# Entrepreneurship in the Education Industry and the 4$^{th}$ Industrial Revolution

**Paul Kim**, PhD.
**Chief Technology Officer & Assistant Dean**
**Stanford University Graduate School of Education**
phkim@stanford.edu

**"The illiterate of the 21st Century are not those who cannot read and write but those who cannot learn, unlearn and relearn."**

*— Alvin Toffler, Powershift: Knowledge, Wealth, and Power at the Edge of the 21st Century*

**Technological advancement rate**
always exceeds
human perception
and behavior change rate…

# New AI tool helps teachers tackle math

**BY LAURA ASCIONE, MANAGING EDITOR, CONTENT SERVICES, @ESN_LAURA**
October 12th, 2017

IBM's free resources help educators pinpoint strategies to help students engage in math.

# China wants to bring artificial intelligence to its classrooms to boost its education system

How the take off of AI-enabled education will affect the interaction between China's 14 million teachers and 188 million pupils

# New incubator program at Paul Allen's AI institute accepts English learning startup

BY **TAYLOR SOPER** on October 26, 2017 at 6:00 am

**SOFTWARE**

NOV
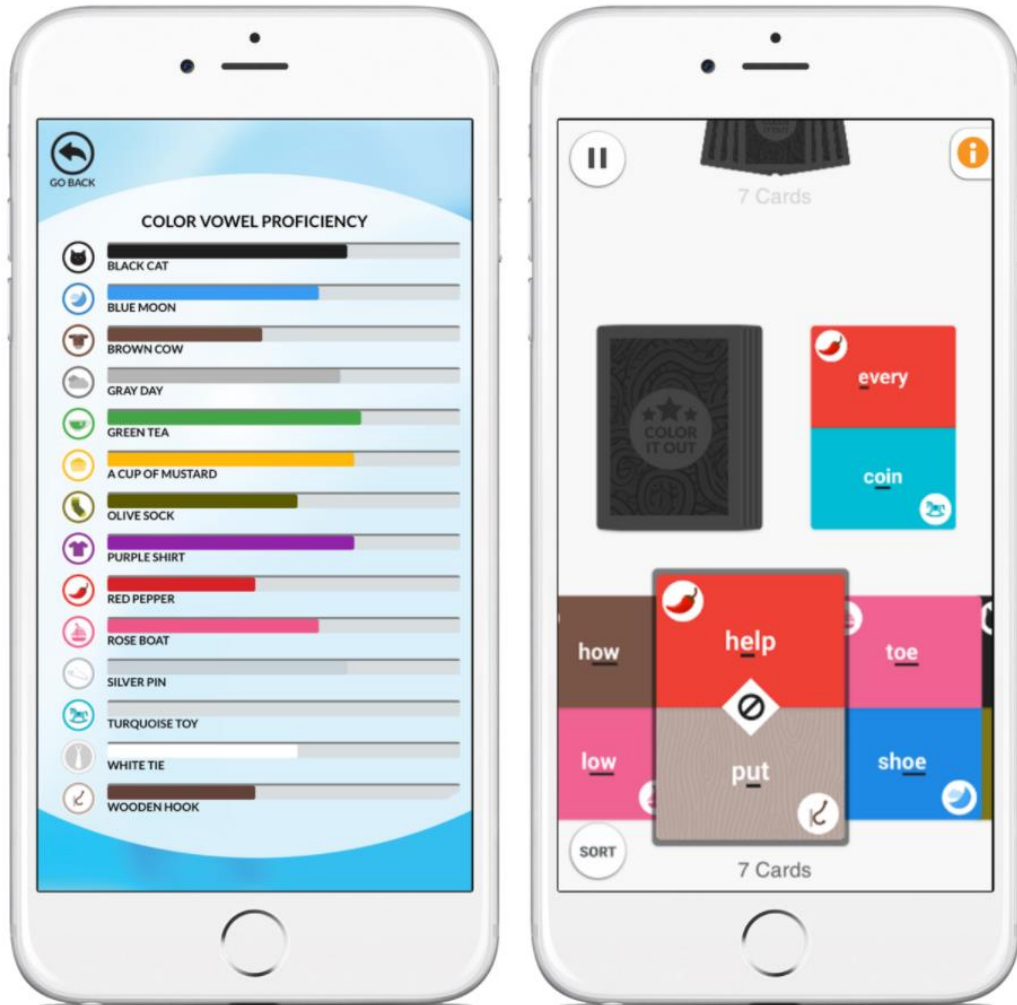16
2017

# AI Boosts Personalized Learning in Higher Education

Artifical intelligence can aid educators in providing support to individual students in large classes.

by  David Hutchins

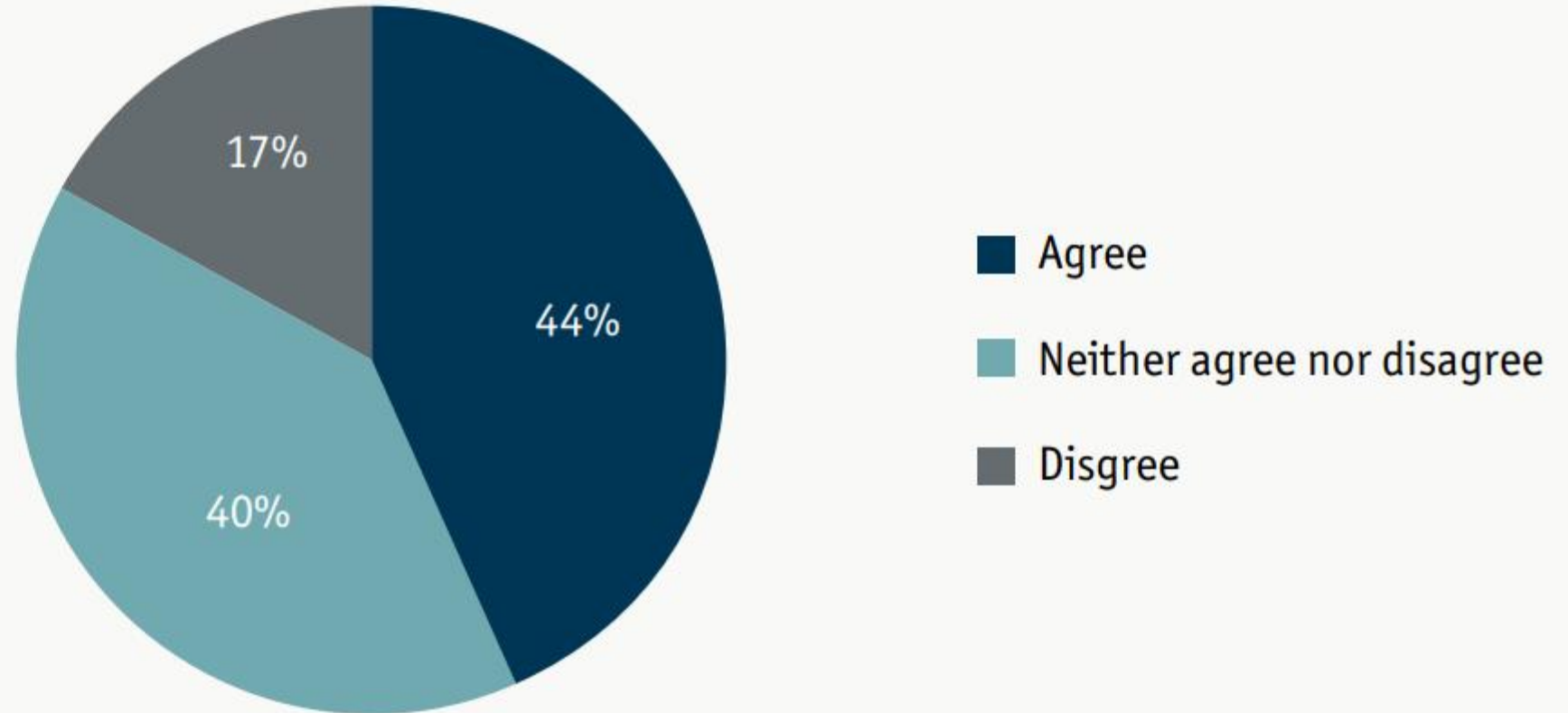"THE WORLD IS CHANGING VERY FAST. BIG WILL NOT BEAT SMALL ANYMORE. IT WILL BE THE FAST BEATING THE SLOW."

