The Internet of Education: What role for Education Research?

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What do you think of western civilisation?

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I think it would be a good idea!

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I think it would be a good idea!

What do you think of technology in education?

Seymour Papert's contribution

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
A.I. LABORATORY

October 1971

Artificial Intelligence
Memo No. 247

LOGO
Memo No. 2

TEACHING CHILDREN THINKING[1,2]

Seymour Papert*

This report describes research done at the Artificial Intelligence Laboratory of the Massachusetts Institute of Technology. Support for the laboratory's education research is provided in part by the National Science Foundation under grant GJ-1049.

*This paper is deeply influenced by Cynthia Solomon and Marvin Minsky.

[1]Presented at the Proceedings of IFIPS World Congress on Computers and Education, Amsterdam, The Netherlands, 1970.

[2]To be published in Mathematics Teaching (The Association of Teachers of Mathematics, Leicester, England: 1972).

The purpose of this essay is to present a grander vision of an educational system in which technology is used not in the form of machines for processing children but as something the child himself will earn to manipulate, to extend, to apply to projects, thereby gaining a greater and more articulate mastery of the world, a sense of the power of applied knowledge and a self-confidently realistic image of himself as an intellectual agent.

Thanks to Hal Abelson

Programming

Lisp
Logo
Imagine
NetLogo
Scratch…

- constructionism

- people learn best by making things and sharing them

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- let’s not only make new ways to learn, let’s make new things for learning

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- Bill Gates is even more scathing: "It's bullshit," he says. "If you can't do multiplication, then tell me, what is your contribution to society going to be?"

technology

technology

- as an informational medium

technology

- as an informational medium
- as a constructional medium

technology

- as an informational medium
- as a constructional medium

- ICT (ugh)

- people learn well if they care about what they’re learning

the knowledge that powers the world is less and less visible

systems are read-only

- let’s not only make new ways to learn, let’s make new things for learning

CXXXVII x IV

Wilensky, Papert

CXXXVII x IV

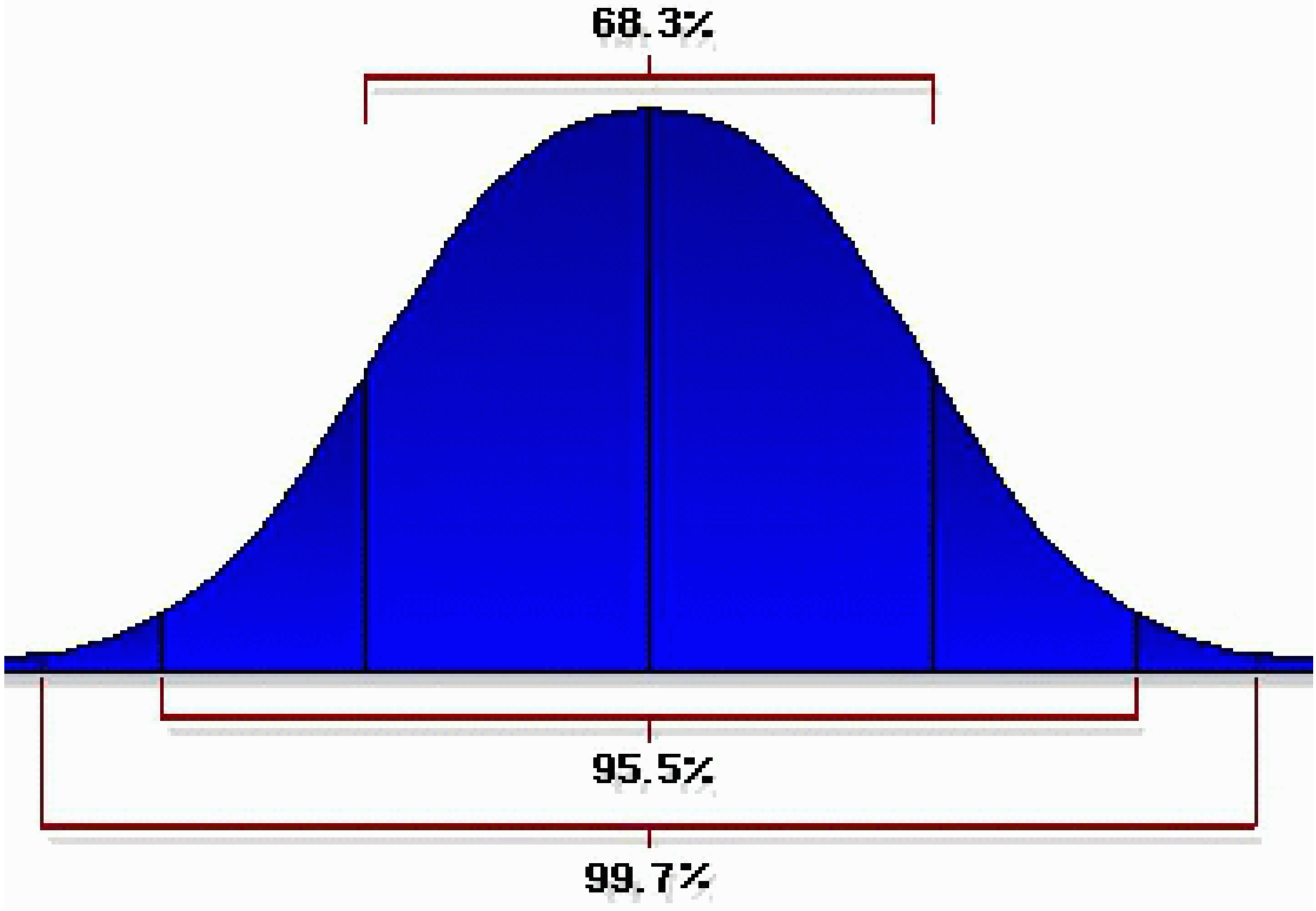
build new representations for existing knowledge

