2019 Learning Technology Expo
Stevens Institute of Technology

Leveraging Technology *for* Innovative Pedagogy and Deep Learning

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Agenda

1. Leveraging Technology
2. Innovative Pedagogy
3. Deep and Flexible Learning

Clarity

Deep and Flexible Learning

Rest Snore Sound

Tired Bed Comfort

Awake Eat Wake

Dream Slumber Night

Shallow Learning

What we process
we learn.

Deep Learning

Shallow Learning

Deep Learning

6 Principles of Deep and Flexible Learning

1. Learning through practice at retrieval
2. Learning through varied tasks and purposes
3. Learning at the principle level
4. Learning awareness and control (metacognition)
5. Learning in response to developmental feedback
6. Learning embedded in prior knowledge and experience

(Engle, 2006; Halpern & Hakel, 2003; Mariano, Doolittle, & Hicks, 2009; Wagner, 2006)

Learning and Memory

What we process
we learn

Cognitive Processing	Behavioral Processing	Social Processing	Affective Processing

Practice at Retrieval	Vary Tasks and Purposes	Principle Level	Awareness and Control	Developmental Feedback	Prior Knowledge & Experience

Processing

25-Word Summaries

Learning Environment: Students create clear and coherently organized 25-word summaries that reflects the essential meaning of the current reading, lecture, video, movie, activity, or experience.

Learning Artifact: Students analyze and interpret a reading, lecture, video, movie, activity, or experience in order to extract the essential meaning and compose a 25-word summary.

25-Word Summaries

A Sample (after reading an article):

Through developing, implementing, and assessing model-eliciting activities, engineering faculty members' beliefs and decisions about teaching, learning, and assessment shift from teacher-centered toward student-centered.
[23 Words]

25-Word Summaries

Grading: Each Chapter Summary Statement is worth 50 points and will be graded using the following criteria:

1. Structural Format — 10 pts
   a. Is the summary 25 words or less?
   b. Is the summary a coherent sentence, or sentences?
   c. Does the summary avoid a simple listing of concepts, terms, or themes?

2. Clarity of Thought and Expression — 15 pts
   a. Are the ideas expressed well, well thought out, and integrated?
   c. Does every word in the summary have a meaningful purpose?
   d. Are correct grammar and syntax used?

3. Delineation of Core Message — 25 pts
   a. Does the summary accurately reflect the reading's central or essential message?
   b. Are the reading's central or essential messages fully integrated?
   c. Does the summary reflect an understanding of the reading?

Plus Developmental Feedback

with Dragon Dictate

25-Word Summaries

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Innovative Pedagogy

Innovation

What Do We Mean by Innovation?

- Innovation is the action required to create new ideas, processes, or products which when implemented lead to positive effective change. (Marc Chesan, Motorola Labs)
- Innovation is creating new value. Value is the key word, stressing the difference between innovation and invention. (Victor Fernandes, Natura)
- Innovation pairs ideas with action….It's not enough just to have a good idea. Only when you *act*, when you *implement*, do you truly innovate. (Tom Kelly, IDEO, *The Art of Innovation*, 2001, *The Ten Faces of Innovation*, 2005)

Innovation is the action required to create new ideas, processes, or products which when implemented lead to positive effective change

