



جامعة حمدان بن محمد الذكية
Hamdan Bin Mohammed Smart University



Access, Equity and Quality: Envisioning the Future of Higher Education in a Digital Age

alain senteni | director of innovation & entrepreneurship | hbmsu | dubai



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6
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www.computerhistory.org

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www.securedgenetworks.com



langwitches.org

tsunami

avalanche



The Coming Tsunami in Educational Technology

Stanford President, John L. Hennessy at the 40th CRA conference, 2012

An Avalanche is Coming

Higher Education and the Revolution Ahead

Michael Barber, UK Institute for Public Policy and Research, 2013

Le Tsunami Numérique

Emmanuel Davidenkoff, Stock, 2014



DISRUPTION?



UAE National Media Council Yearbook 2009

“the challenge is to transform a centralised bureaucratic system into a student centered, decentralised learning environment.”



TRAIL vs LEAD
who sets the pace?

control vs emergence

Le monde
change

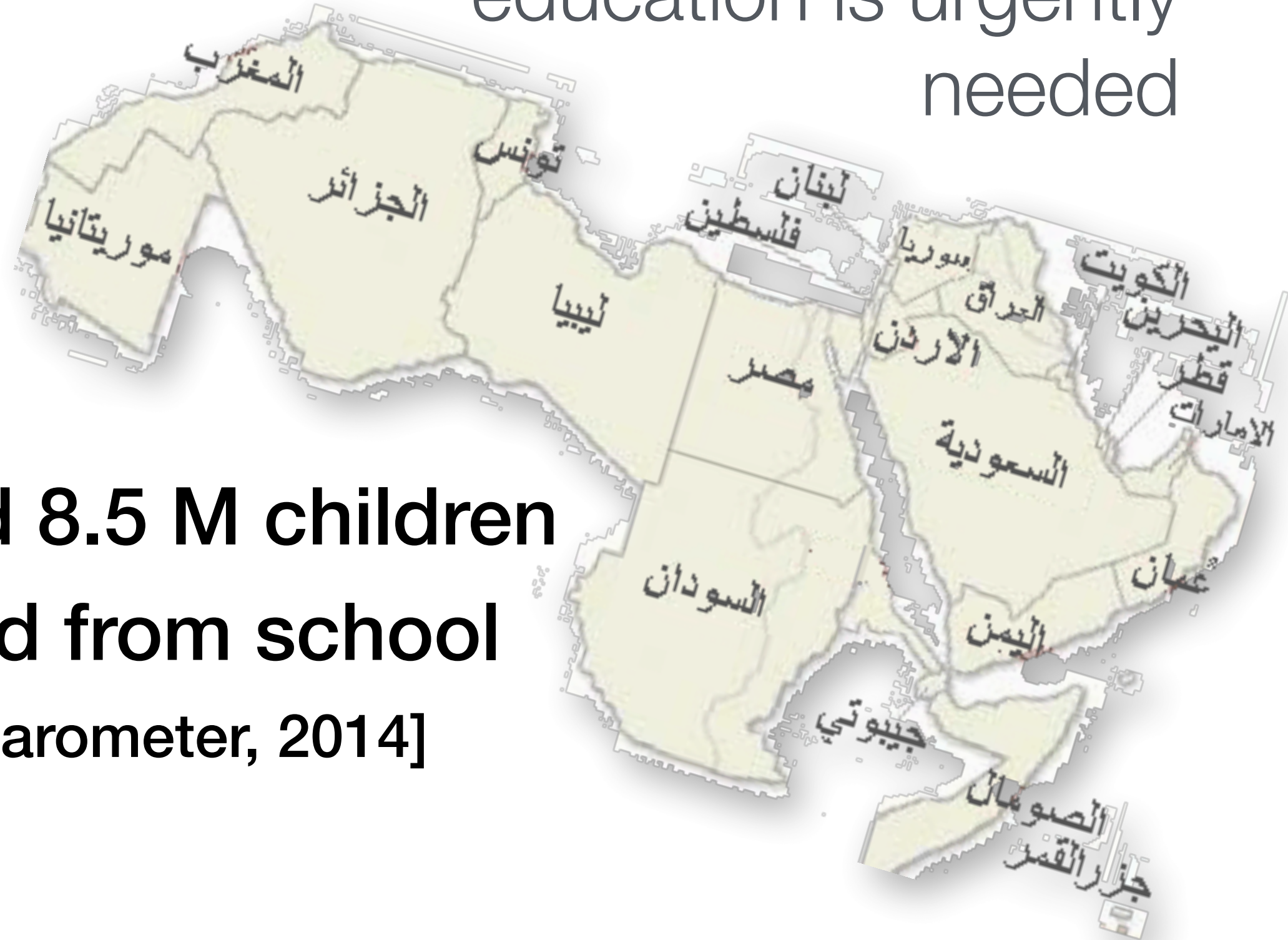
Ben



Les besoins
éducatifs
aussi !

demography

an increased access to education is urgently needed



In 2014, an estimated 8.5 M children still remain excluded from school
[Arab World Learning Barometer, 2014]



economy



secure broad access
increase quality
reduce costs



employers have new expectations



Leadership



Digital literacy



Communication



Emotional intelligence



Entrepreneurship



Global citizenship



Problem solving



Team-working

evolution of the job market from 19th to 21st century



19th century
transformation jobs



transformational work
[workers convert raw materials
into finished goods]



