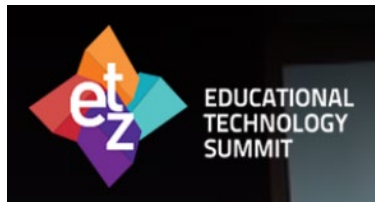


# The Future of Educational Media

Stephen Downes

March 5, 2016

Istanbul, Turkey



# The Inflexible Law of Learning

It's when we do stuff that we learn, not when stuff does something for us.



# The Future in 2016

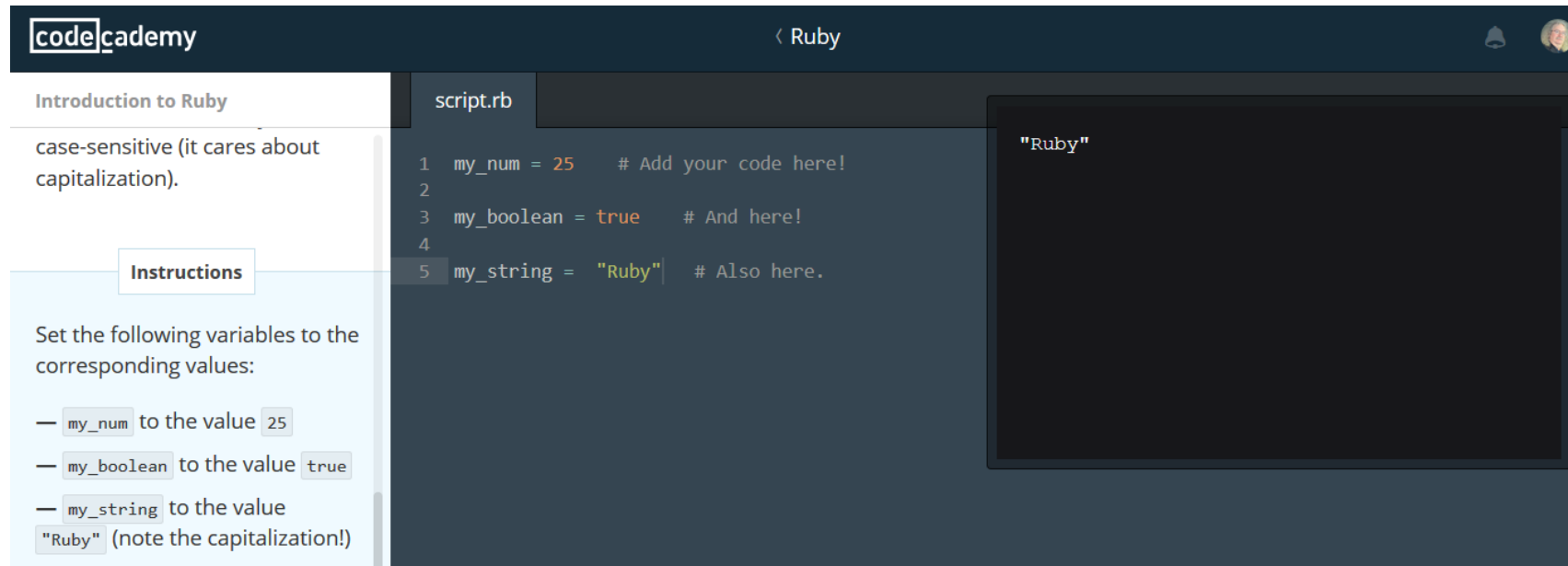
- Machine learning and artificial intelligence
- Handheld and Mobile Computing
- Learning Analytics
- Internet of Things
- Games, Sims and Virtual Reality
- Translation and Collaborative Technology

<http://teachonline.ca/tools-trends/exploring-future-education/2016-look-future-online-learning-part-1>

<http://halfanhour.blogspot.com.tr/2016/03/the-2016-look-at-future-of-online.html>

# Machine learning and AI

- Not simply for adaptive learning
- The idea is to create an *environment*



The screenshot shows the Codecademy interface for a Ruby tutorial. The top navigation bar includes the Codecademy logo, a breadcrumb trail for 'Ruby', and user profile icons. The left sidebar contains the course title 'Introduction to Ruby' and a section titled 'Instructions'. The main content area is divided into a code editor and a terminal. The code editor, titled 'script.rb', contains five lines of Ruby code: `1 my_num = 25 # Add your code here!`, `2`, `3 my_boolean = true # And here!`, `4`, and `5 my_string = "Ruby" # Also here.`. The terminal on the right shows the output of the code, which is the string `"Ruby"`.

codecademy < Ruby

Introduction to Ruby

case-sensitive (it cares about capitalization).

