishments than Montana or Nebraska (9.48% in WY compared to 7.54% in MT and 6.81% in NE). Further, Wyoming's historically resource-dependent economy has become a more diverse mix of

industries, which includes new occupational sectors that require prepared workers. The Bureau of Labor Statistics shows that people in Wyoming today are employed in many occupational categories that often require a college education. For example, 7.3% of all jobs in Wyoming are in the education instruction and library category (with median annual earnings of $50,480); 5.5% of all jobs are in healthcare, including practitioners and related technical workers ($90, 290); 5.2% of all jobs are in management occupations ($96,440); 3.9% are in business and financial operations ($73,170); 1.6% are in architecture and engineering occupations ($83,250); 1.5% are education administrators ($96,270); and 1.1% are in computer and mathematical occupations ($68,770). Nationwide, 63% of high school graduates immediately enroll in college. Although 23.3% of Wyoming high school completers who go on to college leave Wyoming to attend college somewhere else, the majority attend college in the state.

Politicians' concerns, which both reflect and influence popular opinion, underscore the need for all university programs and individual faculty members to illuminate their learning objectives, including their meaning and value.

Wyoming's Department of Education includes both creativity and critical thinking in the performance standards for the state's public secondary schools as part of their "Common Core of Skills" that each student is expected to demonstrate at levels established by the state board of education. This common core of skills is distinct from content knowledge and includes problem-solving; interpersonal communication; computational thinking and computer applications; critical thinking; creativity; and life skills, including personal financial management skills. Clearly, CCT is important to the state of Wyoming even for high school graduates, whether or not they go on to college.

The University of Wyoming is the state's only public four-year college and, to provide access to residents, has one of the nation's highest college acceptance rates (94%). In Fall 2021, UW enrolled 1,453 new first-year students. As of 2018, 66.6% of students enrolled at UW were state residents. A small percentage of UW graduates go on to graduate school. In 2021, only 15.9% immediately went on to additional education or training of any kind. Therefore, it is crucial that the UW undergraduate education helps students build strong CCT skills.

The University of Wyoming's accrediting body, the Higher Learning Commission (HLC), requires that the University offers programs that engage students in collecting, analyzing, and communicating information; in mastering modes of intellectual inquiry or creative work; and in developing skills adaptable to changing environments. It also requires the University to have effective processes for the assessment of student learning. It further requires that the University ensure the quality of its educational offerings and evaluates the success of its graduates. The University's attention to how effectively students develop the learning objectives set out by the university, then, is required for accreditation. UW successfully went through reaccreditation with HLC in 2019 and will go up again for reaccreditation in 2030.

Clear communication about student learning objectives—with stakeholders on- and off-campus—has perhaps never been more important. Recently, in their 2022 budget session, the Wyoming legislature questioned some of the trainings and teachings for UW students, including the 30 credit hours of general studies in the USP 2015. The legislature required the University to report to the joint appropriations committee and the joint education interim committee on the USP and any other extra-major requirements for students seeking non-liberal arts degrees. J. D. Vance, a candidate for U.S. Senator in Ohio, made a speech in 2021 arguing that universities are places where students "learn to hate their country" and places that are disseminating deceit and

lies rather than truth and knowledge. Signaling a broader collapse of public trust in our social institutions including the judiciary, the media, and education, Vance stated that "We have to honestly and aggressively attack the universities in this country." Politicians' concerns, which both reflect and influence popular opinion, underscore the need for all university programs and individual faculty members to illuminate their learning objectives, including their meaning and value. Academic professionals can no longer afford to talk only to other academics who already understand their goals. As Andrew Sullivan put it in 2018, "We all live on campus now."

THE MEANING OF CCT

In a set of three lectures delivered at the turn of the 20th century on "The School and Society," John Dewey defined critical thinking as "the active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends." CCT is an approach to knowledge that depends on and fuels open inquiry, curiosity, truth-seeking, artistic expression, and problem-solving. In 1873 John Stuart Mill described the disciplined mind as characterized by an unending habit of (re)discovery and (self-)correction while connecting important ideas to one another. Steven Pearlman, founder of the Critical Thinking Institute (formerly the Critical Thinking Initiative), describes critical thinking as an ability to answer a question through analysis and evaluation of the assumptions, limitations, interpretations, and validity of evidence. Contemporary scholar Steven Pinker, author of *Rationality: What It Is, Why It Seems Scarce, Why It Still Matters*, shows how CCT is a corrective to irrationality when he argues that the use of reason helps people overcome generators of delusions such as tyrannical authority, emotional

reactions, and superstition. CCT is crucial to overcoming unexamined cognitive biases and effectively evaluating and solving problems.

Students sometimes mistake CCT for habitually criticizing people or things, or developing a skeptical disposition, or having an eagerness to express an opinion about something. But, on the contrary, CCT skills can help students gain respect for and awareness of unfamiliar ways of thinking that will oftentimes necessarily trump their own. CCT skills enable a person to think clearly by identifying, understanding, and evaluating relevant information, claims, and arguments. CCT also involves the ability to show a logical line of reasoning as well as an awareness of the implications or consequences of the position one is taking. Further, CCT skills give one the ability to explain one's own assumptions as well as those of others. CCT involves fair-mindedness and openness—so that one can show sensitivity to alternative points of view, revise one's thinking, and follow an argument wherever it leads. CCT helps people view the world with fewer unexamined assumptions; in other words, to perceive a speaker or their argument fairly and avoid missing out on something by virtue of one's own assumptions.