RUPERT MURDOCH

Lifehack Quotes

The Fast is the New Big

**Figure 2: AI is bad news for slow movers**

Delaying AI implementation will make business vulnerable to start-ups (% of respondents)

- Agree
- Neither agree nor disagree
- Disgree

17%

44%

40%

The Economist. Intelligence Unit.

# How will new collar jobs be formed?

X-Rays of Patients in B.C. 2017 and A.D. 2017

JANUARY 25, 2017

# Deep learning algorithm does as well as dermatologists in identifying skin cancer

*In hopes of creating better access to medical care, Stanford researchers have trained an algorithm to diagnose skin cancer.*

BY TAYLOR KUBOTA

It's scary enough making a doctor's appointment to see if a strange mole could be cancerous. Imagine, then, that you were in that situation while also living far away from the nearest doctor, unable to take time off work and unsure you had the money to cover the cost of the visit. In a scenario like this, an option to receive a diagnosis through your smartphone could be lifesaving.

Universal access to health care was on the minds of computer scientists at Stanford when they set out to create an artificially intelligent diagnosis algorithm for skin cancer. They made a database of nearly 130,000 skin disease images and trained their algorithm to visually diagnose potential cancer. From the very first test, it performed with inspiring accuracy.

"We realized it was feasible, not just to do something well, but as well as

# Meet Jill Watson: Georgia Tech's first AI teaching assistant
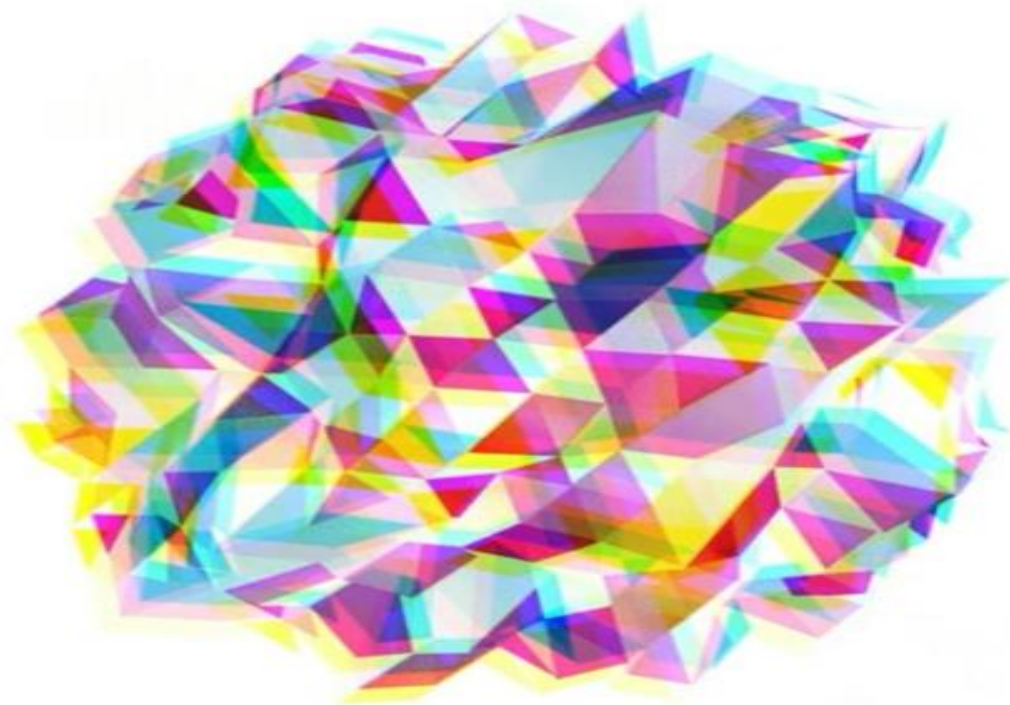
Nov 10, 2016 | By Hillary Lipko

**Dr. Michael Polanyi**

**Polanyi's Paradox** – "We know more than we can tell."
The tacit dimension of human knowledge

flowmachines

Daddy's Car: a song composed by Artificial Intelligence - in the style of the Beatles