**Instructions**

Set the following variables to the corresponding values:

- `my_num` to the value `25`
- `my_boolean` to the value `true`
- `my_string` to the value `"Ruby"` (note the capitalization!)

```
1 my_num = 25 # Add your code here!
2
3 my_boolean = true # And here!
4
5 my_string = "Ruby" # Also here.
```

"Ruby"

<https://www.codecademy.com/>

# Three Types of AI

- **decision engines** - these are expert systems that are based on rule-driven strategies
- **pattern recognition** - perceptual systems that identify patterns from partial or disorganized data
- **cluster detection** - detecting nearest neighbours and categories of things

[http://www.wtec.org/loyola/kb/c1\\_s1.htm](http://www.wtec.org/loyola/kb/c1_s1.htm)

<http://research.microsoft.com/en-us/um/people/cmbishop/prml/>



# Handheld and Mobile Computing

- The future of learning isn't the mobile phone
- It's in the *integrated* performance support system

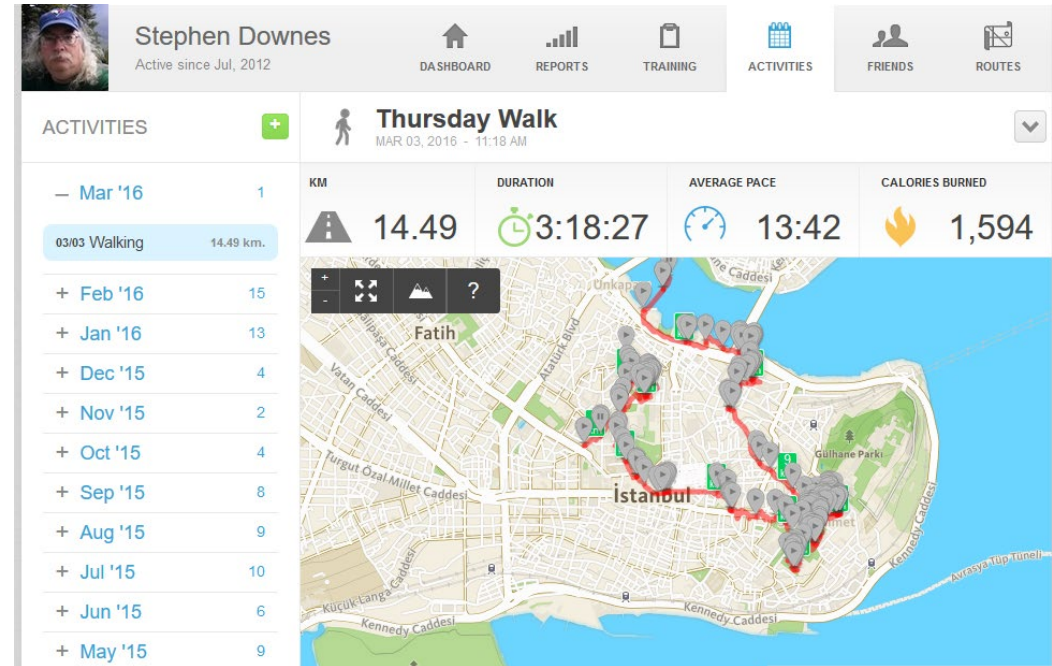


PHOTO COURTESY B

<http://fortune.com/2014/05/27/a-tennis-racquet-that-isnt-just-strung-but-wired/>

# Learning Analytics

- We talk about predictive analytics as though finishing a course is the problem
- The real future is in the quantified self



# Internet of Things



What happens when companies know the state of all your devices?

