

New Perspectives on SAMR and the EdTech Quintet

Ruben R. Puentedura, Ph.D.

Transformation

Redefinition

*Tech allows for the creation of new tasks,
previously inconceivable*

Modification

Tech allows for significant task redesign

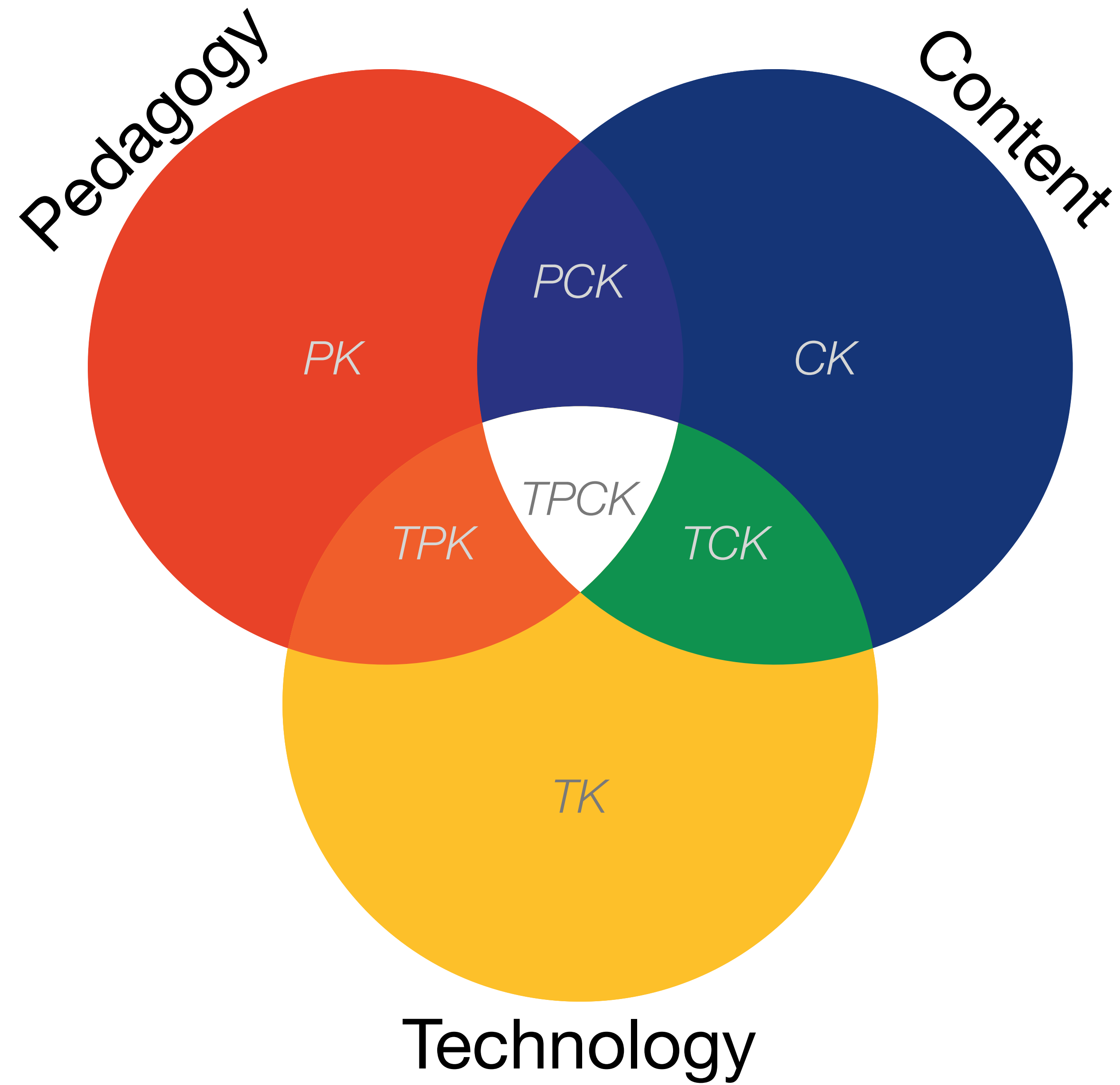
Augmentation

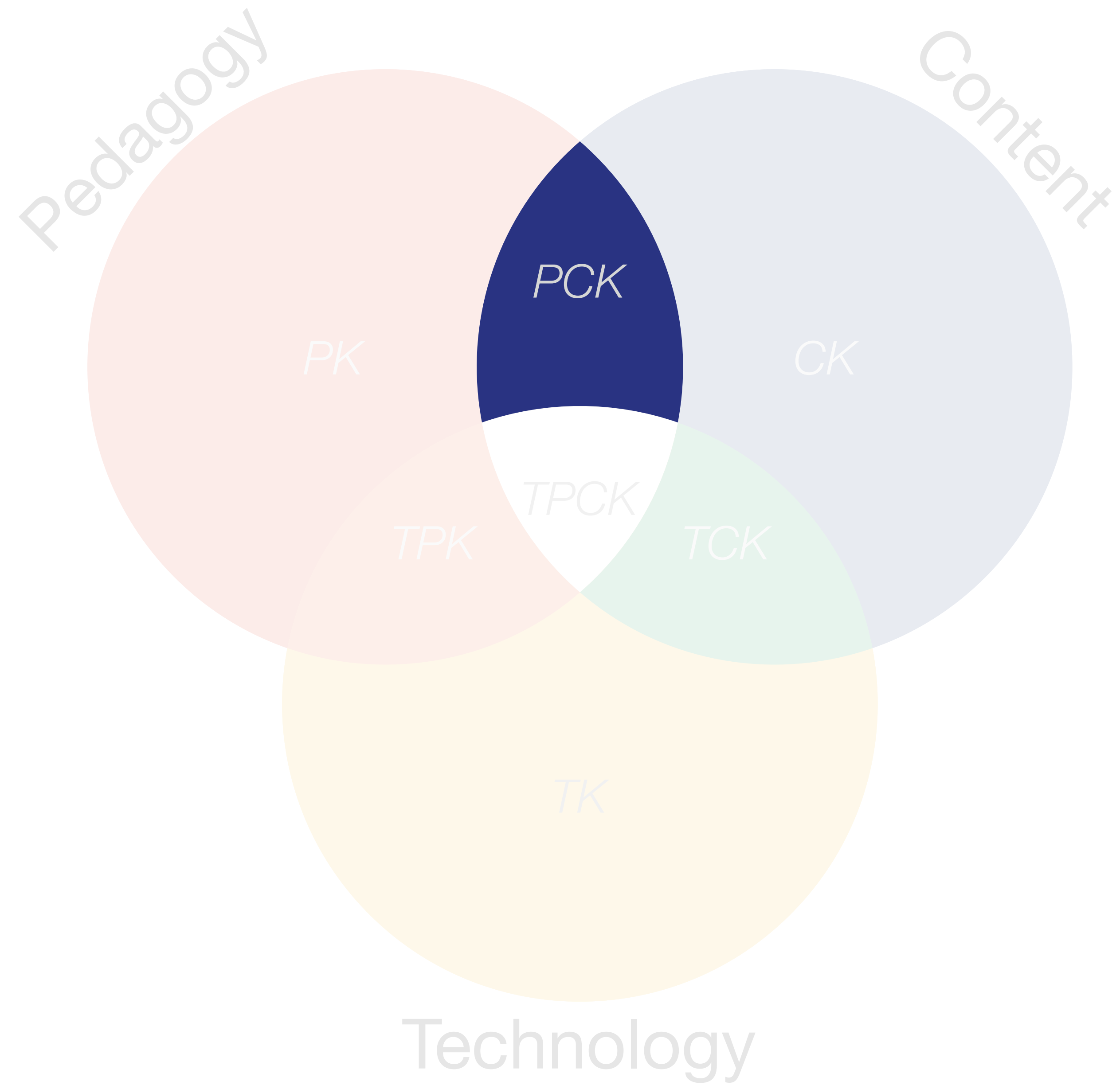
*Tech acts as a direct tool substitute, with
functional improvement*