> ***"General education courses are a prime opportunity for schools to help students develop the skills that can apply to future jobs, such as a general knowledge of college-level math, critical thinking, and the ability to communicate clearly."***
>
> **– American Council of Trustees and Alumni "What Will They Learn?" Project**

In 2019 the American Council of Trustees and Alumni, a nonprofit organization that promotes academic excellence, academic freedom, and accountability at America's colleges and universities, launched the "What Will They Learn?" project to evaluate the general education

requirements at over 1,000 colleges and universities across the U.S. This project began out of a concern expressed by employers, college graduates, and citizens that college students are not learning core skills they need to succeed in today's workplaces. Premised on the belief in the importance of a general education, the What Will They Learn? project embraces the idea that "general education courses are a prime opportunity for schools to help students develop skills that can apply to future jobs, such as a general knowledge of college-level math, critical thinking, and the ability to communicate clearly." The fact that 36% of college students improve very little in their critical thinking skills suggests they are not receiving a well-rounded, general education. The project, therefore, looks for content-rich general education requirements (which ACTA defines as a combination of composition, literature, intermediate-level foreign language, U.S. government or history, economics, mathematics, and natural science), and reports annually on how well schools measure up, assigning each school a letter grade.

To address the needs of 21st Century students in a globally connected, information-saturated world, the Association of American Colleges & Universities (AAC&U), which has some 1,400 member institutions across the nonprofit higher education sector, launched the Liberal Education and America's Promise (LEAP) initiative in 2005. The LEAP initiative generated updated general education recommendations, and many colleges and universities, including UW, have enacted, at least in part, these curricular changes over the past 15 years. The LEAP initiative's four essential learning outcomes are Knowledge of Human Cultures and the Physical and Natural World; Intellectual and Practical Skills (CCT is included here); Personal and Social Responsibility; and Integrative and Applied Learning. While all student learning objectives can work in a complementary fashion, CCT can be seen as the backbone of all learning goals in a general education. The LEAP initiative recommends that the skills associated

with CCT should be practiced *across the curriculum* so that students can progressively encounter more challenging problems, projects, and evaluative expectations.

As Derek Bok, past President of Harvard University, has noted, some of AAC&U's recommendations strike some faculty members as noncollegiate, in that they are applied skills that appear to take away from the content faculty members need to teach, or are too ambitious, in that few faculty can teach the skills. In this light, CCT is perhaps the least controversial of AAC&U's recommendations, a core learning objective that can be embraced whether or not some of AAC&U's other recommendations are taken up.

Independent of the AAC&U, multiple interest groups in the 21st Century have championed an array of student learning outcomes they deem necessary to solve today's social problems, find employment, become engaged citizens, and lead fulfilling lives. Of these, CCT is probably the least controversial and can be seen as a bedrock for many other laudable learning goals, such as civic preparedness, information literacy, digital and media literacy, intercultural competence, climate literacy, and financial literacy. For instance, critical thinking is now seen as an important component of information literacy skills, and as such must be taught and assessed in connection with information literacy instruction. Moreover, CCT even plays a role in students' development of other laudable skills and characteristics such as conscientiousness, personal responsibility, character development, and the pursuit of what is noble and good. Finally, CCT is self-referential, so that students can apply the purposeful, reflective judgment of CCT to become more effective learners and also more capable of what pioneering scholar of meta-cognition John Flavell called "wise and thoughtful life decisions."

While CCT looks different across disciplines, and some faculty may see CCT as first requiring the mastery of discipline-specific skills, the importance of meta-cognition, or "thinking

about thinking," is a component of CCT upon which all instructors can likely agree. CCT can be seen as a system of disciplined thinking that can be consciously applied to any subject. Students can learn to learn more efficiently and effectively and to make logical research-driven arguments. Further, because it's not easy to predict how CCT skills learned in, say, physics translate to English literature, or vice-versa, instructors need to be explicit about the specific CCT (and other) skills they want their students to learn so that students can develop meta-cognition strategies and consider whether or not their cognitive strategies are effective.

CCT as a learning objective captures the knowledge, skills, and approaches students should be able to exhibit as a result of the instruction. Learning objectives guide and motivate students by showing them what they can expect and what is expected of them, and why. Learning objectives guide instructors in designing learning activities and assignments to achieve those objectives, and also help faculty members determine appropriate methods for assessing the effectiveness of both teaching and learning. Intentionally incorporating CCT, including meta-cognition, as a learning objective changes an instructor's course design, instruction, assignments, and grading practices.

While many faculty might resist taking a great deal of time to do faculty development, all faculty members do some such professional development during their careers (e.g., learning to use computers and email was common in the 1990s, and workshops on diversity and inclusion have been more common recently). Most faculty members express a commitment to CCT and its importance for their students, so they are likely to be open to the kind of professional development that will help them help students achieve such a lauded goal. Indeed, faculty members across disciplinary and other divides tend to agree on the importance of helping their students become intellectually curious, innovative, critical and creative thinking, life-long

learners. Moreover, given that only a small percentage of UW graduates go on to graduate school (in 2021, only 15.9% immediately went on to additional education or training of any kind), the faculty cannot assume that the students will go on to opportunities to learn these skills after their bachelor's degree is complete.

THE VALUE OF CCT

The AAC&U points out that CCT skills (and the skills gained from a liberal or general education more broadly) are not only skills valued by employers but also skills necessary for adapting to changing economic realities, for flourishing in one's personal life, and for engaged citizenship. Students' acquisition of CCT skills is urgently needed for addressing the challenges of economic and climate volatility, global political conflict, fast-paced technological change, political polarization, and a crisis in public trust in the social institutions that undergird our democracy. CCT skills, then, have both short-term and long-term benefits to individual students as well as to society as a whole. The benefits of education understood this way moves us out of an "ivory tower" mindset and into what Carol Geary Schneider, past president of the AAC&U, described as "a distinctively American 'can-do' mindset."

CCT can help students think through taken-for-granted interpretations and generate new interpretations. A person with CCT abilities is more cautious in their judgments because they seek to judge based on careful knowledge rather than first impressions, gut feelings, or irrational beliefs. CCT helps students develop the tools with which they can identify and counter normative and/or hegemonic processes and their effects. CCT helps people move beyond taken-for-granted frameworks and serves to counter groupthink. CCT can also help people gain

empathy for others as they begin to understand the context for others' arguments and perspectives. Teaching students CCT skills enables them to think independently using reason and evidence, and by adhering to the methods of investigation or analysis in their major discipline. This is the opposite of asking a student to follow some sociopolitical agenda imposed by or for some group. As such, CCT is self-empowering; there is an immediate benefit of CCT for the individual learner. There may also be a broader benefit of CCT insofar as it helps cultivate a climate of rational discourse, something that many commentators say has declined in our society and, according to recent reports, on college campuses.