Wilensky, Papert

education must **NOT** be read-only


Goldman
Sachs

"We were seeing things that were 25-standard deviation moves, **several days in a row**" said GS's chief financial officer, 2007.


68.3%
95.5%
99.7%


Goldman
Sachs

The expected waiting time for this event, 25 s.d., is **$6*10^{124}$ life of the universe**

The expected waiting time for this event, 25 s.d., is **$6*10^{124}$ life of the universe**

3 days in a row!

‘new trends’

- MOOCs ++, higher education policies, computer human interaction, machine learning, user analytics, automatic assessment, visualization

View In iTunes

$4.99

Category: Education
Updated: Jan 31, 2011
Current Version: 1.5
1.5
Size: 3.9 MB
Languages: English, Dutch, French, German, Japanese, Portuguese
Seller: Paul Schmitt

Rated 4+

Requirements: Compatible with iPad. Requires iOS 3.2 or later

Customer Ratings

Current Version:
★★★★ 16 Ratings

All Versions:
★★★★ 195 Ratings

More iPad Apps by palaware

SoccerMate (score and track

Description

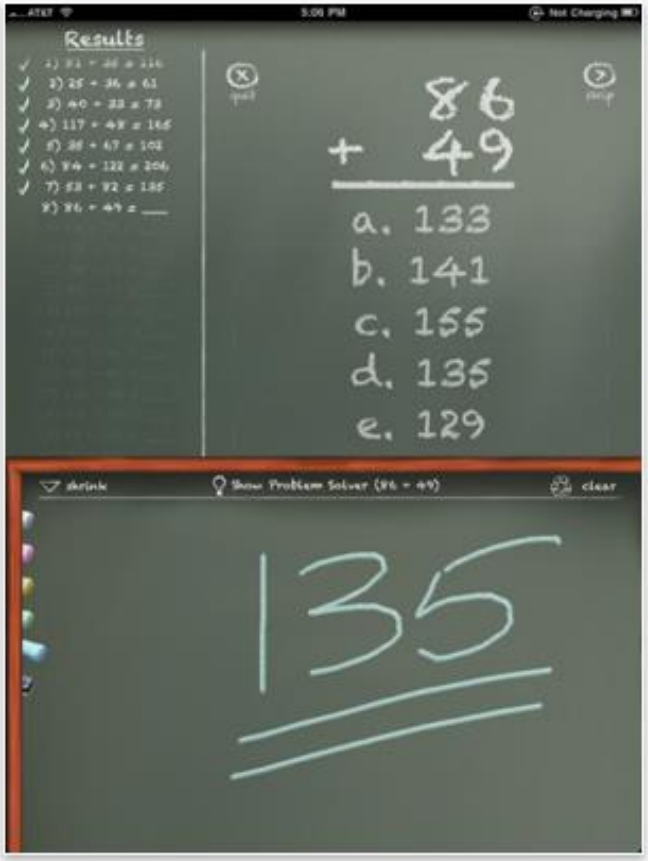
This is the best integer practice app or program I have found in 34 years of teaching math. - Tim Seiber, Math Teacher