806K views

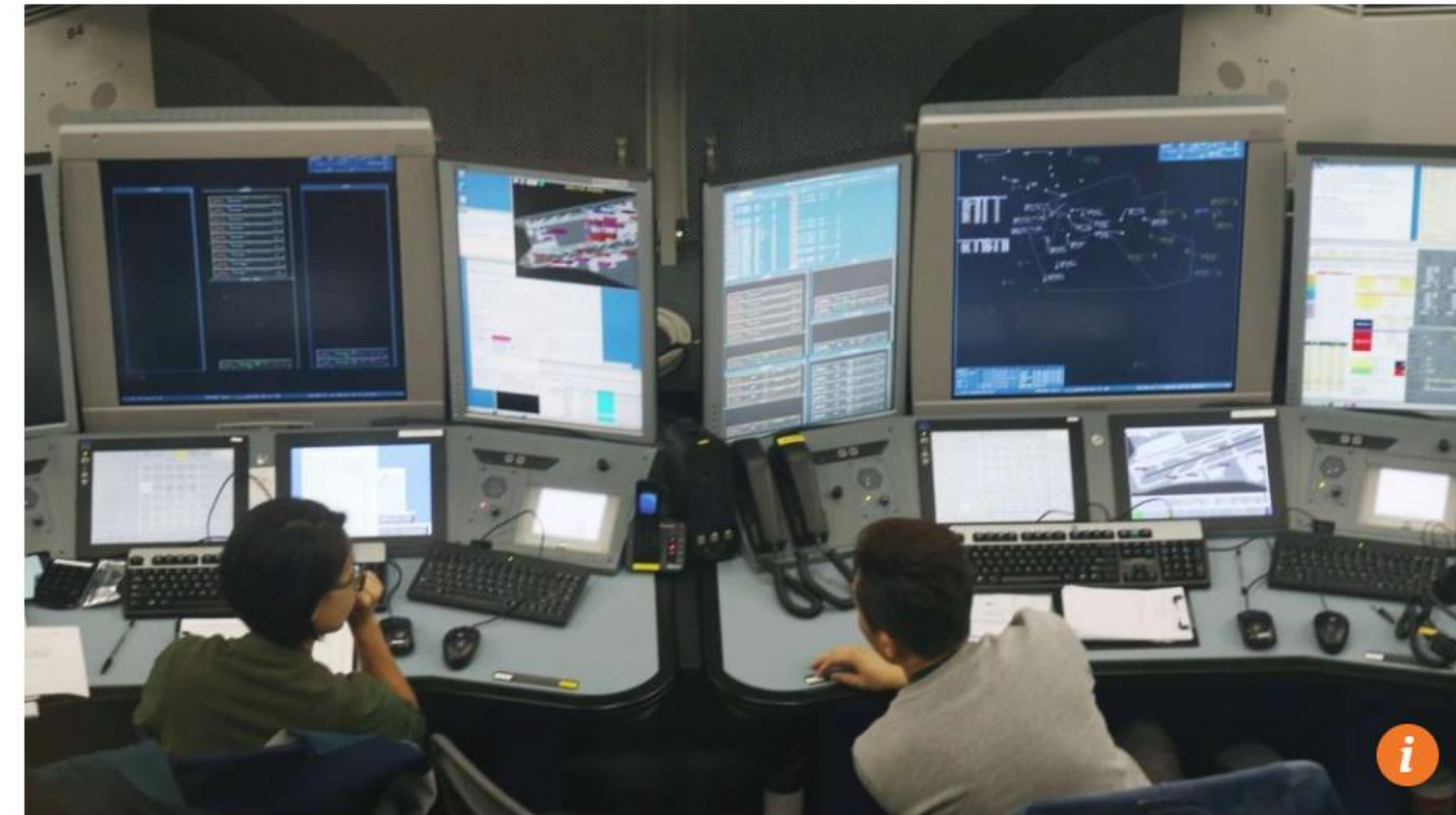# Hong Kong's air traffic control system suffers another glitch

Back-up system deployed for first time as operators lose information on positioning and altitude of planes
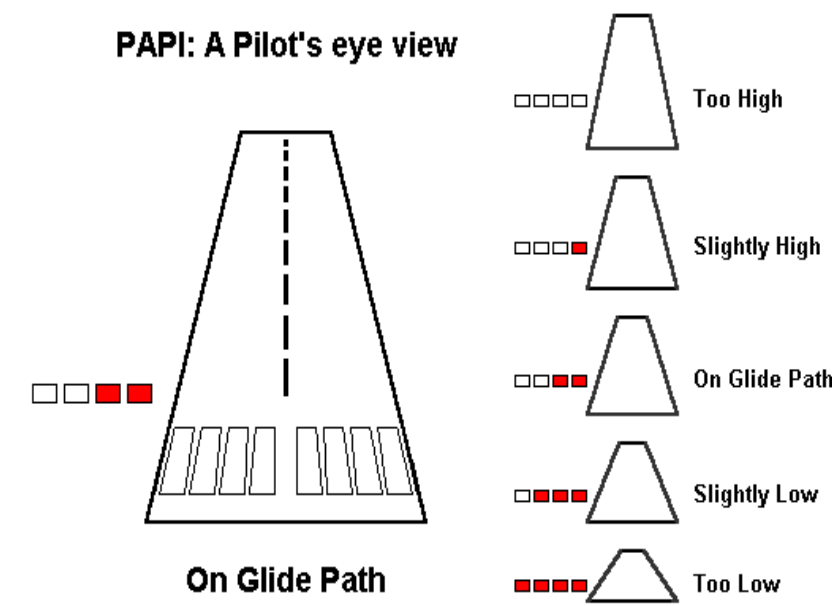
COMMENTS: 11



The new air traffic control system suffered another glitch on Saturday when operators temporarily lost information on the positioning and altitude of a large number of flights.

99.9% Reliability guaranteed software
400,000 flight movements
70M passengers

9800 hours on Airbus 320
48 hours on Boeing 777

Absence of Instrument Landing System
Relying on auto-throttle.

Visual Approach Slope Indicator

PAPI: A Pilot's eye view

Too High

Slightly High

On Glide Path

Slightly Low

Too Low

On Glide Path

# Learn to Live and Live to Learn

**What used to be a privilege for a small group of elite learners has become a disposable learning resource for all.**

**Stanford** | ONLINE

COURSES     ABOUT     ACROSS CAMPUS     VICE PROVOST FOR TEACHING & LEARNING

# Computer Science 101 (Self-Paced)

**Go to Course**

**Course topic:** Engineering & Computer Science

## CS101 now self paced!

The active course run for CS101 has ended, but the course is now available in a self paced mode. You are welcome to join the course and work through the material and exercises at your own pace. When you have completed the exercises with a score of 80% or higher, you can generate your Statement of Accomplishment from within the course.

The course will remain available for an extended period of time. We anticipate the content will be available until at least Sept 1, 2015. You will be notified by email of any changes to content availability beforehand.

## About CS101

CS101 teaches the essential ideas of Computer Science for a zero-prior-experience audience. Computers can appear very complicated, but in reality, computers work within just a few, simple patterns. CS101 demystifies and brings those patterns to life, which is useful for anyone using computers today.

In CS101, participants play and experiment with short bits of "computer code" to bring to life to the power and limitations of computers. Everything works within the browser, so there is no extra software to download or install. CS101 also provides a general background on computers today: what is a computer, what is hardware, what is software, what is the internet. No previous experience is required other than the ability to use a web browser.

VIEW ALL COURSES >

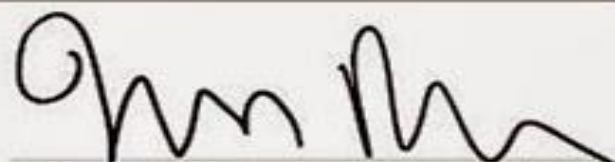Access learning material from upcoming, self-study, and completed courses...

# Stanford | ONLINE

## STATEMENT OF ACCOMPLISHMENT
*September 2nd, 2014*

This is to certify that,

# Ibrahim Omar

has successfully completed a free online offering of

## Computer Science 101

Nick Parlante
Lecturer, Computer Science
Stanford University

**PLEASE NOTE:**
SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON-CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT STANFORD UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A STANFORD UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.