20th century
production jobs

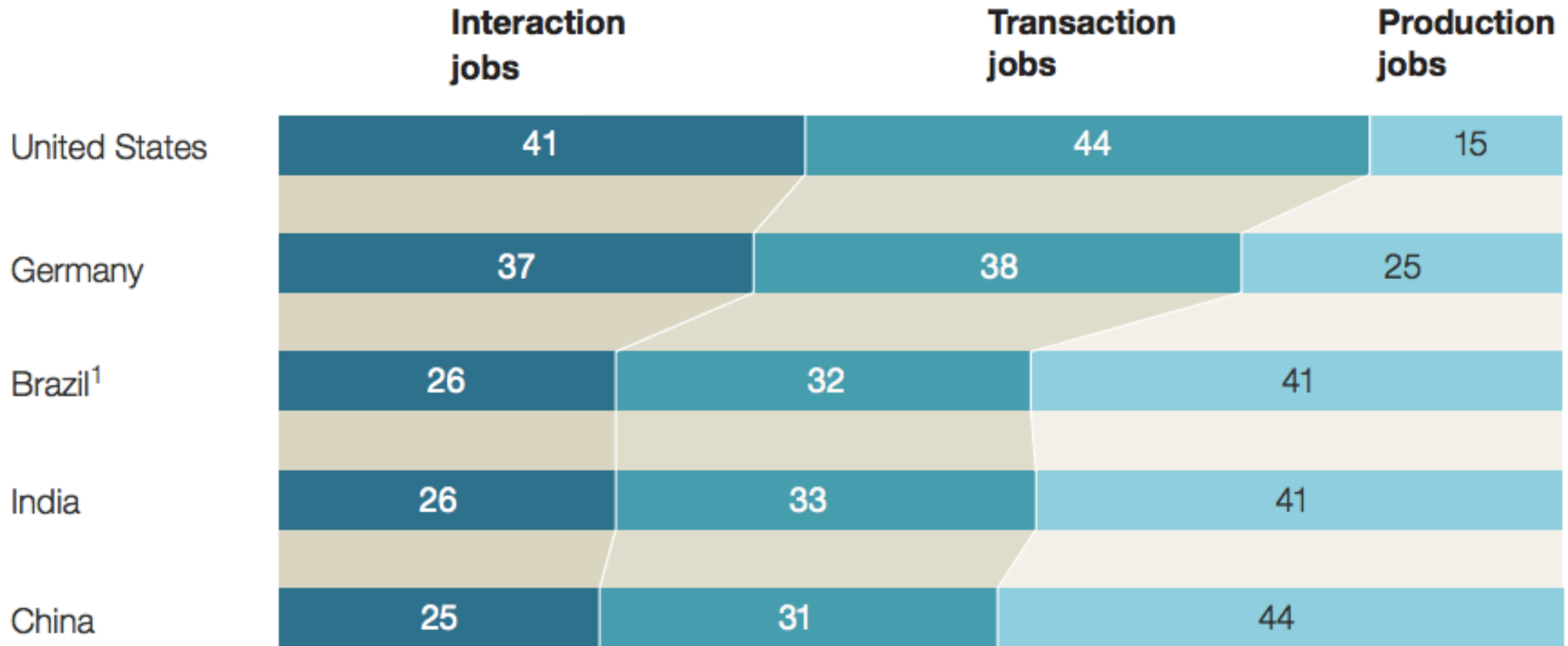


21st century
interaction jobs

management, sales, teaching,
customer service [skilled
professionals whos spend a lot of
time interacting with other people]

Interaction-based work represents a significant proportion of jobs in developed and emerging markets alike.