Innovation is creating new value

New ideas pairs ideas with action

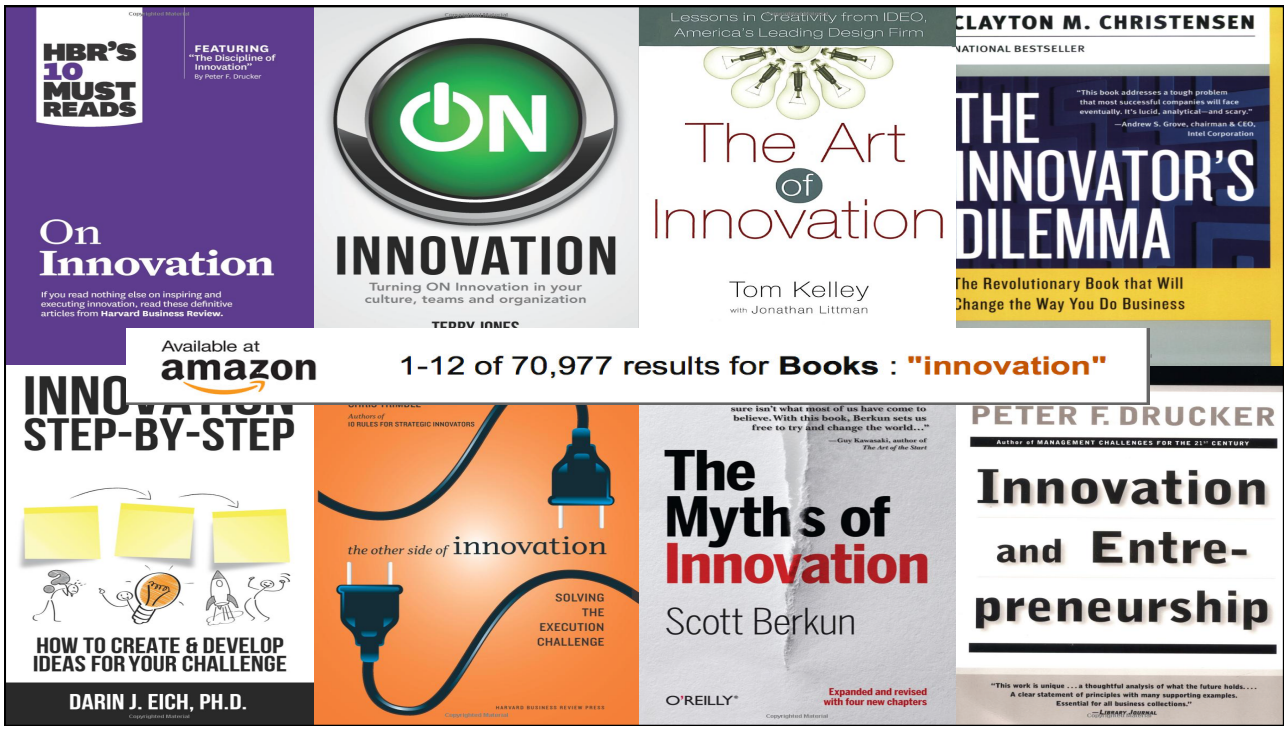
What Do We Mean by Innovation?

