The SAMR Model and Digital Learning

Ruben R. Puentedura, Ph.D.

Education and Research
2011–2016

A development plan

FINNISH NATIONAL
BOARD OF EDUCATION

SEARCH

Current issues   Education system   **Curricula and qualifications**   Education development   Services   Publications   About FNBE

- Pre-primary education

- **Basic education**

- General upper secondary education

- Vocational upper secondary education

- Pre-vocational programmes

- Competence-based qualifications for adults

- Education for immigrants

- Qualification frameworks

▸ Higher education

Basic education

The overall distribution of lesson hours for basic education and the minimum number of lessons for core subjects during basic education are decided by the Government. The present distribution of lesson hours was confirmed in 2012 and will be implemented together with the new core curriculum in 2016.

The new distribution of lesson hours in basic education (pdf, in Finnish)

The distribution of lesson hours stipulate such matters as the core subjects taught to all pupils, and the distribution of teaching hours between various subjects.

The national core curriculum is determined by the Finnish National Board of Education. It includes the objectives and core contents of different subjects, as well as the principles of pupil assessment, special-needs education, pupil welfare and educational guidance. The principles of a good learning environment, working approaches as well as the concept of learning are also addressed in the core curriculum. The present national core curriculum for basic education was confirmed in January 2004 and it was introduced in schools in August 2006.

The education providers, usually the local education authorities and the schools themselves draw up their own curricula for pre-primary and basic education within the framework of the national core curriculum. These curricula may be prepared for individual municipalities or institutions or include both sections.

The national core curriculum is being reformed and the new curriculum will be introduced in August 2016.
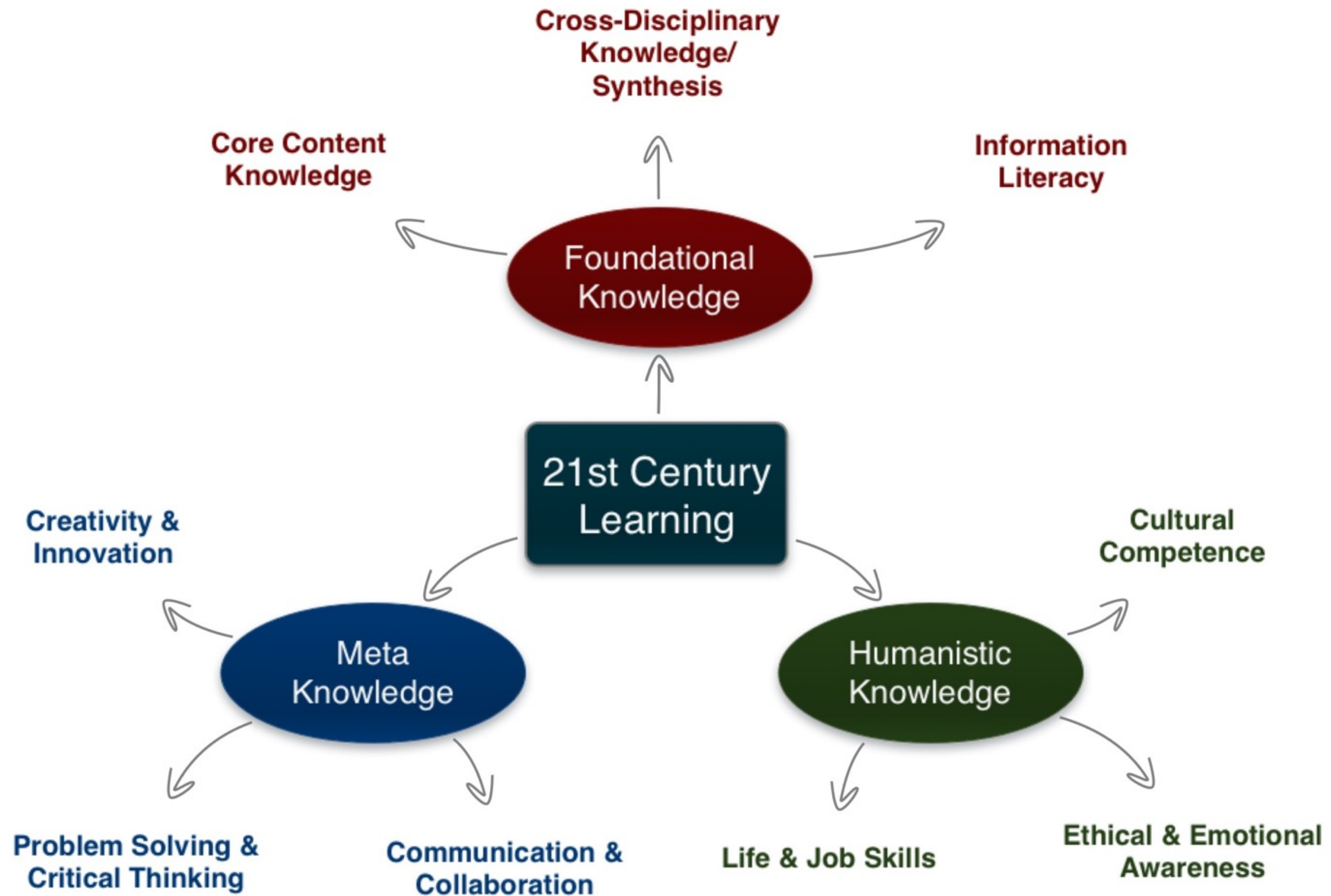
Curriculum reform 2016

Printed publication can be ordered by e-mail: info@kustannustaito.fi .

Amendments and additions

- Amendments and additions to the National Core Curriculum for Basic Education (pdf), valid from 1.1.2011

Read more

- Finland: Teaching and Learning in Single Structure Education (Eurypedia)

Cross-Disciplinary
Knowledge/
Synthesis

Core Content
Knowledge

Information
Literacy

**Foundational
Knowledge**

**21st Century
Learning**

Creativity &
Innovation

Cultural
Competence

**Meta
Knowledge**

**Humanistic
Knowledge**

Problem Solving &
Critical Thinking

Communication &
Collaboration

Life & Job Skills

Ethical & Emotional
Awareness

Meta-analysis	Number of studies	ES type	Mean ES	SE
Bangert-Drowns (1993)	19	Missing	0.27	0.11
Bayraktar (2000)	42	Cohen's d	0.27	0.05
Blok, Oostdam, Otter, and Overmaat (2002)	25	Hedges's g	0.25	0.06
Christmann and Badgett (2000)	16	Missing	0.13	0.05
Fletcher-Flinn and Gravatt (1995)	120	Glass's Δ	0.24	0.05
Goldberg, Russell, and Cook (2003)	15	Hedges's g	0.41	0.07
Hsu (2003)	25	Hedges's g	0.43	0.03
Koufogiannakis and Wiebe (2006)	8	Hedges's g	−0.09	0.19
Kuchler (1998)	65	Hedges's g	0.44	0.05
Kulik and Kulik (1991)	239	Glass's Δ	0.30	0.03
Y. C. Liao (1998)	31	Glass's Δ	0.48	0.05
Y.-I. Liao and Chen (2005)	21	Glass's Δ	0.52	0.05
Y. K. C. Liao (2007)	52	Glass's Δ	0.55	0.05
Michko (2007)	45	Hedges's g	0.43	0.07
Onuoha (2007)	35	Cohen's d	0.26	0.04
Pearson, Ferdig, Blomeyer, and Moran (2005)	20	Hedges's g	0.49[a]	0.11
Roblyer, Castine, and King (1988)	35	Hedges's g	0.31	0.05
Rosen and Salomon (2007)	31	Hedges's g	0.46	0.05
Schenker (2007)	46	Cohen's d	0.24	0.02
Soe, Koki, and Chang (2000)	17	Hedges's g and Pearson's r[a]	0.26[a]	0.05
Timmerman and Kruepke (2006)	114	Pearson's r[a]	0.24	0.03
Torgerson and Elbourne (2002)	5	Cohen's d	0.37	0.16
Waxman, Lin, and Michko (2003)	42	Glass's Δ	0.45	0.14
Yaakub (1998)	20	Glass's Δ and g	0.35	0.05
Zhao (2003)	9	Hedges's g	1.12	0.26

a. Converted to Cohen's d.

