Creative Thinking

What is it?

Creativity is best described as the ability to come up with original ideas that have value. From an educational point of view, creativity may therefore be seen as a marrying of creative thinking and critical thinking, where creative thinking refers to the generation of new ideas and is typically coupled with some critical thinking whereby the creator evaluates whether the idea has value or not.

Creative thinking is not just about the process of a creating a thing. It can also be used in coming up with new ways of doing - e.g. a new way of looking at a situation; a new way of solving a problem; identifying alternative explanations; a new process for achieving something; or a new pathway towards a particular goal. Thus, creative thinking may take many different forms in different contexts.

How can students learn to think creatively?

The potential of activities to promote students' creativity and innovation skills is enhanced by framing projects around a significant and engaging question. The question should arouse students' curiosity in order to engender spontaneity and creativity.

Both creativity and innovation usually start with a generative phase of focusing on the ability to generate numerous different ideas; but need to be followed by an evaluative phase to evaluate, structure, organise and translate the ideas into actions.

The following table can serve as a guide to designing tasks or assessments in any subject area.

1. Task Framing	Pose a significant & engaging question/challenge
	Require production of some new ideas or products, or a reorganization of existing ideas in a new way
	Allow for student choice on matters related to the learning outcomes to be assessed (not just on format)
2. Generative Phase	Students identify, explore and organise information & ideas
	Students imagine possibilities, connect ideas, consider alternatives, seek solutions and put ideas into action
3. Evaluating Phase	Students reflect on, adjust and explain the thinking behind their choices, strategies or actions
	Students analyse, synthesise & evaluate their reasoning & procedures
	Students evaluate the worth of the end result

How can creative thinking be assessed?

Assess student work against the criteria students were trying to reach as well as authentic criteria for real work in your discipline. Here are some examples of useful competencies related to creative thinking which can be assessed:

Introduction level

- Adaptation of exemplars to own specifications
- Consideration new directions or approaches
- Consideration and rejecting less appropriate solutions to a problem
- Inclusion of divergent or contradictory perspectives in a basic way
- Experimentation with novel ideas or products
- Connection of ideas or solutions in new ways

Consolidation level

- Creation of entirely new objects, products or solutions
- Incorporation of new directions or approaches to the assignment
- Selection from among numerous alternatives
- Inclusion of divergent or contradictory perspectives in an exploratory way
- Synthesis of ideas or solutions into a coherent whole

Demonstration level

- Reflection on, and evaluation of own creative process
- Seeks and trialling untested directions or approaches
- Awareness of consequences of solution
- Articulation of reasoning behind choices
- Inclusion of divergent or contradictory perspectives in a comprehensive way
- Extension of new ideas, questions or products to create new knowledge
- Transformation of ideas or solutions into entirely new forms

Good practice examples

The following examples are given for an engineering context but could be easily adjusted for other subject areas.

Introduction level – using basic thinking tools

- Example “idea checklist” activity. Students are shown or given details of a device and asked to examine various points, areas and design possibilities for improving the device by making a list of
  - Ways to put the device to other uses
  - Ways to modify the device
  - Ways to rearrange the device
  - Ways to magnify the device
  - Ways to reduce the device

Consolidation level – practicing systematic processes for effective problem solving

- Students are taught systematic problem-solving pathways common to their discipline and provided with opportunities to practice following them.
- Opportunities for practice are provided through case studies, simulations or role plays.
- Example case study activity. Students are given specific situations or cases and asked to

generate potential solutions and evaluate them. Cases may be based on current global issues relevant to engineering to provide relevance and authenticity, and solutions to the cases are known.

Demonstration level – Working with real-life complex problems

- Example complex problem-solving activity. Students are asked to act as professional engineers and using introduction and consolidation level skills must generate ideas, identify key issues, and then ultimately solve current, real world, contemporary, engineering problems with restrictions attached. Problems presented are unsolved.

Adapted from

Association of American Colleges and Universities. (2009). *Creative Thinking VALUE Rubric.* Retrieved from https://www.aacu.org/value/rubrics/creative-thinking

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