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The Paradox of Structure: What is the Appropriate Amount of Structure for Course Assignments with Regard to Students' Problem-Solving Styles?

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Introduction

- Faculty are expected to use more problem-solving activities in the classroom
- Activities/Assignments are created by an instructor with a specific problem-solving style
- Is it possible for students to receive a lesser (or inflated) grade because of a different problem-solving style?

Objectives

- 1) Explicate AI theory as it relates to a college instructor's preference for adaption or innovation when designing a course assignment,
- 2) Describe how the structure of a course assignment limits and enables student engagement, and
- 3) Present examples of course assignments that have been determined more adaptive or more innovative.

Kirton's Adaption Innovation Theory

- In problem solving…
  - All people are creative, but in different styles
  - Differences affect how people work together
  - Understanding differences of style is critical to preventing misattribution to level

- Both adaptors and innovators are needed to solve complex problems.

Style vs. Level

Level

How many scoops? (how much)

How creative am I?

Style

What flavor? (in what way)

How am I creative?

KAI Definitions

- More Adaptive– A person who solves problems by making things better.
- More Innovative – A person who solves problems by making things different.
- Your KAI score is innate and will not change!

More adaptive

- More structure
- Target a few ideas
- Master details
- Consistent with past
- More conforming
- Accept assumptions
- More prudent risks
- Sensitive to team

More innovative

- Less structure
- Proliferate many ideas
- Neglect details
- Break with past
- Less conforming
- Challenge assumptions
- More daring risks
- Willing to “ruffle” team

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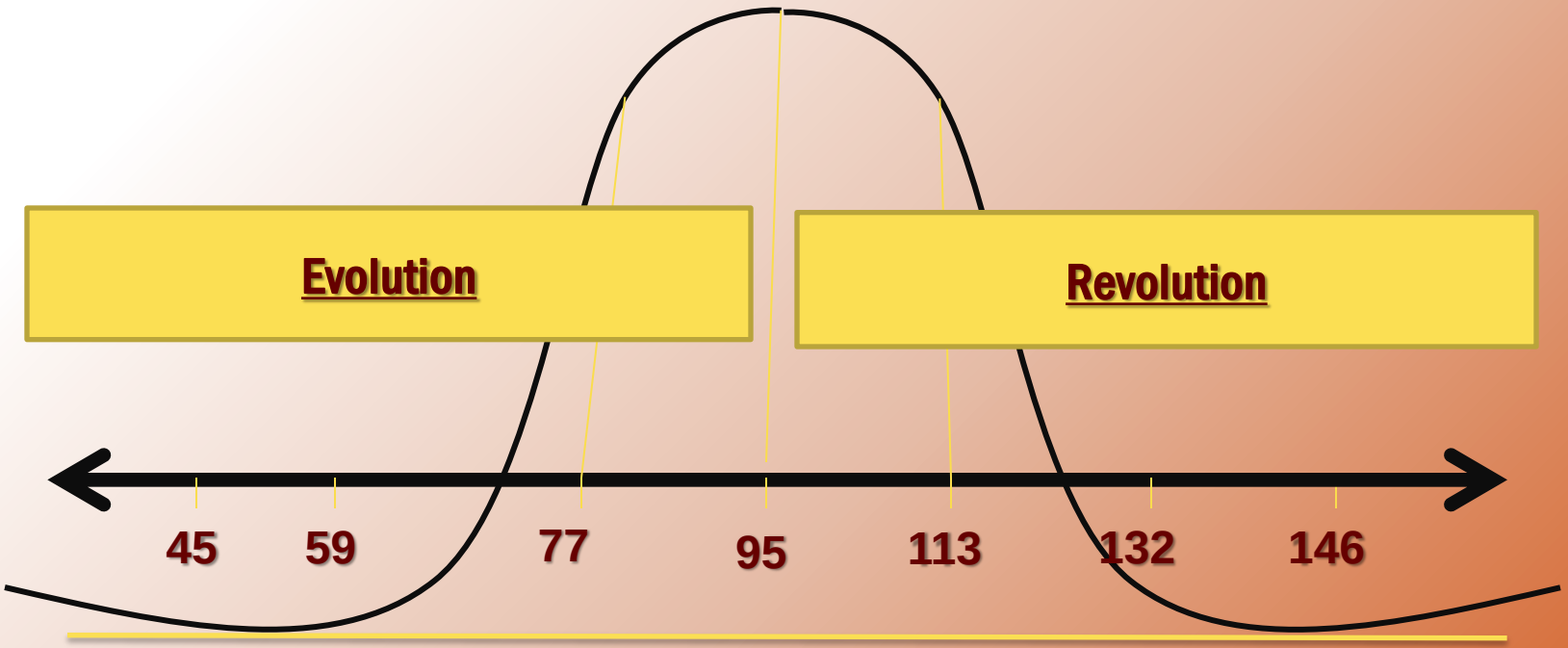
KAI Continuum