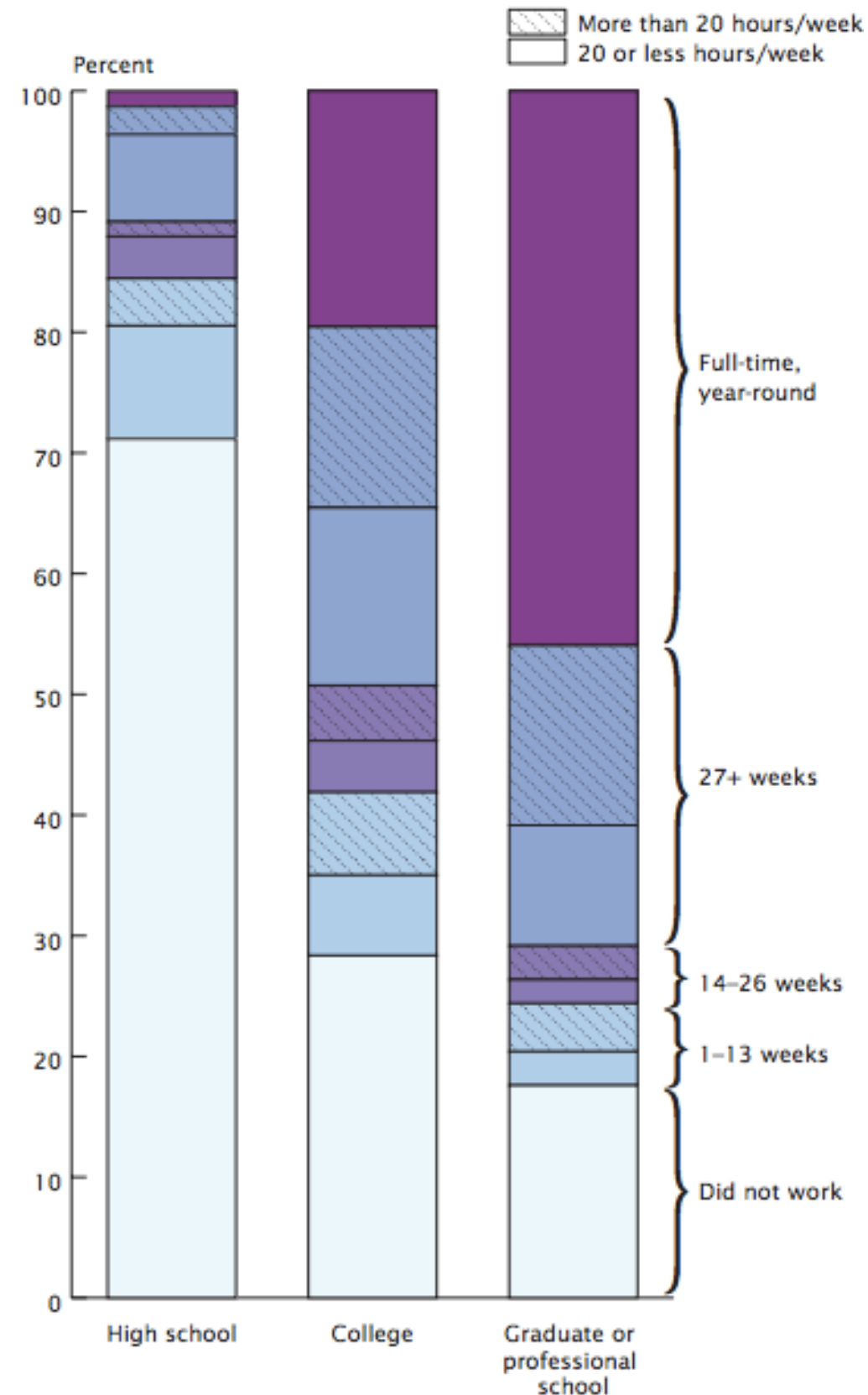
% of workforce



¹Figures do not sum to 100%, because of rounding.

Hours and Weeks Worked for Students Enrolled in High School, College, and Graduate School: 2011

(For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/acs/www)



Increasing diversity of student profiles

(Siemens, 2013)

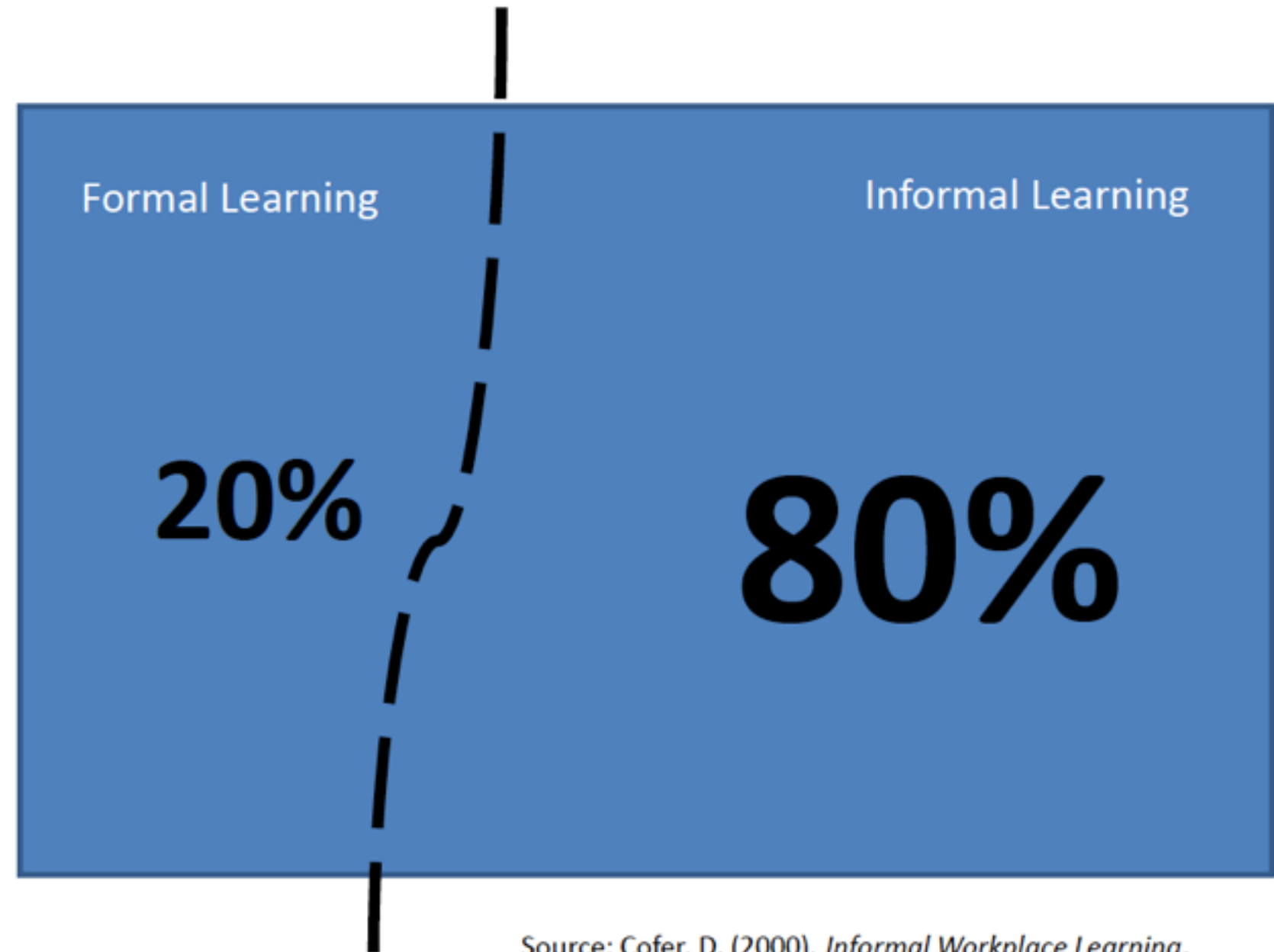
In the US, less than half of the students can be considered full time students.