Teaching students CCT skills enables them to think independently using reason and evidence, and by adhering to the methods of investigation or analysis in their major discipline. This is the opposite of asking a student to follow some sociopolitical agenda imposed by or for some group. As such, CCT is self-empowering; there is an immediate benefit of CCT for the individual learner. There may also be a broader benefit of CCT insofar as it helps cultivate a climate of rational discourse.

Creative thinking, specifically, has been extolled by Doris Sommer, author of *The Work of Art in the World: Civic Agency and Public Humanities*, for its value in solving big problems: "Thinking like an artist is a condition for tackling social, economic, ethical, and political challenges." Aesthetics help students develop a sense of judgment in conjunction with the sciences and professional fields like business. Creative thinkers engage in reason and consider new approaches to reach appropriate answers to questions. Thinking like an artist is thinking that understands divergent risks and innovative changes. While some people assume that the liberal arts fixate on self-absorbed grievances, CCT

actually takes individuals out of personal grievances. As Sommer put it, "the artist is not a victim"—one's problems and pain are turned into creative opportunities for transformation. This is one more way that CCT is an empowering habit of mind.

WHERE AND HOW CCT IS BEING TAUGHT AT UW

All academics seem to agree that CCT is an essential part of a college education, and many college instructors would probably say their courses help students develop CCT skills. In some ways, however, CCT has fallen into the background and is invisible. Despite CCT being a common goal that enjoys widespread support, few members of the faculty actually pay attention to CCT, instead treating it as if it simply shines through the presentations and oozes out of assignments organically. The inattention to CCT by some UW faculty members represents a nationwide pattern, as noted by the Foundation for Critical Thinking:

> Studies demonstrate that most college faculty lack a substantive concept of critical thinking. Consequently, they do not (and cannot) use it as a central organizer in the design of instruction. It does not inform their conception of the student's role as learner. It does not affect how they conceptualize their own role as instructors. They do not link it to the essential thinking that defines the content they teach. They, therefore, usually teach content separate from the thinking students need to engage in if they are to take ownership of that content. They teach history but not historical thinking. They teach biology, but not biological thinking.

CCT is an intellectual virtue that can be cultivated more effectively by paying explicit attention to it. It would be fitting for faculty members who value CCT to explain how their courses teach

and evaluate CCT, since, after all, a hallmark of CCT is being clear, accurate, and precise, and providing evidence of one's claim.

UW students begin developing CCT skills in their First Year Seminar, a 3-hour required course that is part of the USP 2015 curriculum. The six criteria for the CCT student learning outcome (SLO) involve accessing information, distinguishing facts from inferences, evaluating information, synthesizing multiple perspectives, analyzing the relevance of contexts, and communicating ideas in writing, as follows:

UW students begin developing CCT skills in their First Year Seminar, and in other courses in the University Studies Program curriculum. CCT is also embraced explicitly as a student learning outcome in 15 academic degree programs in five different Colleges or Schools. At least another ten degree programs list SLOs that overlap significantly with CCT.

1. Access diverse information through focused research, active discussion, and collaboration with peers.
2. Separate facts from inferences and relevant from irrelevant information, and explain the limitations of information.
3. Evaluate the credibility, accuracy, and reliability of conclusions drawn from information.
4. Recognize and synthesize multiple perspectives to develop innovative viewpoints.
5. Analyze one's own and others' assumptions and evaluate the relevance of contexts when presenting a position.
6. Communicate ideas in writing using appropriate documentation.

Clearly, these learning outcomes overlap with the American Library Association's information literacy SLOs (goals 1, 2, 3, and 6) as well as the AAC&U's intercultural knowledge and competence SLOs (goals 4 and 5) and written communication SLOs (goal 6).

First Year Seminar is the one course in UW's USP 2015 curriculum that aligns with all six criteria of the CCT student learning outcome. First-Year Seminars are common across the

United States and are offered at almost all of the University of Wyoming's peer institutions and aspirational peer institutions. These programs increase student persistence and retention, as well as opportunities for meaningful interactions with faculty members and fellow students, and student engagement in co-curricular activities. The UW First-Year Seminar program offers new students a semester-long opportunity to practice CCT skills and learn how to become better learners and thinkers. In light of the nationwide concerns about "coddled" and "self-censoring" students who lack the skills to engage in constructive intellectual deliberation and turn instead to de-platforming, hostile remarks, or silent acquiescence, CCT skills could help new college students rise above these troubling dynamics through the ongoing practice, in their First-Year Seminars, of evidence-based reasoning and rational discourse.

Courses in the categories called Knowledge of Human Culture, the Physical & Natural World, and the U.S. & Wyoming Constitutions in the USP 2015 curriculum teach two of the six criteria of the CCT SLO. The USP 2015 curriculum map below (Figure 1) shows how the various student learning outcomes are met by courses in USP 2015. The USP 2015courses are categorized as follows: (1) Knowledge of Human Culture, the Physical & Natural World, and the U.S. & Wyoming Constitutions (courses: H, PN, and V); (2) Intellectual and Practical Skills (courses: Q, FY, C1, C1, and C3); and (3) Personal & Social Responsibility (no specific courses).

Some of the SLOs in other areas overlap with or rely on CCT, for instance, one SLO for courses in the Physical & Natural World category is to "use quantitative data analysis as the basis for making critical judgments and drawing conclusions." Some SLOs in the Personal & Social Responsibility category overlap with CCT as well, e.g., "understand various perspectives from within diverse traditions of cultures, regions, religions or worldviews" and "recognize ethical issues and separate facts from assumptions."