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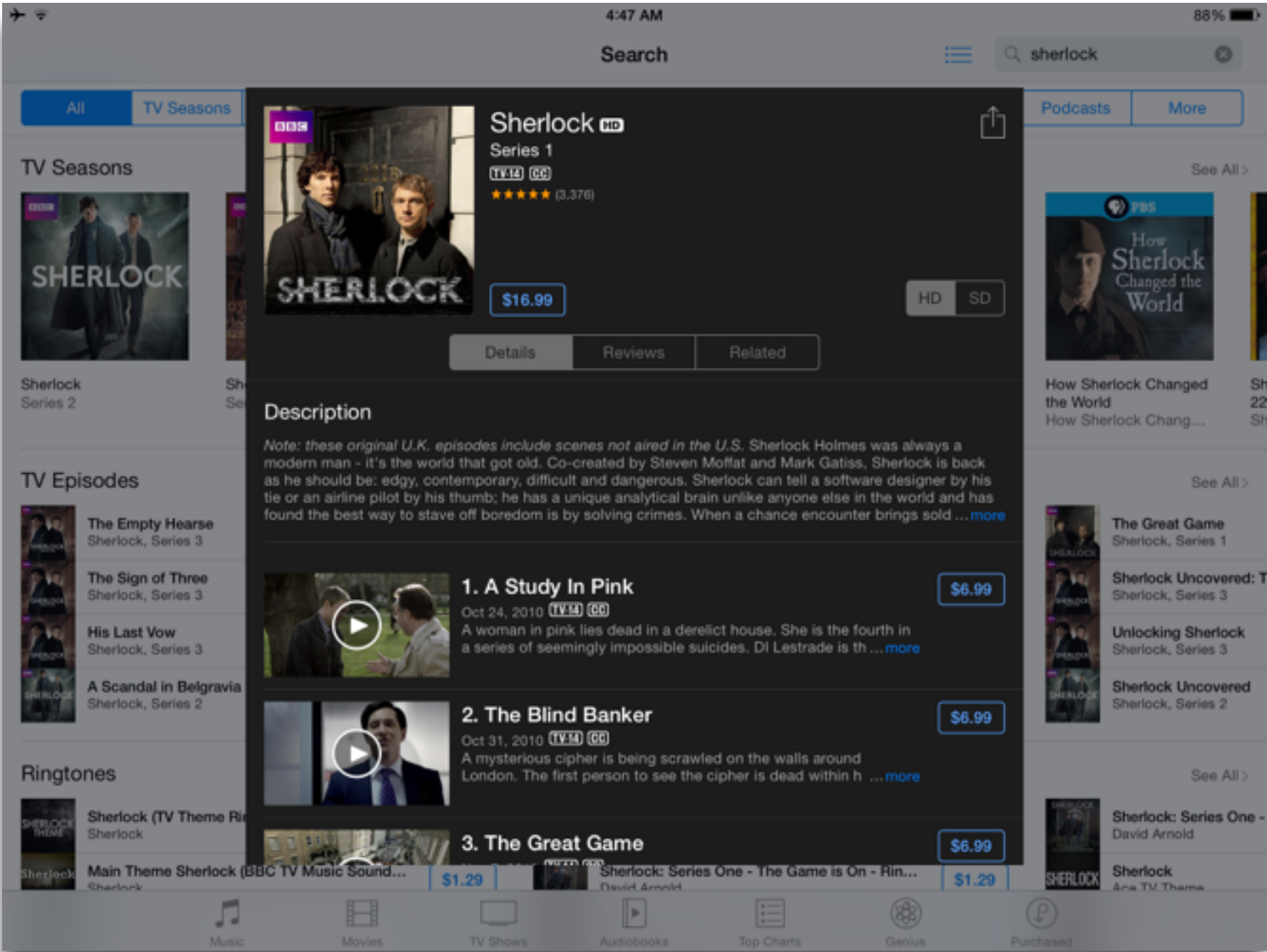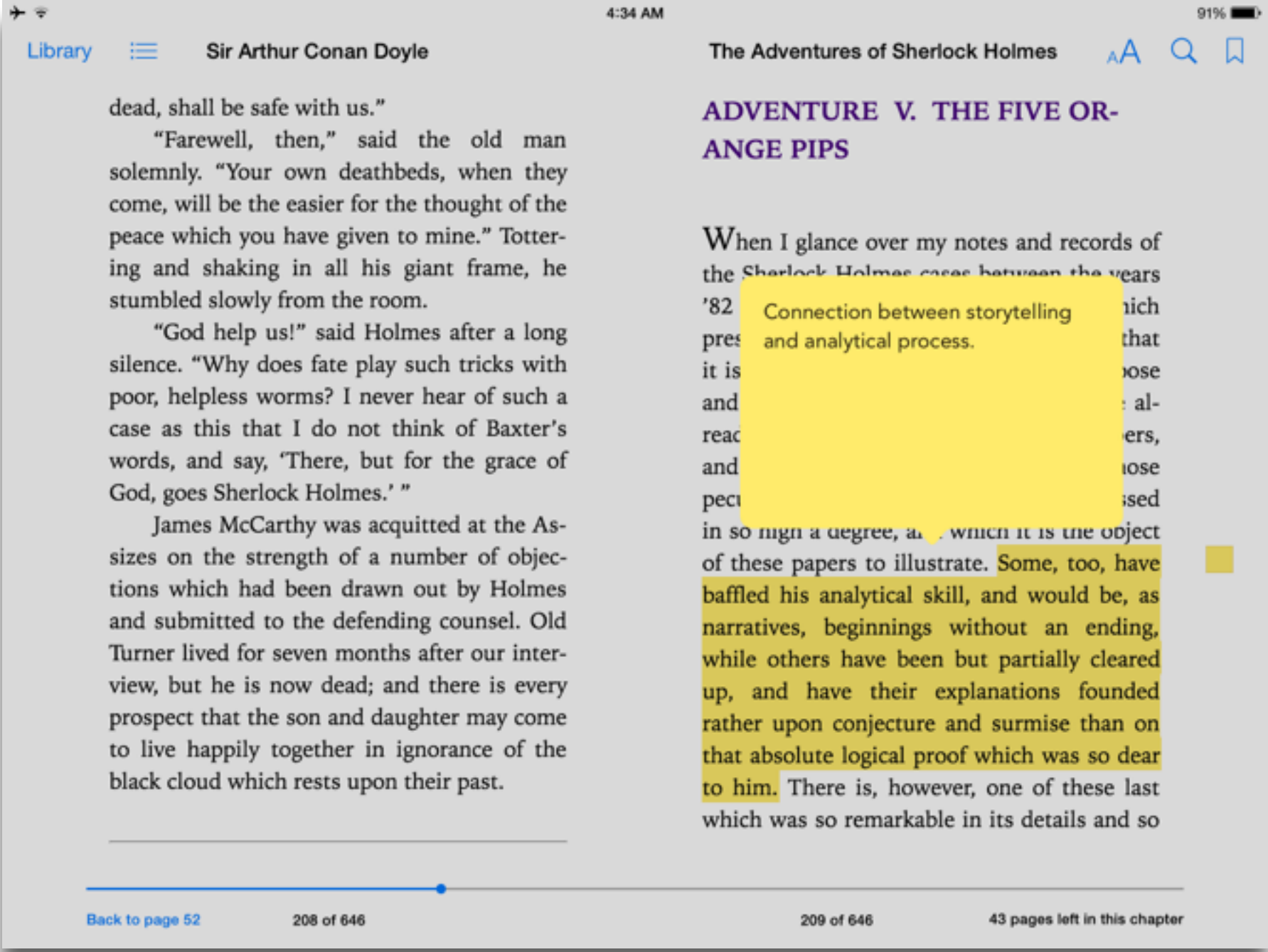*Tech allows for the creation of new tasks, previously inconceivable*

Modification
Tech allows for significant task redesign

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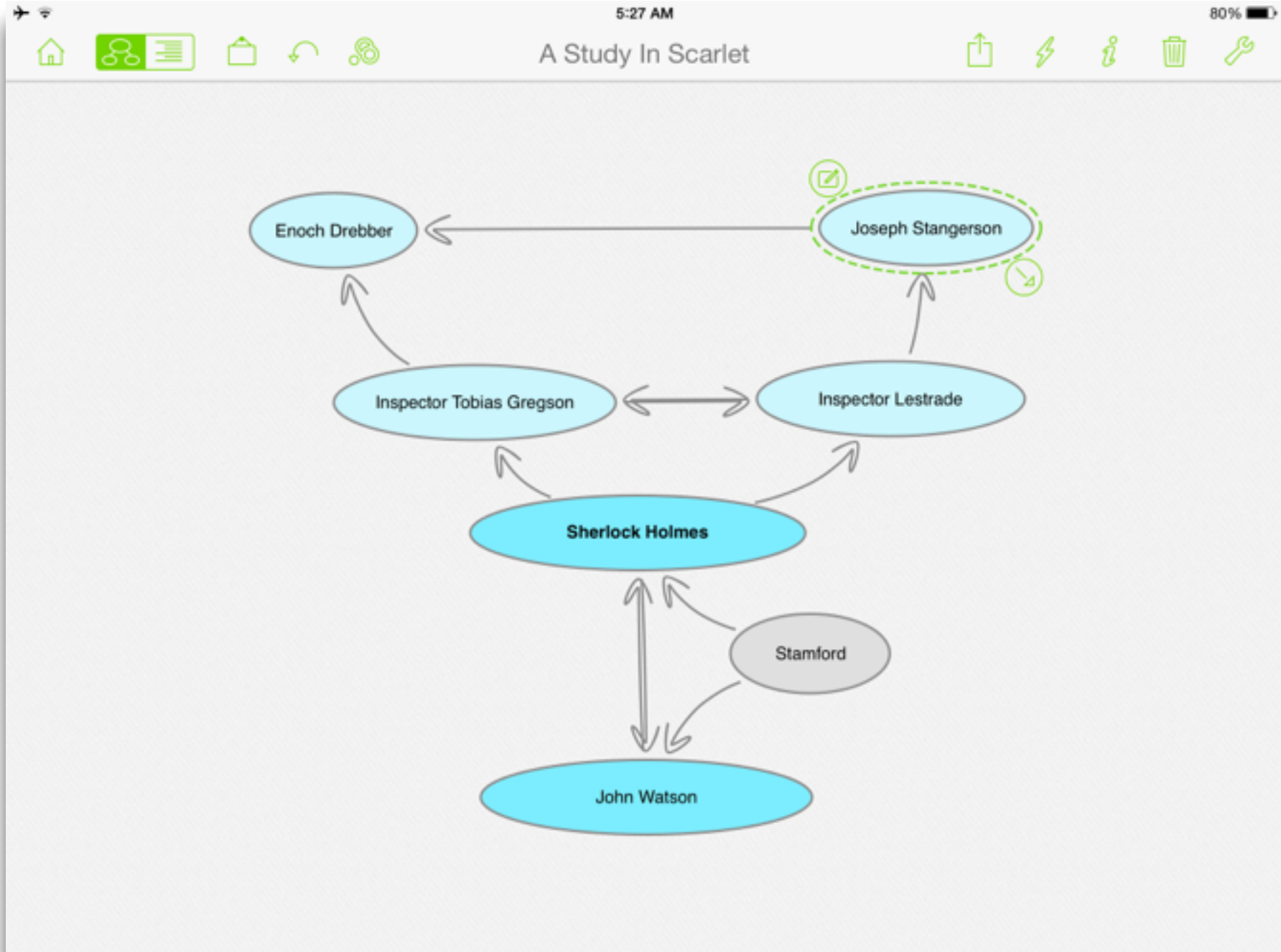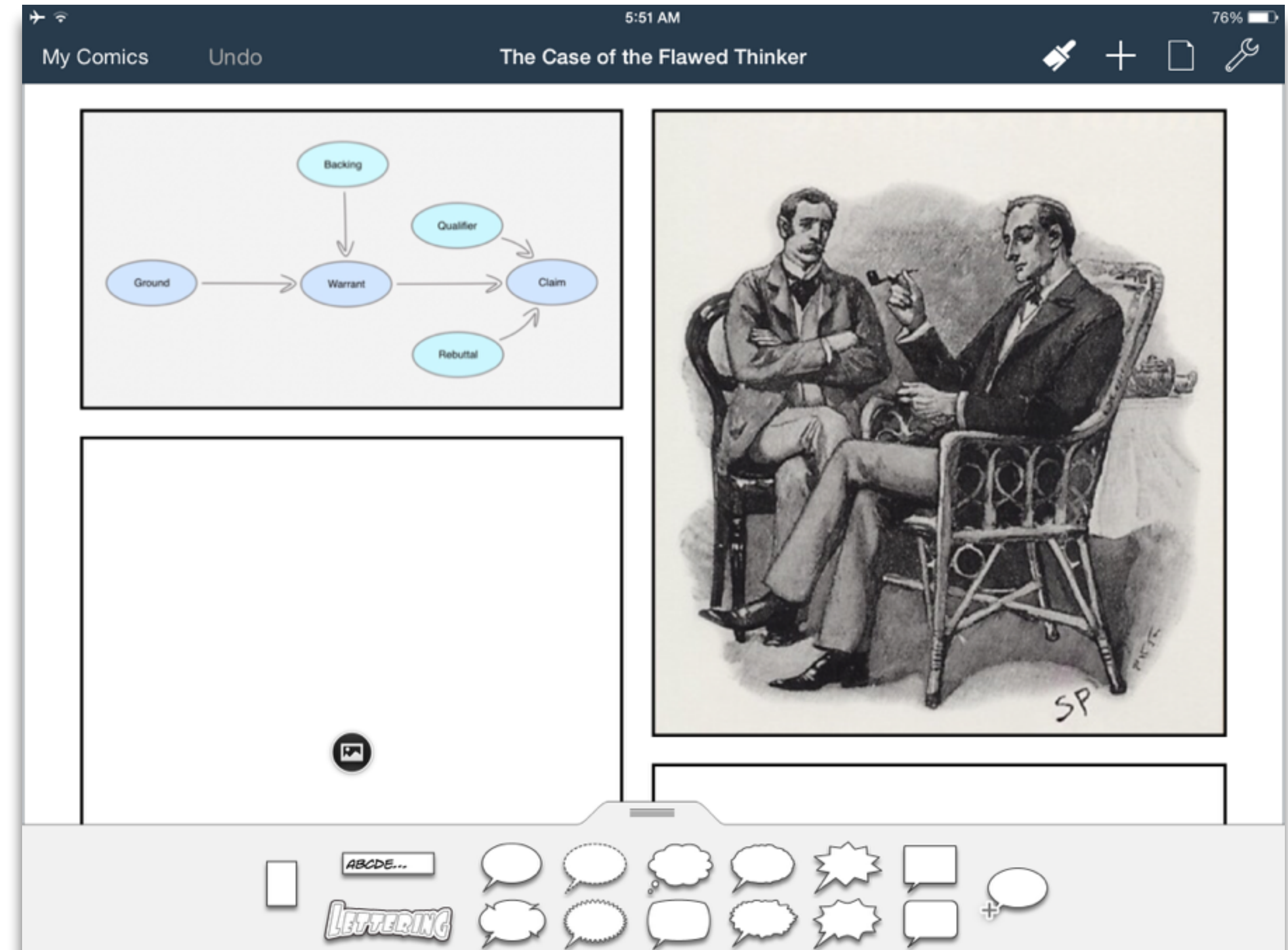*Tech acts as a direct tool substitute, with functional improvement*

