Shaping the experience of young and naïve probabilists

Dave Pratt
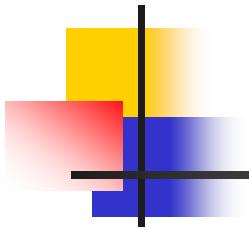
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# Shaping the experience of young and naïve probabilists
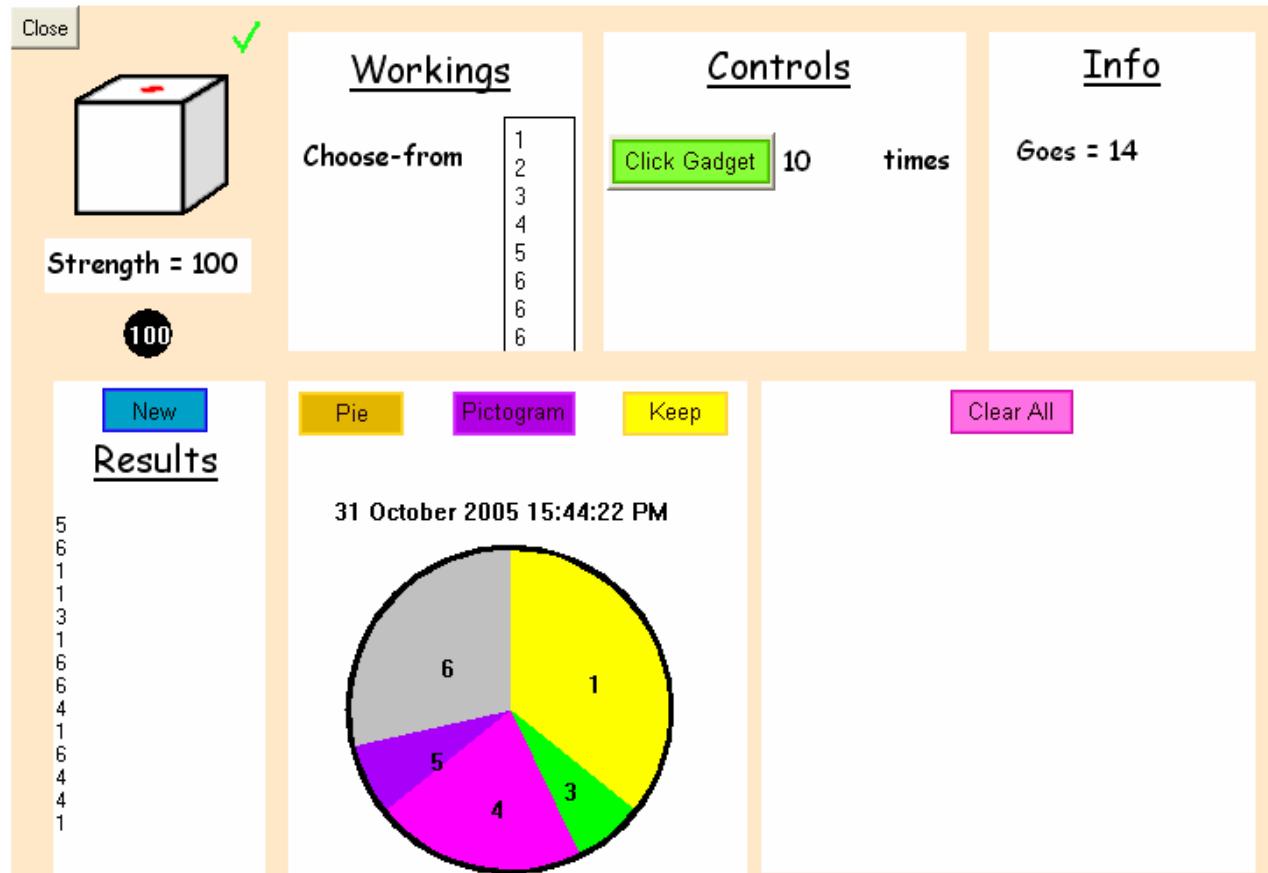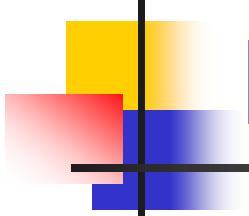
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ChanceMaker