Students who can attend campus five days a week nine-to-five, are now a minority.

(Bates, 2013)

Formal and Informal learning

Increasing importance of informal learning (Wheeler, 2010)



Source: Cofer, D. (2000). *Informal Workplace Learning*.



“the task of universities today is to provide paths from their informal cloud of learning towards formal study for those who wish to take them”

Professor G. Martin Bean
Vice-Chancellor of The UK Open University
[2009-2015]
Vice-Chancellor/President of RMIT University
[2015-]

XXIst century education

what kind of business are we talking about?



Cost

Quality

Access

hand made
customized
high quality & cost
reputation
limited production



Access

Quality



Cost

assembly chain
division of labor
lower cost
mass production
specialization
quality assurance
marketing

to move from a craft activity
to a full-fledged industry,
what paradigm shift is needed ?

tech·nol·o·gy  *noun* \tek-ˈnā-lə-jē\
A white rectangular box containing the definition of technology. The word 'tech·nol·o·gy' is in bold black font. To its right is a blue speaker icon, followed by the word 'noun' in italics and the phonetic transcription '\tek-ˈnā-lə-jē\'.

: the use of science in industry, engineering, etc., to invent
useful things or to solve problems

: a machine, piece of equipment, method, etc., that is
created by technology



**the medium is
the message**

Marshall McLuhan(1964)
Understanding Media

Connectivism: “The pipe is more important than the content in the pipe.”



**the medium is actually
becoming the message**



scalability

ubiquity



XXIst century educator

what kind of job are we talking about?

XXIst
century
educator



Grade 7 pupils at Umm Suqeim Model School in an English class use high-technology equipment as part of the Sheikh Mohammed bin Rashid Smart Learning Programme. Jeffrey E Biteng / The National

Smart Learning Programme transforms education in UAE's government schools





learners prefer to work with the world

what does
this mean?

Authentic Situations

Activity-Based Learning



(Schneider, 2005)

Real World Tasks

Learning Design & Open Practices



socioconstructivism (Lev Vygotski)



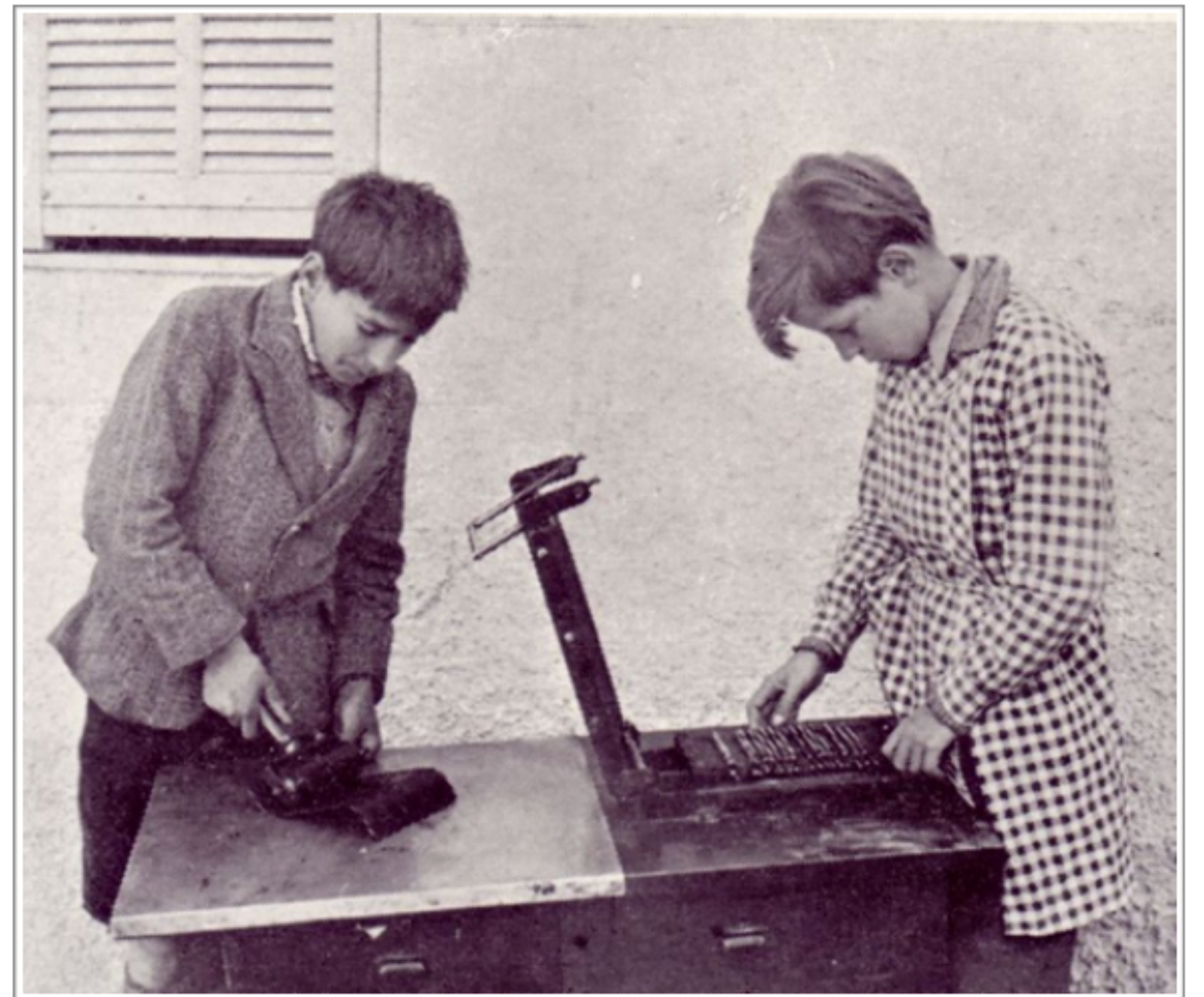
constructivism (Jean Piaget)