Substitution

*Tech acts as a direct tool substitute, with no
functional change*

Enhancement







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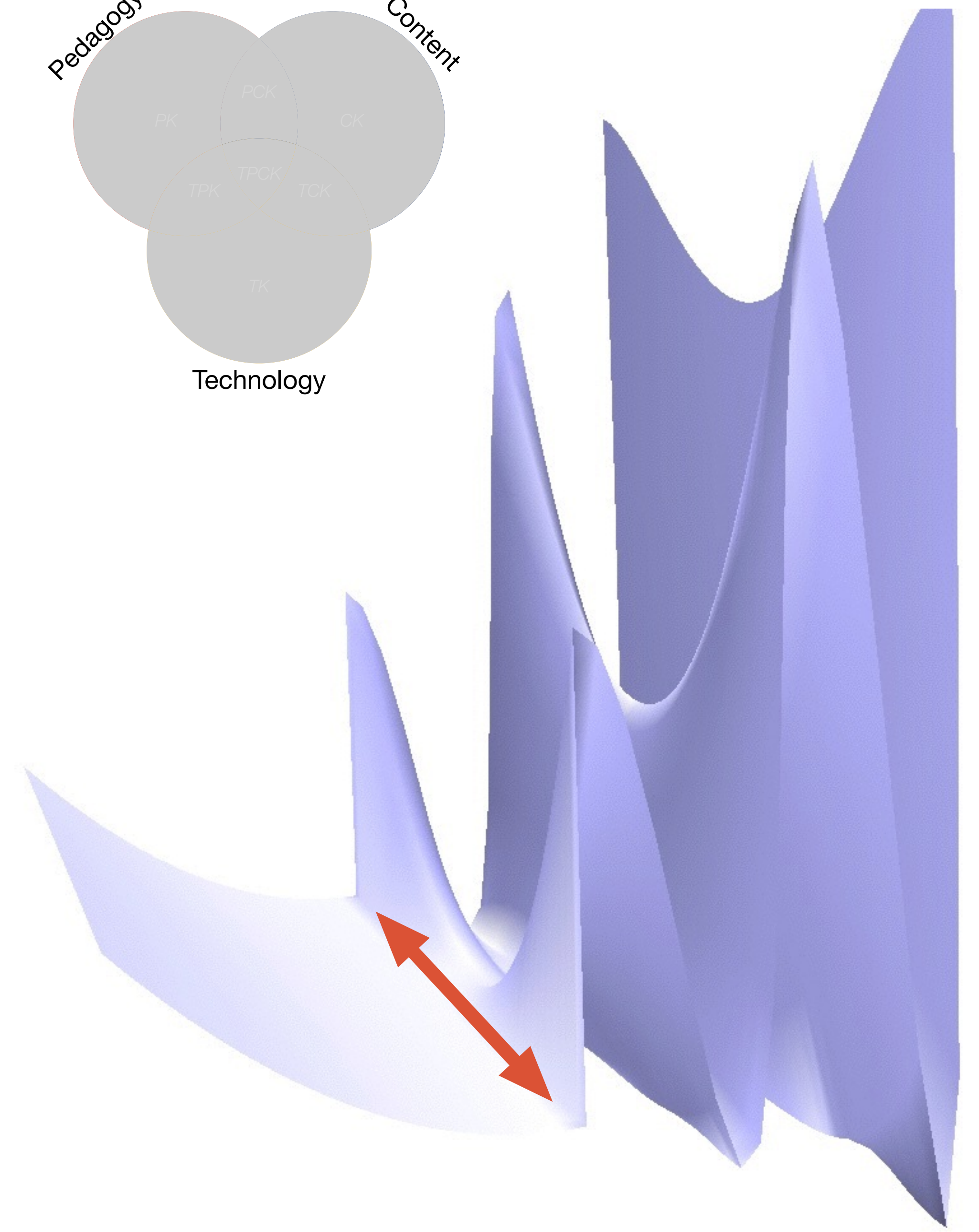
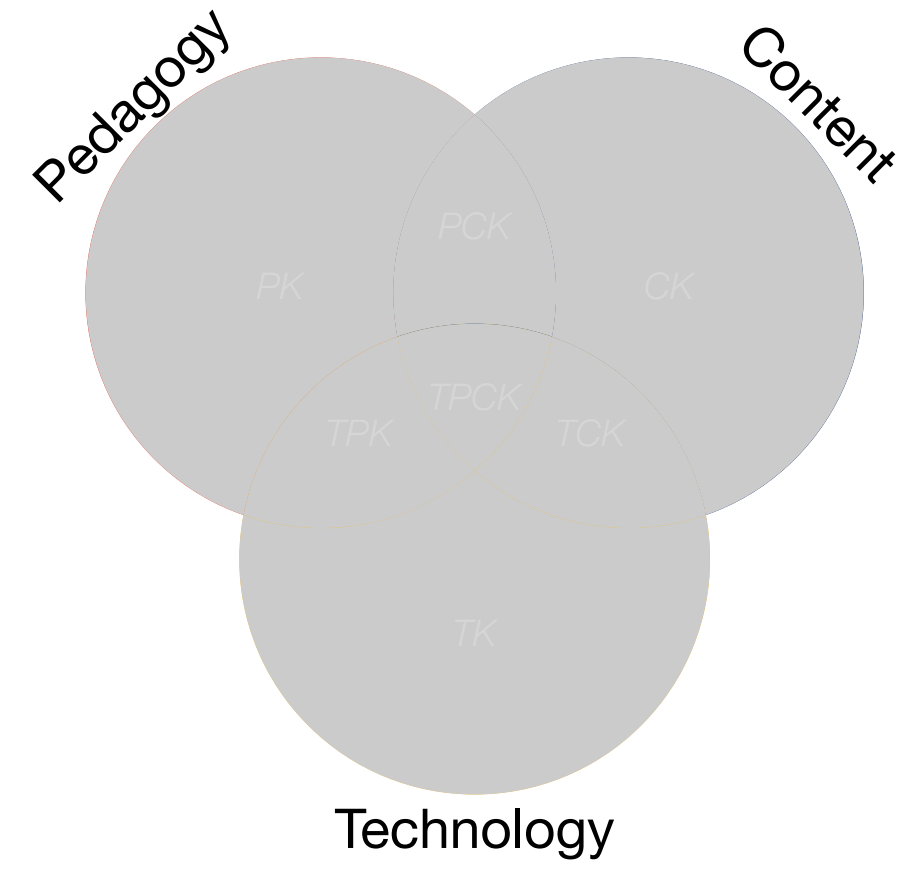
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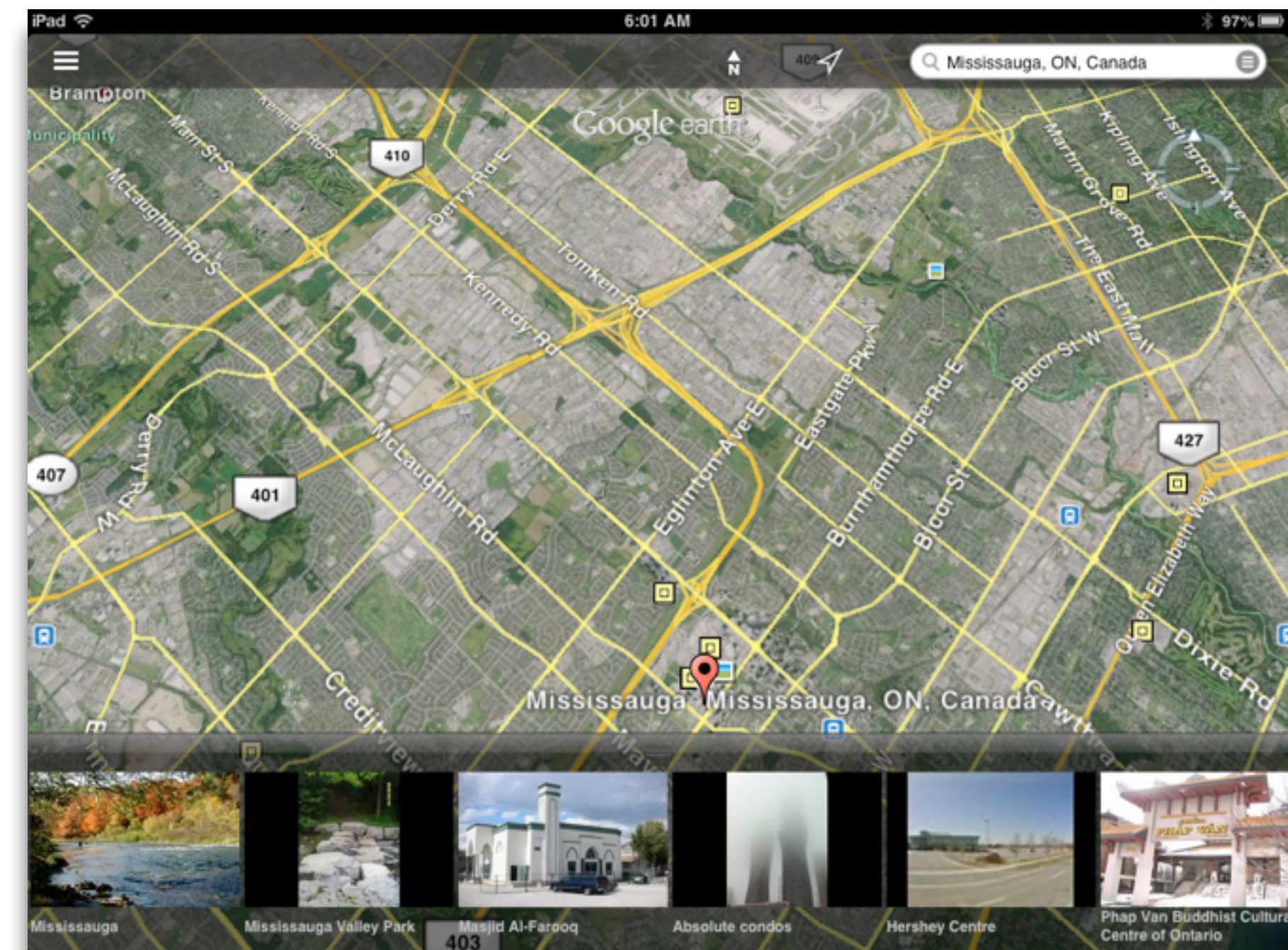
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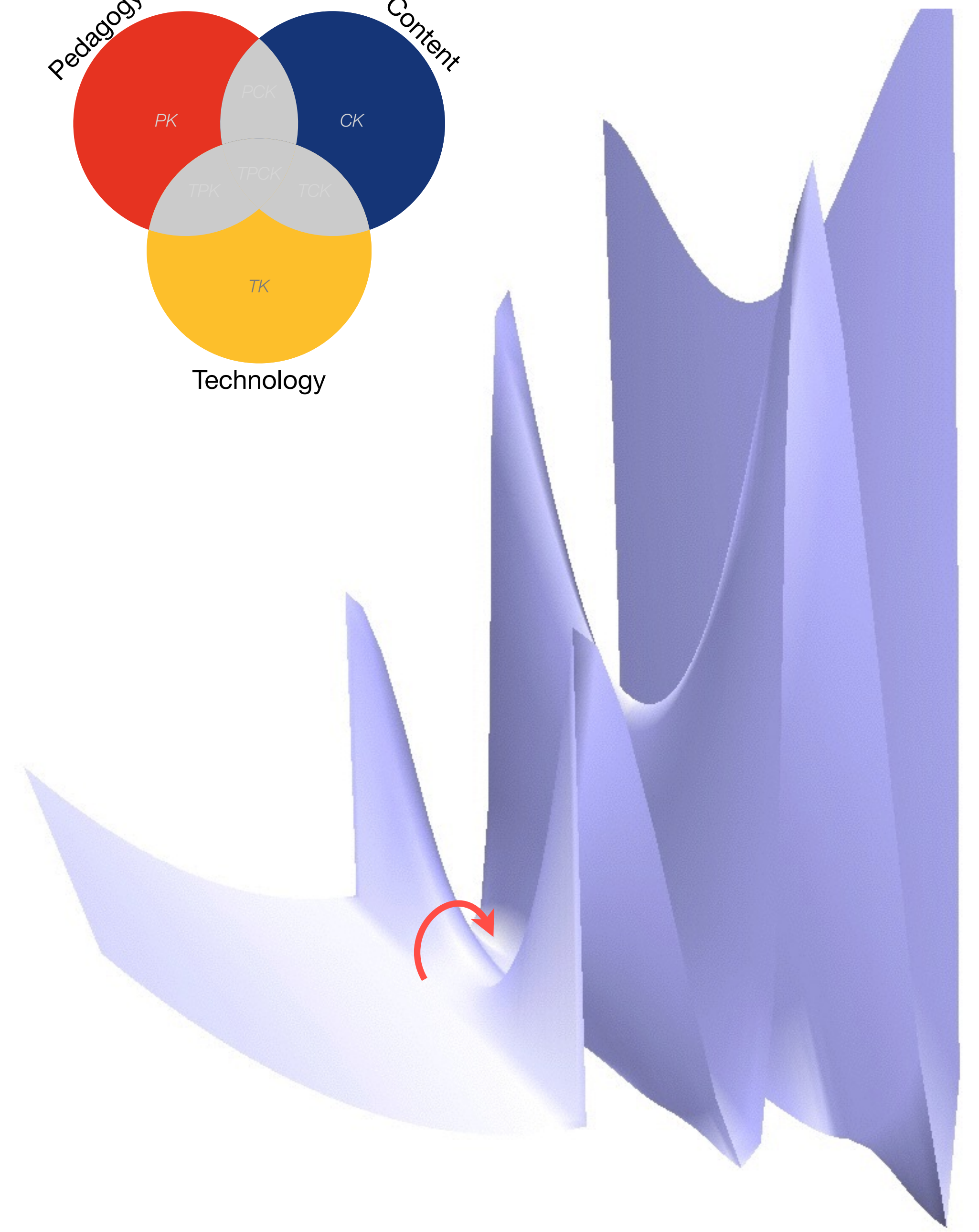
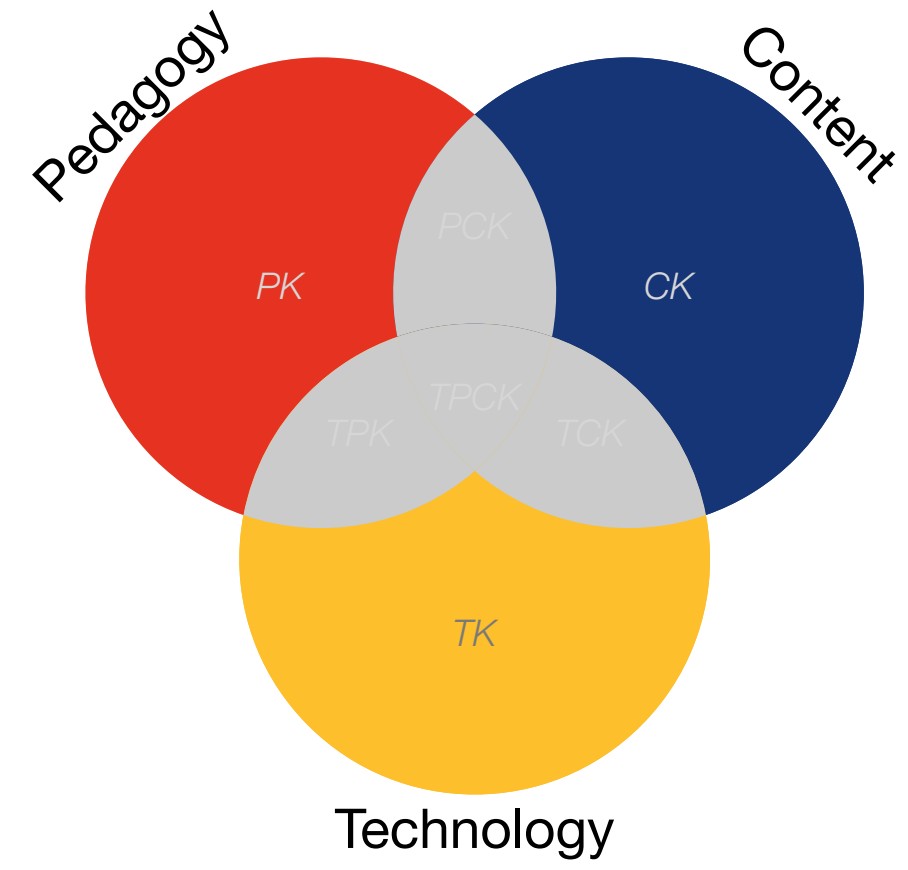