Designers of Conceptual SpaceDesigners of Conceptual Space
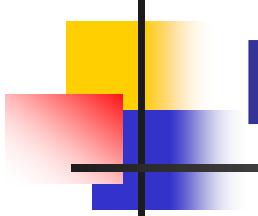
Personal conjectures

- …Design to enable the formulation and *testing of personal conjectures*.
  - *The repeat tool in ChanceMaker*
  - *The workings box in ChanceMaker*
- *…Design redundant controls*
  - *The strength control in ChanceMaker*

What does this mean for the teacher as designer?
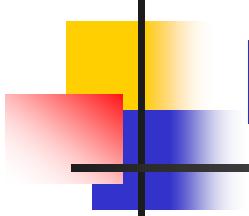
Personal conjectures

Allow space to explore the big ideas such as randomness, position, spread, distribution, law of large numbers,…

Enable students to learn that their way of thinking lacks explanatory power and support how they move on
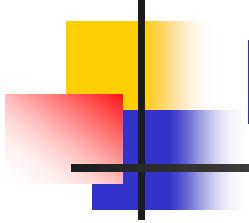
What does this mean for the teacher as designer?

Building on current knowledge

- Build on what students already know to enable them to recognise a lack of explanatory power in their understanding.
  - *Local to Global meanings in ChanceMaker*

What does this mean for the teacher as designer?
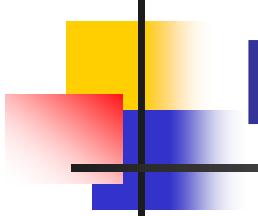
Building on current knowledge

Ideas about average or spread are likely to be naively conceived (rather than mis-conceived)

Promote seeing the broader domain of application of the idea or the specific conditions under which that way of thinking applies
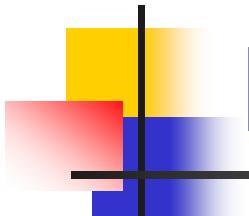
What does this mean for the teacher as designer?

Purpose

- Design for *purpose*.

  - *"Which gadgets are working properly?" in ChanceMaker*

  - *"Mend the broken gadgets" in ChanceMaker*

What does this mean for the teacher as designer?

Purpose

Search for tasks that are likely to be regarded as purposeful.
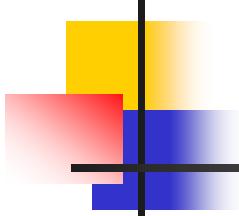
Tasks…

…with an explicit end-product that students might care about,

…that involve making something for another audience,

…that offer opportunities to make meaningful decisions,
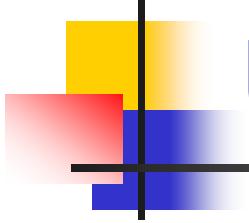
What does this mean for the teacher as designer?

Utility

- Design to *fuse control with representation*.

  - *The workings box in ChanceMaker controls the gadgets and represents distribution.*

What does this mean for the teacher as designer?
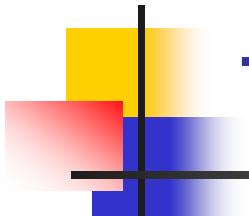
Utility

To pursue the purpose, students use a representation of average, spread or distribution as a control.

Is this possible without technology?

What does this mean for the teacher as designer?

The key challenges…

- By making explicit design heuristics, teachers as designers might find ways of adapting that knowledge to their own situations.

- By making explicit teaching heuristics, designers as teachers might find ways of adapting that knowledge to their own situations.