Authenticity of this statement of accomplishment can be verified at: https://verify.class.stanford.edu/SOA/bdc74cca1d424d7a8071b6929a3811bd

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**380K graduates. 90% job placement rate.**

We build
telepsychiatry networks

Get Started

**83%** of hiring managers say lack of tech talent hurts business.

Lagos, Nigeria, Nairobi, Kenya

What could you build in 2017 with Andela Developers?     LEARN MORE →

# Join the Part-Time Web Developer Track

Become a developer in six months with the structure and rigor of a bootcamp. All without sacrificing your day job.

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## Experienced Mentors

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# Finance

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## Cryptocurrency Trading Course 2017: Make Profits Daily!

The Complete Guide to Cryptocurrency Trading and accumulating profits for your retirement!

By **Suppoman** ™

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**Coding**

**Big Data Analytics**

**Remote Work Control**

**Network Security**

**SNS Optimization**

**A.I. Analysis**

**NLU Development**

**Authentication**

**Drone Printing**

**Gamification**

**IOT Integration**

**Design Thinking**

**VR Development**

**Data Visualization**

**Digital Assistance Optimization**

**Cluster Robots Management**

**65%** of children in elementary school today will have jobs that do not exist, yet.
U.S. Department of Labor report.

**Many of public servant jobs will be replaced by machines.**

# Who are the new workforce in 15 years?
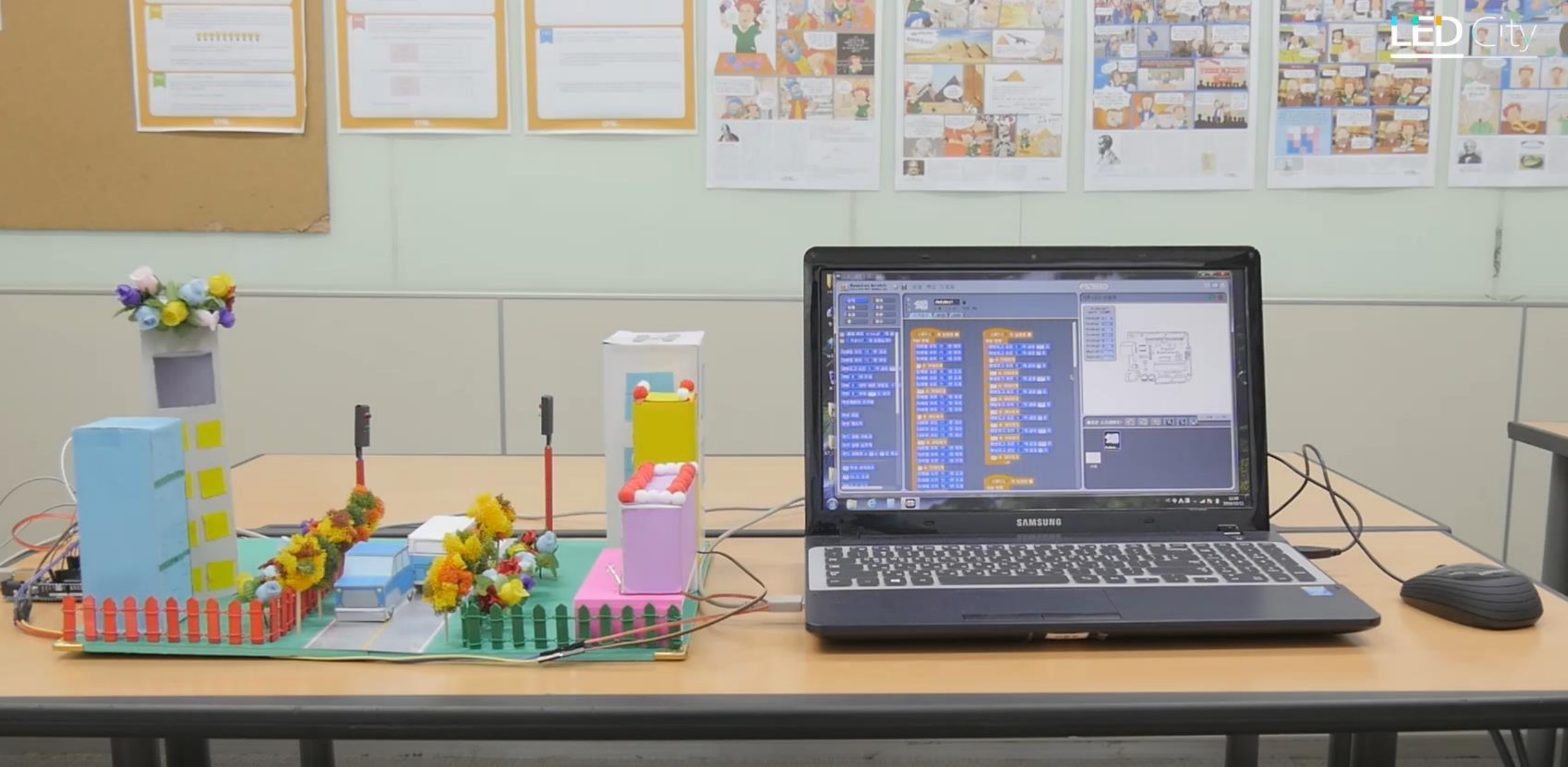
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USB 포

외부 LED

버튼 스위치

외부 LED

빛 센서

온도 센서

외부 LED

적외선 센서

LED1 LED2 LED3

외부LED

I2C

BNM24TM 27?

**3ʳᵈ grade @CMS EDU**

D02 Servo Motor    0
D04 Button                    Button1
D05 Button                    Button2
D06 Button                    Button3
D07 Button                    Button4
D08 Button                    Button5
D09 Speaker
D11 LED            GREEN
D12 LED            YELLOW
D13 LED            RED

Analog Pins
A0 Distance        0
A1 Distance        982
A2 Distance        0
A3 Distance        982
A4 Disrtance       471
A5 Brightness