More *Adaptive*
Accept and work within the problem definition

Doing things better

More *Innovative*
Challenges the structure in order to solve the problem

Doing things differently

Source: Childress, S. (2009)

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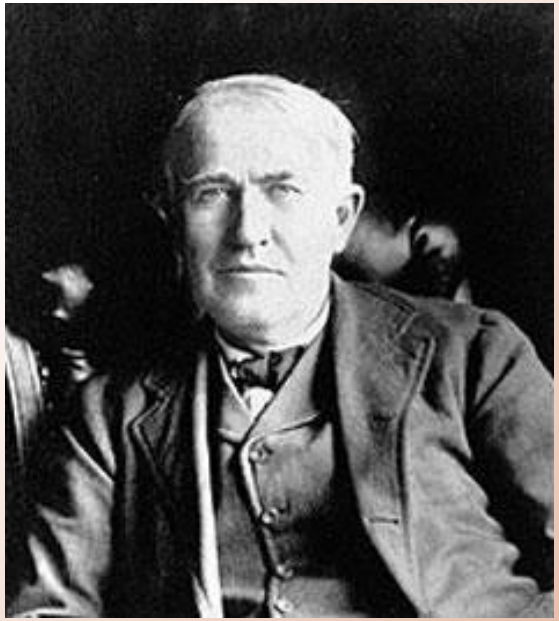
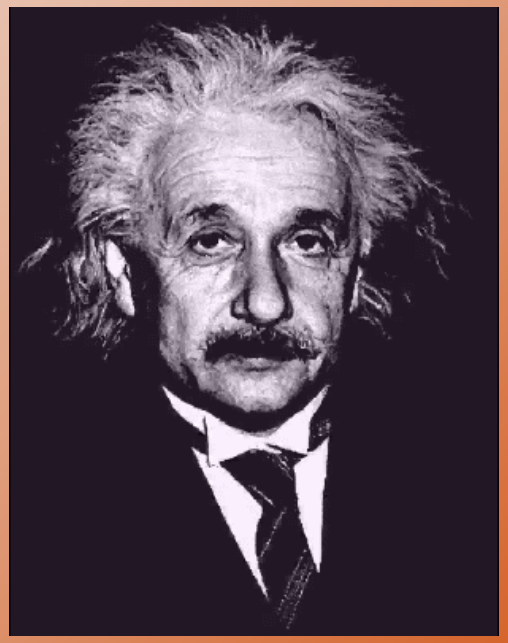
Style Preferences in Science