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

Transformation

Enhancement

Ruben R. Puentedura, *As We May Teach: Educational Technology, From Theory Into Practice*. (2009)

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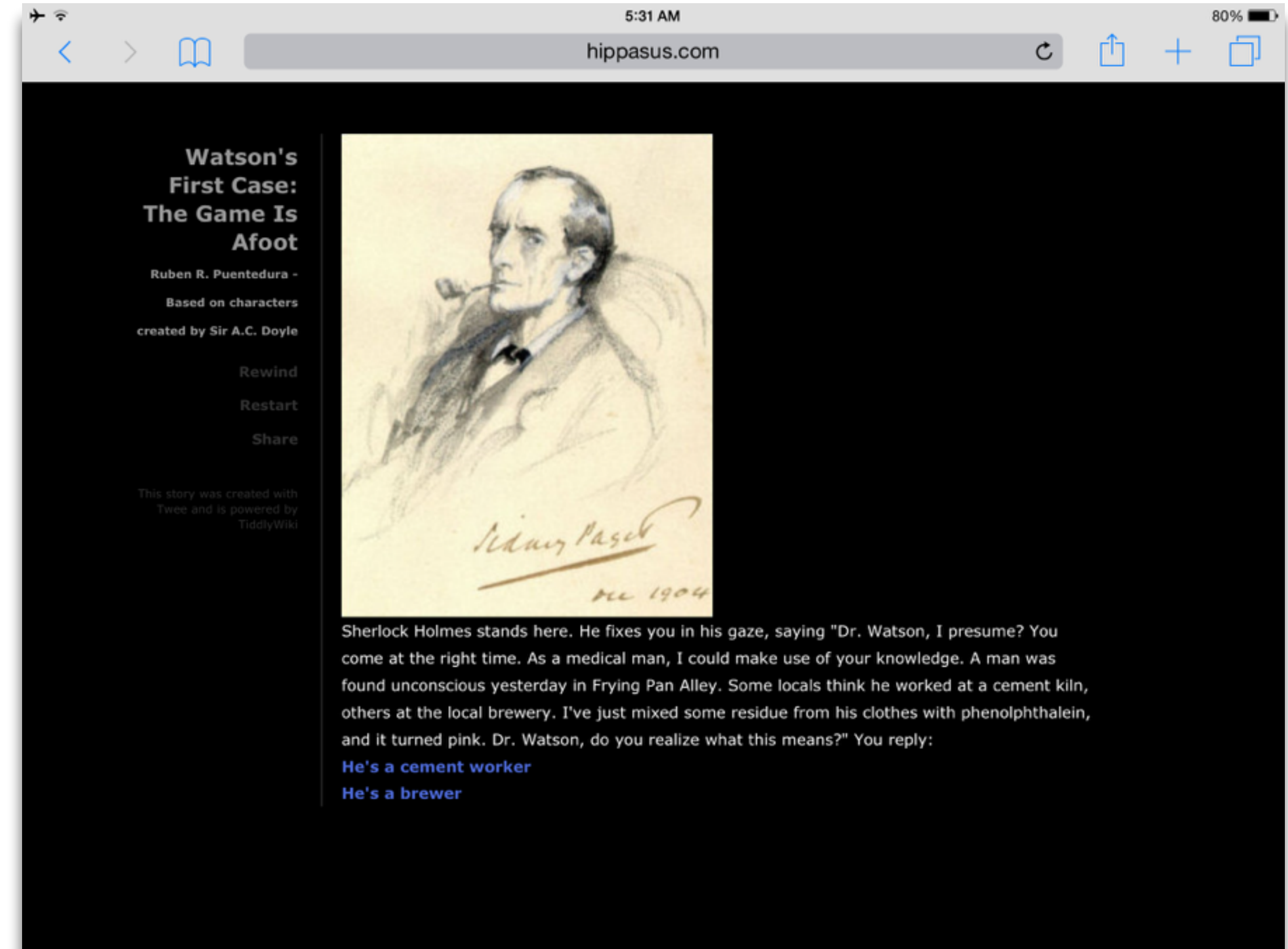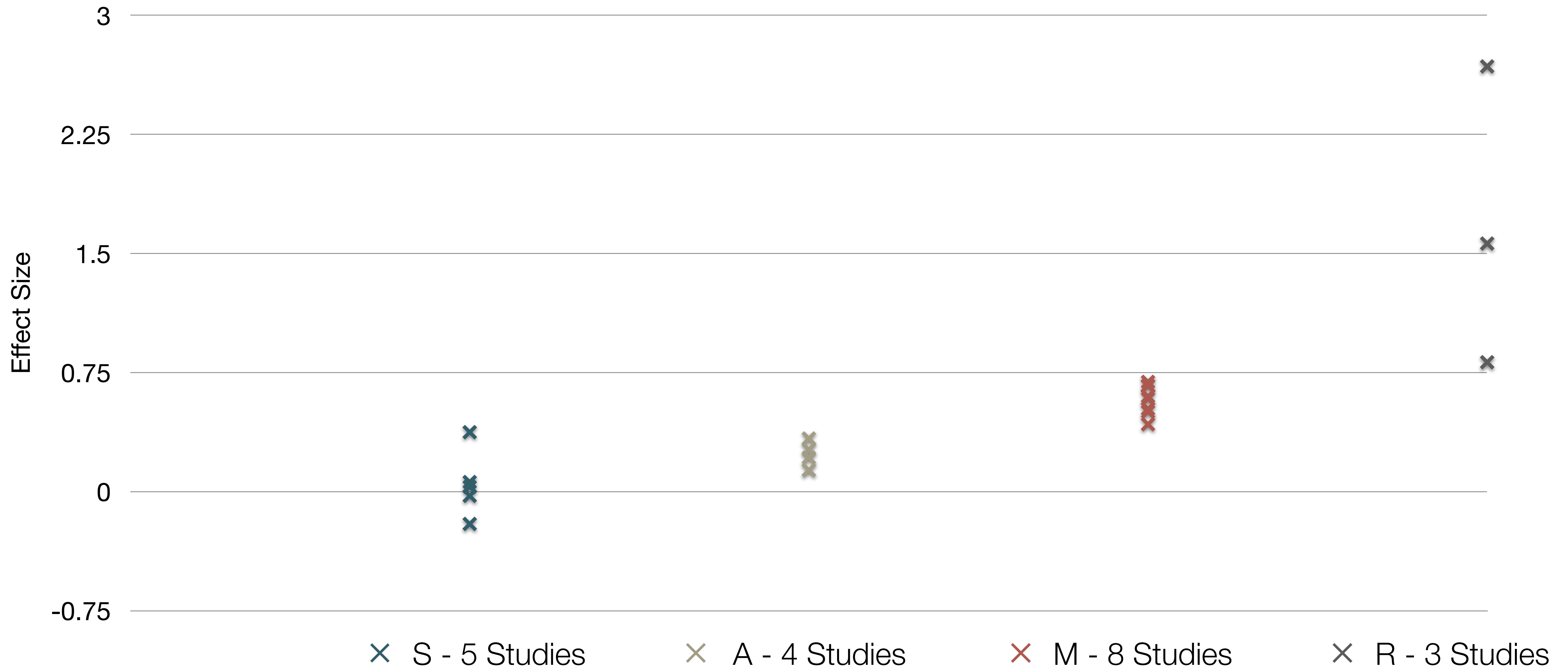
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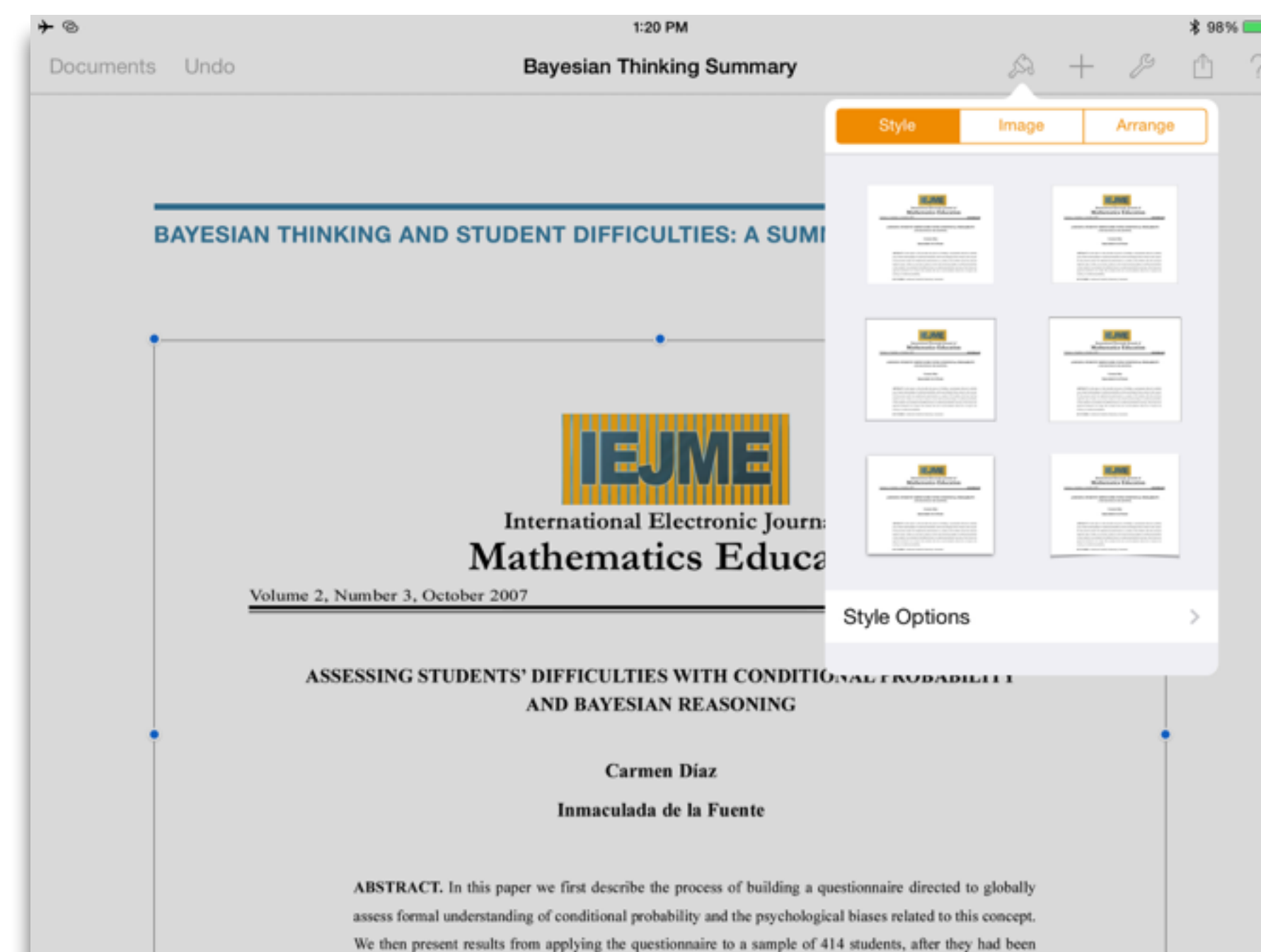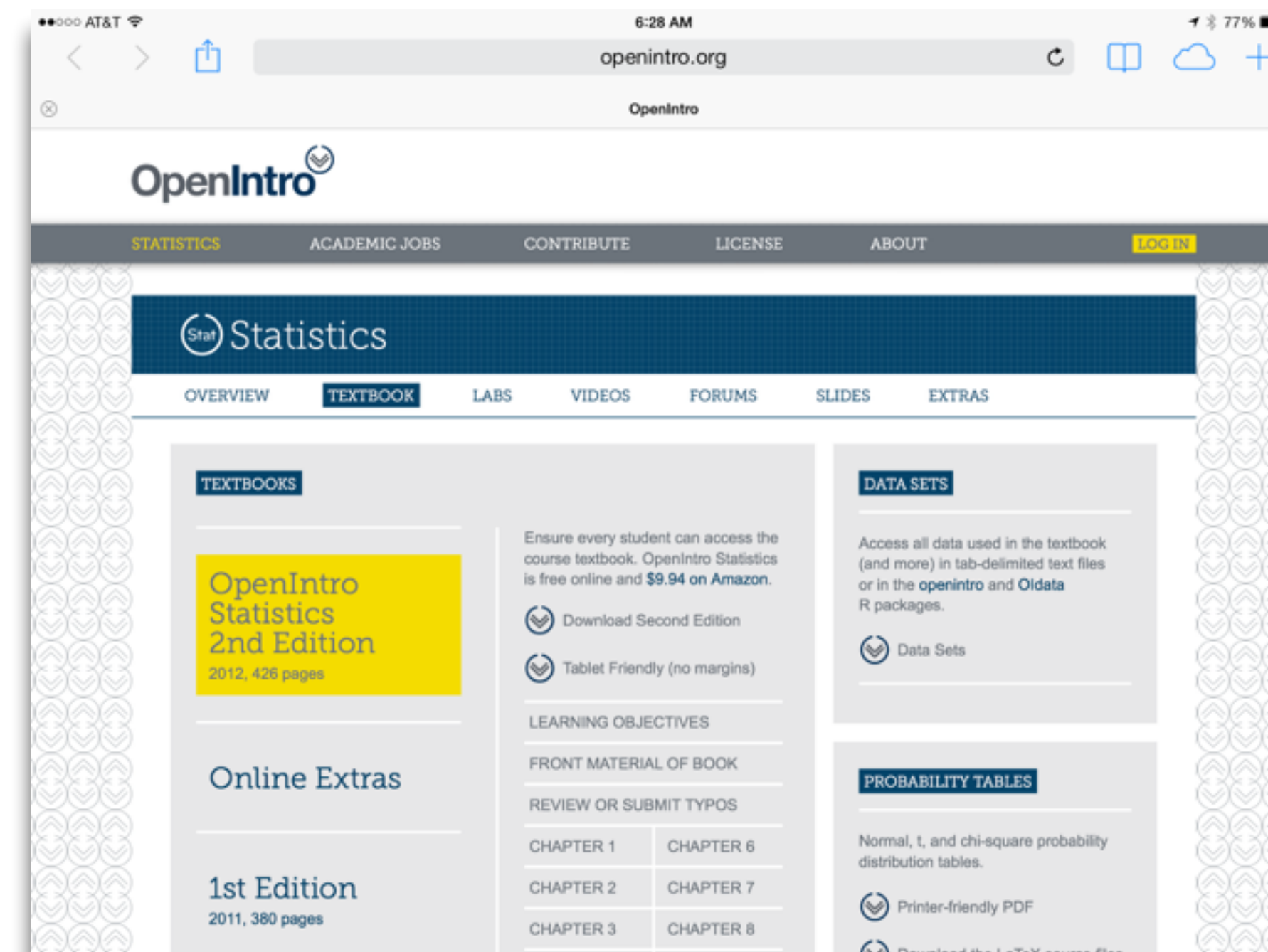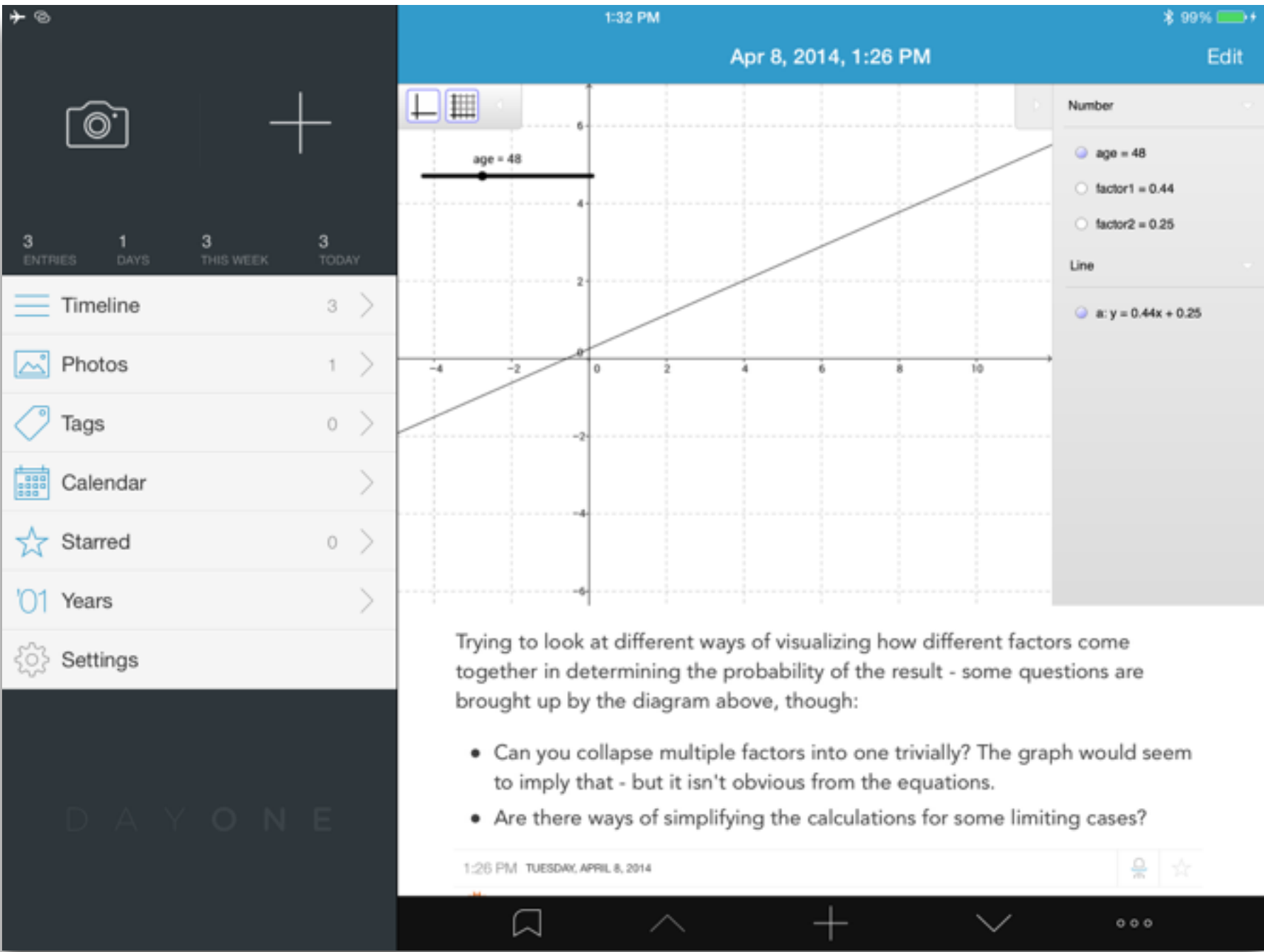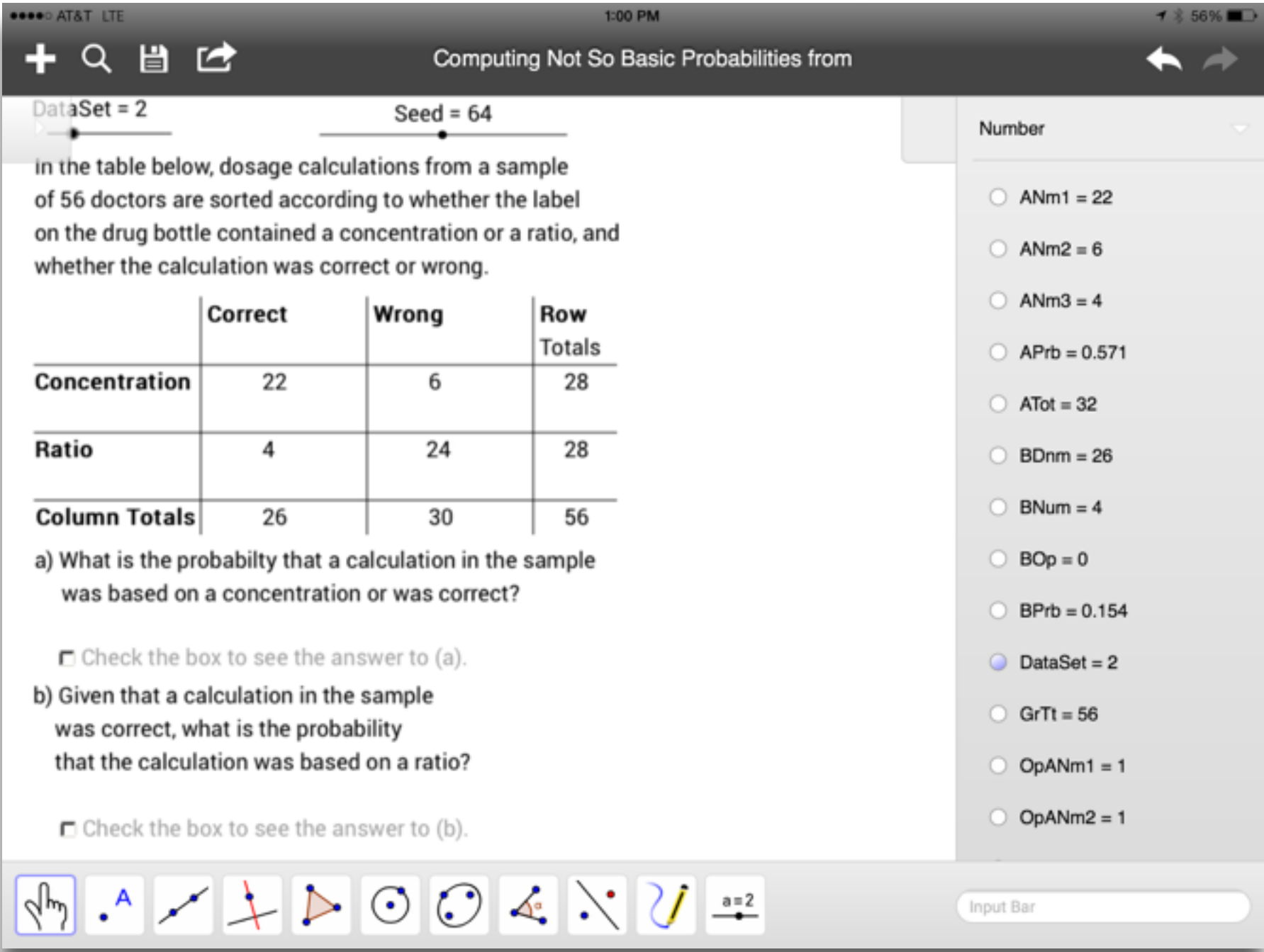
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Study	SAMR Level	Description	Effect Size
Ligas (2002)	S	CAI system used to support direct instruction approach for at-risk students.	**0.029** (50th perc. → 51st perc.)
Xin & Reith (2001)	A	Multimedia resources provided to contextualize learning of word meanings and concepts.	**0.264** (50th perc. → 60th perc.)
Higgins & Raskind (2005)	M	Software/hardware used for text-to-speech, definitions, pronunciation guide for children with reading disabilities.	**0.600** (50th perc. → 73rd perc.)
Salomon, Globerson & Guterman (1989)	R	Software presents students with reading principles and metacognitive questions as part of the reading process.	**1.563** (50th perc. → 94th perc.)