5<sup>th</sup> Grade
@Stratford School

# Makerspace is the New School of Tomorrow

Torrae & Ivan Owen building a hand for Liam

# The Designer is the New Student of Tomorrow

**Future lifelong learners are the designers and makers who must create their own jobs again and again.**

CALIFORNIA COMMUNITY COLLEGES
Doing What MATTERS™
FOR JOBS AND THE ECONOMY

FOR EMPLOYERS:
WORKFORCE TRAINING
RESOURCES

SUCCESS STORIES & AWARDS
Workforce Recognition
eShowcase

CALIFORNIA COMMUNITY COLLEGES
Task Force on
WORKFORCE
JOB CREATION AND A STRONG ECONOMY

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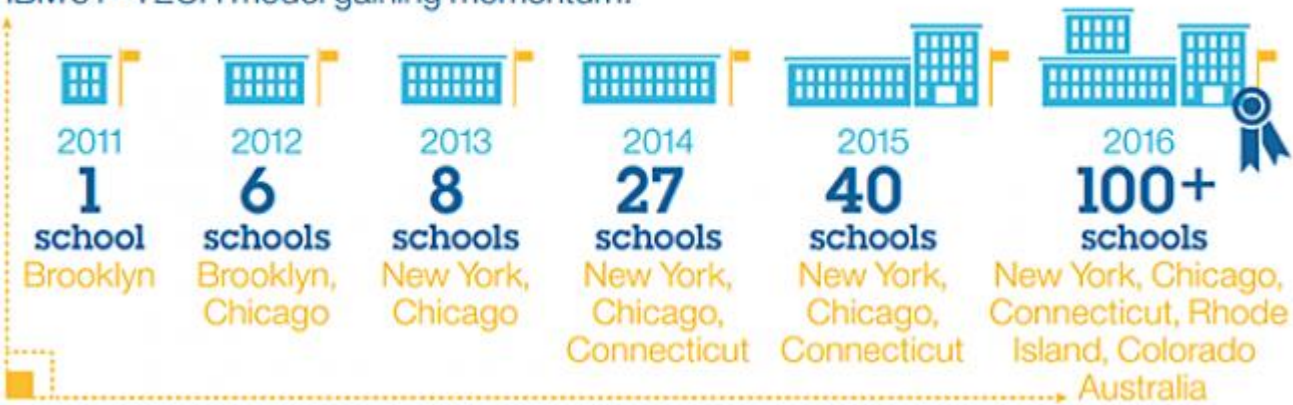
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California population 29M
114 Community Colleges
2.6M students
Establishing an ERP & Big Data – Regional needs finding to Placement – uplifting its education ecosystem
Makerspace / Design Thinking Classes
Career exploration mobile app

# Reinventing High School through STEM Education

IBM's P-TECH model gaining momentum:

| 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|------|------|------|------|------|------|
| **1** | **6** | **8** | **27** | **40** | **100+** |
| school | schools | schools | schools | schools | schools |
| Brooklyn | Brooklyn, Chicago | New York, Chicago | New York, Chicago, Connecticut | New York, Chicago, Connecticut | New York, Chicago, Connecticut, Rhode Island, Colorado Australia |

P·TECH

**Meister Schools**

# A district that pays students for their work

*Students bank $10 an hour for after-school work completing projects for nearby companies*

by **WAYNE D'ORIO**                                            October 16, 2017

L ONGMONT, Colo. — In one back room at Skyline High School, you can learn all you need to know about St. Vrain Valley School District. It's there that bins of materials sit next to past projects, exposing the district's DNA.

Boxes holding glue, Popsicle sticks, tape, pipe cleaners, compasses, zip ties and rulers lie nestled inside a 6-foot-high, student-constructed rack. Behind the storage unit sits a rectangular wooden box stuffed with bicycle tires filled with Silly Putty to replicate human intestines. For that biomedical project, students had to create a probe and learn to maneuver it sight unseen from behind a curtain on the box's opening to procure a sample from the intestine/bike tire.



A robot built by students to research endangered frogs in Lake Titicaca, in Peru, being tested in June, 2016, by Lindsey Hamblin (left), then a Skyline High School senior, and Callie Meyers, then a Skyline junior. Photo: Courtesy of Jeffrey Sylvester

Not just re-tweaking of education system
New whole ecosystem is needed – needs finding, education, training, assessment, credentialing, placement, continuing development

# Perception Still Supersedes Reality

Documenting
Manipulating
Sharing
Making questions
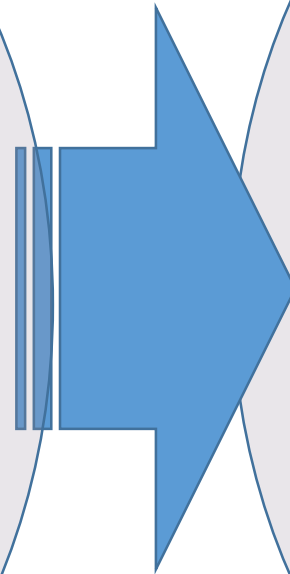Organizing
Presenting

# Old Problems in Education Industry

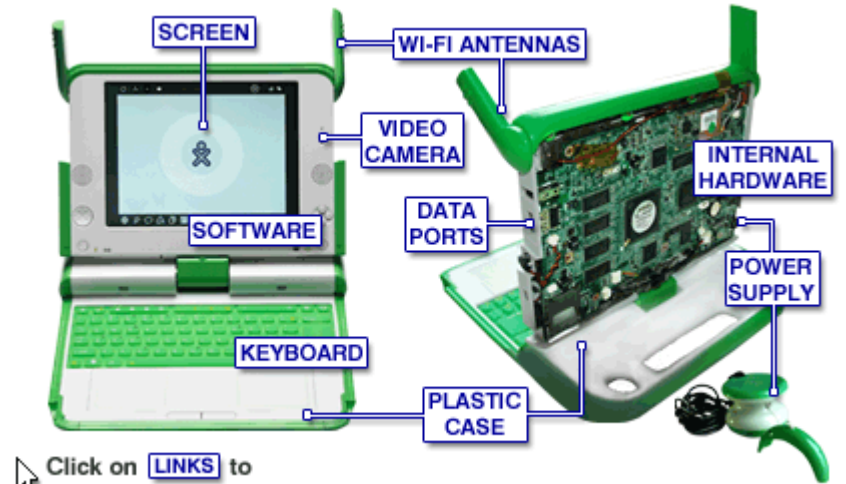Flipping Inside the Box

**Focus**

Delivery
Display
Teaching

→

Engagement
Enablement
Coaching

**Learning**

Scripted
Passive

Inquiry-Based
Self-Regulated

# OLPC



Diagram labels: SCREEN, WI-FI ANTENNAS, VIDEO CAMERA, SOFTWARE, DATA PORTS, INTERNAL HARDWARE, KEYBOARD, PLASTIC CASE, POWER SUPPLY