situated cognition (J. Lave, E. Wenger)



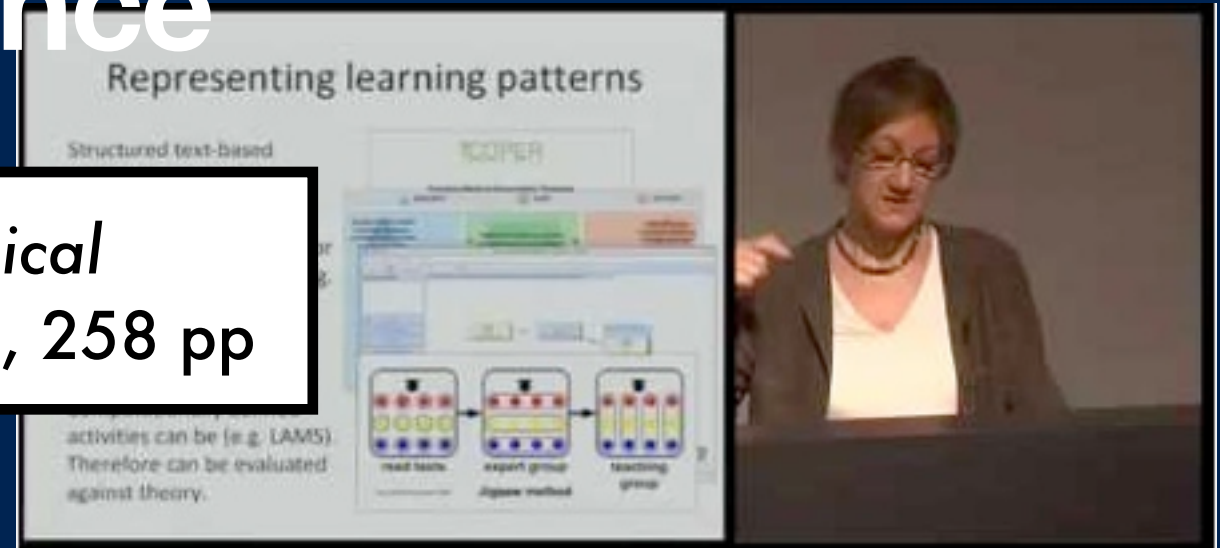
Celestin Freinet
(1896-1966)



innovative pedagogy (1950s)

teaching is becoming a design science

Laurillard, D. (2012) *Teaching as a Design Science: Building Pedagogical Patterns for Learning and Technology* - New York/London: Routledge, 258 pp

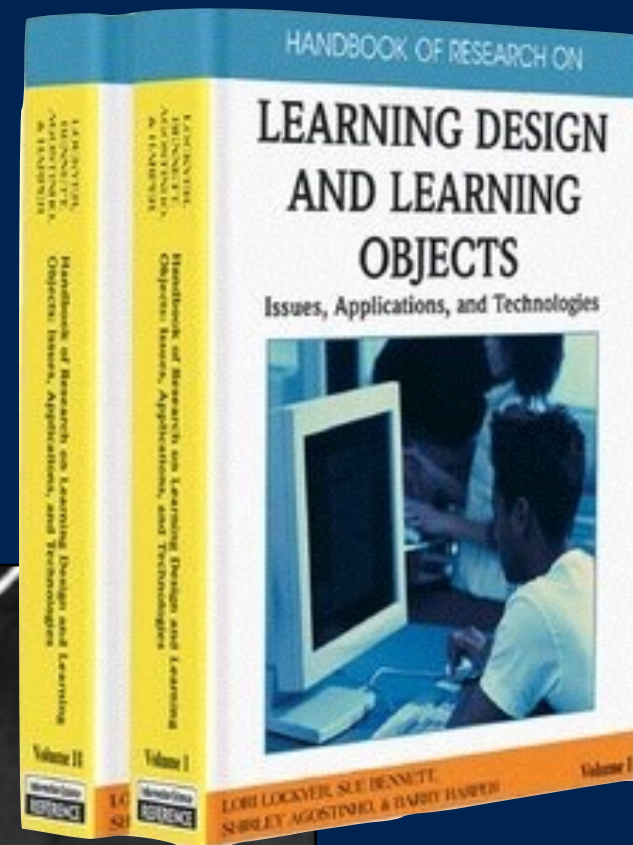


Like other design professionals teachers have to work out creative and evidence-based ways of improving what they do.

Every day, teachers design and test new ways of teaching, using learning technology to help their students.

