

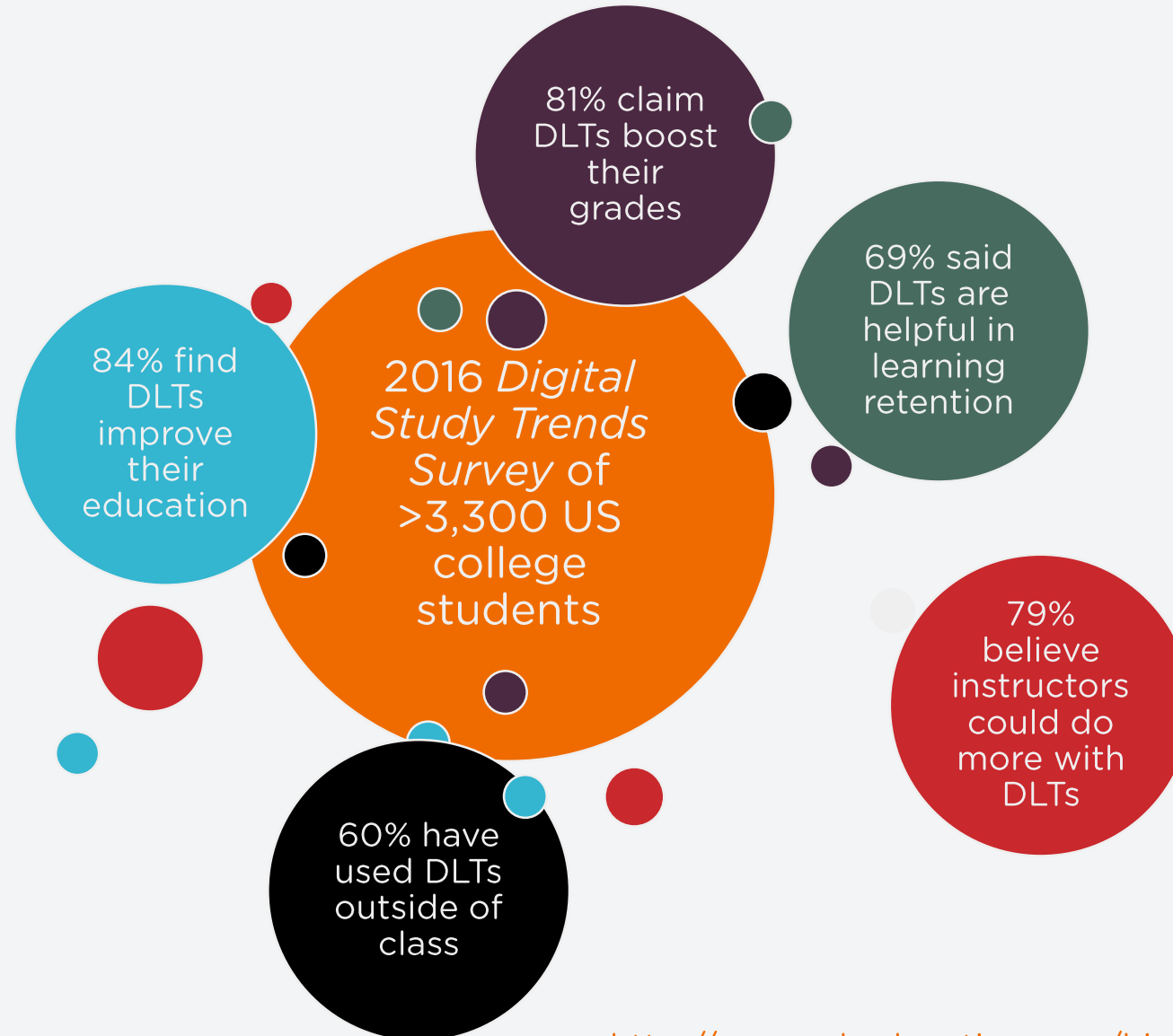
semantico 

Interactive data visualization for students

Tasha Mellins-Cohen

16 November 2016

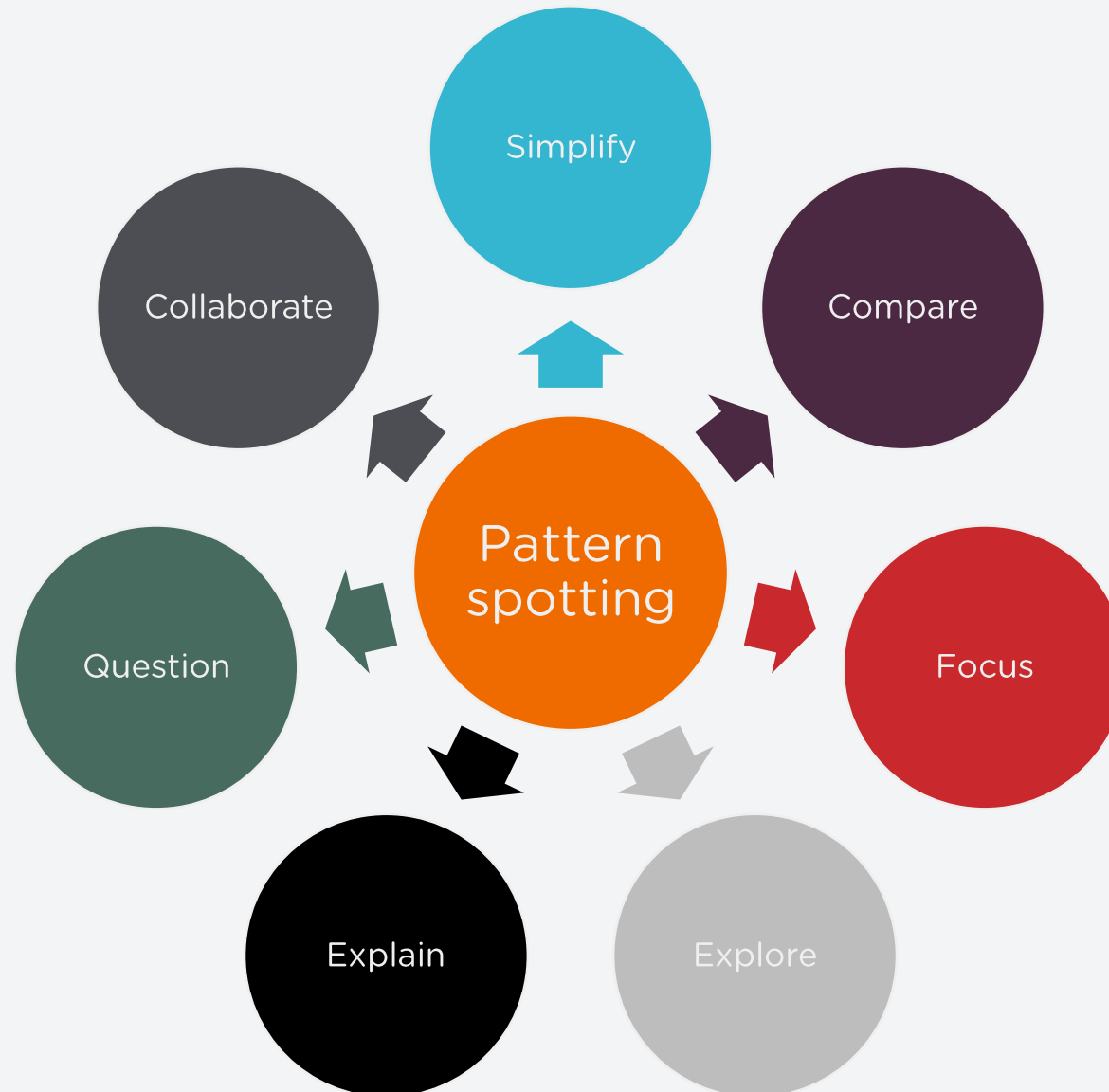
Digital learning technologies



Materials science and the joy of spreadsheets

- Introductory video available at https://www.youtube.com/watch?v=nVH66Vs_3IM

Key design principles in data visualization



DataVis demo

Single property lookup

Find a property value for a material

 Clear

- [Titanium Carbide \(TiC\)](#)
- [Titanium: Ti-6Al-4V](#)



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[Release Notes](#)

Single property lookup

Find a property value for a material

Titanium: Ti-6Al-4V Clear

den| Clear

Density

Hardness: Wood **Indentation** – Property not applicable



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[Release Notes](#)

Single property lookup

Find a property value for a material

Titanium: Ti-6Al-4V [Clear](#)

Density [Clear](#)

4430

Source: **Matweb**, [matweb.com](#)

Compare Density for all materials



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Contextual visualization

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UKSG forum demo +

UKSG forum demo Add Description | View Tabular Data

Add Visualization

Select Materials 1 selected

Enter a material or classification

Expand All Select All

- Metal (97)
- Polymer (32)
- Ceramic (28)
- Composite (31)
- Advanced (3)

Display Settings

- Show all included
- Show selected and in range only
- Show starred only

More Settings

Density (kg/m³)