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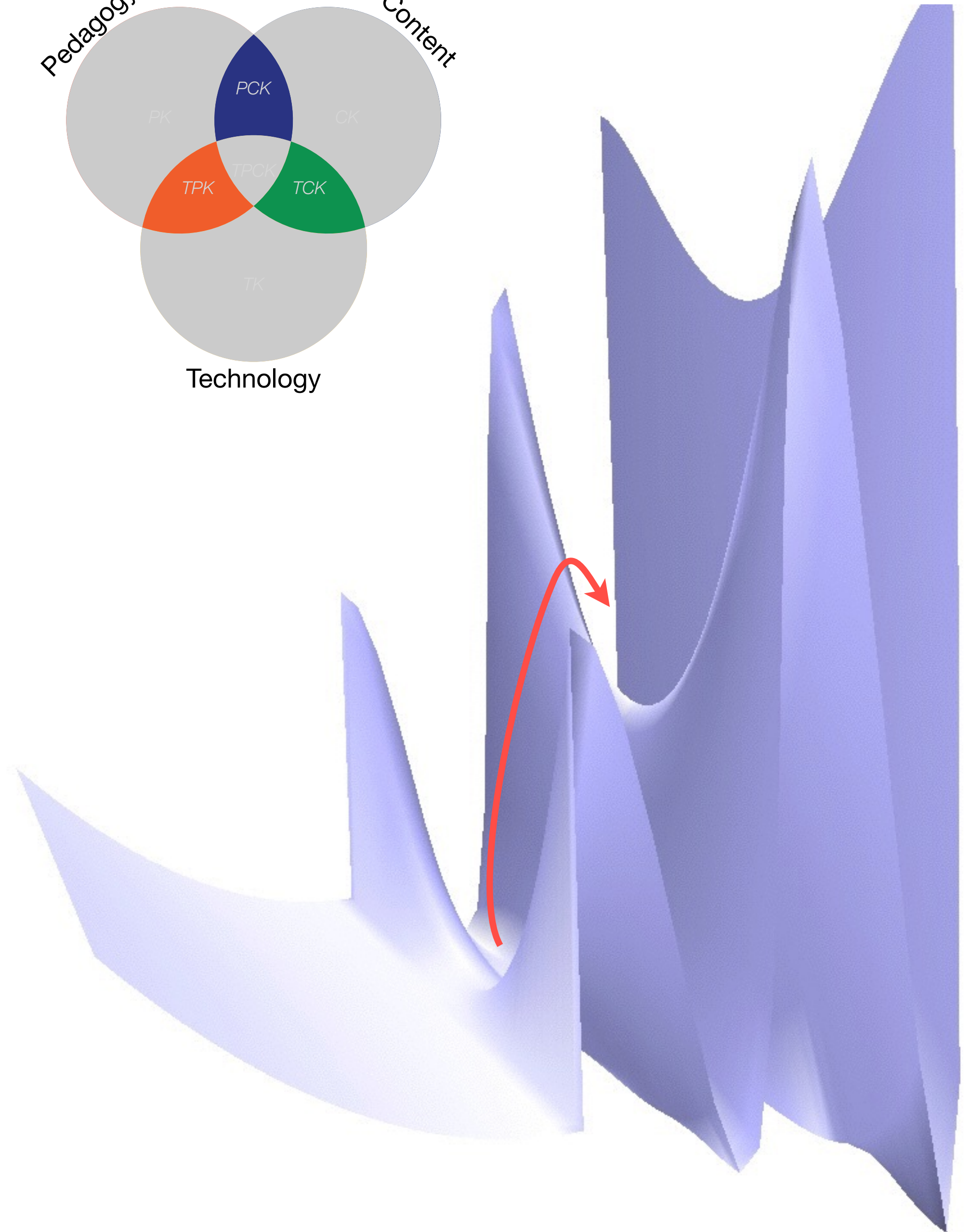
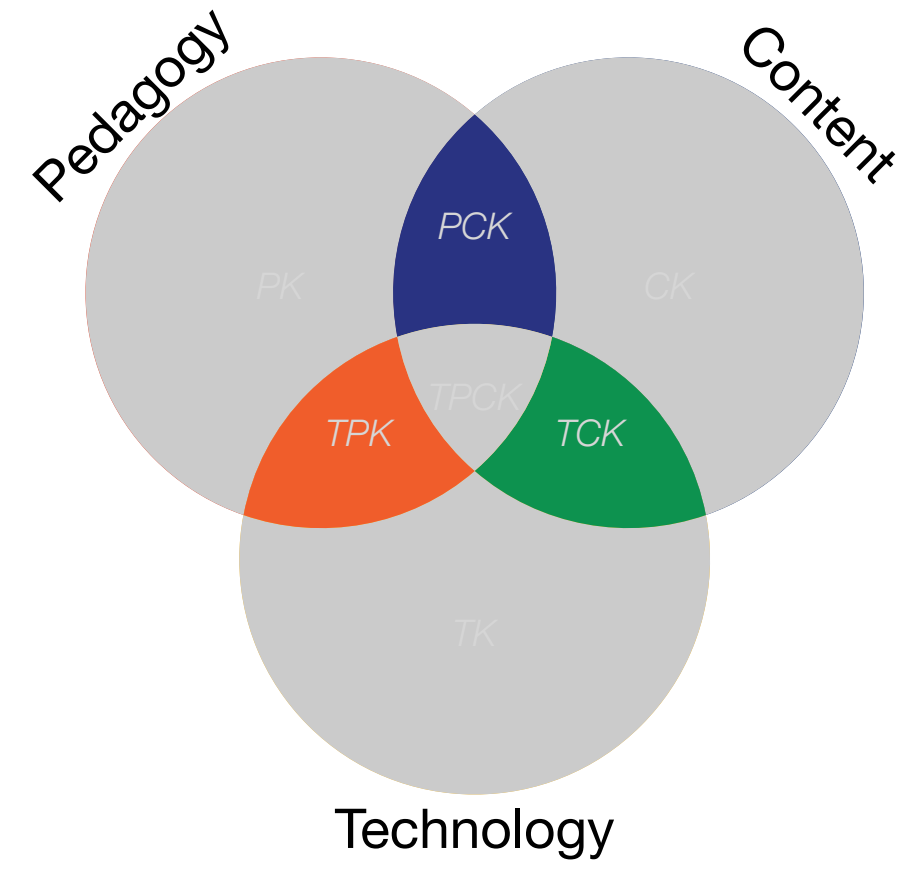