Click on LINKS to find out more

IMAGE SOURCE: Mike McGregor

**$100 target**
**$400 actual cost**
**25% usage (Uruguay)**
**A lot in storage**
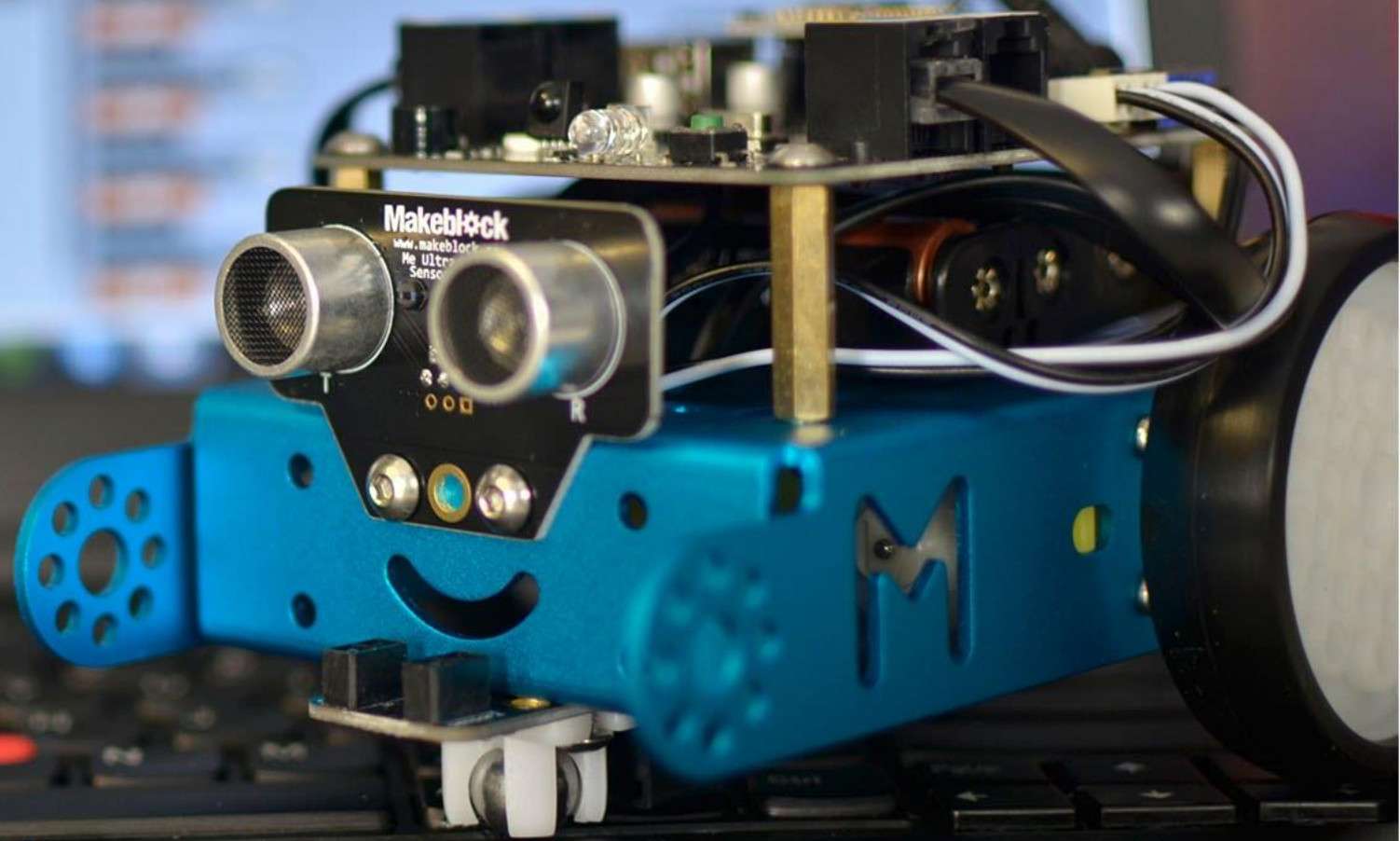
**OAPC?**

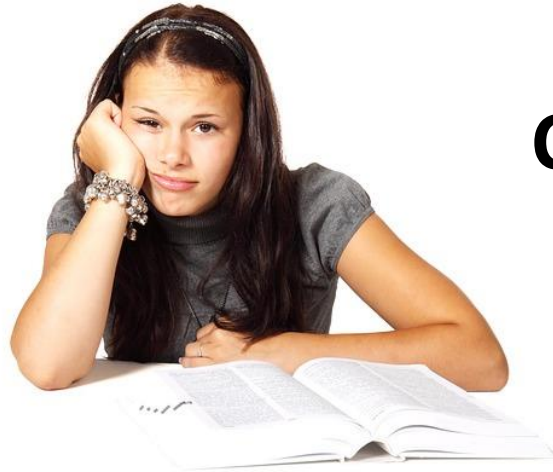**A child asks about 40,000 questions between the ages of 2 and 5.**

**During that span, a shift occurs in the kind of questions being asked:**

**from simple factual ones (name of object) to questions seeking explanations.**

**Falling-off-the-cliff phenomenon as students move from elementary school through high school.**

Paul Harris, Harvard University

**K12**

**College**

**Work**

# Google's Secrets Of Innovation: Empowering Its Employees

**Laura He,** CONTRIBUTOR

*Covering billionaires and Chinese entrepreneurs.* **FULL BIO** ⌄

Opinions expressed by Forbes Contributors are their own.

economy in a sustainable way?"

Skip question
Flag as inappropriate

Effie S, San Francisco, CA

Currently in the lead:

"How will you decrease America's dependency on oil?"
Katie Jacobs Stanton, Mountain View, California
Flag as inappropriate
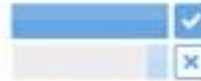
"Which Democrat(s) would you invite to serve in your Administration?"
Katie Jacobs Stanton, Mountain View, California
Flag as inappropriate

"How will you strengthen America's economy in a sustainable way?"
Effie S, San Francisco, CA
Flag as inappropriate
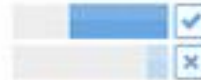
and if so how?"

Suggest a question
Back to Top

Innovation Question Fisher: DORY

# A Great Question is the New Innovation

SMILE (Stanford Mobile Inquiry-based Learning Environment)

**Short Overview & Triggering Questions**

**In Teams**

- **Make** Question
- **Incorporate** Mobile media
- **Share**
- **Solve**
- **Rate**
- **Reflect**
- **Exchange**

Where is lecture or memorization?

**Mobility, Social Networking, & Gamification**

👤 annika balakrishnan asks:

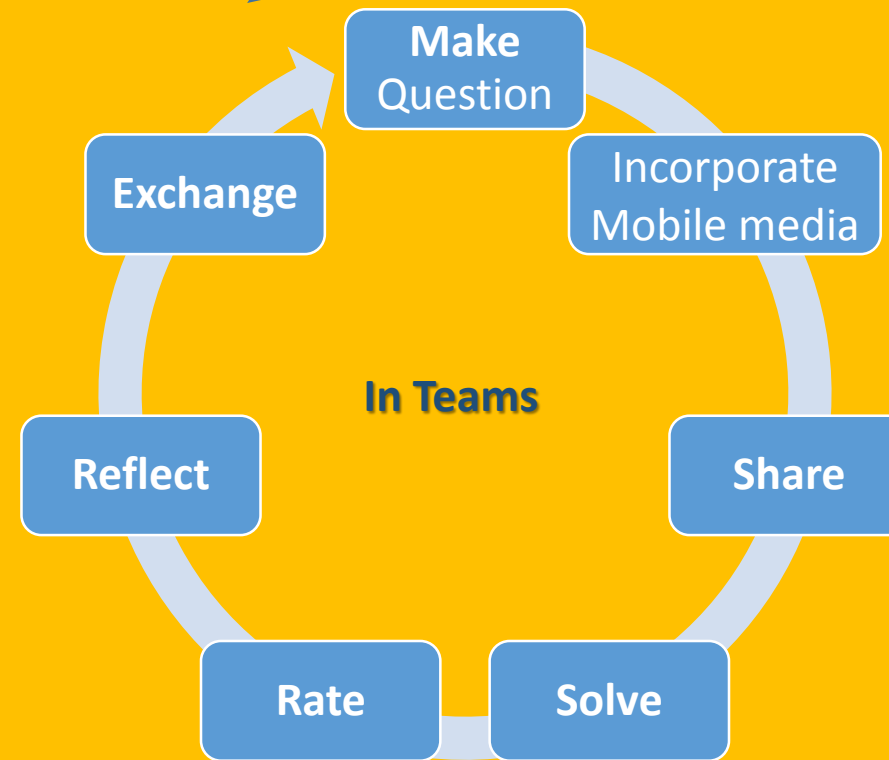**did the erly people gro frurits?**

| | |
|---|---|
| A. | did the erly people not eat the sed? |
| ✅ | did the erly people feel ful? |
| C. | did thy start to eat seeds |
| D. | they start grow plants |