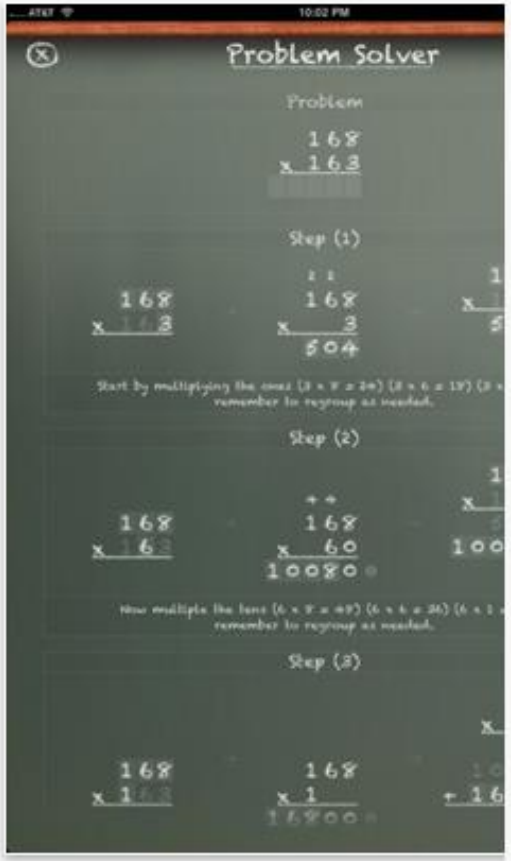
palaware Web Site ▸ MathBoard Support ▸ ...More

What's New in Version 1.5

- Added landscape support.
- Added support for left handed students.

iPad Screenshots





tel.ac.uk

TECHNOLOGY ENHANCED LEARNING RESEARCH PROGRAMME (2007-13)

1 Connect

Exploit the power of personal devices to enhance learning.

2 Share

Catch the wave of social networking
to share ideas and learn together.

7 Engage

Go beyond the keyboard and mouse to learn through movement and gesture.

10 Know

Employ tools to help learners make sense of the information overload.

8 Streamline

Enhance teachers' productivity with new tools for designing teaching and learning.

"

Learning Designer puts teachers in the driving seat. It's a power tool for them just like computer-aided design is for architects. We want teachers to be able to play with lesson planning, to be creative. And we want to capture their pedagogy, to give them the chance to share their good ideas.

Professor Diana Laurillard, director of Learning Designer progect.

Technology Enhanced Learning Research Programme, UK

9 Include

Empower the digitally and socially excluded to learn with technology.

"