Density (kg/m³) Edit

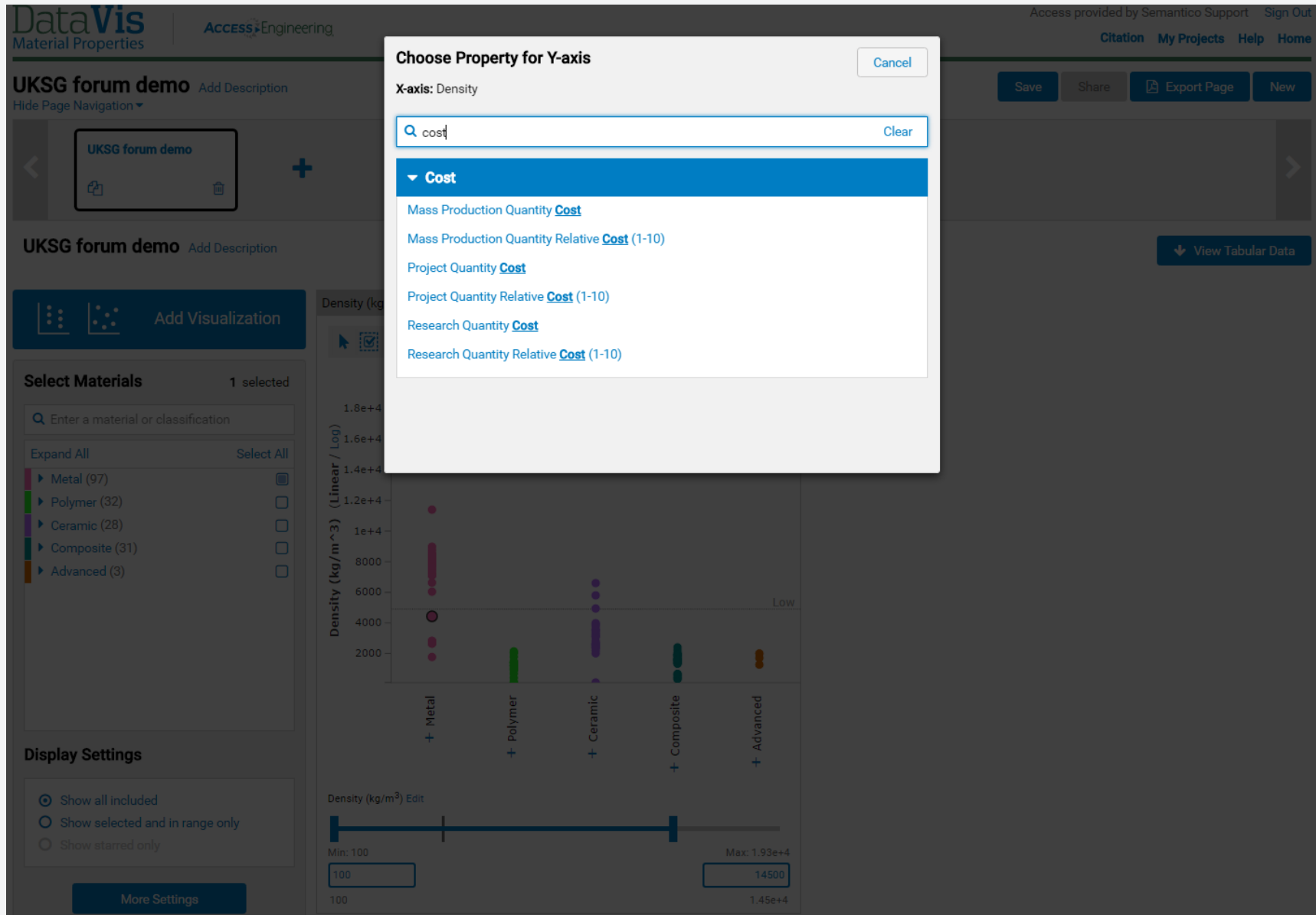
Min: 100 Max: 1.93e+4

100 19300

100 1.93e+4

Material Class	Density Range (kg/m ³)
Metal	~1800 - 1.8e+4
Polymer	~1000 - 2500
Ceramic	~1000 - 1.6e+4
Composite	~1000 - 2500
Advanced	~1000 - 2000

Dynamic queries



DataVis Material Properties | ACCESS Engineering

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UKSG forum demo Add Description

Add Visualization

Select Materials 1 selected

Enter a material or classification

- Expand All Select All
- Metal (97)
- Polymer (32)
- Ceramic (28)
- Composite (31)
- Advanced (3)

Display Settings

- Show all included
- Show selected and in range only
- Show starred only

More Settings

Choose Property for Y-axis Cancel

X-axis: Density

cost Clear

- Cost
- Mass Production Quantity Cost
- Mass Production Quantity Relative Cost (1-10)
- Project Quantity Cost
- Project Quantity Relative Cost (1-10)
- Research Quantity Cost
- Research Quantity Relative Cost (1-10)