By representing and communicating their best ideas as structured pedagogical patterns, teachers could develop this vital professional knowledge collectively.

From this unique perspective on the nature of teaching, Diana Laurillard argues that a twenty-first century education system needs teachers who work collaboratively to design effective and innovative teaching.

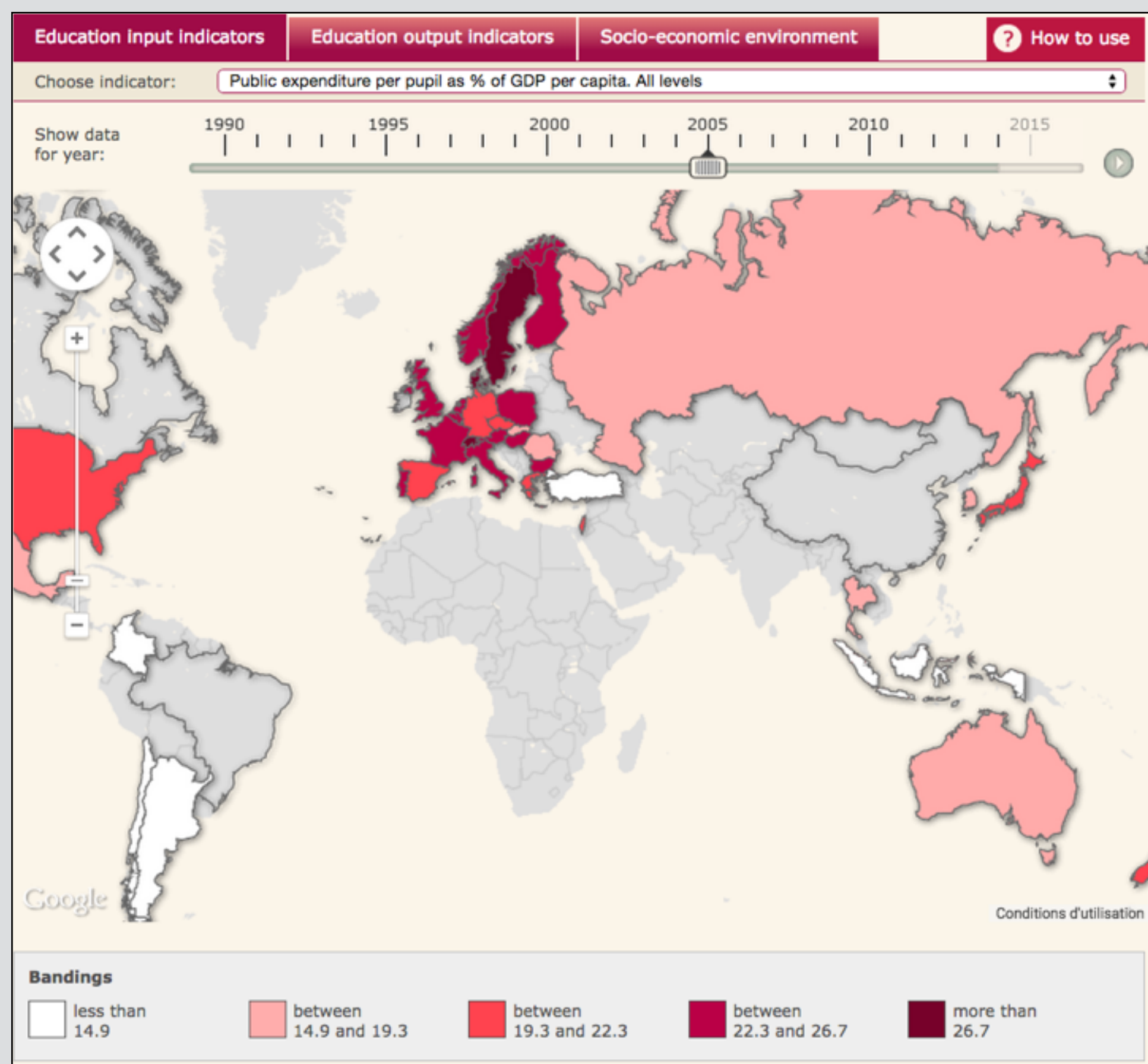


w e n e e d t o
(r e) - d e s i g n
t h e l e a r n i n g
s p a c e !