Pearson, P.D., Ferdig, R.E., Blomeyer Jr, R.L., & Moran, J. "The Effects of Technology on Reading Performance in the Middle-School Grades: A Meta-Analysis With Recommendations for Policy." *Learning Point Associates/North Central Regional Educational Laboratory (NCREL)* (2005).

Effect Size

3

2.25

1.5

0.75

0

-0.75

✕ S - 5 Studies   ✕ A - 4 Studies   ✕ M - 8 Studies   ✕ R - 3 Studies

Pearson, P.D., Ferdig, R.E., Blomeyer Jr, R.L., & Moran, J. "The Effects of Technology on Reading Performance in the Middle-School Grades: A Meta-Analysis With Recommendations for Policy." *Learning Point Associates/North Central Regional Educational Laboratory (NCREL)* (2005).

Fig. 2. Estimates by 160 gynecologists of the probability that a woman has breast cancer given a positive mammogram, before and after receiving training in how to translate conditional probabilities into natural frequencies.

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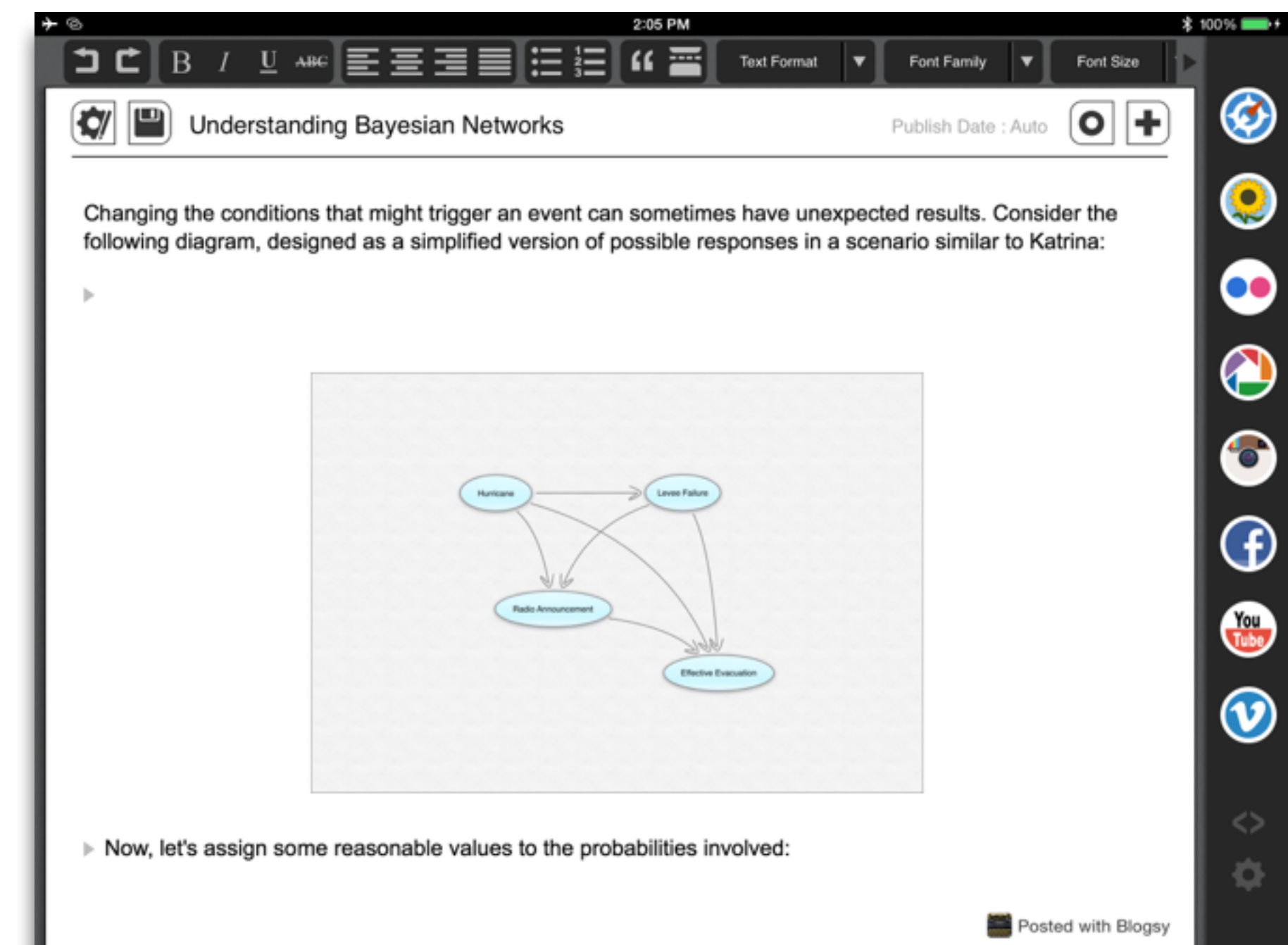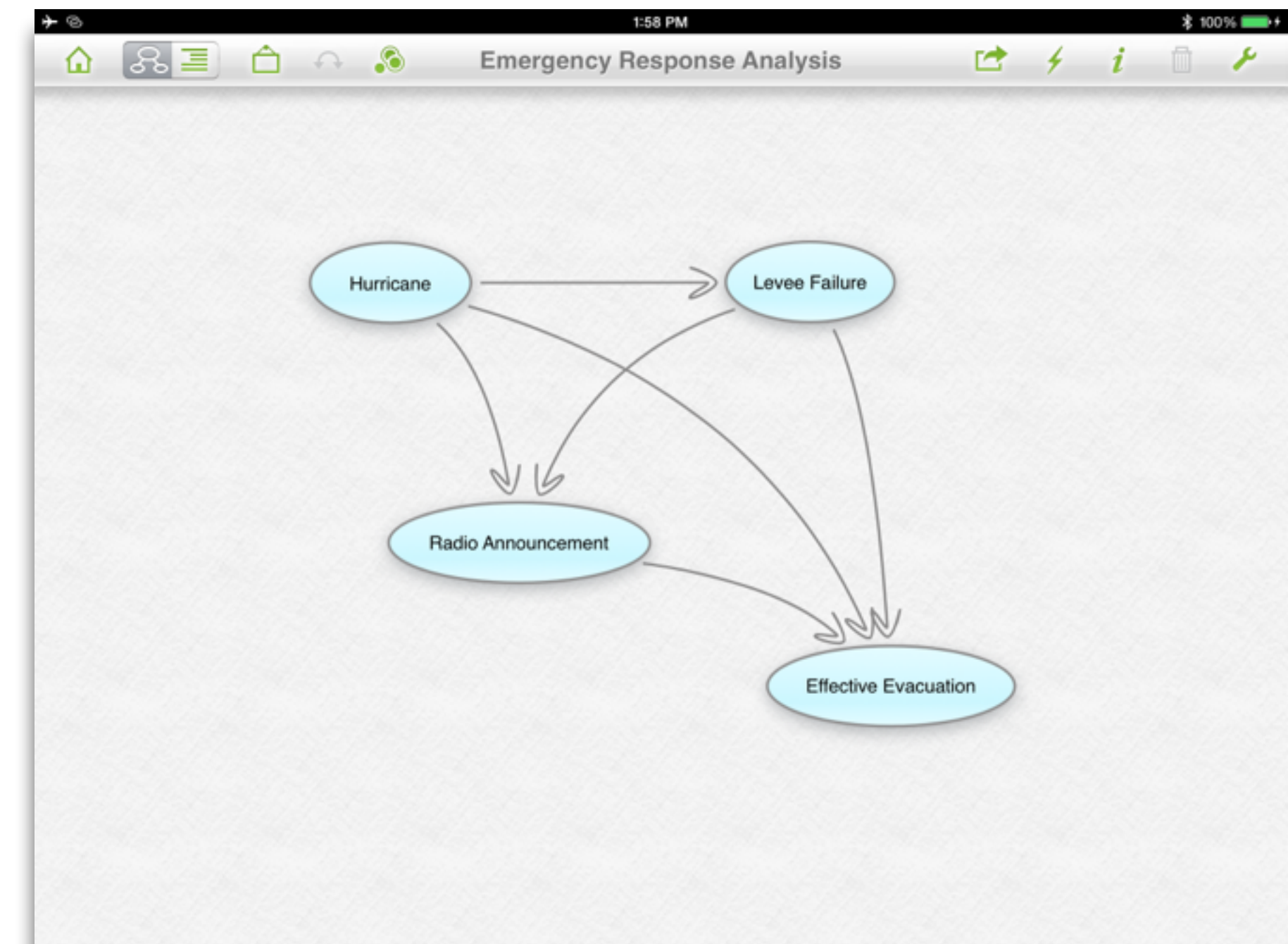*Tech allows for the creation of new tasks, previously inconceivable*