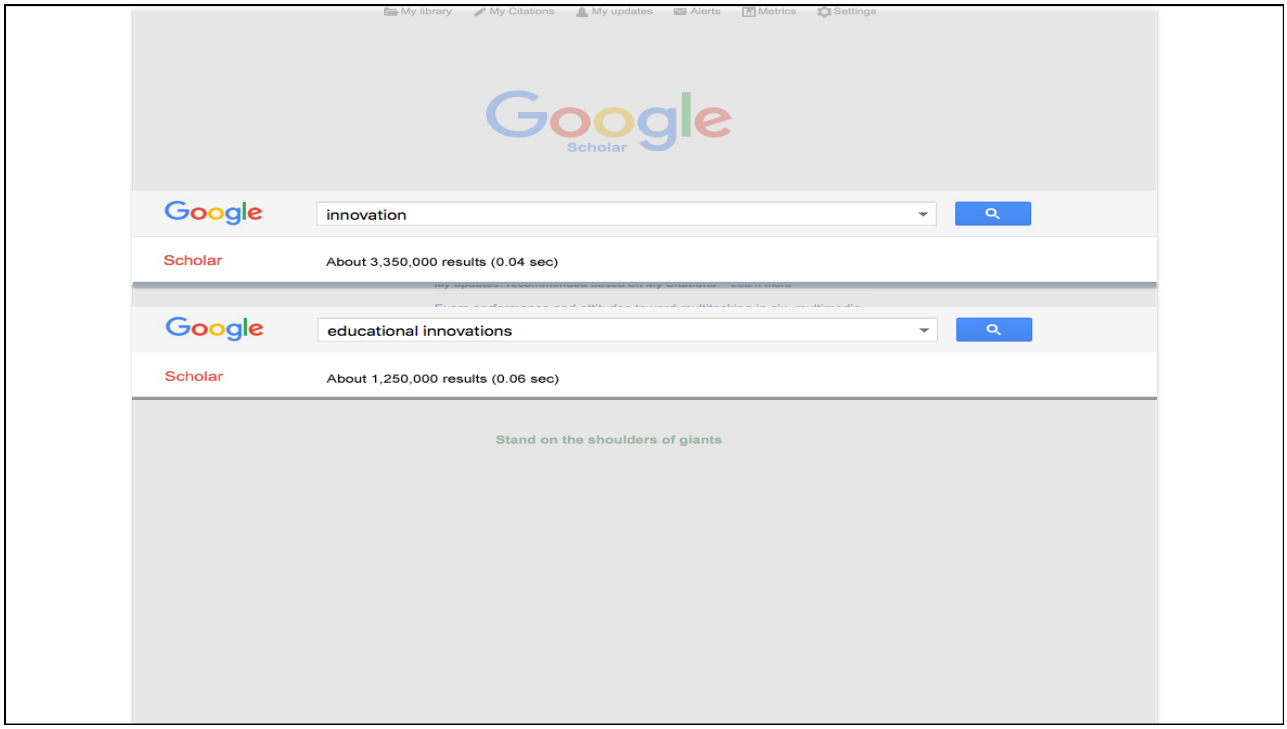
Three Attributes of Innovation

Create New → Implement → Positive Outcome

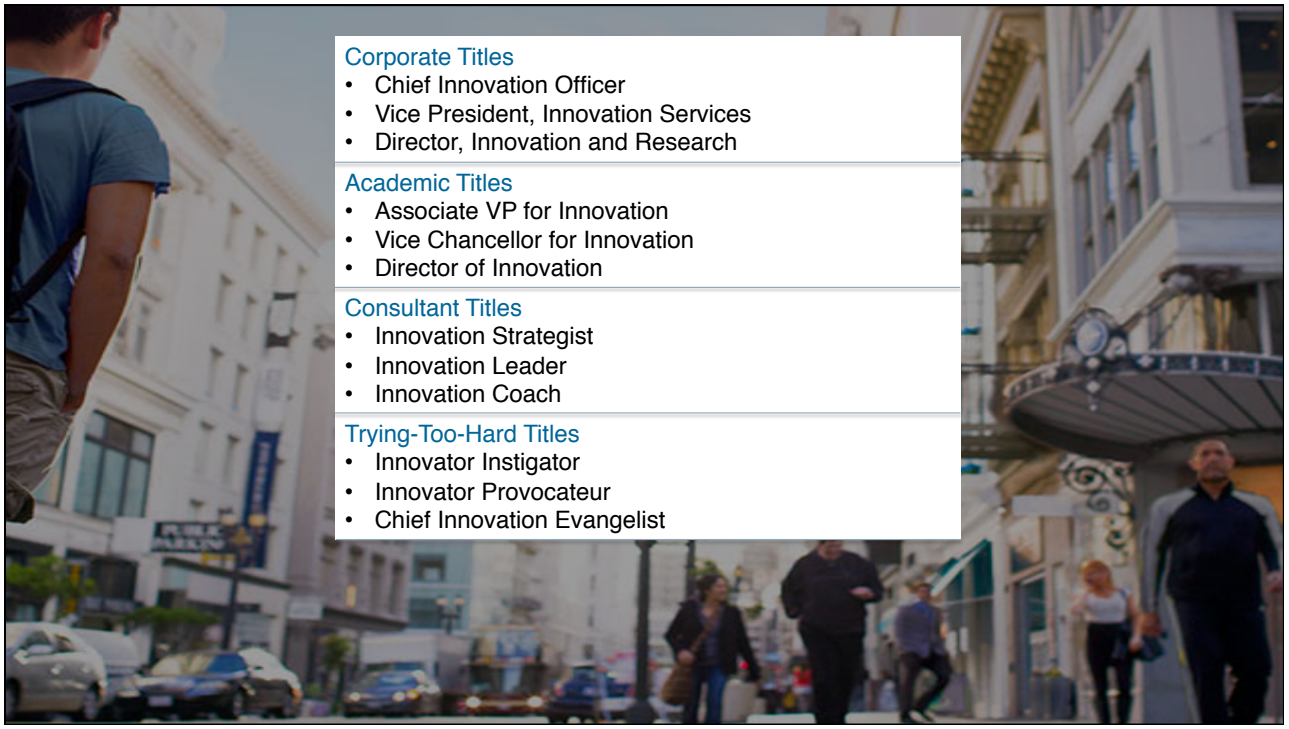
~~Invention~~
~~Creativity~~

Making Things Better




My library
My Citations
My updates
Alerts
Metrics
Settings
Google Scholar
Google
innovation
Scholar
About 3,350,000 results (0.04 sec)
Google
educational innovations
Scholar
About 1,250,000 results (0.06 sec)
Stand on the shoulders of giants