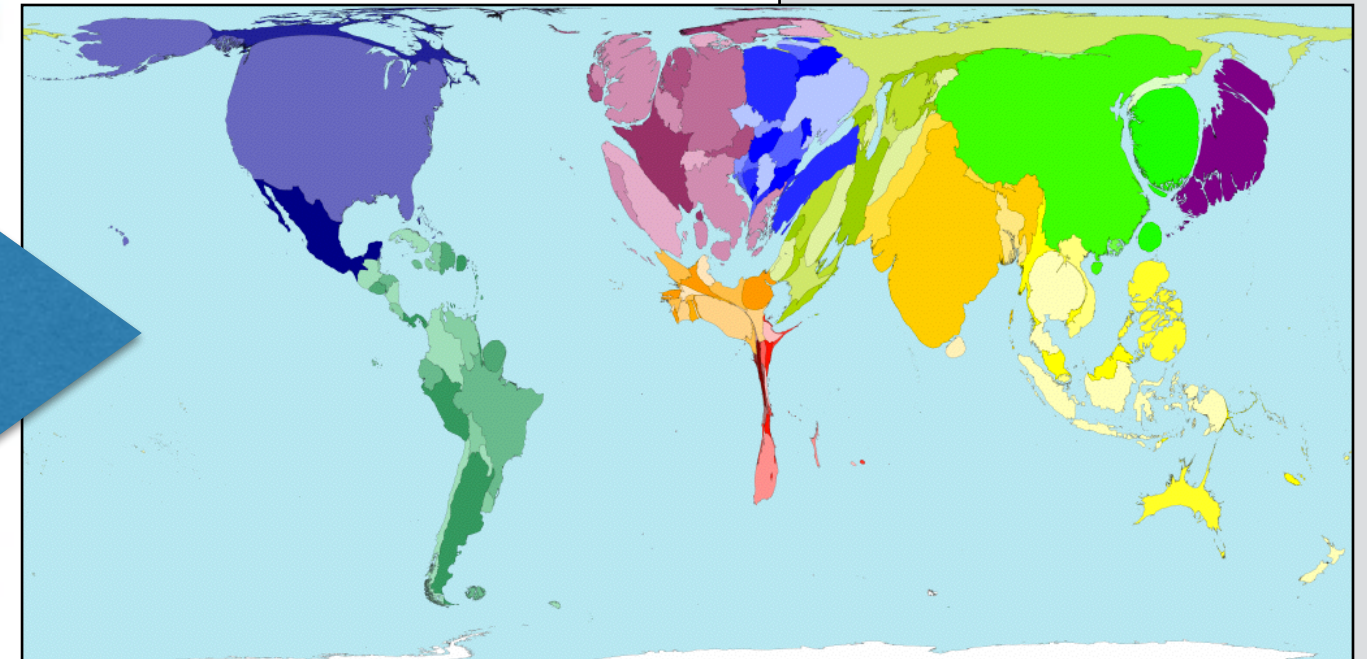
Data Visualisation Tools

heat map



what should be taught?

$$\begin{aligned}
 & \frac{1}{\Delta t_n} \int_{\Omega} \begin{vmatrix} N_i [(1-\gamma)\theta_{\text{liq}}^n + \gamma\theta_{\text{liq}}^{n+1}] & N_i \rho_b \left\| \begin{matrix} C_j^{n+1} \\ a_j^{n+1} \end{matrix} \right\| \\ 0 & N_i \rho_b \left\| \begin{matrix} C_j^n \\ a_j^n \end{matrix} \right\| \end{vmatrix} \partial\Omega - \\
 & - \frac{1}{\Delta t_n} \int_{\Omega} \begin{vmatrix} N_i [(1-\gamma)\theta_{\text{liq}}^n + \gamma\theta_{\text{liq}}^{n+1}] & N_i \rho_b \left\| \begin{matrix} C_j^n \\ a_j^n \end{matrix} \right\| \\ 0 & N_i \rho_b \left\| \begin{matrix} C_j^{n+1} \\ a_j^{n+1} \end{matrix} \right\| \end{vmatrix} \partial\Omega + (1-\gamma) \times \\
 & \times \int_{\Omega} \begin{vmatrix} N_i \left(\frac{\theta_{\text{liq}}^{n+1} - \theta_{\text{liq}}^n}{\Delta t_n} + \lambda [(1-\gamma)\theta_{\text{liq}}^n + \gamma\theta_{\text{liq}}^{n+1}] + \lambda \rho_b K_d \right) N_i \\ -N_i \beta \rho_b K_d N_i \end{vmatrix} \\
 & \times \int_{\Omega} \begin{vmatrix} N_i \left(\frac{\theta_{\text{liq}}^{n+1} - \theta_{\text{liq}}^n}{\Delta t_n} + \lambda [(1-\gamma)\theta_{\text{liq}}^n + \gamma\theta_{\text{liq}}^{n+1}] + \lambda \rho_b K_d \right) N_j \\ -N_i \beta \rho_b K_d N_j \end{vmatrix} \\
 & - (1-\gamma) \int_{\Omega} \begin{vmatrix} \nabla N_i (\theta_{\text{liq}} \mathbf{D} \nabla N_j - \mathbf{u} N_j) & 0 \left\| \begin{matrix} C_j^n \\ a_j^n \end{matrix} \right\| \\ 0 & 0 \left\| \begin{matrix} C_j^{n+1} \\ a_j^{n+1} \end{matrix} \right\| \end{vmatrix} \partial\Omega - \gamma \int_{\Omega} \begin{vmatrix} \nabla N_i (\theta_{\text{liq}} \mathbf{D} \nabla N_j - \mathbf{u} N_j) & 0 \left\| \begin{matrix} C_j^{n+1} \\ a_j^{n+1} \end{matrix} \right\| \\ 0 & 0 \left\| \begin{matrix} C_j^n \\ a_j^n \end{matrix} \right\| \end{vmatrix} \partial\Omega = 0
 \end{aligned}$$