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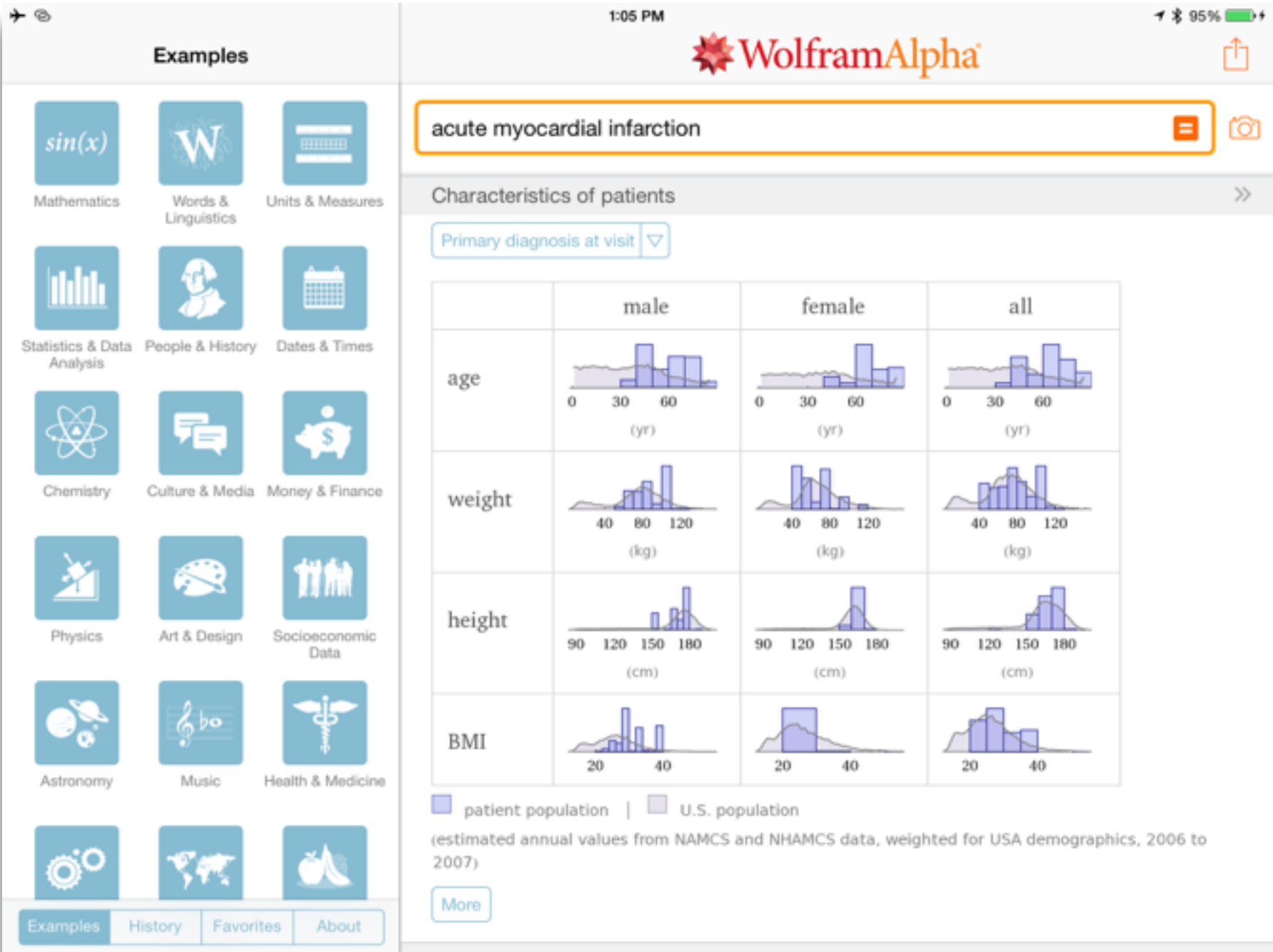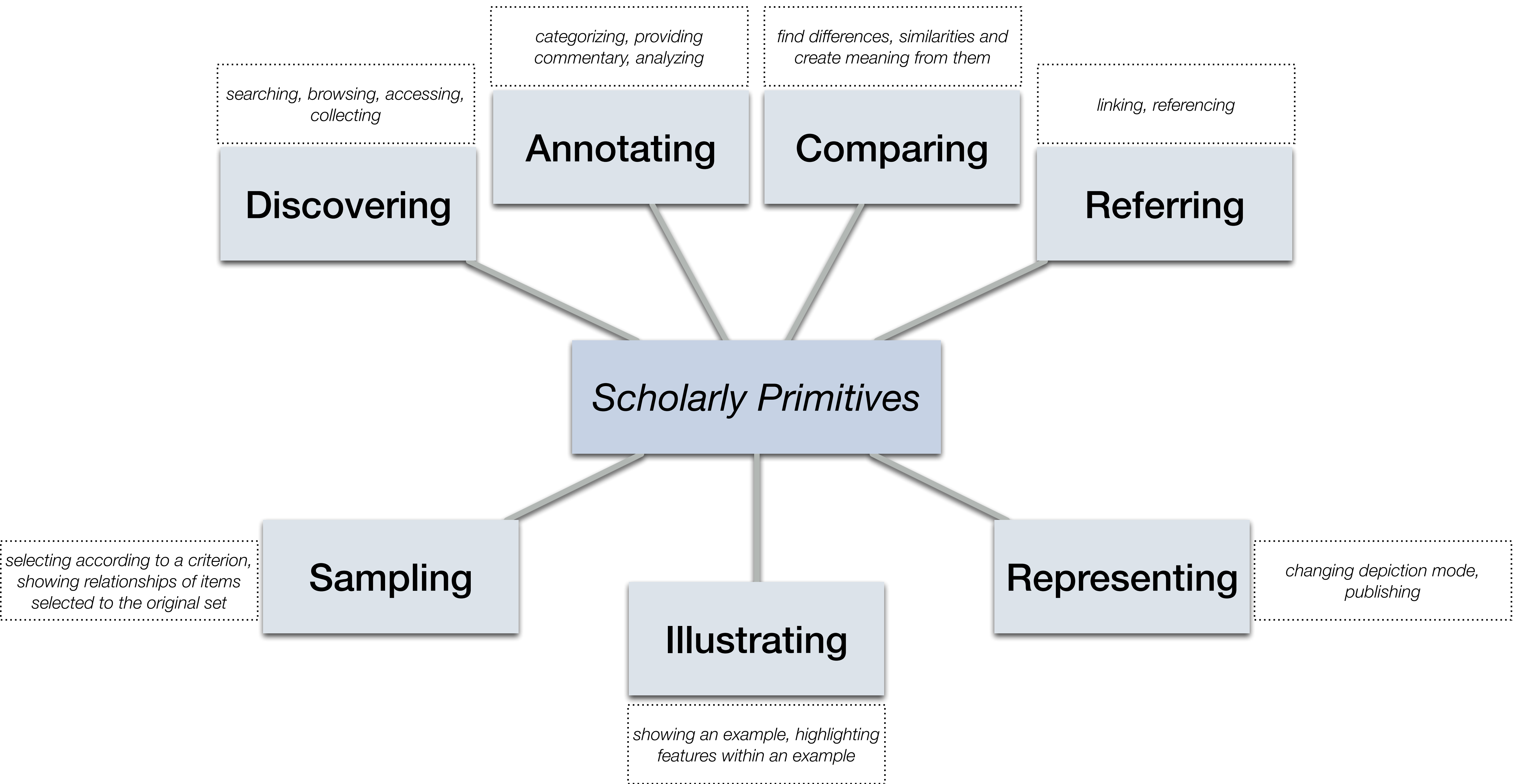
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searching, browsing, accessing, collecting

categorizing, providing commentary, analyzing

find differences, similarities and create meaning from them

linking, referencing

Discovering

Annotating

Comparing

Referring

Scholarly Primitives

selecting according to a criterion, showing relationships of items selected to the original set