Density (kg/m³) (Log)

Density (kg/m³) (Linear / Log)

Low

+ Metal + Polymer + Ceramic + Composite + Advanced

Density (kg/m³) Edit

Min: 100 Max: 1.93e+4

100 14500

100 1.45e+4

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UKSG forum demo

View Tabular Data

Add Visualization

Select Materials 1 selected

Enter a material or classification

Expand All | Select All

- Metal (97)
- Polymer (32)
- Ceramic (28)
- Composite (31)
- Advanced (3)

Display Settings

- Show all included
- Show selected and in range only
- Show starred only

More Settings

Density (kg/m³)

Density (kg/m³) Edit

Min: 100 | Max: 1.93e+4

100 | 14500 | 1.45e+4

Mass Production Quantity Relative Cost (1-10) vs Density (kg/m³)

Mass Production Quantity Relative Cost (1-10) (Linear / Log)

Density (kg/m³) (Linear / Log)

Density (kg/m³) Edit

Min: 100 | Max: 1.93e+4

Mass Production Quantity Relative Cost (1-10) Edit

Min: 1 | Max: 8

100 | 14500 | 1 | 8

Details on demand

Display Settings

- Show all included
- Show selected and in range only
- Show starred only

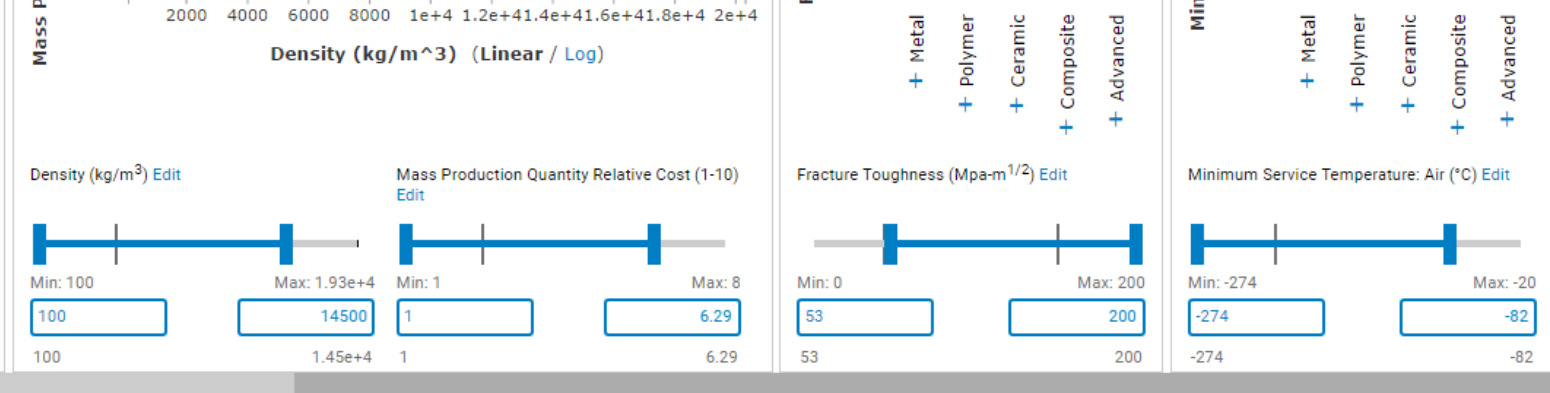
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Related Content [Add/Edit](#)

Strength of materials

Titanium and titanium alloys

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Tabular Data [Reorder Columns](#) [Export CSV](#)

Range	Star	Material	Classification	Density (kg/m ³)	Mass Production Quantity Relative Cost (1-10)	Fracture Toughness (Mpa-m ^{1/2})	Minimum Service Temperature: Air (°C)
In	☆	Stainless Steel: SAE 403 (Wire)	Metal	7800	3.0	100	-273
In	☆	Stainless Steel: SAE 409	Metal	7800	2.5	100	-273
In	☆	Stainless Steel: SAE 410	Metal	7800	2.5	100	-273
In	☆	Stainless Steel: SAE 430	Metal	7800	5.5	100	-273
In	★	Titanium: Ti-6Al-4V	Metal	4430	4.0	75	-273
In	☆	Tool Steel: AISI D2	Metal	7700	3.5	100	-273
In	☆	White Cast Iron Overview	Metal	7700	2.5	8.0e+01	-273
Out	☆	Acetal Copolymer	Polymer	1420	3.0	1	-40
Out	☆	Acrylonitrile Butadiene Styrene (ABS): Molded	Polymer	1060	2.5	2.5	-50