

MODIFYING THE VALUE RUBRICS TO ASSESS THE ENTREPRENEURIAL MINDSET

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KEEN ENGINEERING UNLEASHED

Cards EM Series Subnets Forums Events

Hi Blake

Cards ▶ Expanded KEEN Student Outcomes (aka e-KSOs)

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Mindset

Curiosity

- Demonstrate constant curiosity about our changing world
- Explore a contrarian view of accepted solution

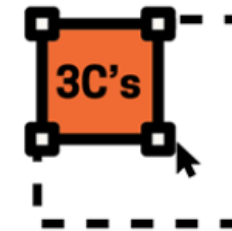
Connections

- Integrate information from many sources to gain insight
- Assess and manage risk

Creating Value

- Identify unexpected opportunities to create extraordinary value
- Persist through and learn from failure

Skillsets



Engineering Disciplines

- Aerospace Engineering
- Agricultural Engineering
- Architectural Engineering
- Arts & Sciences



How do we ASSESS engineering entrepreneurship?

Knowledge of
Entrepreneurial
Concepts

Attitudes Towards
Entrepreneurship

Entrepreneurship or
Innovation Self-Efficacy

What about course- and
activity-level assessment?

Run-down on Rubrics

- Both summative and formative applications
- Transparency and clarity of expectations
- Aids in consistency and reliability of assessment

Criteria	Achievement Levels				
	Excellent	Good	Average	Poor	Not acceptable
State an objective	Describe characteristic features of each level of achievement				



*Association
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VALUE Rubrics

Released in 2009

Cover 16 dimensions including things like creativity, communication, and ethics

<https://www.aacu.org/value>

Learning Outcome → **CRITICAL THINKING VALUE RUBRIC** ← **Definition**

Definition
Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.

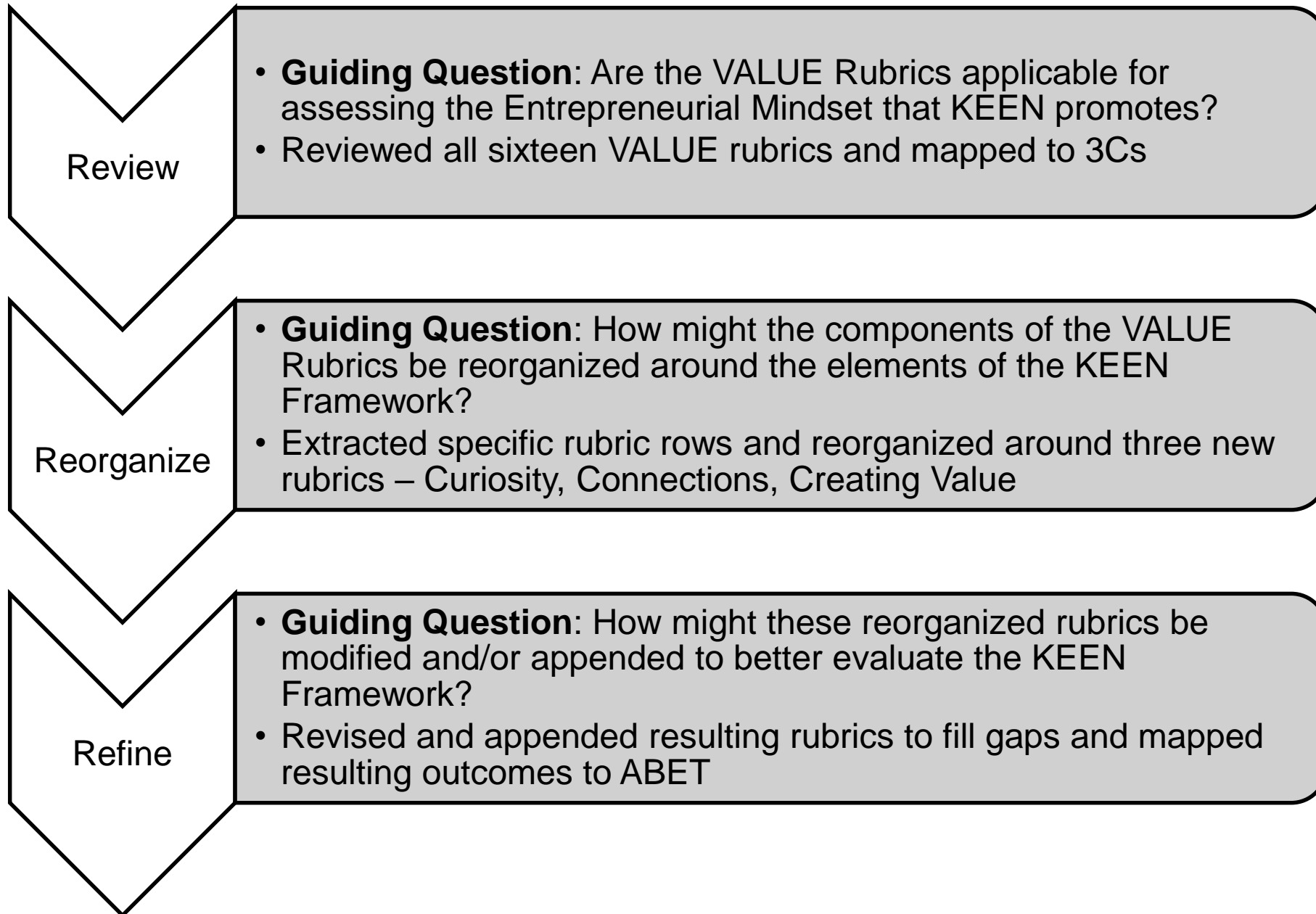
Evaluators are encouraged to assign a zero to any work sample or solution of work that does not meet benchmark performance levels.