<http://www.cbc.ca/news/canada/car-tracking-devices-spark-privacy-concerns-1.1366687>



# Games, Sims and Virtual Reality

‘Gamification’ – adds game elements to learning

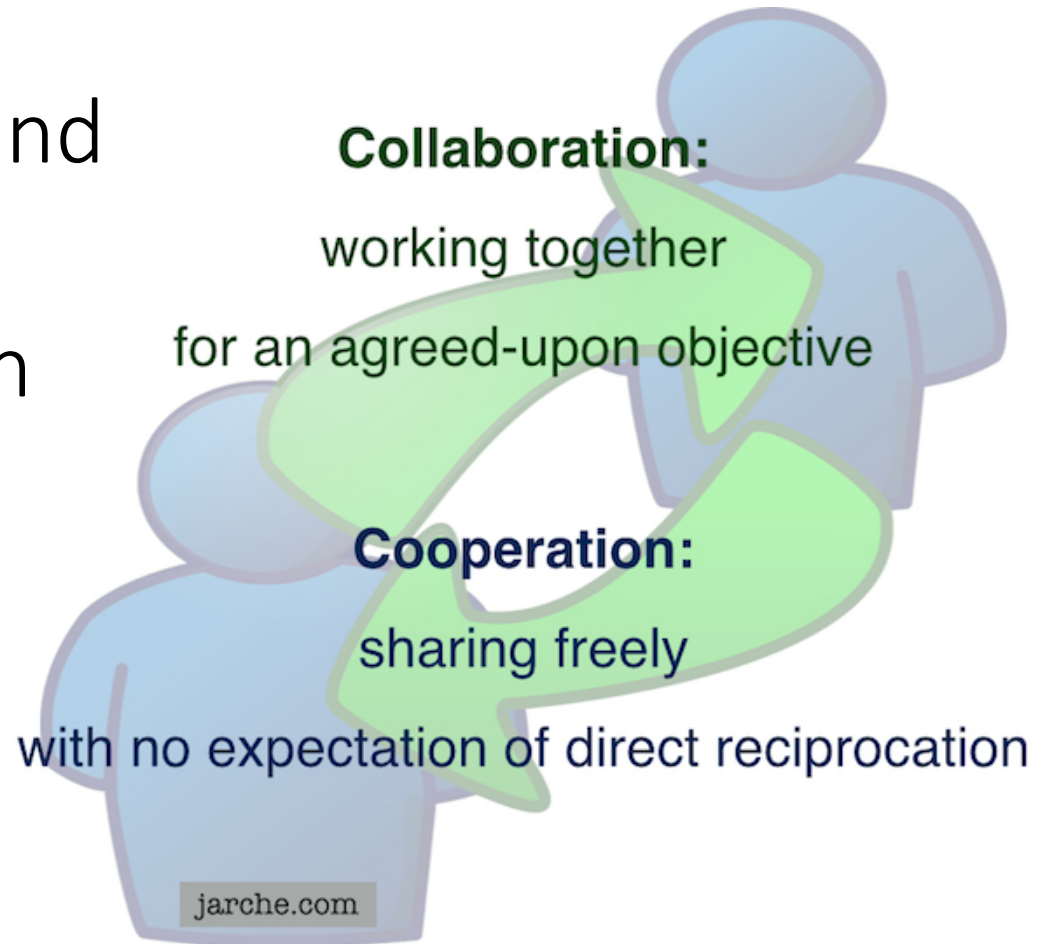
‘Serious Games’ – employs a game to facilitate learning



<https://badgeville.com/wiki/Gamification>

# Translation and Collaborative Technology

- Communication is and will be everywhere
- But the future lies in cooperation, not collaboration



<https://cyber.law.harvard.edu/research/cooperation>

Image: <http://Jarche.com>

# What Does Learning Become?

- Context-Sensitive
- Engaging
- Personal



# Any Time / Any Place?



- It's all about context
- The airplane cockpit is no place for a two week course
- Learning will be like water or electricity – or text

# Engaging = Immersive + Wanted

- Just because it's interactive doesn't make it engaging
- We have to *want* to be there
- And we have to *believe* that we're there