University Studies Program 2015
Curriculum Map

Student Learning Outcomes	Knowledge of Human Culture, Physical and Natural World, and U.S. and Wyoming Constitutions			Intellectual and Practical Skills					Personal and Social Responsibility
	Human Culture (H) 6 Credits	Physical and Natural World (PN) 6 Credits	US/WY Constitutions (V) 3 Credits	Communication 1 (Com1) 3 Credits	Communication 2 (Com2) 3 Credits	Communication 3 (Com3) 3 Credits	First-Year Seminar (FYS) 3 Credits	Quantitative Reasoning (Q) 3 Credits	
Knowledge of Human Cultures	X Must Meet 3 out of 6 SLO criteria								
Knowledge of Physical and Natural World		X Must meet 3 out of 5 SLO criteria							
U.S. and Wyoming Constitutions			X Must meet 3 out of 3 SLO criteria						
Communication Skills • Introductory Level • Intermediate Level • Advanced Level				X Must meet 7 out of 7 SLO criteria	X Must meet 7 out of 7 SLO criteria	X Must meet 7 out of 7 SLO criteria			
Critical and Creative Thinking	X Must meet 2 out of 6 SLO criteria	X Must meet 2 out of 6 SLO criteria	X Must meet 2 out of 6 SLO criteria				X Must meet 6 out of 6 SLO criteria		
Quantitative Reasoning								X Must meet 3 out of 3 SLO criteria	
Personal and Social Responsibility (7 student learning outcomes)									X Unique experiences depending on the coursework and co-curricular activities chosen by students

Figure 1. USP 2015 Curriculum Map. Source:

http://www.uwyo.edu/assessment/SLO/index.html

CCT will surely be central to the forthcoming proposal for a revised USP curriculum, which UW is in the process of designing. UW's general studies program was first instituted in 1991, revised in 2003, and updated again in 2015. In Spring 2022 the committee charged with leading the current revision effort sought the input of the faculty. Only 55 faculty members responded to the survey to offer their input on potential USP revisions, however. That said, the survey results indicated that faculty value CCT and effective communication a great deal (36.4% listed "think critically" and 46.8% listed "proficiency in writing"—the top two answers to the question of what students should be able to do after completing a strong, effective general studies program). However, the survey results also revealed that faculty members do not necessarily know where CCT is being taught. For only 13% of respondents said they thought

First Year Seminar was effective, while 24% said it was ineffective, despite the fact that all FYS courses teach all six of the CCT learning objectives. This indicates either that faculty members realize CCT is taught in FYS but do not believe FYS teaches it well enough, or that they do not know how and where CCT is being taught in the USP 2015 curriculum and therefore do not value the course that embraces the very learning objectives they also embrace.

CCT is also embraced explicitly as a student learning outcome in 15 academic degree programs in five different Colleges or Schools. At least another ten degree programs list SLOs that overlap significantly with CCT even though they do not use the words "critical and creative thinking." (Note, however, that not all academic units have posted SLOs.) The chart below captures the various academic units at UW and notes whether they mention CCT explicitly in their stated program-level Student Learning Outcomes, list SLOs similar to CCT, or list SLOs that do not include CCT (Figure 2). Those units not reporting SLOs on their public-facing website are noted as well. In some cases, academic units refer to a larger body that inspires or drives their specific SLOs, such as the AAC&U or a college- or discipline-specific accrediting agency (e.g., Council on Social Work Education), or the report of a discipline-specific professional organization (e.g., the Center for the Advancement of Pharmacy Education).

Unit-Level SLOs: Presence or Absence of CCT

	CCT MENTIONED	SIMILAR TO CCT	CCT NOT MENTIONED	NO SLOs POSTED
College of Agriculture and Natural Resources:				
Agricultural Communications			x	
Agriculture & Applied Economics			x	
Animal Science				x
Bachelor of Applied Sciences--Organizational Leadership		x		
Ecosystem Science & Management	x			
Family & Consumer Sciences	x			
Molecular Biology		x		
Plant Sciences		x		
Veternary Sciences	x			
College of Arts and Sciences:				
African American & Diaspora Studies	x			
American Indian Studies			x	
American Studies				x
Anthropology				x
Art				x
Botany		x		
Chemistry	x			
Chicano Studies/Latina/o Studies			x	
Communication & Journalism			x	
Criminal Justice			x	
English			x	
Gender & Women's Studies	x			
Geography			x	
Geology & Geophysics	x			
Global & Area Studies				x
History				x
Life Sciences	x			
Mathematics			x	
Modern & Classical Languages	x			
Music			x	
Philosophy	x			
Physics & Astronomy			x	
Political Science				x
Psychology				x
Religious Studies	x			
Sociology				x
Statistics				x

Theatre & Dance			x	
Zoology & Physiology			x	
College of Business:				
Accounting & Finance				x
Economics				x
Management & Marketing			x	
College of Education:				
Adult Learning & Technology				x
Counselor Education			x	
Curriculum & Instruction				x
Educational Leadership				x
Ph.D. & Ed.D. in Education				x
Special Education				x
Wyoming Teaching Education Programs				x
College of Engineering and Applied Science:				
Atmospheric Science				x
Architectural			x	
Chemical				x
Civil		x		
Computer Science		x		
Electrical & Computer Engineering		x		
Mechanical		x		
Petroleum				x
College of Health Sciences:				
Communication Disorders			x	
Kinesiology and Health	x			
Nursing		x		
Pharmacy		x		
Social Work	x			
College of Law:				x
Haub School of Environment and Natural Resources:				
Environment & Natural Resources	x			
Environmental Systems Science				x
Outdoor Recreation & Tourism Managment				x
School of Energy Resources:				
Energy Resource Management & Devel.	x			

Figure 2. Unit-level SLOs Indicating the Presence of CCT

Even if course syllabi were easy to attain, it would be difficult to look to individual course syllabi to determine whether and how CCT is being taught because the University does

not require assignment details or week-to-week schedules of activities to be listed on syllabi. A syllabus may list CCT as a student learning outcome, but there's often no way to know what, if anything, the instructor is actually doing to teach CCT skills or evaluate the students' development of such skills. Teaching some USP 2015 courses, such as the First Year Seminar, requires completing a proposal form in which the instructor explains how their activities and assignments align with each of the six CCT goals. These are not necessarily on the syllabi, but are spelled out on the proposal and reviewed by a faculty committee.