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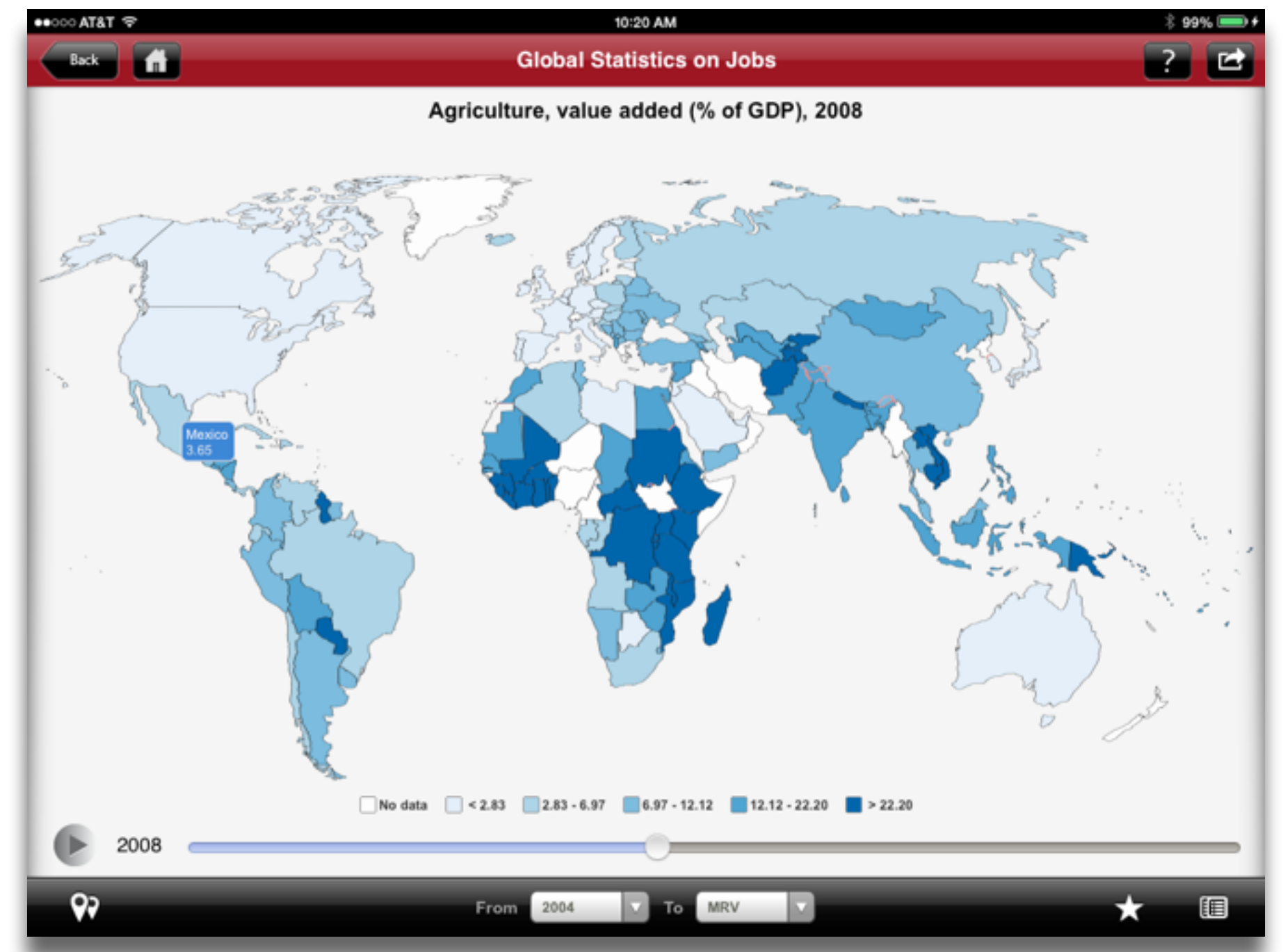
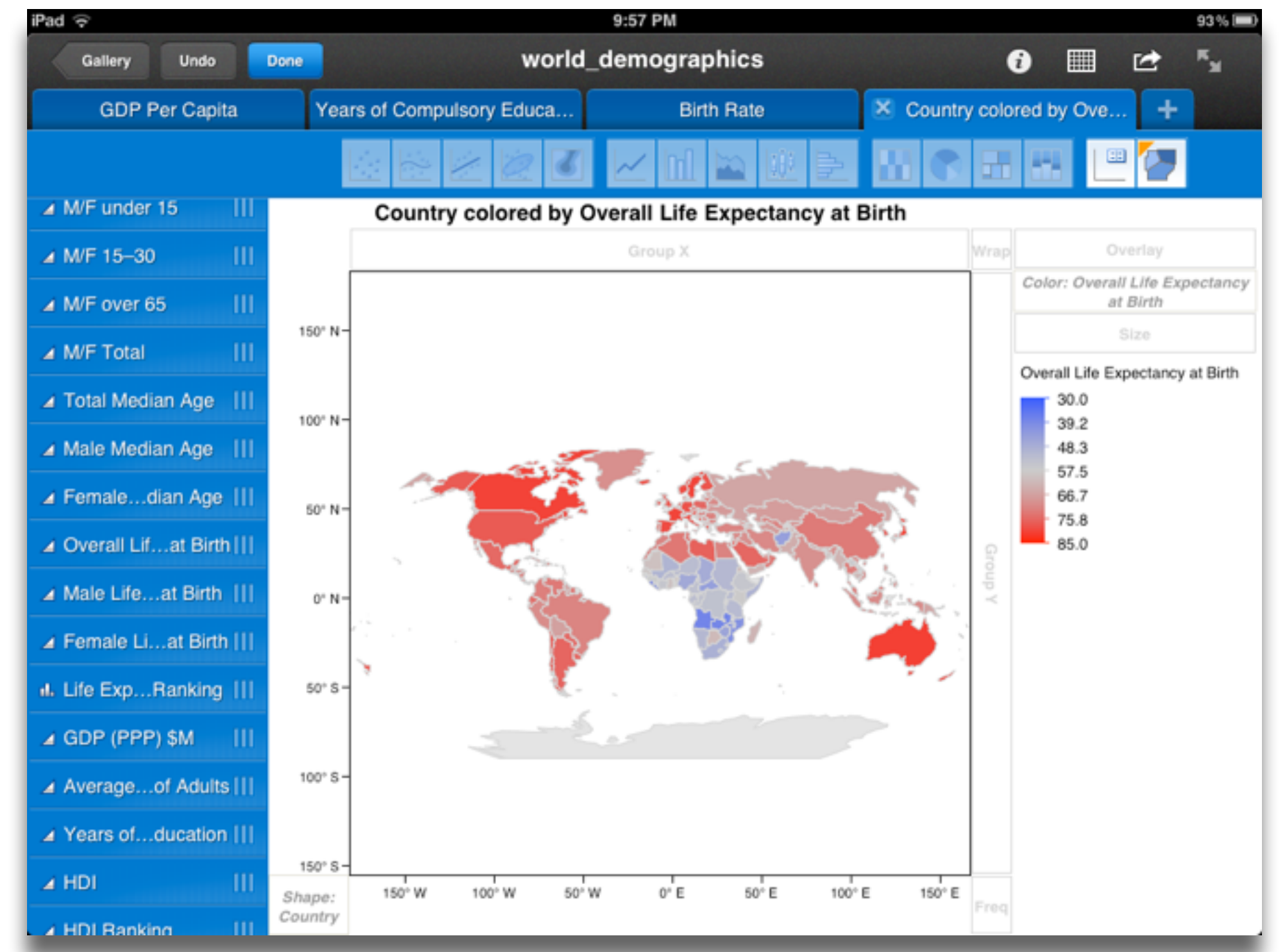
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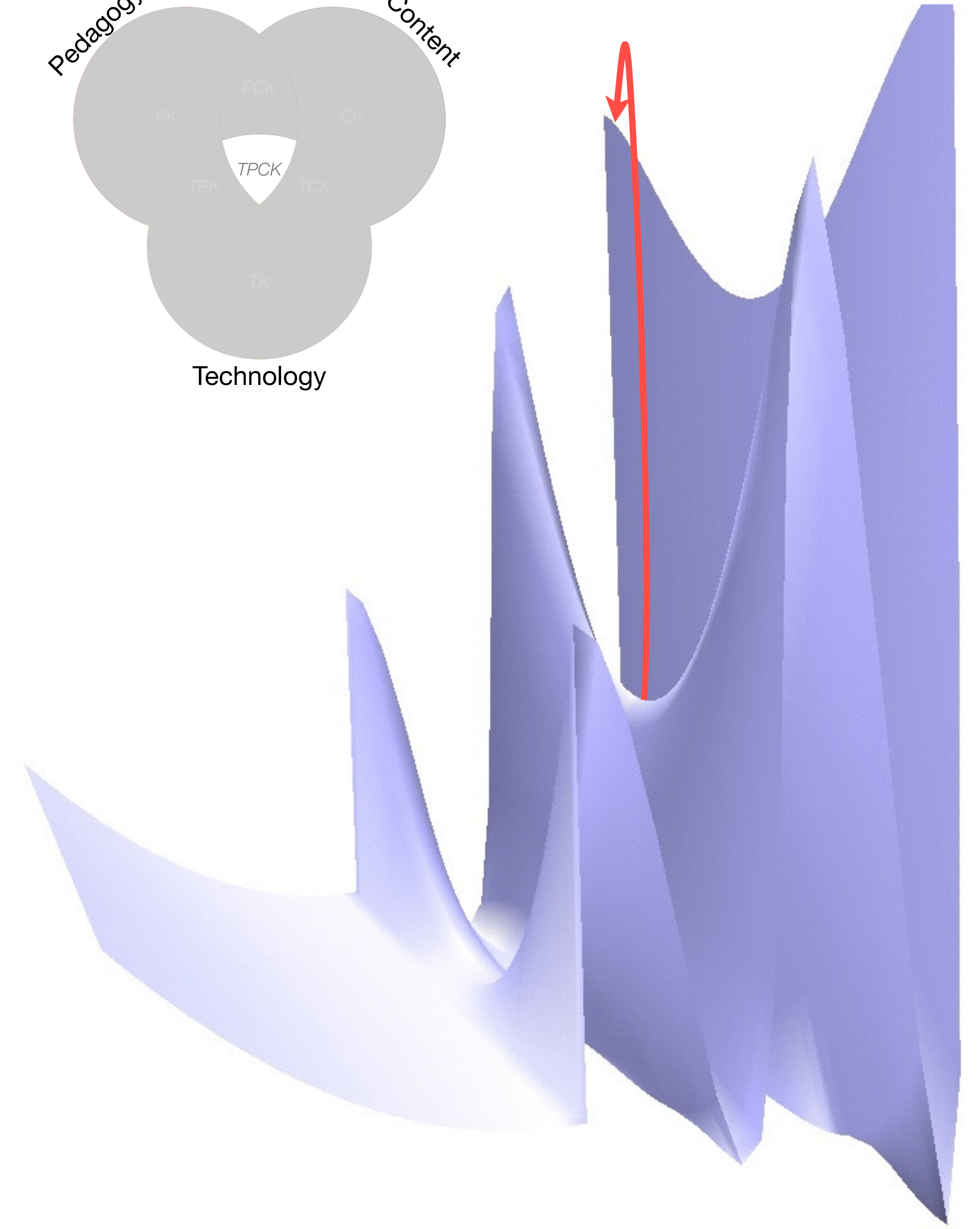
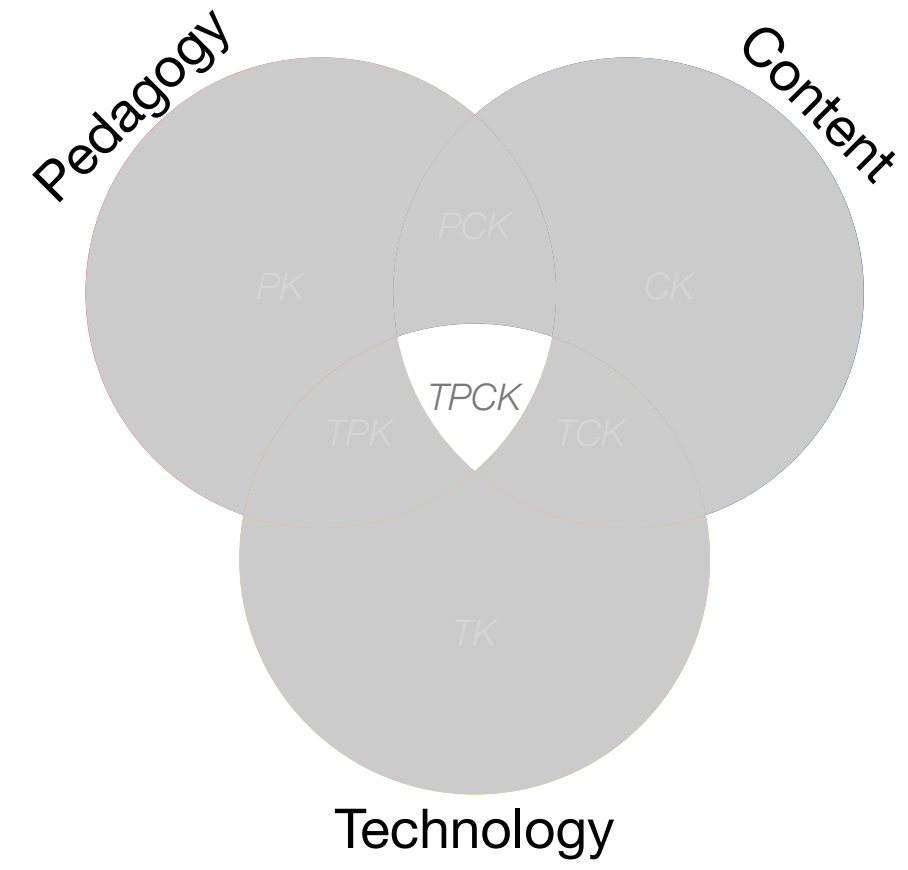