Sampling

Illustrating

Representing

changing depiction mode, publishing

showing an example, highlighting features within an example

John Unsworth. *Scholarly Primitives: What Methods Do Humanities Researchers Have in Common and How Might Our Tools Reflect This?* Humanities Computing, Formal Methods, Experimental Practice Symposium, Kings College, London. (May 2000)

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

Bloom's Taxonomy: Cognitive Processes

Anderson & Krathwohl (2001)	Characteristic Processes	
Remember	• Recalling memorized knowledge • Recognizing correspondences between memorized knowledge and new material	
Understand	• Paraphrasing materials • Exemplifying concepts, principles • Classifying items • Summarizing materials	• Extrapolating principles • Comparing items
Apply	• Applying a procedure to a familiar task • Using a procedure to solve an unfamiliar, but typed task	
Analyze	• Distinguishing relevant/irrelevant or important/unimportant portions of material • Integrating heterogeneous elements into a structure • Attributing intent in materials	
Evaluate	• Testing for consistency, appropriateness, and effectiveness in principles and procedures • Critiquing the consistency, appropriateness, and effectiveness of principles and procedures, basing the critique upon appropriate tests	
Create	• Generating multiple hypotheses based on given criteria • Designing a procedure to accomplish an untyped task • Inventing a product to accomplish an untyped task	

Lorin W. Anderson and David R. Krathwohl (Eds.), *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives, Complete Edition*. Longman. (2000)

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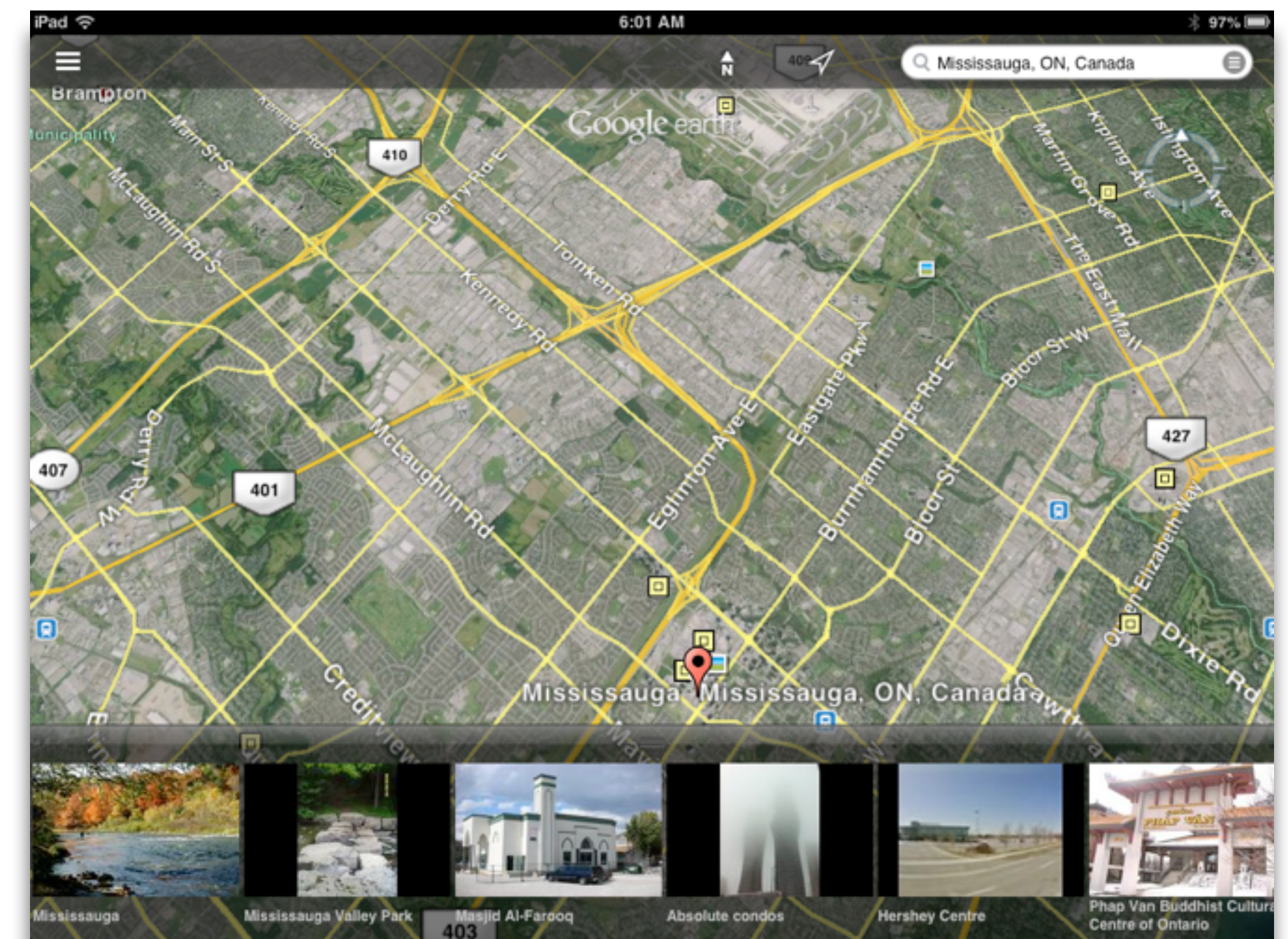*Tech allows for the creation of new tasks, previously inconceivable*

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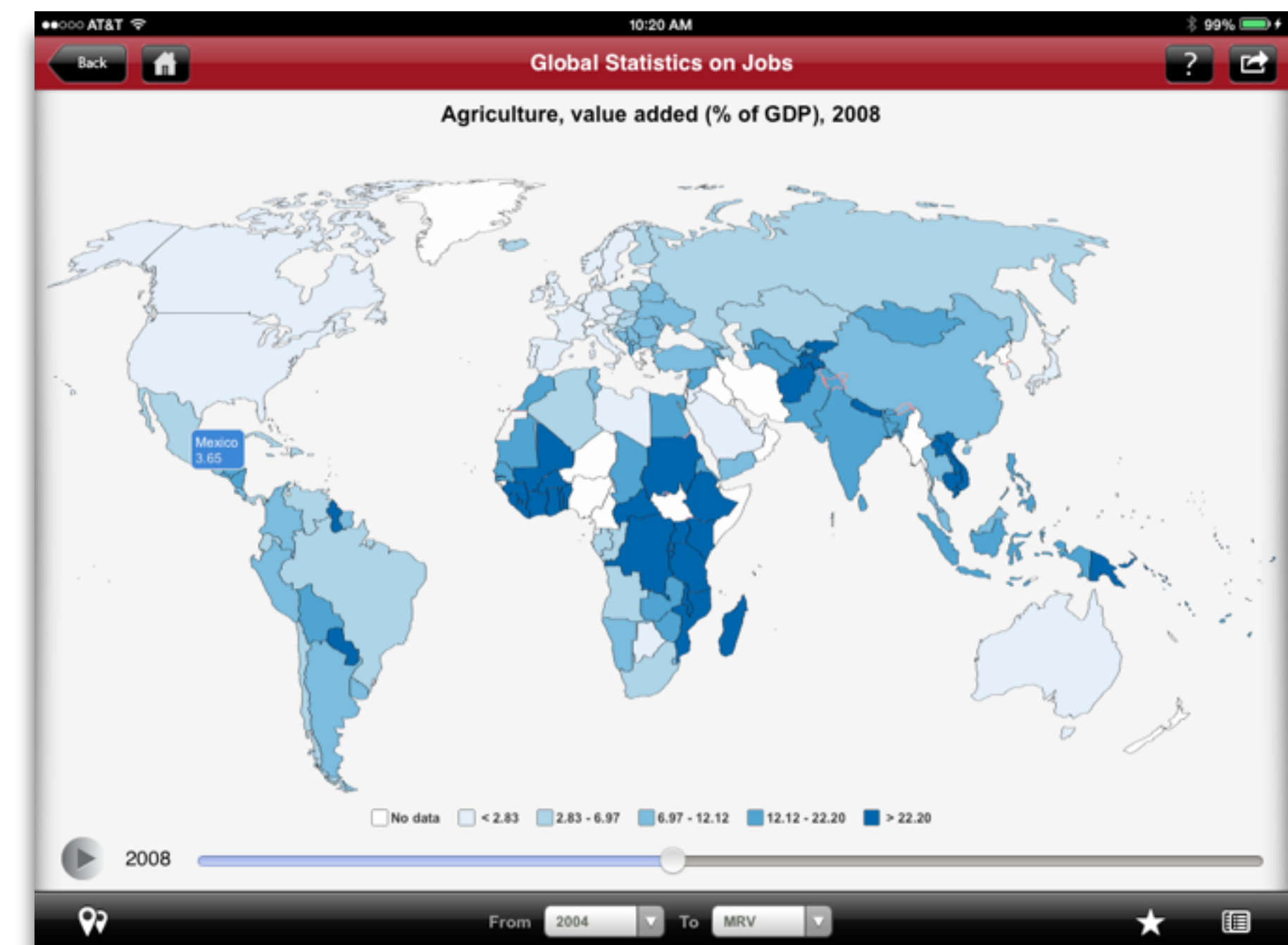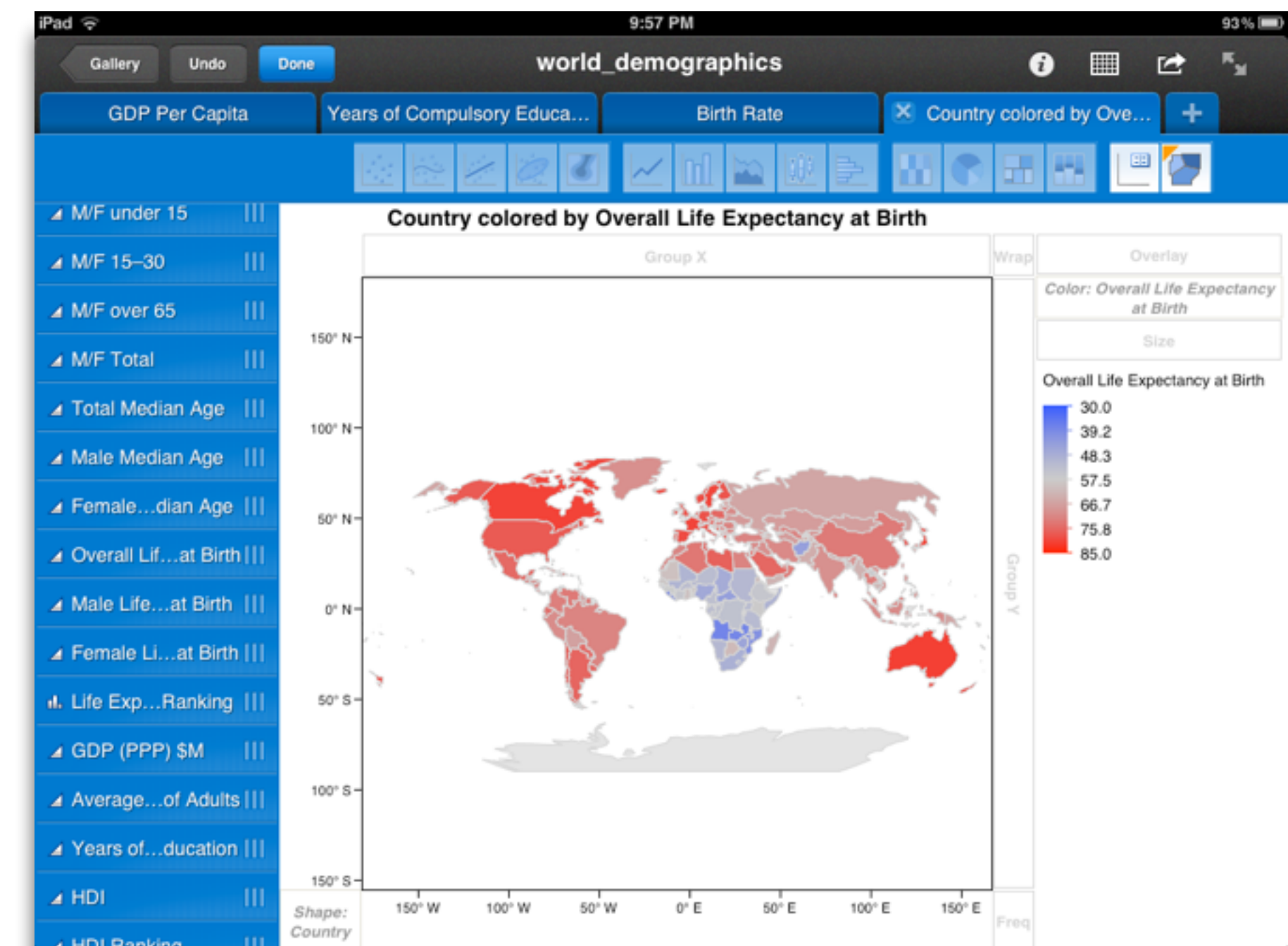*Tech allows for significant task redesign*