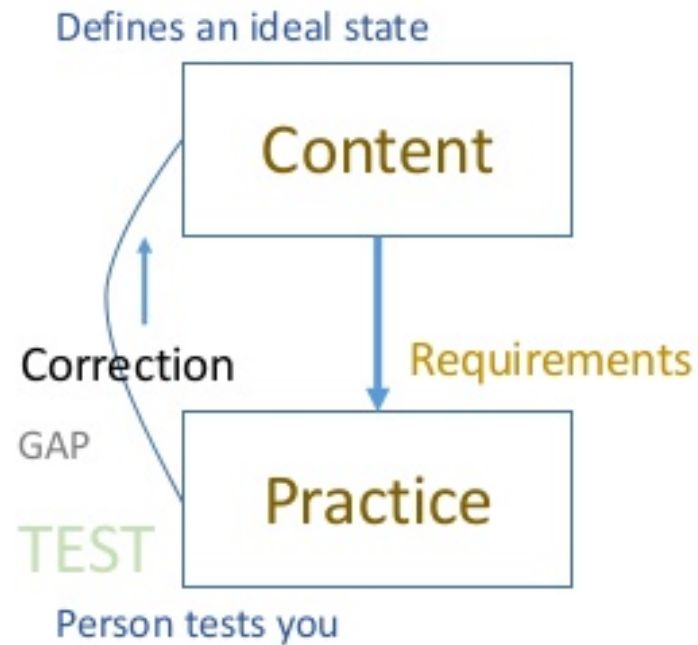
$$\begin{aligned}dA &= -PdV - SdT \rightarrow dA = (\partial A/\partial V)_T dV + (\partial A/\partial T)_V dT \text{ \& } \\dG &= VdP - SdT \rightarrow dG = (\partial G/\partial P)_T dP + (\partial G/\partial T)_P dT \\ \& \text{ \& } dH &= (\partial H/\partial S)_P dS + (\partial H/\partial P)_S dP \rightarrow V = (\partial H/\partial P)_S = (\partial G/\partial P)_T \\ &\rightarrow -S = (\partial A/\partial T)_V = (\partial G/\partial T)_P \text{ \& } (\partial P/\partial T)_V = (\partial S/\partial V)_T\end{aligned}$$