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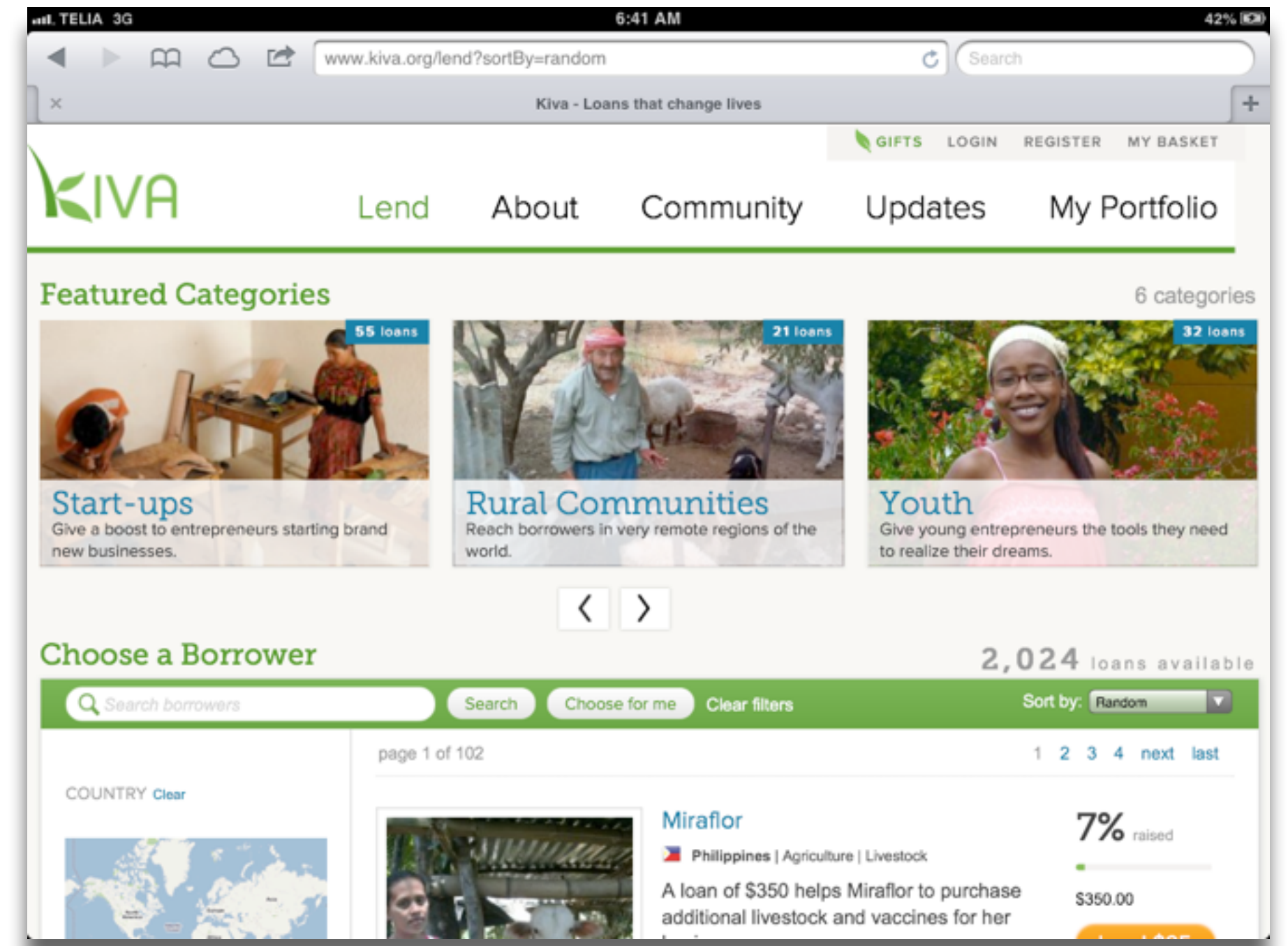
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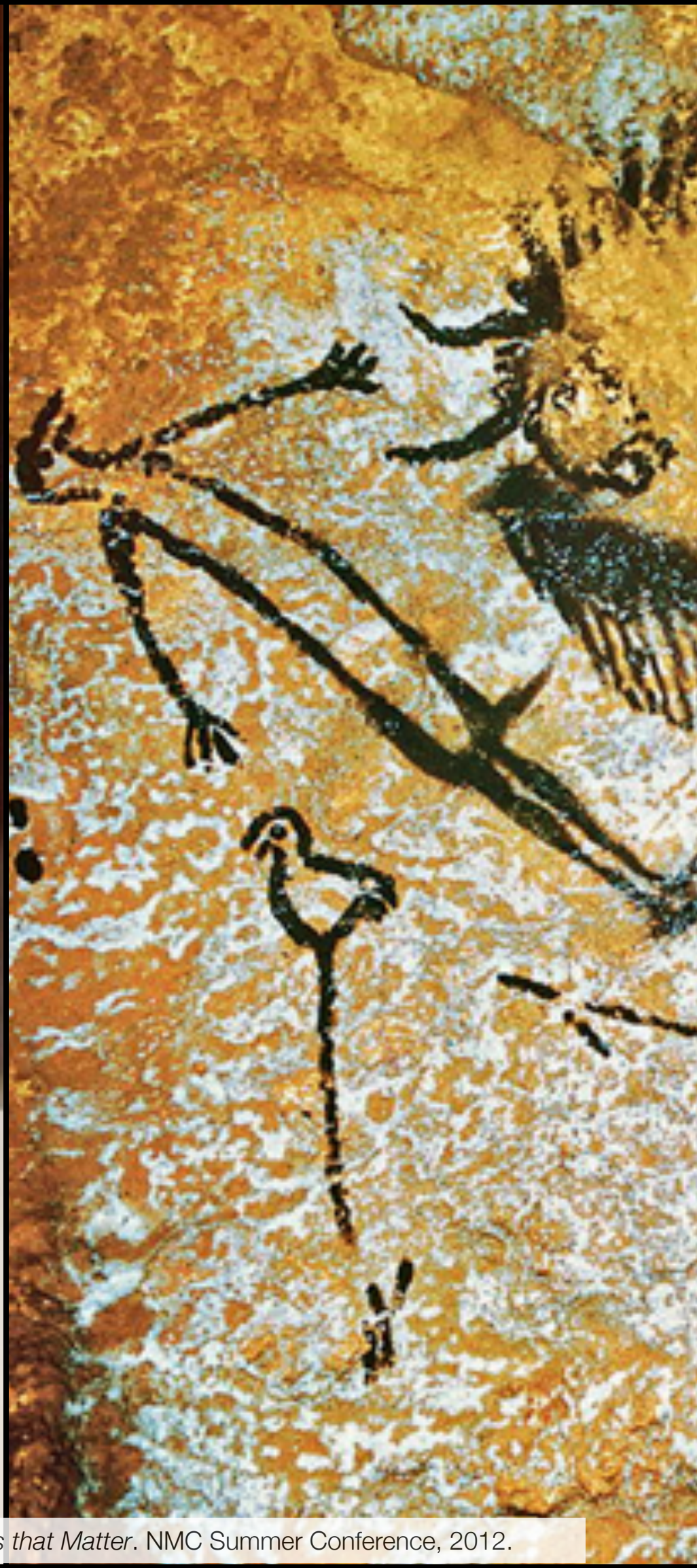