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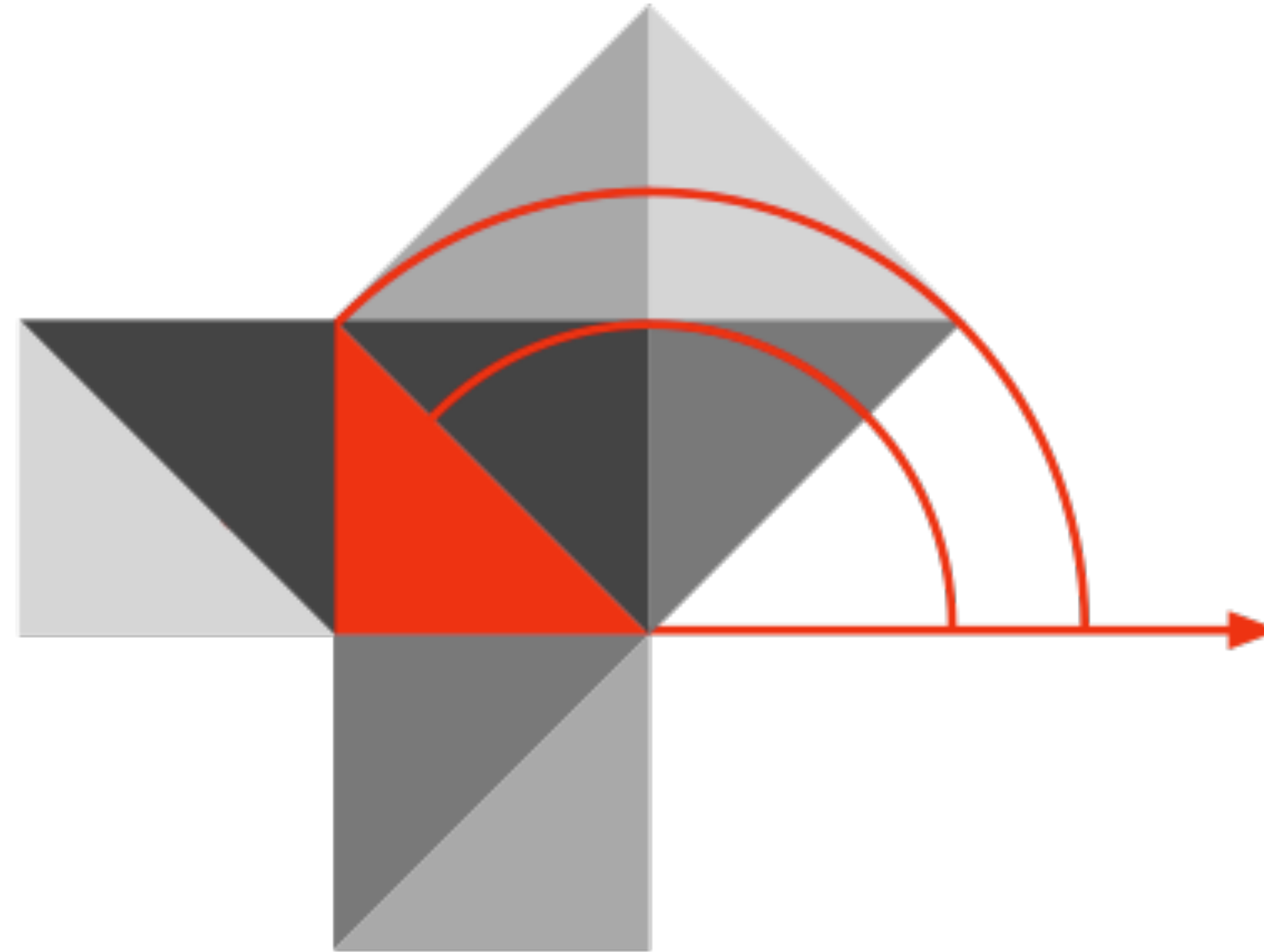*Tech acts as a direct tool substitute, with functional improvement*

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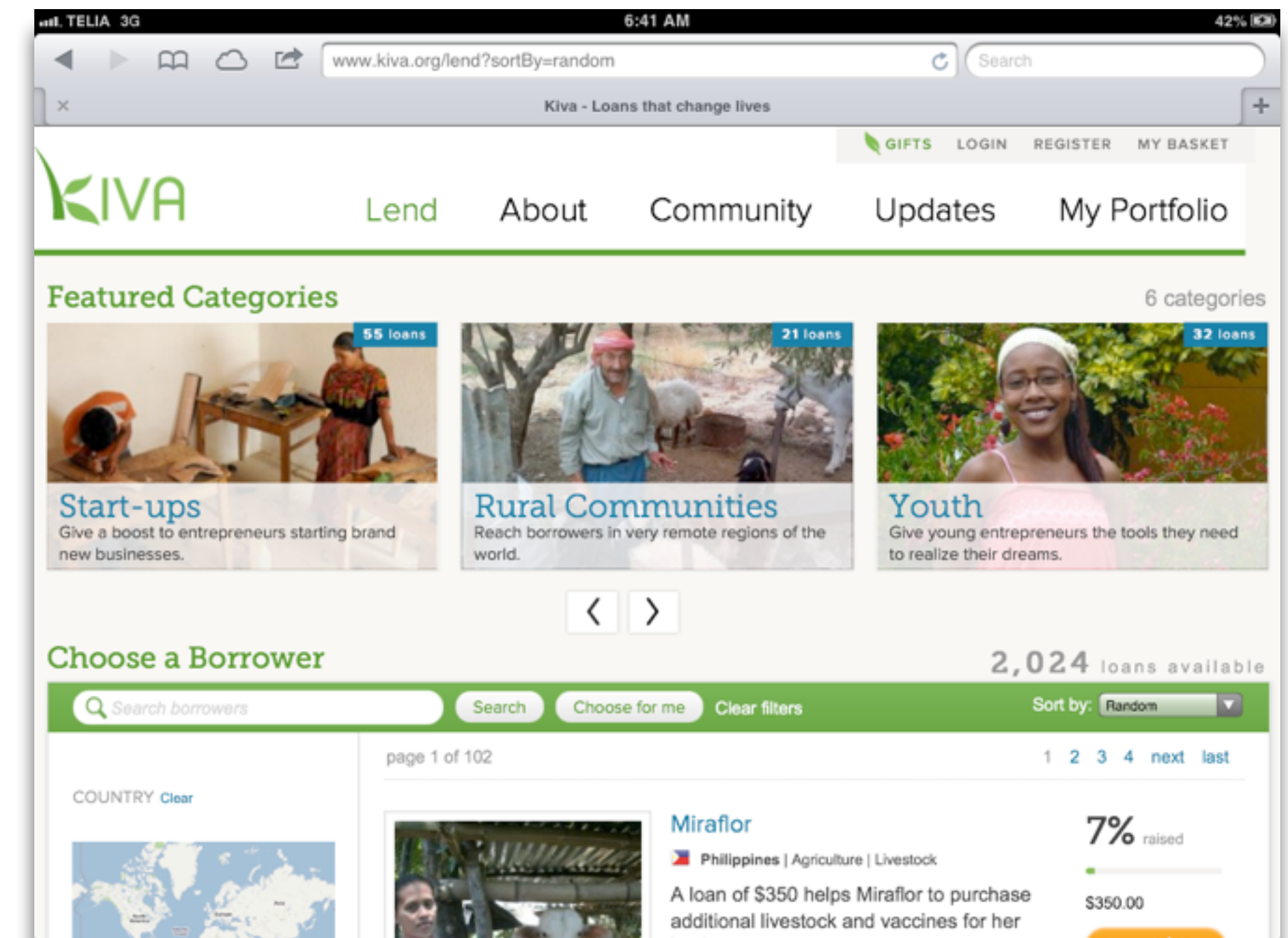
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