

# Thinking and Reasoning

## Definition

Thinking and Reasoning is the ability to analyze and synthesize ideas and evidence, to question assumptions, to weigh alternative interpretations, to draw defensible conclusions, and to derive further questions and ideas.

## Rationale

The habits of inquiry and analysis share common attributes across all disciplines. Successful critical thinkers need to be able to apply those habits in various and dynamic situations. This rubric is intended to apply to a wide array of forms of thinking and reasoning (critical, creative and aesthetic experience-related, quantitative, historical, scientific, etc.). Recognizing that thinking and reasoning skills develop in a variety of learning contexts, the rubric's categories are broadly stated. Thinking and reasoning skills can be evidenced in assignments suitable to each discipline that call for comprehensive exploration of ideas before formulating a conclusion.

## Glossary

**Analysis:** Achieves insight by identifying and appropriately representing components of problems.

**Use of Evidence:** Selects and exhibits information to represent effectively a state of affairs or point of view for purposes of advancing an investigation or establishing a conclusion.

**Questioning of Assumptions:** Productively challenges assumptions; experiments with different approaches.

**Synthesis:** Organizes evidence and/or ideas; achieves coherence; reaches meaningful conclusions.

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	<b>4 - Mastery</b>	<b>3 - Advanced</b>	<b>2- Intermediate</b>	<b>1- Beginning</b>
<b>Analysis</b>	Provides <b>thorough and innovative framing</b> of key components of subject matter leading to defensible conclusions which reflect informed evaluation	Provides an <b>illuminating framing</b> of key components of subject matter	<b>Clearly identifies</b> key components of subject matter	<b>Indicates</b> key components of subject matter or concepts without clearly identifying them
<b>Use of Evidence</b>	Uses substantial, relevant evidence <b>to reveal important patterns, differences, or similarities</b> related to focus	Uses <b>substantial</b> , relevant evidence	<b>Uses relevant</b> evidence	<b>Indicates the kind of</b> evidence that would be relevant but without properly using it
<b>Questioning of Assumptions</b>	<b>Analyzes</b> assumptions & methodologies, giving relevant reasons for their acceptance or rejection	<b>Gives relevant justification of</b> method in awareness of significant issues and assumptions	<b>Recognizes significant</b> issues and assumptions	<b>Begins to recognize</b> relevant context and assumptions
<b>Synthesis</b>	Provides clear, <b>appropriately complex</b> organization, cogent and cohesive argumentation	Provides <b>clear</b> organization, logically consistent argumentation	Demonstrates a <b>basic organization</b> of ideas	<b>Indicates significance of topic</b> without clear organization of ideas

## Communication

### Definition

Communication is the ability to engage as both receiver and producer in the meaning-making process and requires the development and expression of ideas through written, oral, and/or visual means.

### Rationale

This rubric is designed to be used across a variety of communication events and in a variety of communication contexts; it is, therefore, intentionally broad and contextual directed. When utilizing this rubric, assessors should take care to consider the intended audience and context for the communication event under review.

### Glossary

**Content & Development:** Ideas encompass the central point or thesis of the work, the evidence gathered in support of the work, and development of ideas and evidence in tandem.

**Organization:** Organization is the grouping and sequencing of ideas and supporting material in the work.

**Discourse Conventions & Style:** Attention to the rules that constitute appropriate communication to specific discourse communities; in this case, conventions apply both to the mechanics of, say, APA style, and stylistic expectations at large. These would include attention to diction, disciplinary concerns, presentation style, and cultural differences.