The Ellbogen Center for Teaching and Learning (ECTL) has a Critical and Creative Thinking Division, which stimulates dialogue about CCT and supports instructors in developing and implementing research-based CCT pedagogies. The ECTL's CCT Division has organized workshops, learning communities, book discussion groups, and faculty development institutes. Book discussion groups have read, for instance, *America's Critical Thinking Crisis: The Failure and Promise of American Education* and *Foundations for Critical Thinking*, as well as articles about how to help students develop CCT skills. The CCT Division also featured a panel of several faculty members who described their pedagogy and shared their assignments for teaching CCT. Faculty across all ranks and all colleges have participated in the CCT Division's programs. Participants have gone on to incorporate CCT concepts in, for example, UWYO 1600-01, an FYS for Veteran's Services; ENGL 1010, "College Composition and Rhetoric"; ENGL 2015, "College Composition and Rhetoric II: College and Career"; HIST 2020, "American Military History"; and HIST 4030, a senior capstone course on historiography.

Not all faculty are participating in these professional development opportunities, however, and it seems that faculty members and academic units across the campus are sometimes using different terminology for what might be the same student learning outcomes. For example,

the undergraduate degree program in botany states that students will be able to "practice the skills of the scientific method," which surely overlap with CCT skills. The campus simply lacks a common language, even if faculty members agree on the goal of students truly mastering something to the point that they can engage that material in critical and creative ways.

It's possible, then, that all UW students are developing and practicing CCT skills throughout the curriculum, in accordance with best practices articulated by AAC&U's vertical model of integration. But it's also possible that students do not actually get enough courses that aim to teach CCT, or that students are exposed to it in bits and pieces, without knowing it and without anyone assessing their CCT growth. For this reason, assessment of CCT is just as important as articulating the goal of CCT and knowing where it is being taught.

WHERE AND HOW CCT IS BEING ASSESSED AT UW

While some academic units post both learning objectives and an assessment plan on their websites, no assessment data on CCT specifically could be found on departmental websites. At present, it appears that CCT is not currently being assessed whatsoever, and the members of UW's team of college assessment coordinators were unable to share any information about CCT being assessed at this time. However, one approach might be for the Division of Assessment and Scholarship of Teaching and Learning (SoTL) to work with the college-level assessment coordinators to implement a new plan to assess CCT. To be sure, whichever SLOs the Next Generation General Education Committee (NGGE) identifies, such SLOs will need to be specific (rather than broad) so as to be measurable. This will enable assessment to be worked into the revised curriculum.

From 2011 until about 2017, UW used the Critical Thinking Assessment (or CAT Test), created by Tennessee Tech and used by multiple universities. Around ten UW units with an identified critical thinking SLO participated in that project—pharmacy, social work, the College of Business, nursing, agriculture, kinesiology & health, veterinary sciences, zoology & physiology, and life sciences. Over 800 UW students were tested each year. Unlike other nationally developed tests, the CAT was facilitated by university faculty, some of whom traveled to Tennessee Tech for training in the scoring techniques. Scoring sessions lasted approximately eight hours, and faculty scorers received modest compensation for their time.

Unfortunately, the CAT test assessment initiative had difficulty continuing after the original set of trained faculty members moved on to other positions or retired because the program lacked the necessary resources. Leadership changes also made it difficult to sustain the momentum, and eventually, the CAT test was no longer administered. It is unclear whether students in any particular academic unit scored higher on the CAT test than other students, or how any results gleaned from this assessment effort informed curricular or pedagogical changes in any given participating unit. While it is possible that some academic units are actively assessing their students' development of CCT, it is also possible that CCT has not been assessed since the days of the CAT test.

In October 2020, a small team from UW attended the HLC Assessment Academy and submitted the "HLC Assessment Academy Plan," which is a 4-year plan that serves as a guiding document for renewing institutional assessment for student learning work on campus. Institutional assessment for student learning has not taken place at UW since 2015-2016 – supporting the institution to engage in meaningful assessment for student learning that

encourages inquiry and dialogue to utilize assessment data to impact practice, pedagogy, and curricula to better support all learners is a top priority.

To support the "HLC Assessment Academy Plan" the following has occurred: 1. Assessment for Student Learning Survey (report made public to campus community November 2021); 2. Monthly meetings for Assessment Coordinators & HLC Assessment Academy Team; 3. Formation of "Assessment for Student Learning Working Group;" 4. Partnership with Student Affairs to launch the National Survey for Student Engagement (NSSE) and Faculty Survey for Student Engagement (FSSE) in Spring 2022 ("NSSE Open Comments" report accessible on the UW website – tailored to instructors inquiring into comments related to assessment, teaching and learning); 5. Support "Closing the Loop" – ECTL Assessment Academy (March 2022 – 38 participants), Assessment Learning Communities (Spring 2022, six programs participating, & Academic Year 2022/2023, two programs participating), Student Learning Outcomes Workshop, Curriculum Mapping Workshop, and individual program and department consultations upon request; 6. Assessment Matrix Pilot Program – utilizing a curriculum mapping tool developed by Dr. Francois Jacobs at UW (4 programs currently participating, one to be added in Spring 2023, and will be utilizing this tool to map the current USP2015 beginning January 2023); 7. Developed the "University of Wyoming Institutional Assessment for Student Learning Plan" (made available to the campus community in September 2022).