Edison



Einstein

More adaptive

More innovative

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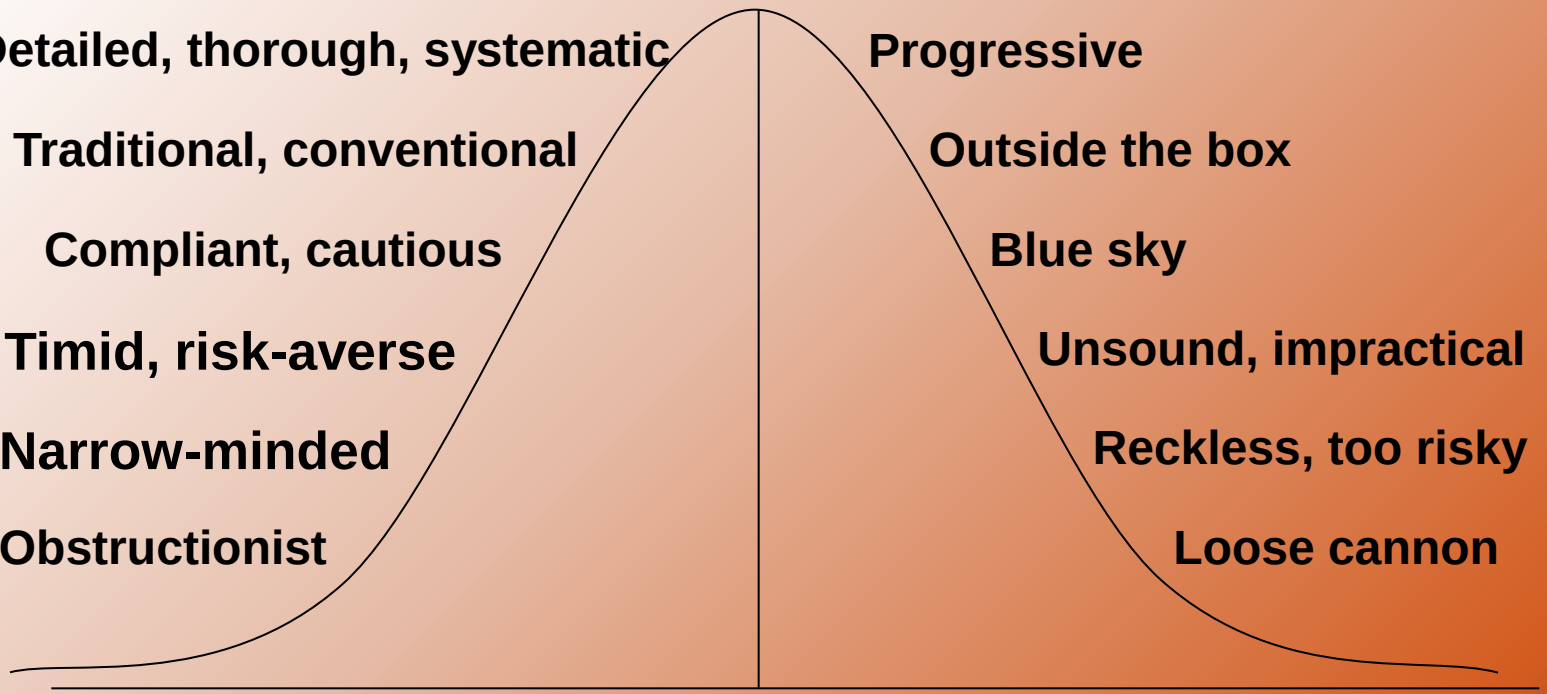
Perceptions of Differences

More Adaptive (Do Better) are often seen as

- Detailed, thorough, systematic
- Traditional, conventional
- Compliant, cautious
- Timid, risk-averse
- Narrow-minded
- Obstructionist

More Innovative (Do Different) are often seen as

- Progressive
- Outside the box
- Blue sky
- Unsound, impractical
- Reckless, too risky
- Loose cannon



A-I Theory Applied to Learning

- A 20-point style gap between student and instructor may inhibit:
  - Communication
  - Working together
  - Trust
- What impact does this have on the structure of the assignment?

A-I Theory Applied to Learning

- Motivation may be used to bridge cognitive-style gap.
  - How motivated were students to complete the assignment?
  - How motivated were you to consider answers outside the structure of the assignment?
  - How motivated were you to consider more details vs. the larger picture?

Assignments: Enabling and Limiting

- Assignments are both limiting and enabling
  - Increased structure provides opportunity for depth in the topic
  - Decreased structure provides opportunity for breadth in the topic
  - Range of structures allow opportunity to be expressive in the students' preferred style.
- Challenge and rigor are not related to cognitive style.