**Mechanics:** Refers to the communicator's ability to present work that is fluent, clear, and error-free.

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	<b>4 - Mastery</b>	<b>3 - Advanced</b>	<b>2- Intermediate</b>	<b>1- Beginning</b>
<b>Content &amp; Development</b>	Supports a <b>clear and salient</b> central message with <b>compelling, appropriate and relevant material</b> and conveys a <b>deep and nuanced</b> understanding of the issue(s).	Supports a <b>clear and salient</b> central message with <b>compelling, appropriate and relevant material</b> and conveys a <b>complex</b> understanding of the issue(s).	Supports a <b>clear</b> central message with <b>appropriate and relevant material</b> and conveys <b>understanding</b> of the issue(s).	A central message is somewhat supported by material and conveys <b>basic</b> understanding of the issue(s).
<b>Organization</b>	Demonstrates <b>clear and consistent</b> organizational pattern that provides <b>appropriate</b> shape and a <b>cohesive</b> framework for the content.	Demonstrates <b>clear and consistent</b> organizational pattern that provides <b>appropriate</b> shape and a framework for the content.	Demonstrates an organizational pattern that provides <b>appropriate</b> shape and a framework for the content.	Demonstrates an organizational pattern that provides <b>rudimentary</b> shape and framework for the content.
<b>Discourse Conventions &amp; Style</b>	Demonstrates <b>thoughtful</b> attention to audience and <b>distinctive and engaging</b> execution of <b>important</b> conventions particular to the specific discipline and or task at hand.	Demonstrates <b>thoughtful</b> attention to audience and <b>consistent</b> execution of <b>important</b> conventions particular to the specific discipline and or task at hand.	Demonstrates <b>adequate</b> attention to audience and <b>consistent</b> execution of <b>basic conventions</b> particular to the specific discipline and or task at hand.	Demonstrates <b>basic awareness</b> of audience and <b>inconsistent</b> execution of <b>basic conventions</b> particular to the specific discipline and or task at hand.
<b>Mechanics</b>	<b>Sophisticated</b> use of language and/or communication components that communicate meaning with <b>clarity and fluency</b> and is <b>virtually error-free</b> .	<b>Skillfully</b> uses language and/or communication components that communicate meaning with <b>clarity and fluency</b> and is <b>virtually error-free</b> .	Uses <b>straightforward</b> language and/or communication components that <b>generally</b> communicate meaning with <b>clarity</b> with <b>few errors</b> .	Uses language and/or communication components that <b>frequently</b> communicate meaning with <b>clarity</b> but <b>may have some errors</b> .

## Integrative & Collaborative Learning

### Definition

Integrative and Collaborative Learning is the ability to build connections between curricular and co-curricular ideas and experiences, to synthesize and transfer learning to new and/or complex situations, and to interactively engage one or more persons in shared reciprocal work to achieve purposeful outcomes.

### Rationale

Fostering students' abilities to integrate learning—across courses, over time, and between campus and community life—is one of the most important goals and challenges for higher education. Initially, students connect previous learning to new classroom learning. Later, significant knowledge within individual disciplines serves as the foundation, but integrative learning goes beyond academic boundaries. Indeed, integrative experiences often occur as learners address real-world problems, unscripted and sufficiently broad, to require multiple areas of knowledge and multiple modes of inquiry, offering multiple solutions and benefiting from multiple perspectives. Because integrative learning is about making connections, this learning may not be as evident in traditional academic artifacts such as research papers and academic projects unless the student, for example, is prompted to draw implications for practice. These connections often surface, however, in reflective work, self assessment, or creative endeavors of all kinds. Integrative assignments foster learning between courses or by connecting courses to experientially-based work.

Likewise, students collaborate in many different settings. For example, a given student may work on separate teams to complete a lab assignment, give an oral presentation, or participate in a community engagement project. Furthermore, the people the student works with are likely to be different for each of these teams. As a result, it is assumed that a work sample or collection of work that demonstrates a student's collaborative skills could include a diverse range of inputs.

### Glossary

**Experience:** Learning that takes place in a setting outside of the formal classroom, such as a service learning site, internship site, research project, study abroad, or field course.

**Contexts:** Includes things, such as, family life, artistic participation, civic involvement, and work experience.

**Reflection:** A meta-cognitive act of examining a performance in order to explore its significance and consequences.

**Self Assessment:** Describing, interpreting, and judging a performance based on stated or implied expectations followed by planning for further learning.

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	<b>4 - Mastery</b>	<b>3 - Advanced</b>	<b>2- Intermediate</b>	<b>1- Beginning</b>
<b>Connections to Experience</b>	<b>Meaningfully synthesizes</b> connections among experiences to deepen understanding of fields of study and to broaden own points of view.	<b>Effectively selects and develops</b> examples of experiences, drawn from a variety of contexts to illuminate concepts/theories/frameworks of fields of study.	<b>Compares</b> experiences and academic knowledge to infer differences and acknowledge perspectives other than own.	<b>Identifies connections</b> between experiences and those academic texts and ideas perceived as similar and related to own interests.
<b>Synthesis</b>	<b>Going beyond the prompt, draws conclusions by combining</b> examples, facts, or theories from more than one field of study or perspective.	<b>Going beyond the prompt, connects</b> examples, facts, or theories from more than one field of study or perspective.	<b>When prompted, connects</b> examples, facts, or theories from more than one field of study or perspective.	<b>When prompted, presents</b> examples, facts, or theories from more than one field of study or perspective.
<b>Transfer</b>	<b>Adapts and applies</b> skills, abilities, theories, or methodologies gained in one situation to new situations <b>to solve difficult problems or explore complex issues in original ways.</b>	<b>Adapts and applies</b> skills, abilities, theories, or methodologies gained in one situation to new situations <b>to solve problems or explore issues.</b>	<b>Applies</b> skills, abilities, theories, or methodologies gained from one situation to a new situation <b>to effectively explain problems or issues.</b>	<b>Applies</b> skills, abilities, theories, or methodologies gained for one situation to a new situation, <b>in a basic way.</b>
<b>Engagement in and Contribution to Group Settings</b>	<b>Engages consistently</b> in collaborative group learning, articulation of alternative ideas, and the execution of purposeful outcomes	<b>Engages frequently in collaboration,</b> offering alternative solutions and building on work of others <b>for achieving purposeful outcomes</b>	<b>Makes several meaningful and independent</b> suggestions and engagements <b>to advance</b> the work of the group.	<b>Makes occasional attempts</b> to share ideas and engage with work of the group.