Page 15 of the "University of Wyoming Institutional Assessment for Student Learning Plan" outlines the work for USP2015 and NGGE assessment. It is important to note that the Office of Assessment is represented on the USP Committee and the NGGE Committee. *Currently,* the USP2015 and institutional learning outcomes (ILOs) are the same – thus, the inclusion of CCT-related SLOs will be assessed through the assessment of USP2015. Support for CCT from

the Office of Assessment will be narrowly focused on the assessment of CCT – addressing CCT SLOs, rubrics, and establishing a structure to assess CCT on a regular basis through USP2015 (CCT assessment with an emphasis on "support/closing the loop" will exist as with other institutional assessment for student learning on campus).

CONCLUSIONS & RECOMMENDATIONS

The examination and contextualization of student learning of CCT at UW can help the ECTL plan effectively for potential improvement strategies. The goal, of course, is to support higher levels of student learning and engagement at UW. Clearly, some units embrace CCT and surely many individual faculty members across the campus help students gain CCT skills. More data on campus can always be gathered, but it is also likely that the absence of explicit discussions of CCT across campus signals the need to improve implementation and faculty development efforts, followed up by assessment of these efforts and closing the loop by allowing the results of assessment to inform further faculty development efforts. This ongoing effort would include working on uptake, implementation, workshops, communication, and professional development, then evaluating and revising these efforts as the process continues. Given the crucial importance, and yet invisibility, of teaching and assessing CCT at UW, an aspirational action plan could include the following strategies in the areas of faculty development, assessment, and communication strategies:

Faculty Development

Although faculty members often resist excessive amounts of training and fear extensive course revision will require losing valuable content, improving one's ability to teach CCT is hardly the same as learning to teach some new academic fad. Further, improving pedagogy for CCT is arguably the least costly change faculty members can make to their courses. As Jonathan Haber explains in *The Chronicle*, "Changing colleges to embrace both methods and a culture of critical thinking does not require overhauling education, eliminating courses or even asking professors to sacrifice approaches they have developed and used successfully. It simply involves adding new tools to their arsenal that allow them to accomplish what they already wholeheartedly support: helping students develop the skills needed to think critically about the world."

Faculty development might first have to involve checking faculty members' understanding of CCT through facilitated faculty self-evaluation. The Foundation for Critical Thinking recommends an assessment of faculty understanding of critical thinking and its importance to instruction, offering a set of questions they call the "Critical Thinking Interview Profile For Teachers and Faculty." Clearly, faculty development is not a simple matter of reminding faculty members to add SLOs to their syllabi (something some faculty members would resist as "teaching to the test"), but rather working with faculty to help them understand how to align their course activities and assignments with the goal of improving students' CCT skills. Recent research in transparent assignment design indicates that well-designed assignments that include the purpose of an assignment, and the learning outcomes, along with the

tasks to accomplish and the criteria for a successful assignment, improve the learning of all students, especially of traditionally underrepresented minority and first-generation students.

Faculty development takes many forms, of course, from using coaches and mentors to providing faculty with short sessions in which one faculty member shares a pedagogical practice that works well to summer- or year-long immersive institutes or academies. Most universities provide an array of in-person and online faculty development opportunities. These professional development activities themselves can be assessment for faculty growth and, ultimately, student learning growth. As Condon, et al show, faculty development done well translates to documented improvements in student learning.

At a program or department level, faculty members need to be on the same page about what CCT means and have a rubric for assessing whether or not they've successfully taught CCT to their students. Faculty teams could create or revise assignments explicitly designed to produce student work that develops and demonstrates CCT. The Foundation for Critical Thinking offers a guide for department-level self-evaluation. It can be helpful to provide a set of faculty (in First Year Seminar or in other academic units that embrace CCT) a quick reference about CCT, such as a six-sided cube displaying the 6 aspects of CCT, or on a pen with 6 messages.

Sponsoring a set of faculty learning communities can also be an effective way to involve faculty members in efforts to make CCT a more intentional, explicit part of their courses. Recruiting faculty members to participate in efforts to improve their ability to teach and evaluate students' CCT can take many forms, from department- and college-level incentives to awarding stipends to faculty members who have redesigned a course. An example message designed to appeal to faculty to incorporate CCT more intentionally can be found below (Figure 3).

Figure 3. Sample message appealing to faculty.

Assessment

Faculty members will truly know how well their efforts to teach CCT are working only when they assess students' CCT skills. Efforts to design assignments that can meaningfully evaluate students' CCT skills as well as designing program- or unit-level assessment that tracks students' improvement as they move through the curriculum effort can inform efforts to improve pedagogy and curriculum.

In order to better determine which units are engaged in assessment, more information could be gathered by surveying the entire faculty about CCT, or surveying specifically those in the units that identify CCT as a goal of their undergraduate majors. UW's Division of Assessment and Scholarship of Teaching and Learning (SoTL) attempts to track the assessment plans of each degree program and is currently in the process of rejuvenating assessment since annual assessment reports stopped being collected after 2015-16. It might be possible to coordinate with SoTL on efforts to assess CCT.

The CAT Test could be reinitiated, but it would have to continue over multiple years in order to reveal changes in student achievement over time, for instance, to test first-year students and retest those same students years later at graduation. Another assessment option, recommended by the Foundation for Critical Thinking, is the use of the International Critical Thinking Test as well as the Critical Thinking Interview Profile for College Students. A multi-year institutional commitment would be necessary and would have to include the infrastructure behind it for training faculty raters, scoring, analyzing the data, and sharing the results, as well as for involving more academic programs. It is often difficult for faculty members to participate in assessment when it's not clear what will come of their efforts.

The ECTL and/or the Division of Assessment might be able to take advantage of technology to pull assignments from the Canvas online course management system so as to provide a set of artifacts for a team of raters to assess after a calibration session. Since so many courses have students upload their assignments to Canvas, relevant assignments could be tagged CCT (or any other SLO), giving an assessment team easy access to relevant student artifacts. The work of a set of students could be tracked and assessed as the students move through the curriculum from first to senior year so that any learning gains can be charted. Sample student work can be scored using a rubric the faculty creates or using the AAC&U's VALUE rubrics. Student work can also be examined for how well the assignment prompts and grading rubrics include explicit cues to prompt CCT. The sample student assignments could also be sent to the AAC&U for scoring using the VALUE rubrics by their scoring service, although some faculty members believe that subject matter expertise is required for effecting scoring and thus would not trust AAC&U raters. While the scoring services, even if trusted, save faculty time, participation in assessment is itself a faculty development opportunity.