Rate question: ☆ ☆ ☆ ☆ ☆

**Submit Answer**

Answer Distribution:

| | | |
|---|---|---|
| A. | ▇ | **3** (14%) |
| B. | ▇▇ | **4** (19%) |
| C. | ▌ | **1** (5%) |
| D. | ▇▇▇▇▇ | **13** (62%) |

Comments:

Type your comment here

**Post Comment**

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🏠 https://smile.stanford.edu/#sessio  :D  ⋮
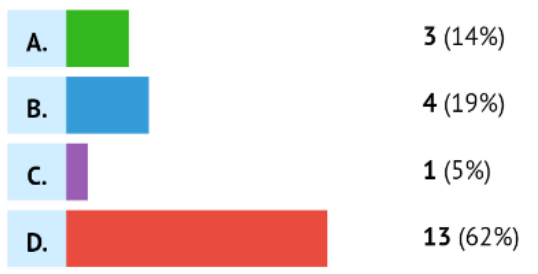
< Previous                    Next >
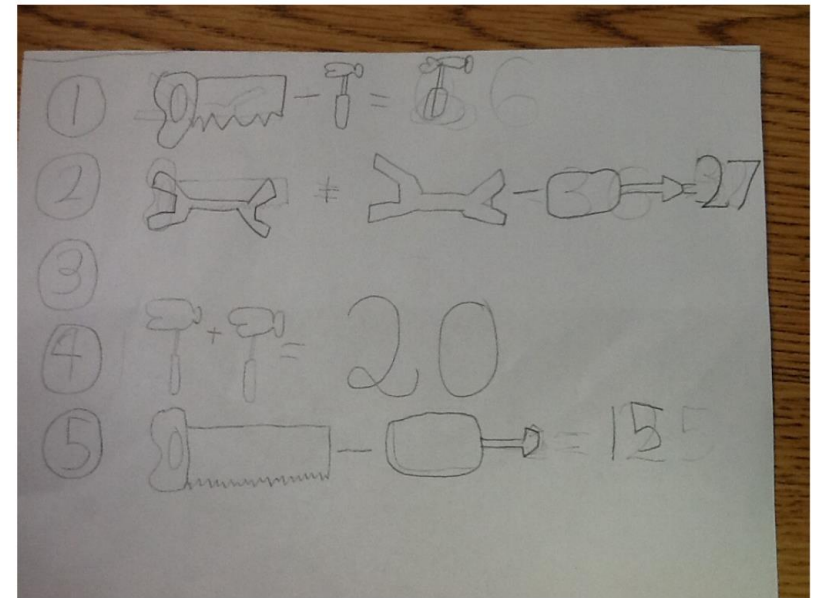
👤 madison brewer asks:

**Each tool below represents a number.Look at the equations below and identify the value of each tool.**



| | |
|---|---|
| A. | whrench |
| B. | screwdriver |
| C. | chainsaw |
| D. | hammer |

| SMILE is a methodology that applies the learning strategy based on skills and | Go! |

Great job, your question looks like it is making use of your *higher-order thinking skills*. Perhaps you could even go deeper if you reframed your question using a verb like Estimate.

AskBetter's QRE™ Question Recognition Engine Results

higher_order

synthesis :: 4.151%
evaluation :: 46.541%
analysis :: 28.376%
application :: 17.301%
comprehension :: 1.896%
knowledge :: 1.735%

| With all the potential tourism we have with the most exotic beaches and sea | Go! |

Great job, your question looks like it is making use of your *higher-order thinking skills*. Perhaps you could even go deeper if you reframed your question using a verb like Modify.

AskBetter's QRE™ Question Recognition Engine Results

higher_order

synthesis :: 1.284%
evaluation :: 95.53%
analysis :: 1.642%
application :: 0.518%
comprehension :: 0.245%
knowledge :: 0.781%

**Our system gives statistical analysis on how close each question is to a different type and quality of questions.**

**Using existing question sets as training data. A few ways to improve the performance of our system:**
- **Use better and more training data (SMILE accumulating questions everyday. You can help!)**
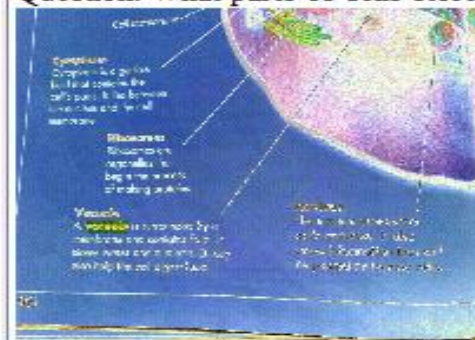- **Enhance our algorithm layers to make our analysis much deeper learning**
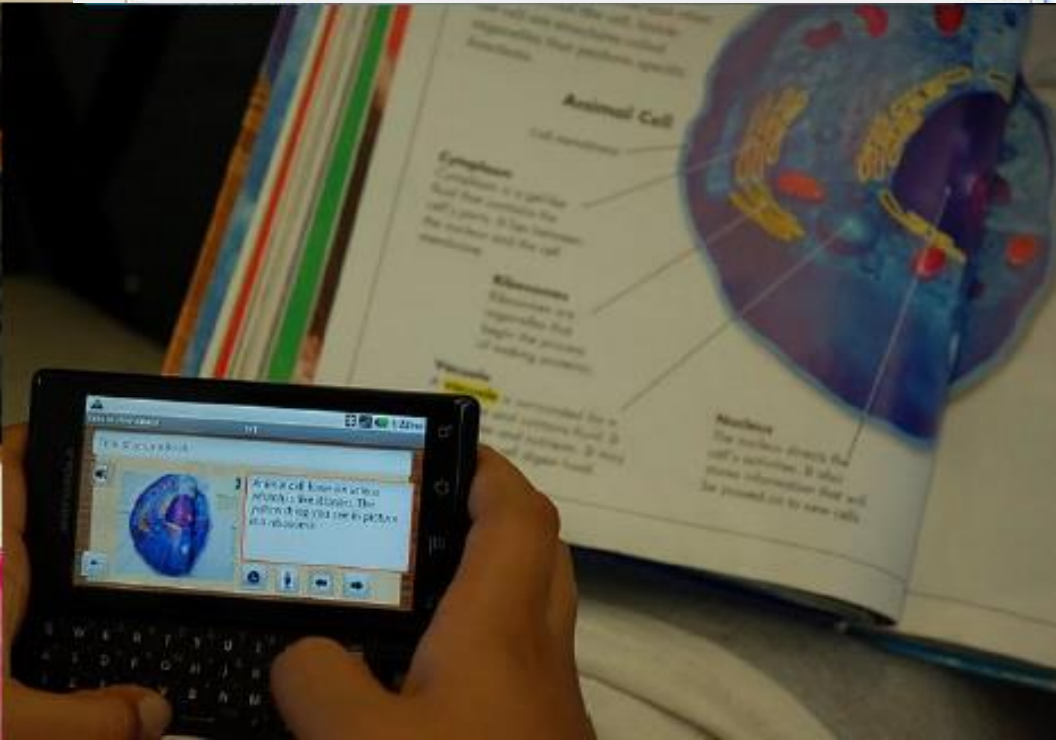
**AlphaGo training itself with 30,000 games a day.**

(Question created by Eric)

Question: What parts of cells store energy?