## Problem Solving and Creative Practice

### Definition

Problem Solving and Creative Practice is the ability to synthesize divergent ideas and work in imaginative, innovative ways, including artistic creation, in order to produce new ideas about or propose solutions to challenging, meaningful and complex problems of intellectual inquiry.

### Rationale

Problem solving and creative practice covers a wide range of activities that may vary significantly across disciplines. Problem solving and creative practice are interrelated activities in the sense that a creative exercise can be understood as an exercise in problem solving, and truly effective problem solving is a creative practice. Problem solving and creative practice in higher education can only be expressed productively within a particular domain. The student must acquire a foundation in the strategies and skills of the domain in order to make connections and synthesize. While demonstrating solid knowledge of the domain's parameters, at the highest levels of performance, problem-solving and creative practice pushes beyond those boundaries in new, unique, or atypical recombinations, uncovering or critically perceiving new syntheses and using or recognizing creative risk-taking to achieve a solution.

Activities that cultivate this SLO in students may range from well defined to ambiguous in a variety of settings, including laboratories, studios, and various field settings. This rubric attempts to cover the ways that problem solving and creative practice occurs in a wide range of disciplines. Much of this rubric is designed to measure the quality of a process, rather than the quality of an end-product. As a result, work samples or collections of work will need to include some evidence of the tasks involved in problem-solving and creative practice. Examples of work samples or collections of work that could be assessed for creative thinking may include research papers, lab reports, musical compositions, a mathematical equation that solves a problem, a prototype design, a reflective piece about the final product of an assignment, or other academic works. The work samples or collections of work may be completed by an individual student or by a group of students.

### Glossary

**Problem:** a broadly conceived term designed to include all challenges, dilemmas, obstacles or questions

**Domain:** Field of study or activity and sphere of knowledge and influence.

**Outside of the established domain:** Cognitive pathways that are unexpected and often counterintuitive, analogous, and paradoxical.

**Readymade response:** An already existing option or solution that has not been significantly modified; one that might be used to address a number of different problems in its existing form.

**Tailored:** Sensitive to contextual factors of the problem or challenge including ethical, logical or cultural dimensions.

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<b>Strategy</b>	Develops multiple pathways of approaching a problem, <b>several of</b> which are <b>outside</b> the established problem domain	Develops multiple pathways of approaching a problem, <b>at least one of</b> which is <b>outside</b> the established problem domain	Develops <b>multiple</b> pathways of approaching a problem, all of which are <b>within</b> the problem domain	Develops <b>one</b> pathway of approaching a problem <b>within</b> the problem domain
<b>Response</b>	Formulates <b>multiple responses</b> that are <b>tailored specifically</b> to the problem at hand	Formulates <b>one response</b> that is <b>tailored specifically</b> to the problem at hand	Formulates one <b>readymade</b> response that directly addresses the problem	Formulates one response that is <b>vague or only indirectly</b> addresses the problem
<b>Evaluation</b>	Provides an <b>in-depth</b> evaluation of response/s that <b>comprehensively</b> considers relevant criteria	Provides a <b>in-depth, detailed</b> evaluation of response/s that considers <b>some</b> relevant criteria	Provides an evaluation of the response that considers <b>some relevant criteria</b>	Provides an evaluation of the response that considers <b>few relevant criteria</b>
<b>Innovation and Outcome</b>	<b>Transforms</b> ideas or responses into a <b>coherent and novel form that crosses boundaries</b>	<b>Synthesizes</b> ideas or responses into a <b>coherent and novel</b> whole	<b>Connects</b> ideas or responses in <b>novel</b> ways lacking full coherence	<b>Reformulates</b> a collection of <b>available</b> ideas