



Fractious Problem-Solving Skills (FPSS)

Author(s)

Roberta M. Berry

Description

Worksheet describes Five Characteristics of Fractious Problems and Six Skills for Addressing the Characteristics of Fractious Problems To Advance Understanding and Potential Resolutions. Includes a grading rubric and grade sheets.

Body

A. Five Characteristics of Fractious Problems

(1) Novel

- These problems are *generated by rapid advances* in science and technology.
- *We have not encountered* them before.
- *We have not arrived at a broadly shared social understanding* of them.
- *We have not arrived at stable policy resolutions* for them.

(2) Complex

- These problems are *scientifically complex* because *they concern life*.

- They are *psychologically complex* because they implicate our *self-understanding* (as moral agents, as agents with free will, as ensouled persons, etc.)
- They are *socially complex* because they implicate our *understanding of ourselves as social beings* (members of families, ethnicities, religions, disability/difference groups, species, etc.)

(3) Ethically Fraught

- These problems *evoke significant ethical concerns across diverse and sometimes conflicting religious & secular worldviews.*
- They *concern the most sensitive and profound of human experiences* (procreation and parenting; beginning and end of life; death and dying; illness, disability, and suffering; privacy and choice; survival of individuals and of social groups—families, ethnicities, religions, disability/difference groups, species, etc.)

(4) Public

- These problems *resist confinement to the purely private realm* of individual choice.
- The dividing line between their *private and public dimensions will be controversial and contested.*
- The *dimensions that are contested are those that are ethically fraught*—we strive to protect or advance many, often conflicting values associated with shared human experiences of procreation, parenting, etc.

(5) Divisive

- The above 4 characteristics *render these problems socially divisive.*
- *We will struggle to understand and address their novelty.*
- *We struggle with the multiple levels of complexity.*
- Our struggle is *compounded by their ethically fraught nature*—these things really matter to almost all of us across our diverse and sometimes conflicting worldviews.
- Our struggle is *compounded by the contested dividing line between private and public.*

B. Six Skills for Addressing the Characteristics of Fractious Problems To Advance Understanding and Potential Resolutions

(1) Perspectives

Consider *multiple and diverse perspectives*—disciplinary, worldview, life experience—to advance understanding of and potential resolutions addressing:

- *novelty* (multiple and diverse efforts to understand and address)
- *complexity* (scientific, psychological, social)
- *ethically fraught nature* (across worldviews, concerning sensitive and profound)
- *public nature* (contested dividing lines between public and private dimensions)
- *divisiveness* (understand and address incorporating diverse perspectives)

(2) Precedent

Consider *historical analogies to similar or related problems*, including past and current policy resolutions and their rationales, to advance understanding of and potential resolutions addressing:

- *novelty* (we have encountered, understood, and resolved similar or related)
- *complexity* (scientific, psychological, social understood and addressed previously)
- *ethically fraught nature* (we have addressed ethical concerns previously)
- *public nature* (we have defined the public and private dimensions previously)
- *divisiveness* (we have achieved principled consensus resolutions previously)

(3) Prediction

Consider the *predicted future impacts of possible understandings and policy resolutions on all stakeholders*, to advance understanding of and potential resolutions addressing:

- *novelty* (what are the predicted impacts of possible policy resolutions)
- *complexity* (what are the scientific, psychological, social dimensions of these)
- *ethically fraught nature* (what are the ethical implications across worldviews)
- *public nature* (what are the implications for the line between public and private)
- *divisiveness* (what are the implications for the divisiveness of the problem)

(4) Possibilities

Employ imagination and flexibility to expand the range of possible understandings and policy resolutions, by brainstorming, reflection, role-playing, reference to literature, film, or other devices, to advance understanding of and potential resolutions addressing:

- *novelty* (what are the predicted impacts of possible policy resolutions)
- *complexity* (what are the scientific, psychological, social dimensions of these)
- *ethically fraught nature* (what are the ethical implications across worldviews)
- *public nature* (what are the implications for the line between public and private)
- *divisiveness* (what are the implications for the divisiveness of the problem)

(5) Persistence

Consider social understanding and policy resolutions as part of a dynamic, incremental, iterative, ongoing process requiring persistence in response to changed conditions and to feedback from previous choices, to advance understanding of and potential resolutions addressing:

- *novelty* (some novel dimensions may be addressed later with more understanding)
- *complexity* (more dimensions may emerge and be addressed later)
- *ethically fraught nature* (worldviews may shift with impacts & understanding)
- *public nature* (the line between public and private may also shift)
- *divisiveness* (divisiveness may change as other characteristics change)

(6) Principles

Strive to identify limited, non-comprehensive consensus principles that capture shared understanding and policy resolutions adequate to a persistent process, to advance understanding of and potential resolutions addressing:

- *novelty* (principles for coping with novelty and uncertainty)
- *complexity* (principles for coping with complexity)
- *ethically fraught nature* (principles that are shared across worldviews)
- *public nature* (principles for defining the line between public and private)
- *divisiveness* (principles for addressing divisiveness)

C. Grading Rubric for Assessing Fractious Problem Skills

- Excellent application of skill - (A grade)
- Proficient application of skill - (B grade)
- Fair application of skill - (C grade)
- Poor evidence of application of skill - (D grade)

Notes

This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/> or send a letter to Creative Commons, 444 Castro Street, Suite 900, Mountain View, California, 94041, USA.

Contact author: Roberta M. Berry <robertaberry@gatech.edu>

Rights

Use of Materials on the OEC

Resource Type

Instructor Materials

Topics

Ethical Decision-Making
Pedagogical Approaches

Discipline(s)

Engineering
Teaching Ethics in STEM