Charles Leadbeater:
Education innovation in the slums
Linda Hill:
How to manage for collective creativity
CREATIVE AGILITY
Gever Tulley:
Life lessons through tinkering
Nirmalya Kumar:
India's invisible innovation
TED
"innovation"
1 - 12 of 1663 results
Anil Gupta:
India's hidden hotbeds of invention
entrepreneur, cartoonist, designer, activist ...
Mariana Mazzucato:
Government — investor, risk-taker, innovator
Robert Gordon:
The death of innovation, the end of growth



Innovative Pedagogy

Create New Pedagogy → Implement → Positive Outcome

Making Things Better

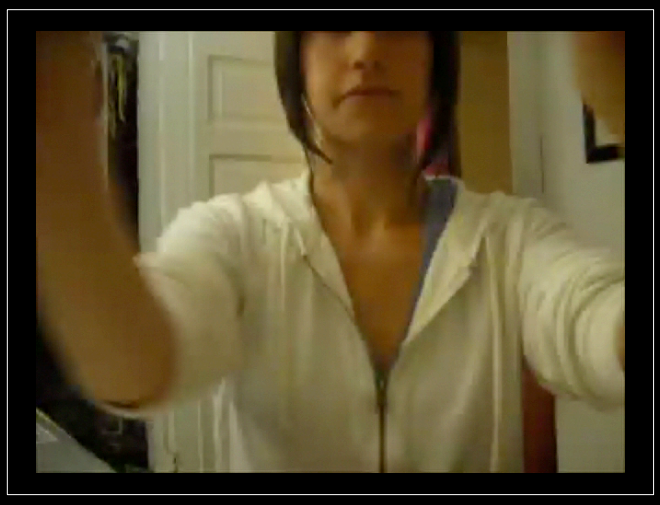
Leveraging Technology
Technology →

Oral Explanations

Learning Environment: Students create clear and coherently organized 10-15 minute videos that reflect the student's understanding of the current topic under discussion, plus an application to their lives.

Learning Artifact: Students analyze and interpret readings, notes, and discussions; organize concepts and ideas; apply to a life issue; create an oral explanation.

Explanation



Oral Explanations

Grading: Each Oral Explanation is worth 100 pts and will be graded using the following criteria:

1. Organization — 20 pts
   a. are introductions and conclusions used effectively?
   b. do the expressed ideas follow a logical progression?
   c. are explanations and applications provided?

2. Clarity of Thought and Expression — 20 pts
   a. are the ideas expressed well, well thought out, and integrated?
   b. are there clear and logical transitions between ideas?
   c. are correct grammar and syntax used?

3. Essential Content Explanation — 30 pts
   a. does the content of the explanation accurately reflect the addressed constructivism?
   b. does the explanation explain, rather than just list, the main concept components?
   c. is the content of the explanation free from personal interjections?

4. Essential Content Application — 30 pts
   a. is a problem, issue, or situation explained clearly?
   b. are concepts from the texts and class used to address the cited problem?
   c. is the application thorough, meaningful, and appropriate?

Oral Explanations

- ✓ 1. Learning through practice at retrieval
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Experiential Learning: Solar Decathlon

Learning Environment: Students design, develop, implement, and evaluate a solar innovation in teams for the U.S. Department of Energy's Solar Decathlon.

Learning Artifact: Students analyze and interpret the current state of solar science and cultural needs, design a solution to a need, develop and implement the solution, and evaluate and refine the solution in light of criteria.

Experiential Learning: Solar Decathlon

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Crazy →

Technology is neither good not bad

but using it makes it so.

Making Things Better

Crazy →

Here's the Crazy Ones

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Innovative Pedagogy and Deep Learning

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