# Learning is Personal

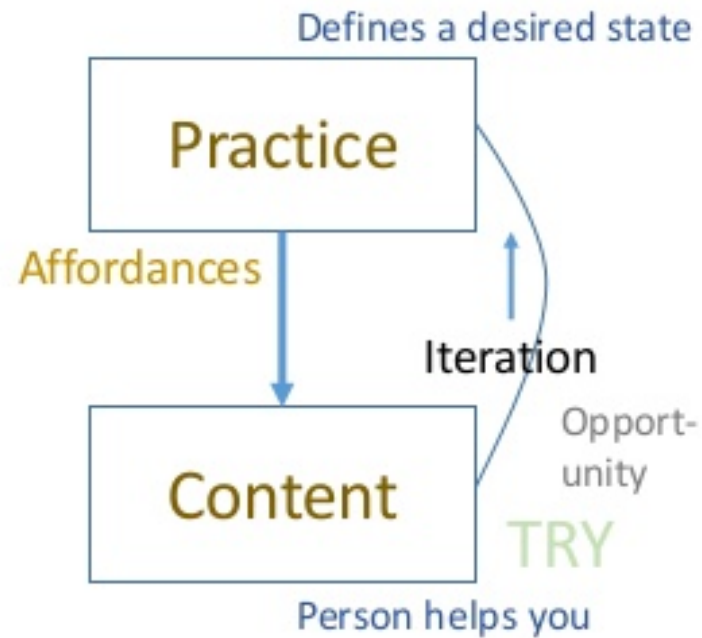
## Personalized

We do for you

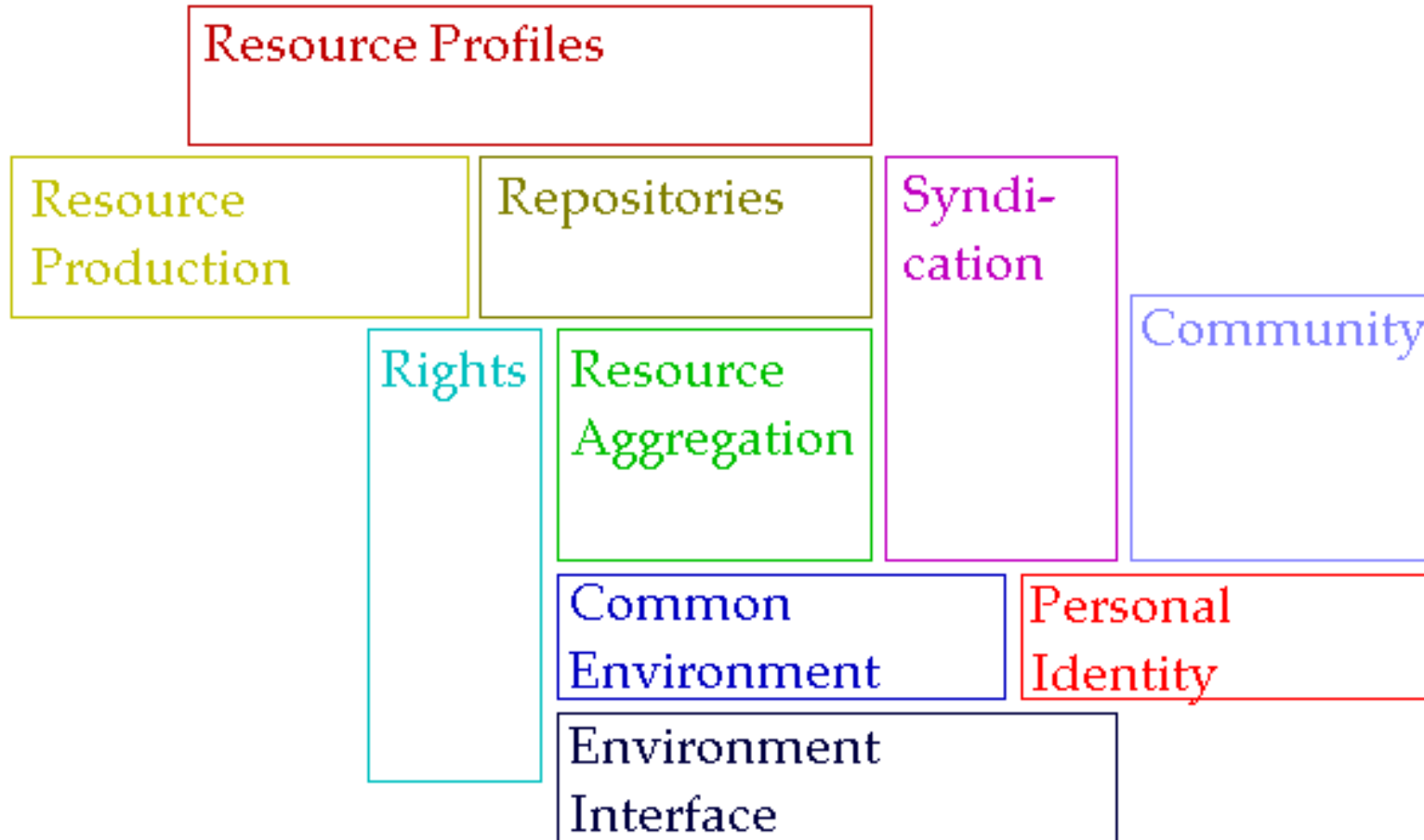


## Personal

You do for yourself



# A Personal Learning Architecture

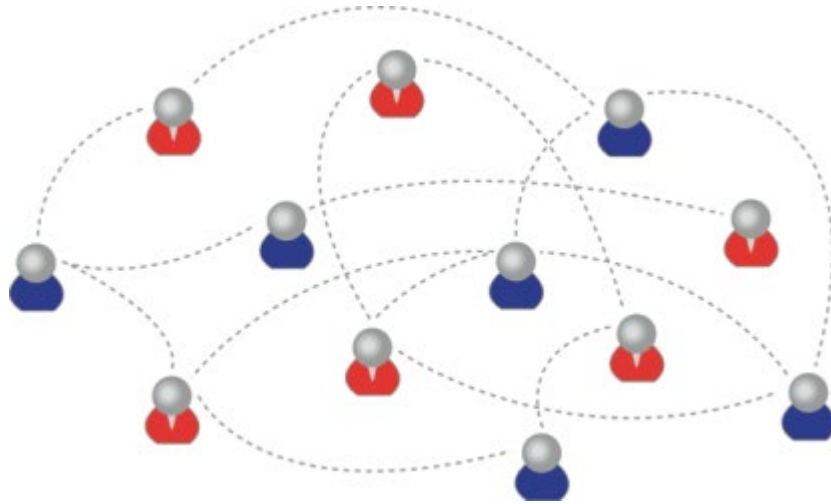


# The New Institutional Perspective

## From Management to Meaning

- Don't do things *to* people, do things *with* people, help people *do things*
- If we have to ask “how do we motivate people” then we're taking the wrong approach – Kohn
- “Knowledge sharing is your job” – Buckman
- Provide opportunities for autonomy, mastery, purpose – Pink