Assignments: Enabling and Limiting

Less Structure

- Favored by more innovative students
- Frustrating for more adaptive students
- More adaptive students will develop structure to compensate

More Structure

- Favored by more adaptive students
- Frustrating for more innovative students
- More innovative students will tend to bend structure to which there is no consequence

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Example Portfolio Rubric

Points	Concepts	Reflection	Overall Presentation
90-100	Items clearly demonstrate that the desired learning outcomes for the term have been achieved. The student has gained a significant understanding of the concepts and applications.	Reflections illustrate the ability to effectively critique work, and to suggest constructive practical alternatives.	Items are clearly introduced, well organized, and creatively displayed, showing connection between items
75-89	Items clearly demonstrate most of the desired learning outcomes for the term. The student has gained a general understanding of the concepts and applications.	Reflections illustrate the ability to critique work, and to suggest constructive practical alternatives.	Items are introduced and well organized, showing connection between items.
60-75	Items demonstrate some of the desired learning outcomes for the term. The student has gained some understanding of the concepts and attempts to apply them.	Reflections illustrate an attempt to critique work, and to suggest alternatives.	Items are introduced and somewhat organized, showing some connection between items.

Example Portfolio Rubric

Points	Concepts Presented
91-100	The assignment you turn in exceeds in depth and scope, although not necessarily in length, what was assigned. The paper is written in an insightful, complete, and original manner. An A range paper has well developed ideas with outstanding organization and development. A range papers also demonstrate mastery of the literature.
81-90	The assignment you turn in matches what was assigned. The paper is written in an insightful, complete, and original manner. The text is long enough to develop completely your theses. A B range paper has well developed ideas with good organization and development. There are no "folksy phrases" or errors in syntax, grammar, or spelling to interfere with the reader's understanding of the assignment
71-80	The assignment you turn in matches what was assigned. The paper is written in a thoughtful and well-developed manner. There may be some flaws in the presentation, either from a stylistic or content point of view. There may be some errors in syntax, grammar, or spelling, but they do not deter understanding.

Example Assignments

- The online forum will be graded on how well you answered the question:

1. Content: Clear, succinct discussion with recognition of similarities and/or differences in relation to scholarly definitions shared in class.
2. Organization: Response allows for easy recognition of key ideas with focus of ideas and appropriate citations.
3. Contribution to the group: Must provide three concepts connecting personal experience to the discussion. Must respond to two other posts
4. Accuracy: Brings attention to major units of study from the course. Is free from structural, grammatical, and spelling errors that might otherwise distract the reader.

Each item will be rated on a 1-5 scale.

Example Assignments

- The online forum will be graded on how well you answered the above three questions with respect to:

1. Content: did you cover the major concepts in depth, provide examples, or consider alternative thoughts,
2. Organization: content is provided in an organized and logical fashion,
3. Contribution to the group: Was the response insightful,
4. Accuracy: Is the information correct, with no misspellings or grammatical errors.

- Each item will be rated on a 1-5 scale.

Example Assignments

- The Journal Article Critique must be one page in length (single spaced, 10 point Times New Roman font, one inch margins).

- The contemplation will include:

1) a BRIEF description of the article,
2) identification of one or two fundamental and powerful concepts you learned from the article,
3) discussion of how these concepts relate to what you have learned in the course, and
4) a plan for implementing what you have learned from the article to help you become a better teaching faculty member.

Practices for Maintaining Neutrality

- Code completed assignments that may pertain to cognitive style.
  - Thinking outside-the-box vs. inside-the-box
  - Focus on the trees or the forest
  - Approach towards assumptions
  - Inductive or deductive in writing

Practices for Maintaining Neutrality

- Predict adaptive and innovative responses
- Read several assignments before assigning grades
- Stay motivated throughout grading process

Conclusions

- A-I theory may be applicable to the teaching and learning process.
- Adaption and innovation can be identified in student work.
- Faculty are encouraged to consider cognitive style without sacrificing rigor.

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Thank You!