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| Social | Mobility | Visualization | Storytelling | Gaming |
|--|---|--|--|--|
| 200,000 years | 70,000 years | 40,000 years | 17,000 years | 8,000 years |
|  |  |  |  |  |

The EdTech Quintet – Associated Practices

| | |
|---------------|---|
| Social | Communication, Collaboration, Sharing |
| Mobility | Anytime, Anyplace Learning and Creation |
| Visualization | Making Abstract Concepts Tangible |
| Storytelling | Knowledge Integration and Transmission |
| Gaming | Feedback Loops and Formative Assessment |

Key Trends Driving Ed Tech Adoption

Fast
(1-2 yrs.)

Rethinking the Roles of Teachers
Shift to Deeper Learning Approaches

Mid-Range
(3-5 yrs.)

Increasing Focus on OER
Increasing Use of Hybrid Learning Designs

Long-Range
(5+ yrs.)

Rapid Acceleration of Intuitive Technology
Rethinking How Schools Work

Important Ed Tech Developments

Adoption:
1 yr. or less

BYOD
Cloud Computing

Adoption:
2-3 yrs.

Games and Gamification
Learning Analytics

Adoption:
4-5 yrs.

The Internet of Things
Wearable Technology

Significant Challenges Impeding Ed Tech Adoption

Solvable

understand and know how to solve

Authentic Learning Opportunities
Integrating Personalized Learning

Difficult

understand but solutions are elusive

Complex Thinking & Communication
Safety of Student Data

Wicked

complex to define, much less address

Competition from New Models of Ed
Keeping Formal Education Relevant

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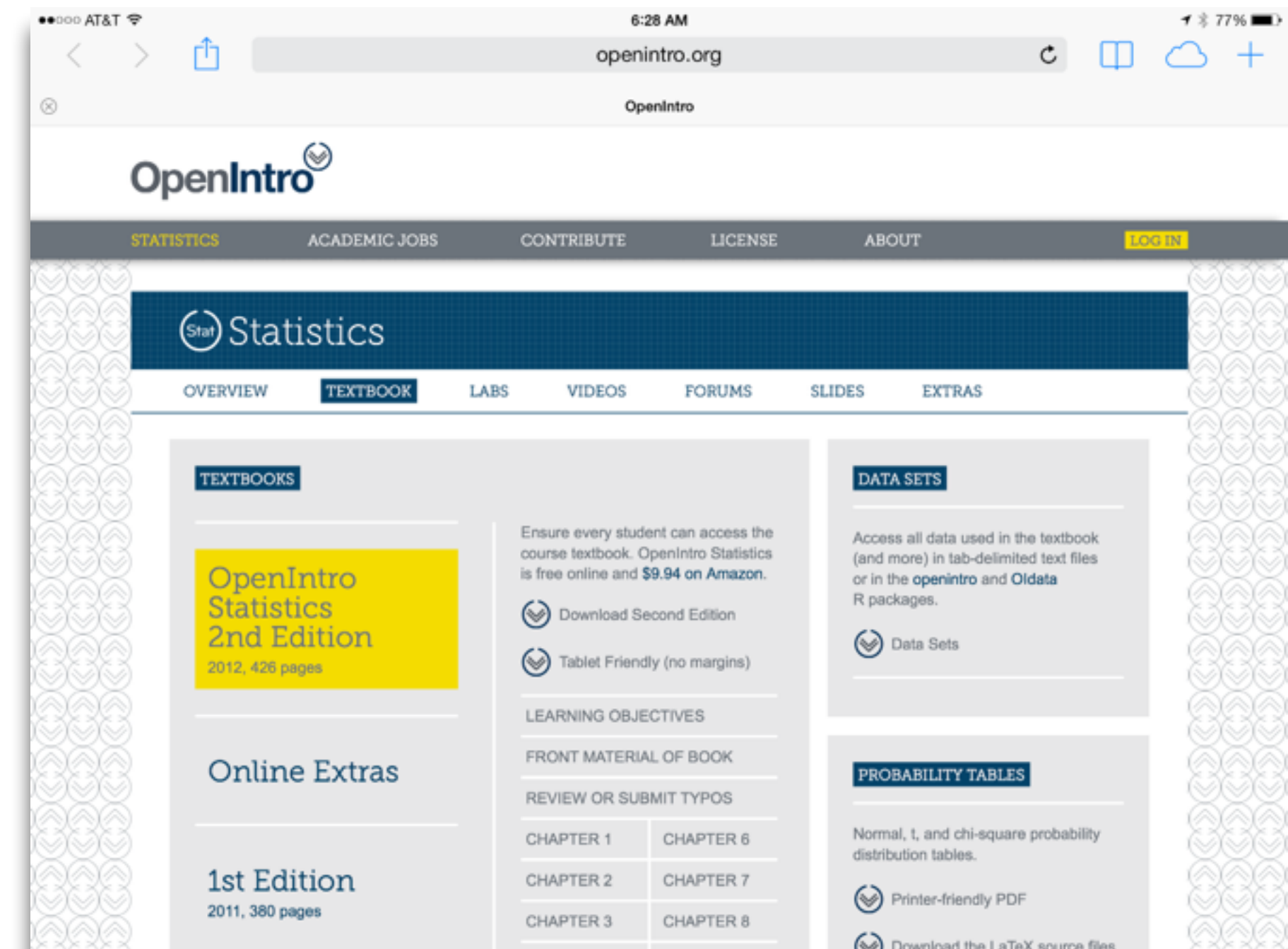
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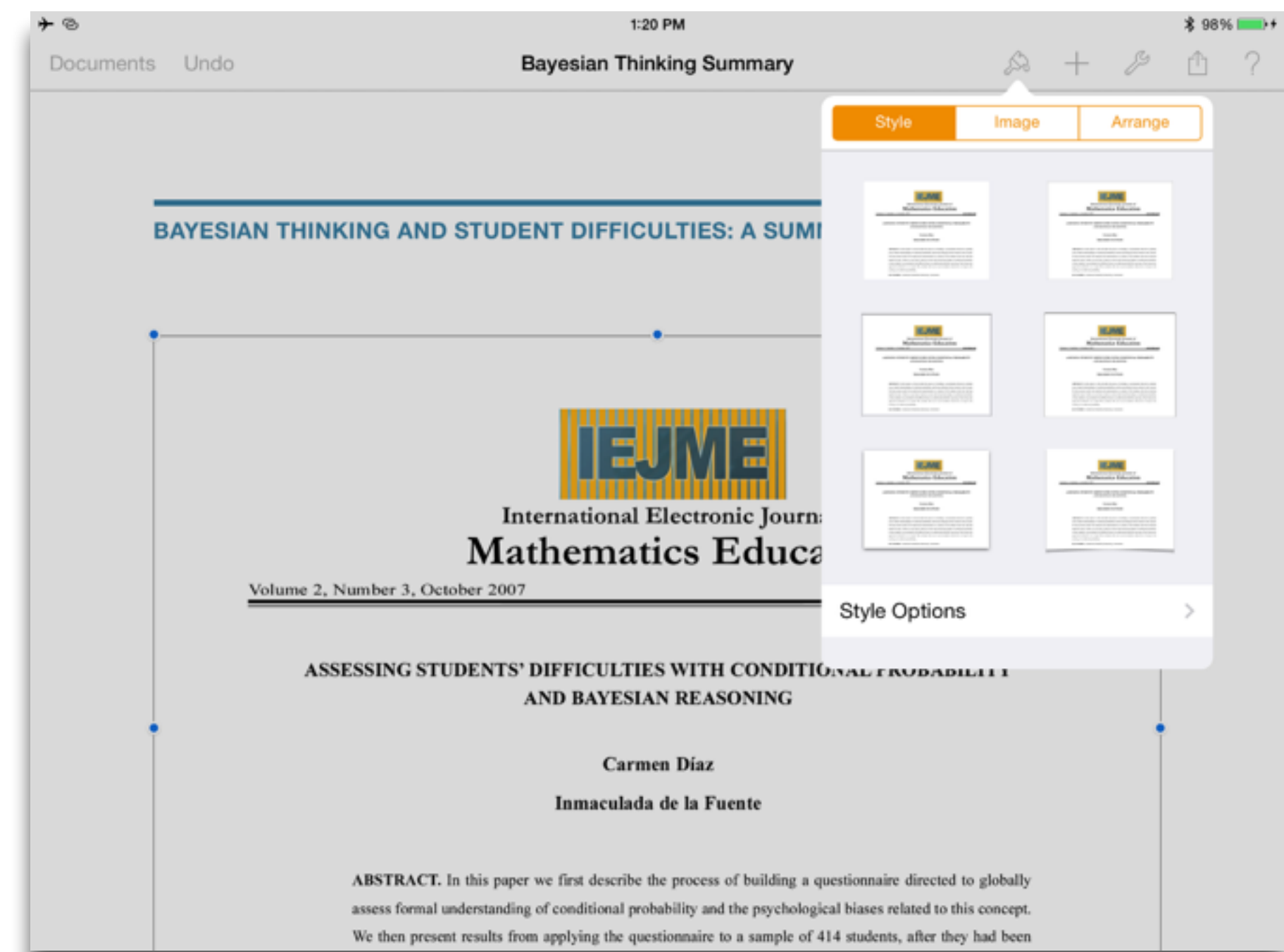
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The screenshot shows the OpenIntro Statistics website. The main navigation bar includes 'STATISTICS', 'ACADEMIC JOBS', 'CONTRIBUTE', 'LICENSE', 'ABOUT', and 'LOGIN'. Below this is a 'Statistics' header with sub-navigation for 'OVERVIEW', 'TEXTBOOK', 'LABS', 'VIDEOS', 'FORUMS', 'SLIDES', and 'EXTRAS'. The 'TEXTBOOKS' section features two options: 'OpenIntro Statistics 2nd Edition' (2012, 426 pages) and '1st Edition' (2011, 380 pages). The 2nd edition is highlighted with a yellow background. To the right, there are sections for 'DATA SETS' and 'PROBABILITY TABLES'. The 'DATA SETS' section offers 'Data Sets' and 'Printer-friendly PDF'. The 'PROBABILITY TABLES' section offers 'Printer-friendly PDF' and 'Download the LaTeX source files'. A table of contents is also visible, listing chapters 1 through 8.