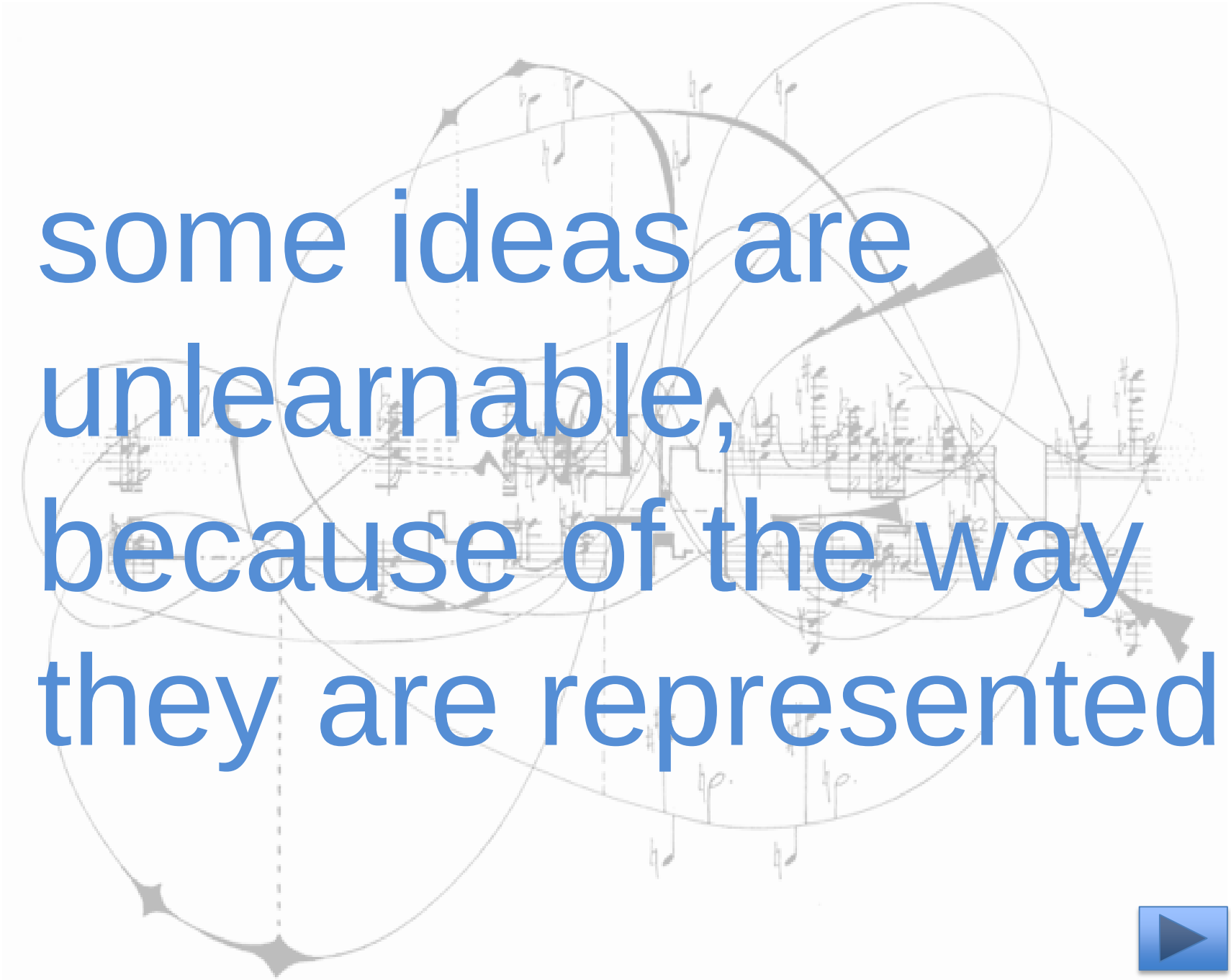
Echoes has a massive impact on children with autism. It enables them to communicate and succeed without any barriers or feeling constrained by everyday teaching. They are free to explore, learn and develop by themselves, which is absolutely fascinating to see.

Ian Lowe, Headteacher, Topcliffe Primary School

Technology Enhanced Learning Research Programme, UK

11 Compute

Understand how computers think, to help learners shape the world around them.