Only with further research and assessment will anyone know how well UW courses and degree programs are teaching students CCT skills, and whether or not CCT is embedded ubiquitously and explicitly. Assessment can be used to identify achievement gaps, track growth, find ways to revise and improve assignments, and steer the adoption of various high-impact practices, the success of which can be judged through further assessment.

Communication Strategies

It became clear that various faculty members cannot point to specific efforts to teach CCT skills, and that those who are involved in teaching CCT do not know who else is involved. Further, there is little agreement on what teaching CCT looks like. Finally, the faculty members

who believe CCT is important do not necessarily see the very courses designed to teach CCT (i.e., First Year Seminar) as effective, indicating a serious incongruence of institutional efforts, values, and communication. A clear communication strategy, aimed at students, faculty, and external stakeholders (e.g., parents of students, taxpayers, legislators) should explain what CCT is, why it's important, and how the university integrates it into specific courses and programs of study.

While it's clear how and why students and stakeholders could gain from clearer communications about CCT at UW, it should be stated that the faculty could benefit from such communication efforts as well, since faculty members generally benefit from students having a clearer appreciation of and investment in their purpose at the University. Faculty members tend to find their instruction time more rewarding when students do not see their course as a simple requirement to check off or as a means simply to get a good-paying job. Communication efforts that help students embrace the short- and long-term value of a college course, and of learning objectives like CCT, can help produce more engaged students who embrace their educational opportunities.

The aforementioned faculty development efforts would certainly help instructors clarify how their courses align with CCT skills and how those benefit students in immediate as well as long-term ways. But there are many ways in which communication about CCT goes beyond individual faculty members. Groups of faculty, administrators, and/or the ECTL could engage in a number of communications to highlight the importance of CCT, for example, to the University's Strategic Plan, to the University Studies Program, to any given bachelor's degree or major, and to various careers for which a given major prepares students.

Beyond this, CCT could become a common narrative, central to the story UW tells about itself. In the parlance of university institutional marketing, CCT could become part of UW's brand promise. As such, websites, student recruitment swag, and programming for prospective and new students would describe the importance of CCT. UW's brand ambassadors (a group that already exists, consisting of enthusiastic students who share stories about the university for promotion and marketing purposes) could include CCT. Summer Bridge programming, which serves several hundred new students annually, new student orientation, and the new Saddle Up program could make a point of introducing students to the importance of CCT at UW. It is not clear whether or not students will be introduced to how CCT fits into the curriculum during Saddle Up. When new students saddle up and take the reins for the ride of their undergraduate education, they should understand that CCT is the horse sense they'll be developing throughout their time in college.

Putting a message about the university's commitment to CCT (what it is, why it's important) in the hands of every college student could be an effort that gains real buy-in from students and their supporters. The message could be on posters, in social media memes, and in the free academic calendar books students are given. Such a message could connect to UW's existing brand promise which includes creative outside thinkers with grit and independence. A sample message poster linked to UW's brand promise is included below (Figure 4). The university could even put the message on a *Sproftacchel* where students can stand in to take their photos and post these to social media.