# Learning Outcomes



We are using one of these

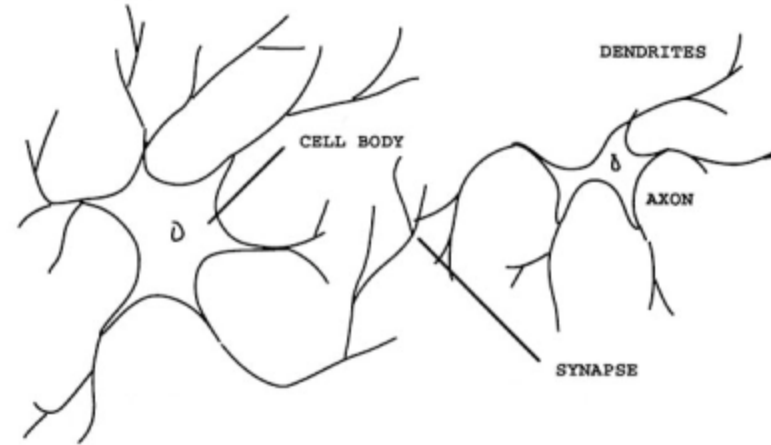


Figure 1. Biological Neuron

To create one of these

Personal knowledge consists of *neural* connections,  
not facts and data

# Learning Outcomes

- Learning a discipline is a *total state* and not a collection of specific states
- It is obtained through *immersion* in an environment rather than acquisition of particular entities
- It is expressed functionally (can you perform ‘as a geographer’ ?) rather than cognitively (can you state ‘geography facts’ or do ‘geography tasks’ ?)



# Learning Outcomes

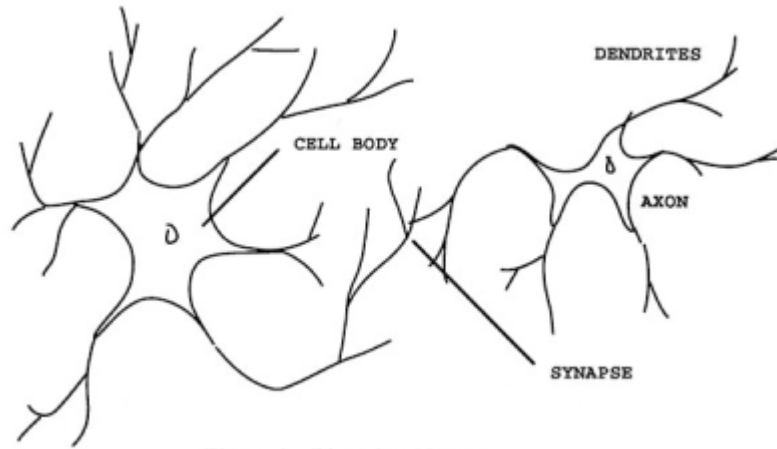
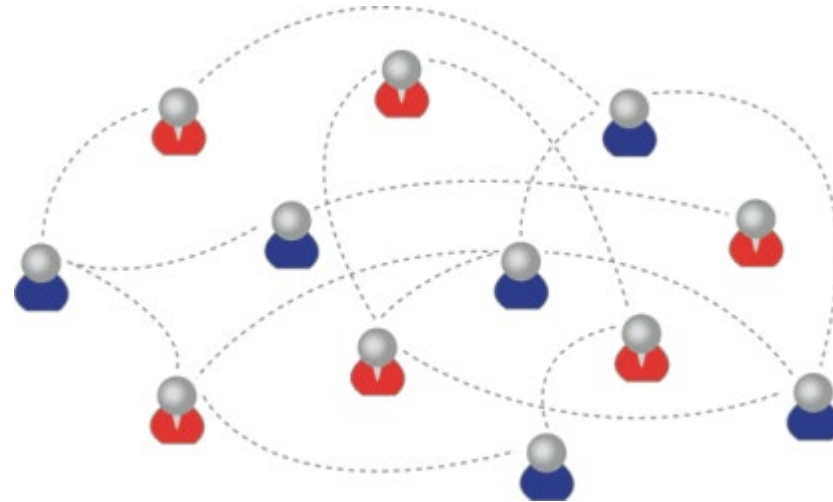


Figure 1. Biological Neuron

We recognize this



By performance in this

There are not specific bits of knowledge or competencies, but rather, personal capacities

# The New Model of Work and Learning

- Sharing - create linked documents, data, and objects within a distributed network
- Contributing - employ social networking applications of the Web to facilitate group communication
- Co-creating - work through networks that facilitate cooperative group work toward common goals

(Dutton, p. 12)





<http://www.downes.ca>