some ideas are unlearnable, because of the way they are represented

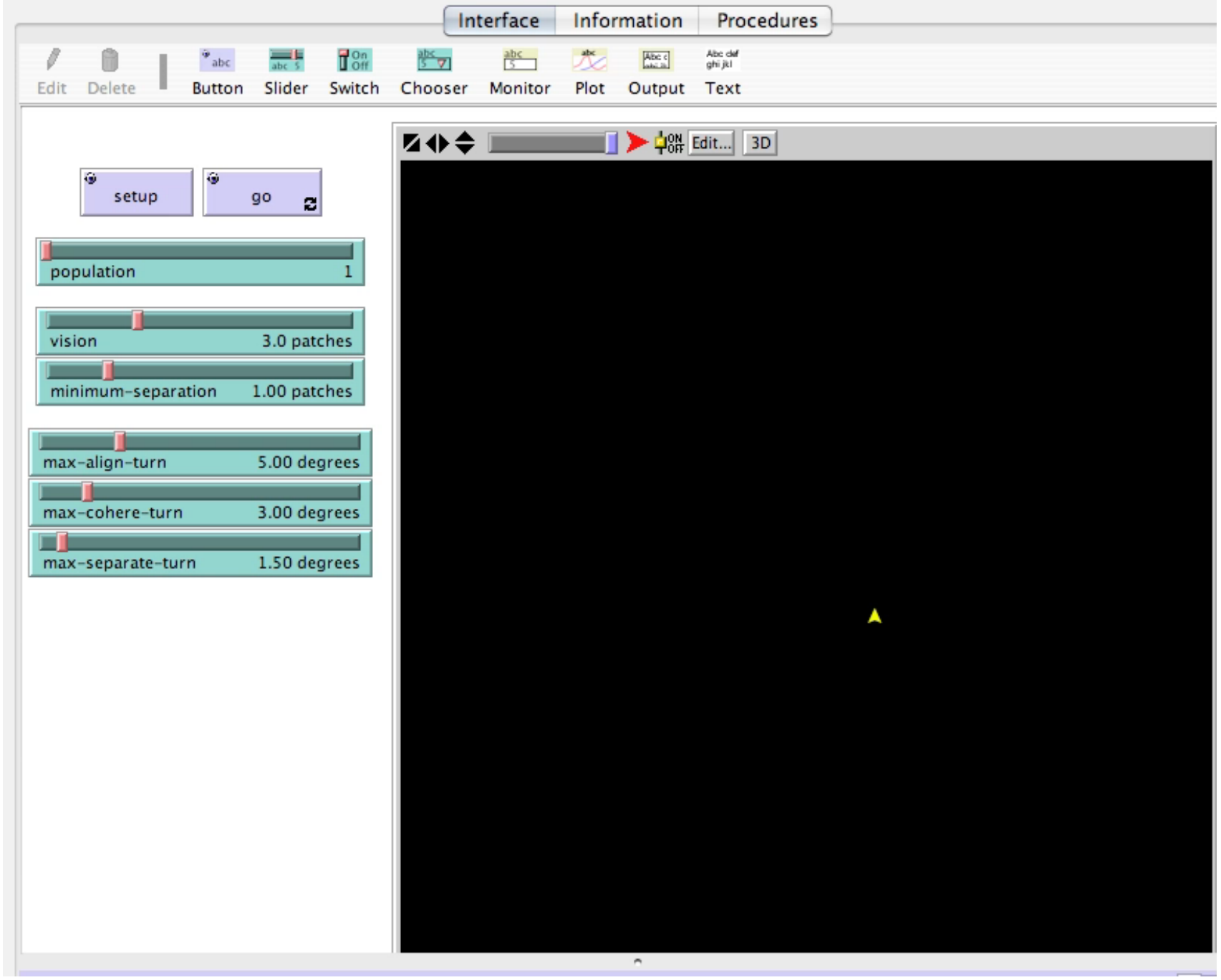
Let us consider a Taylor expansion of $\psi(\mathbf{v}^*)$ around $\mathbf{v}'$. Thanks to (23), we get

$$\psi(\mathbf{v}^*) = \psi(\mathbf{v}') + \gamma a(|\mathbf{x}-\mathbf{y}|)\nabla\psi(\mathbf{v}')\cdot(\mathbf{q}\cdot\mathbf{n})\mathbf{n} + \frac{1}{2}\gamma^2 a(|\mathbf{x}-\mathbf{y}|)^2 \sum_{i,j} \frac{\partial^2\psi(\mathbf{v}')}{\partial \mathbf{v}'_i \partial \mathbf{v}'_j}(\mathbf{q}\cdot\mathbf{n})^2 \mathbf{n}_i \mathbf{n}_j + \dots \tag{24}$$

If the interactions are nearly elastic, so that $\gamma << 1$, we can truncate the expansion (24) after the first–order term. Inserting (24) into (21) gives

$$\begin{aligned} \langle \psi\,,\, \bar{Q}_P(f,f)\rangle \quad &\approx \quad \frac{1}{\epsilon}\int_{\mathbb{R}^3}\int_{\mathbb{R}^3}\int_{\mathbb{R}^3} B(|\mathbf{x}-\mathbf{y}|)\left(\psi(\mathbf{v}')-\psi(\mathbf{v})\right. \\ &\quad \left.+\gamma\nabla\psi(\mathbf{v}')\cdot a(|\mathbf{x}-\mathbf{y}|)(\mathbf{q}\cdot\mathbf{n})\mathbf{n}\right) f(\mathbf{x},\mathbf{v}) f(\mathbf{y},\mathbf{w}) d\mathbf{v}\, d\mathbf{w}\, d\mathbf{y} \\ &= \langle \psi\,,\, \mathscr{Q}_P(f,f)\rangle \;+\gamma\langle \psi\,,\, \mathscr{F}(f,f)\rangle\,. \end{aligned} \tag{25}$$

It is a simple matter to recognize that in (25) $\mathscr{Q}_P(f,f)$ is a Povzner collision operator of the type (5), since the post-interaction velocity v' in (25) is obtained from the pre-interaction velocities (v,w) through the elastic interaction (21).