The screenshot shows a document editor interface. The document title is 'Bayesian Thinking Summary'. The main content is a summary of a paper titled 'BAYESIAN THINKING AND STUDENT DIFFICULTIES: A SUMMARY'. The paper is from the 'International Electronic Journal of Mathematics Education' (IEJME), Volume 2, Number 3, October 2007. The authors listed are Carmen Diaz and Inmaculada de la Fuente. The abstract describes the process of building a questionnaire to assess formal understanding of conditional probability and psychological biases. A style menu is open on the right side of the document, showing options for 'Style', 'Image', and 'Arrange'. The 'Style' option is selected, and a 'Style Options' dropdown is visible below it.

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Computing Not So Basic Probabilities from

DataSet = 2 Seed = 64

in the table below, dosage calculations from a sample of 56 doctors are sorted according to whether the label on the drug bottle contained a concentration or a ratio, and whether the calculation was correct or wrong.

| | Correct | Wrong | Row Totals |
|---------------|---------|-------|------------|
| Concentration | 22 | 6 | 28 |
| Ratio | 4 | 24 | 28 |
| Column Totals | 26 | 30 | 56 |

a) What is the probability that a calculation in the sample was based on a concentration or was correct?

Check the box to see the answer to (a).

b) Given that a calculation in the sample was correct, what is the probability that the calculation was based on a ratio?

Check the box to see the answer to (b).

Number

- ANm1 = 22
- ANm2 = 6
- ANm3 = 4
- APrb = 0.571
- ATot = 32
- BDnm = 26
- BNum = 4
- BOp = 0
- BPrb = 0.154
- DataSet = 2
- GrTt = 56
- OpANm1 = 1
- OpANm2 = 1

Input Bar

Apr 8, 2014, 1:26 PM Edit

age = 48

Number

- age = 48
- factor1 = 0.44
- factor2 = 0.25

Line

- a: $y = 0.44x + 0.25$

Trying to look at different ways of visualizing how different factors come together in determining the probability of the result - some questions are brought up by the diagram above, though:

- Can you collapse multiple factors into one trivially? The graph would seem to imply that - but it isn't obvious from the equations.
- Are there ways of simplifying the calculations for some limiting cases?

1:26 PM TUESDAY, APRIL 8, 2014

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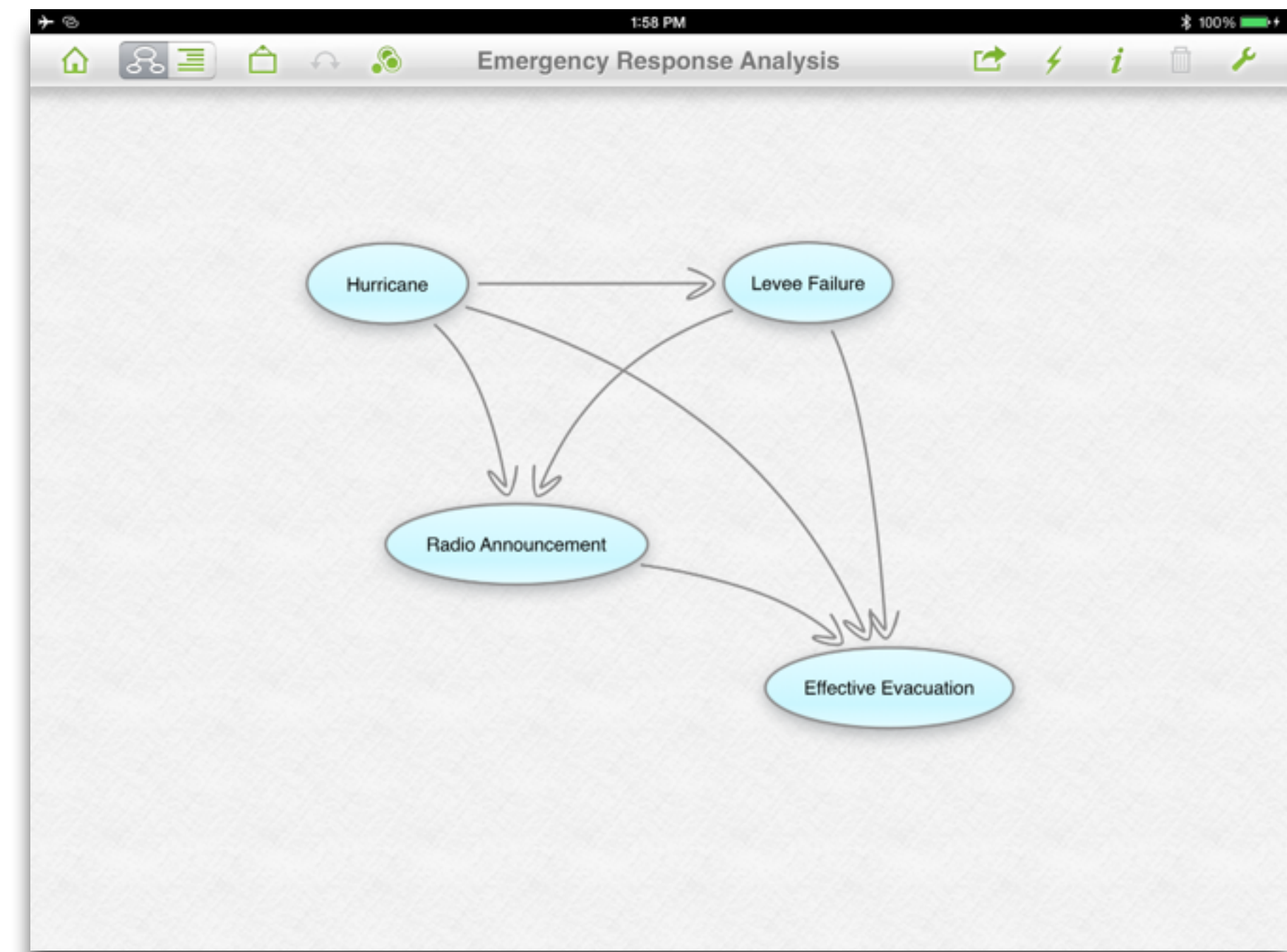
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Understanding Bayesian Networks

Changing the conditions that might trigger an event can sometimes have unexpected results. Consider the following diagram, designed as a simplified version of possible responses in a scenario similar to Katrina:

```
graph TD; Hurricane --> Levee Failure; Hurricane --> Radio Announcement; Levee Failure --> Radio Announcement; Levee Failure --> Effective Evacuation; Radio Announcement --> Effective Evacuation;
```

► Now, let's assign some reasonable values to the probabilities involved:

Posted with Blogsy

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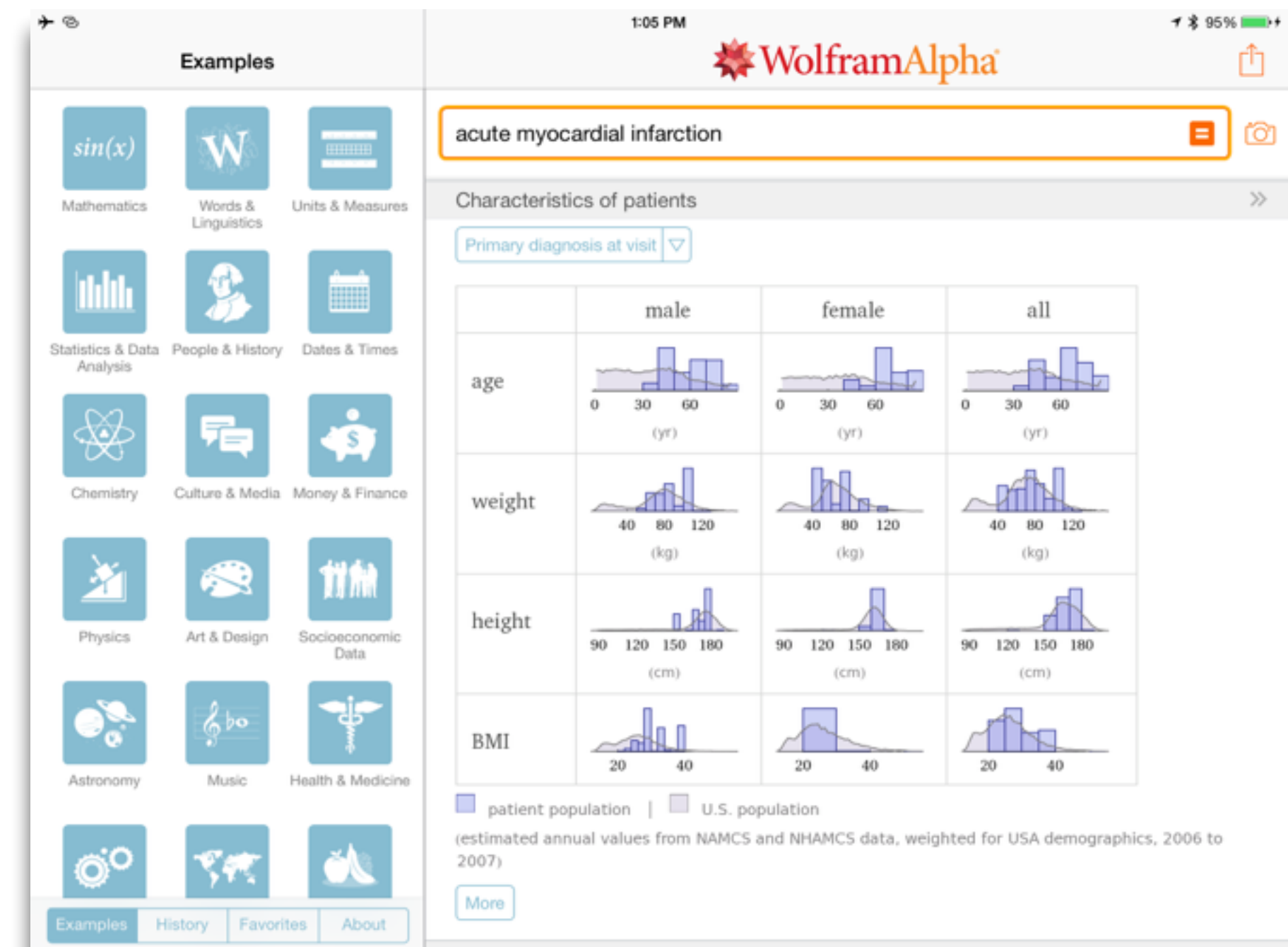
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Presentations Undo Stent Policy Analysis

| Independent Predictor | Hazard Ratio | 95% CI | P Value |
|--|--------------|-------------|---------|
| 30-Day Major Adverse Cardiac or Cerebrovascular Event | | | |
| >1 vessel treated | 1.416 | 1.138-1.762 | 0.0018 |
| Urgent procedure | 3.27 | 2.5-5.54 | <0.0001 |
| Female sex | 1.464 | 1.03-2.07 | 0.0321 |
| Chronic obstructive pulmonary disease | 1.541 | 1.04-2.276 | 0.03 |
| Hypertension | 1.622 | 1.037-2.535 | 0.0339 |
| 3-Year Survival | | | |
| >1 vessel treated | 1.252 | 1.072-1.462 | 0.0045 |
| NYHA functional class III or IV | 1.35 | 1.015-1.796 | 0.0389 |
| Prior myocardial infarction | 1.411 | 1.077-1.848 | 0.0047 |
| Age >65 yr | 2.182 | 1.663-2.864 | <0.0001 |
| Chronic renal insufficiency | 1.963 | 1.481-2.602 | <0.0001 |
| Valvulopathy | 1.641 | 1.183-2.277 | 0.0031 |
| Family history of coronary artery disease | 0.615 | 0.437-0.865 | 0.0039 |
| Hyperlipidemia | 0.66 | 0.518-0.841 | 0.0002 |
| Congenital heart disease | 2.312 | 1.692-3.16 | <0.0001 |
| Peripheral vascular disease | 1.921 | 1.452-2.541 | <0.0001 |

Will Stent Revascularization Replace Coronary Artery Bypass Grafting?
James M. Wilson, MD

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| Mid-Range (3-5 yrs.) | Rise of Data-Driven Learning, Assessment Shift from Students as Consumers to Students as Creators |
| Long-Range (5+ yrs.) | Agile Approaches to Change Evolution of Online Learning |

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| Adoption: 1 yr. or less | Flipped Classroom Learning Analytics |
| Adoption: 2-3 yrs. | 3D Printing Games and Gamification |
| Adoption: 4-5 yrs. | Quantified Self Virtual Assistants |

Significant Challenges Impeding Ed Tech Adoption

| Solvable <i>understand and know how to solve</i> | Difficult <i>understand but solutions are elusive</i> | Wicked <i>complex to define, much less address</i> |
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| Low Digital Fluency of Faculty Relative Lack of Rewards for Teaching | Competition from New Models of Ed Scaling Teaching Innovations | Expanding Access Keeping Education Relevant |

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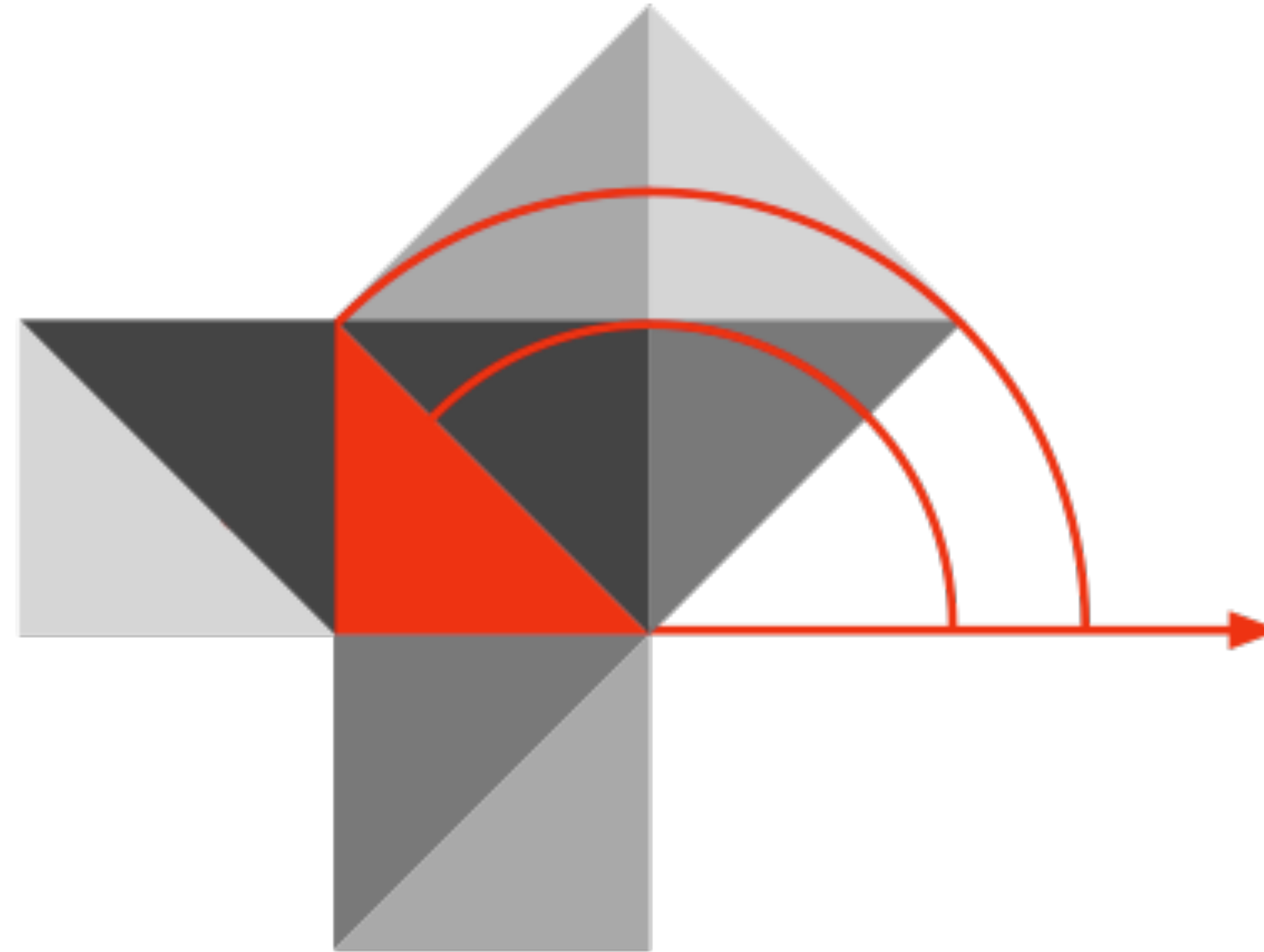
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Hippasus



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Twitter: @rubenrp

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