(1) A. Cytoplasm
(2) B. Ribosomes
(3) C. Vacuole ✔
(4) D. Mitochondria

Correct Answer: 3
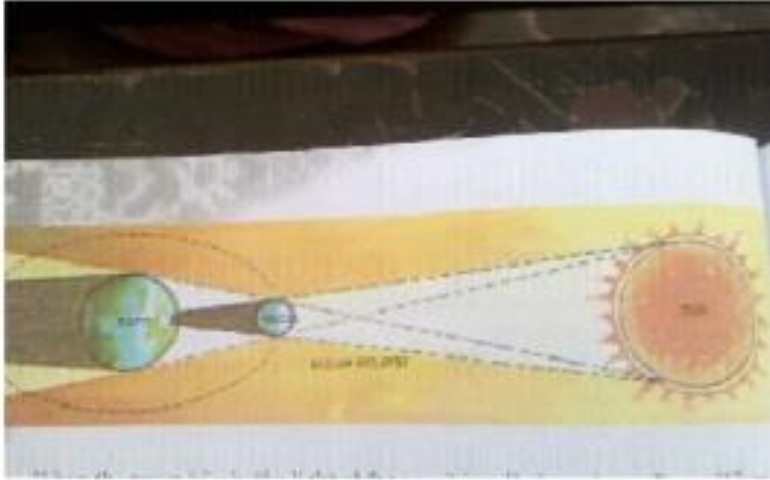
3rd    Students solve the peer-generated problems

Question: When the moon blocks the light of sun it is called .....

(1) Solar ecilpse
(2) Total solar eclipse
(3) Partial eclipse
(4) Lunar eclipse

Answer  (1)  (2)  (3)  (4)

Rating  1  2  3  4  5

Reset    Prev    Next

*"The textbook is missing this question…"*

My life

Questions    Resources

Showing 1 - 2 of 2 questions

Hamella Ayitey **1. Under the regiem of President Kwame Nkrumah Ghana moved into**
Answered by 0

Reuben Thiessen **When it came time to help South Korea in the Korean War of 1950, two countries in Africa came to their aid, Ethiopia and...**
rated by 0

## Create a New Question

Words selected for you to use in your question are: ethiopia, education

Question

During the war in _____ that lasted for _____ years _____ and _____ helped South Korea to fight of the _____

Attach

Tags:

Remove Multiple Choice Options

Multiple Choice Options:
A. 1957, 17, Egypt, Eritrea, British
B. 1950, 3, Ethiopia, British, Romans
C. 1961,

---

1998

## B.E.CE – 1998

### PART I
### SECTION A
### COMPREHENSION

*Read the following passages carefully and answer the questions that follow.*

### PASSAGE I

After the wine had been drunk Okwonkwo laid his difficulties before Nwakibie. I have come to you for help, he said. 'Perhaps you can already guess what it is. I have cleared a farm but have [no] yams to sow. I know what it is to ask a man to trust another with his yams, especially these da[ys] when young men are afraid of hard work. I am not afraid of work.

The lizard that jumped from the high iroko tree to the ground said he would praise himself if [no] one else did. I began to fend for myself at an age when most people will suck at their mothe[r's] breast. If you give me some yam seeds I shall not fail you.'

Nwakibie cleared his throat, 'It pleases me to see a determined young man like you these d[ays] when our youth have gone so soft. Many young men have come to me to ask for yams but I ha[ve] refused because I knew they would just dump them in the earth and leave them to be chocked [by] weeds. When I say no to them they think I am hard-hearted. But it is not so. Eneke the bird s[aid] that since men have learnt to shoot without missing, he has learnt to fly without perching. I h[ave] learnt to be stingy with my yams. But I can trust you. I know it as I look at you. As our fath[ers] said, you can tell a ripe corn by its look. I shall give you twice four hundred yams. Go ahead [and] [pre]pare your farm.

C. be wild
D. refuse to smile

[..........] of if no one else did will be,

4. Nwakibie refused to give yams to some young men because they were.............
   A. lazy
   [B.] stingy
   [...a]ble to shoot well
   [....] trust him

Edit    Delete    You created this question.     English ▾

< Previous

### When was Ethiopia invaded by Fascist Italy?

| A. | 1926 |
|---|---|
| ✅ | 1935 |
| C. | 1941 |
| D. | 1950 |

Comments:

Type your comment here

**Post Comment**
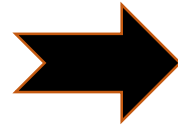
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Next >

### Does our Constitution protect women's rights?

Responses:

Type your comment here

**Post Comment**

$200

$35

4 times faster
4 times more storage
Quad-core CPU

Tanzania

Questions in Swahili and English.
No textbook. Only the teacher owns textbooks.

Learning English by creating questions with photos (below).



(Question created by 3)

Question: What is this?

(1) Cow
(2) Table
(3) Chair
(4) Bottle ✔

Correct Answer: 4

**Our brain finds ways to reduce our mental workload and one way is to <u>accept without questioning</u>...**

John Kounios, Drexel University

# Habit Loop

# CHANGE IS HARD AT FIRST, MESSY IN THE MIDDLE AND GORGEOUS AT THE END

ROBIN SHARMA

# Eight Ways To Transform Your Company's Innovation Culture

**Tendayi Viki,** CONTRIBUTOR

FULL BIO ∨

Opinions expressed by Forbes Contributors are their own.

- *Focus On Why*
- **Begin With Discovery**
- *Get Air-Cover*
- *Executive Buy In Is Not Enough*
- **Work With Early Adopters**
- **Get An Early Win**
- *Be Tough On Principles, But Loose on Tactics*
- **It's A Battle For Hearts (And Minds)**

IF YOU WANT SOMETHING YOU'VE NEVER HAD, THEN YOU'VE GOT TO DO SOMETHING YOU'VE NEVER DONE

Dick Fosbury

Gabi Shull

NEVER GIVE UP ON YOUR DREAMS

THE TRUTH 365

CANCER SURVIVOR, AMPUTEE & DANCER
GABI SHULL
DANCERS VS CANCER

# Email your comments to
**phkim@Stanford.edu**