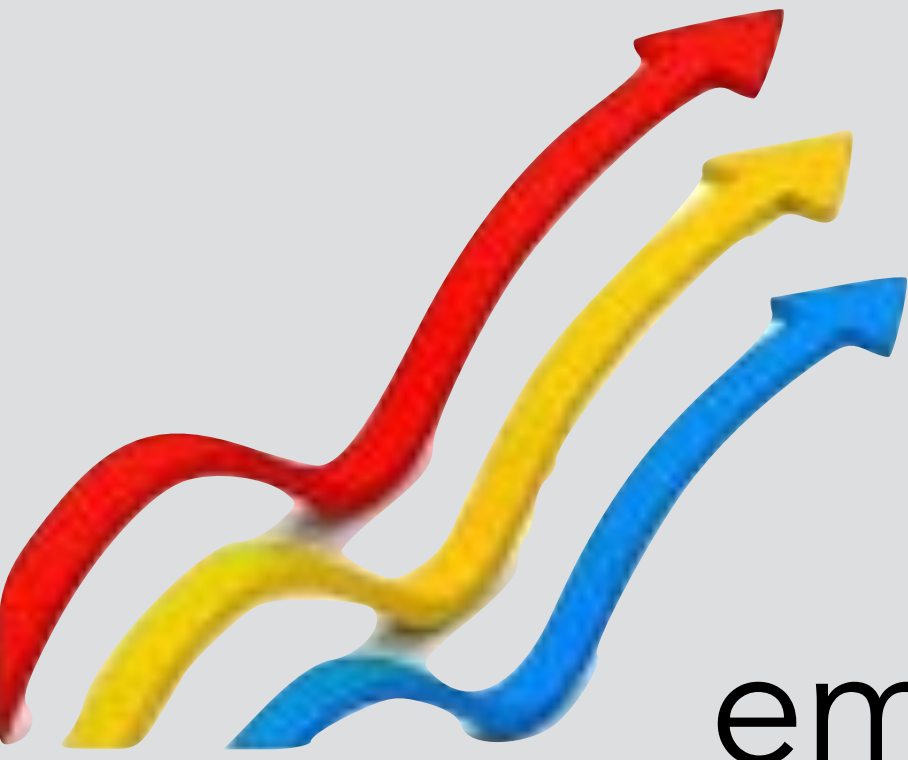
Learning

Analytics

V

transparency
individualization

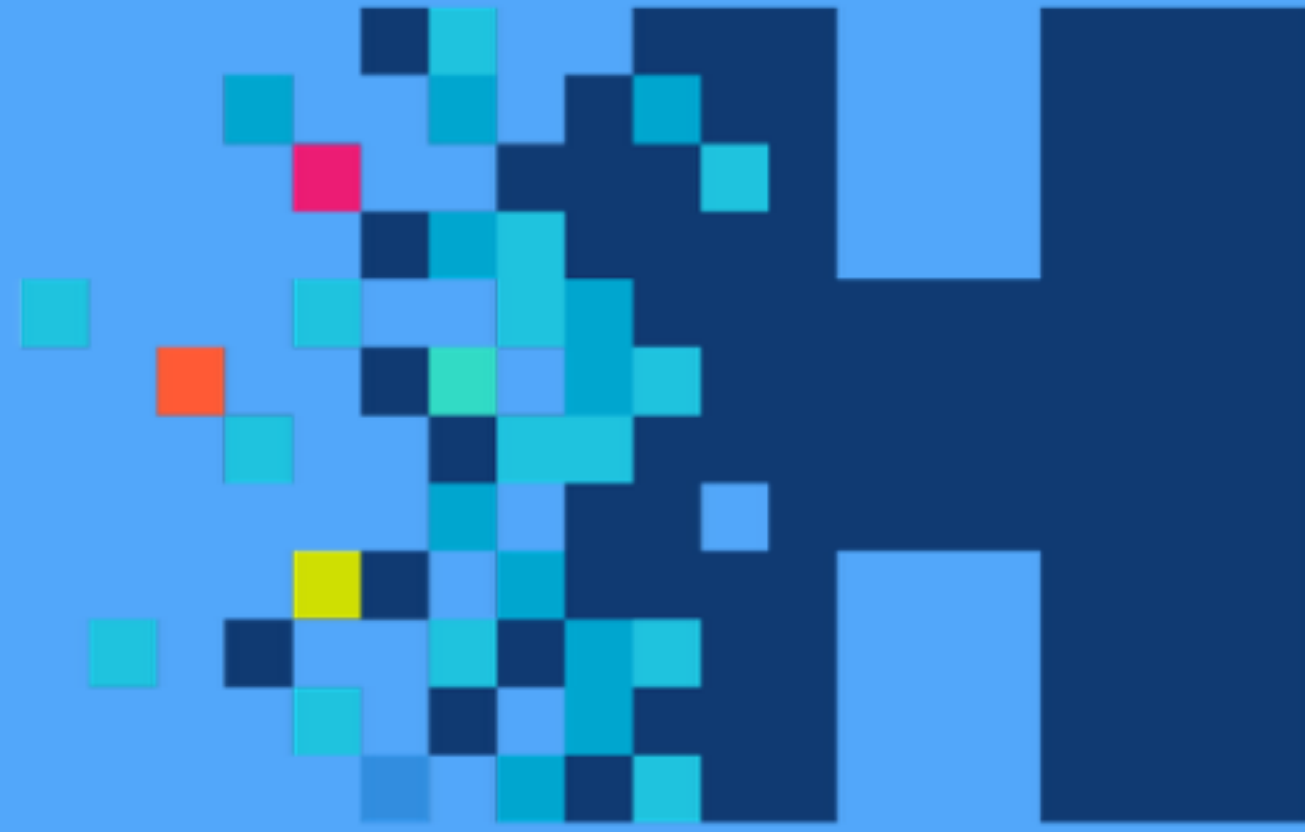
Learning analytics provide big data to ~~test~~
measure learning activity continuously,
at run time, not a posteriori.



emerging trends (*Siemens, 2013*)

Participatory culture - Social/technical connectivity
(Rise of the Individual)

Transparency and surveillance culture
(Rise of Data and Analytics)



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Thank you for your attention !