Uri Wilensky: ccl.northwestern.edu/**netlogo**/

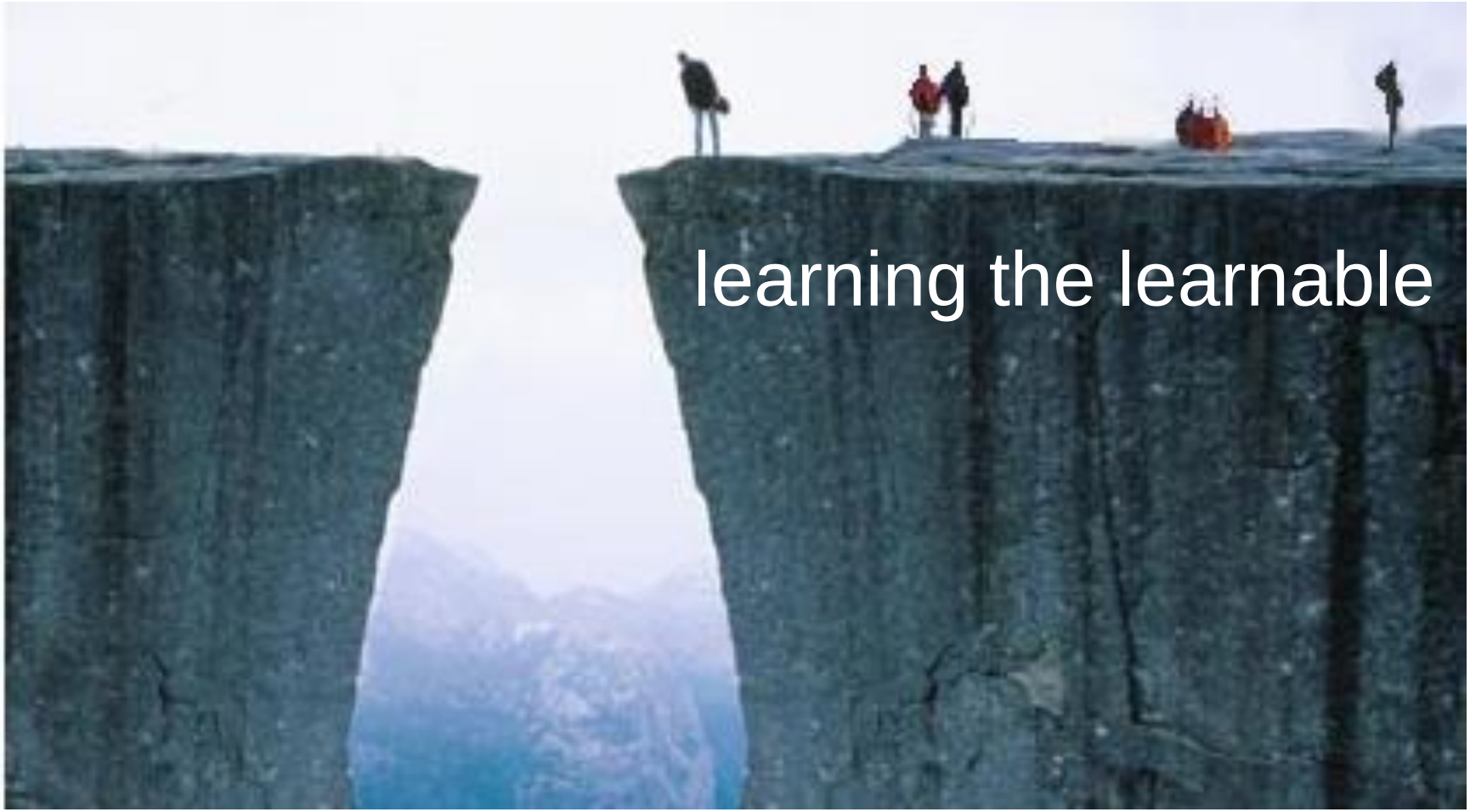
2 CHALLENGES

1. building learning technologies

2 CHALLENGES

1. building learning technologies

2. building learnable curricula


learning the learnable