Performance Levels

Levels (4,3,2,1,0)	Performance Levels			
	4	3	2	1
Explanation of issues	Issues/problem to be considered critically at various times and discussed comprehensively, delivering all relevant information necessary for full understanding.	Issues/problem to be considered critically at various times, but classified so that understanding is not seriously impeded by omissions.	Issues/problem to be considered critically at various times but incomplete across some issues (undefined, unexplored, boundaries undetermined, and/or backgrounded) omissions.	Issues/problem to be considered critically without comprehensive or description.
Evidence <i>Selecting and using information to investigate a part of one or more issues</i>	Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as merely fact, with little questioning.	Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels omissions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexity of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Other points of view are synthesized within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexity of an issue. Other points of view are acknowledged within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints, related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Dimensions ↑ ↑ **Performance Descriptors**

Study Methods



Results and Use Case

Curiosity

Curiosity	Capstone
<i>Inquisitiveness</i> (ABET-7)	Asks complex questions about certain problems or issues, seeks out and articulates answers to these questions that reflect multiple perspectives.
<i>Skepticism</i> (ABET-7)	Questions information to the highest degree; uses every possible resource to confirm or reject the information.
<i>Openness</i> (ABET-5)	Initiates and develops interactions with people who have differing perspectives; suspends judgment in valuing interactions with others.
<i>Thoroughness</i> (ABET-7)	Explores a topic in depth, yielding a rich awareness and/or little-known information indicating intense interest in the subject.

Connections

<i>Connections to Diverse Disciplines</i> (ABET-7)
<i>Connections to Diverse Viewpoints</i> (ABET-2/4)
<i>Connections to Global Contexts</i> (ABET-2/4)
<i>Connections to Existing Knowledge</i> (ABET-7)

<i>Connections to Personal Experiences</i> (ABET-7)
<i>Connections to Problem Contexts</i> (ABET-2/4)
<i>Connections to Alternative Solutions</i> (ABET-2)

Creating Value

Creating Value	Capstone
<i>Solving Problems</i> (ABET-1/2)	Not only develops a logical, consistent plan to solve problem, but recognizes consequences of solution and can articulate reason for choosing solution.
<i>Identifying Strategies</i> (ABET-1/2)	Identifies multiple approaches for solving the problem that apply within a specific context.
<i>Innovative Thinking</i> (ABET-2)	Extends a novel or unique idea, question, format, or product to create new knowledge or knowledge that crosses boundaries.
<i>Taking Risks</i> (ABET-2)	Actively seeks out and follows through on untested and potentially risky directions or approaches to the assignment in the final product.

Next Steps

- 1) Feedback from constituent groups
- 2) Classroom testing
- 3) Evaluation of validity/reliability

Have feedback?
Take our survey!



Want to help with iteration
and evaluation?

Email: j-hylton@onu.edu

Use subject line:

EM VALUE Rubrics – ASEE 2019

Mapping of VALUE Rubrics to KEEN Framework

VALUE Rubric	Curiosity	Connections	Creating Value
Civic Engagement	2	3	0
Creative Thinking	1	3	0
Critical Thinking	0	3	0
Ethical Reasoning	0	0	0
Information Literacy	0	2	0
Inquiry and Analysis	2	2	0
Integrative Learning	3	3	3
Intercultural Knowledge and Competence	3	3	0
Foundations and Skills for Lifelong Learning	3	0	3
Oral Communication	1	1	0
Problem Solving	0	2	0
Quantitative Literacy	0	0	0
Reading	0	3	0
Teamwork	0	1	0
Written Communication	0	2	0
Global Learning	0	0	0