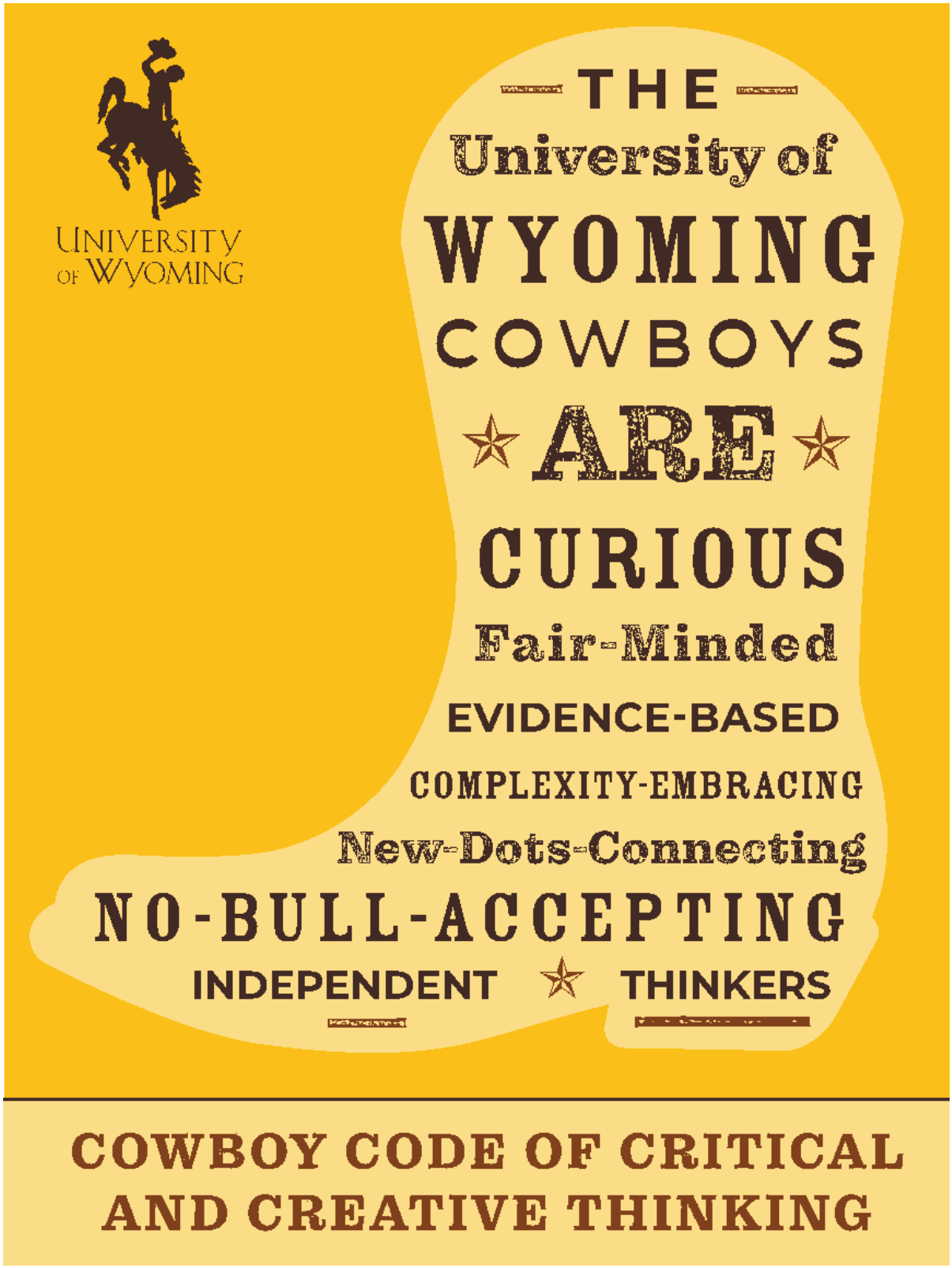

Figure 4. Sample message about CCT geared toward students.

As Constance C. Relihan wrote in a recent article in *Academic Leader*, universities must work to "transform (general education) from a suite of courses that students almost universally just want 'to get out of the way' into an aspect of their university experience that they understand is providing them with the skills and predispositions they will need in the future." The same is true, of course, for CCT skills, both inside and outside the general studies curriculum. Given the broader culture wars over the purpose of the university, what students are learning, and how they're being taught, it behooves individual faculty members, academic programs, and the entire university to have a clear message about student learning outcomes. An example of what a poster about UW's USP could look like is included below (Figure 5).

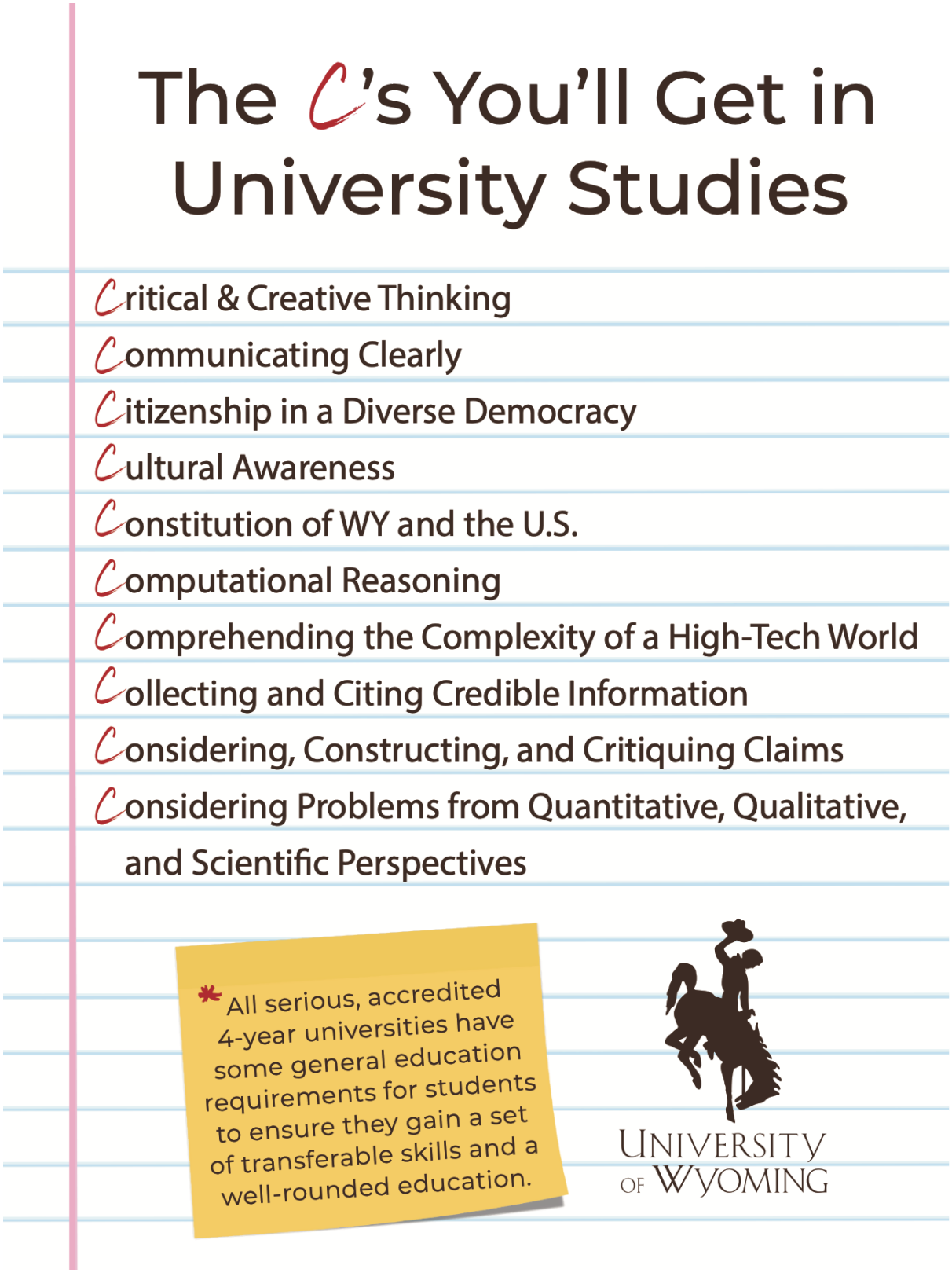

Figure 5. Sample message about the goals of a general education (USP).