Digital Information Literacy: Challenges and Opportunities for 21st Century Education

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Overview

- The status of reading in a digital world

- Are "digital natives" prepared for skilled uses of the Web?

  - The issue of cognitive theories and frameworks

  - Key obstacles to proficient digital reading

- How can schools foster students' digital information literacy?

Welcome to a digital world

Computers in use worldwide
(Million units, source: ITU)
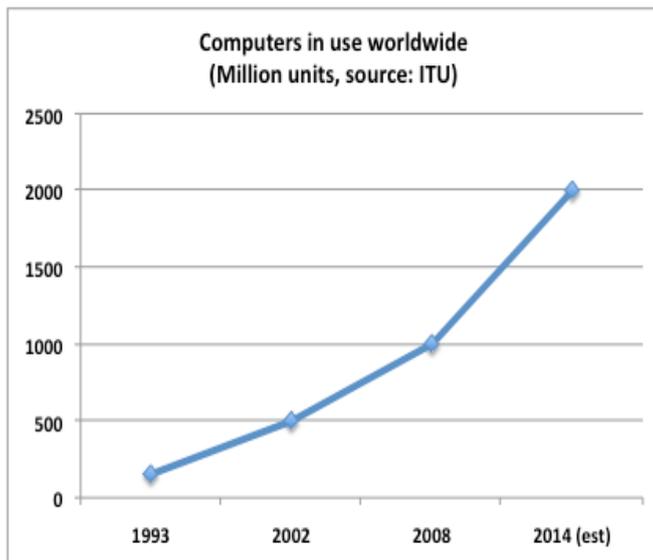
- more than 1.5Bn computers in use worldwide (est., ITU)

- 70% of OECD households connected to the Internet, up from 10% in Year 2000 (OECD, 2010).

- 6 bn mobile phone subscriptions in 2012, up from less than 1 bn in 2000 (World Bank).

- 2-digit growth in digital pads over the past few years.

Some popular beliefs about the digital era

- Fading of book industry, multimedia has it all, reading not so important anymore.

- "Digital natives" outperform older generations in ICT literacy and skills.

- Need to refocus educational objectives and standards to adjust schools to digital native culture.

- *But what does it <u>really</u> take to be a skilled user of Web-based resources and services?*

Skilled use of the Web, what does it take?
1/3 Tourism

Skilled use of the Web, what does it take?
2/3 Shopping on line

So what does it take?

Reading,

Reading,

Reading.

Reading has never been as important as today
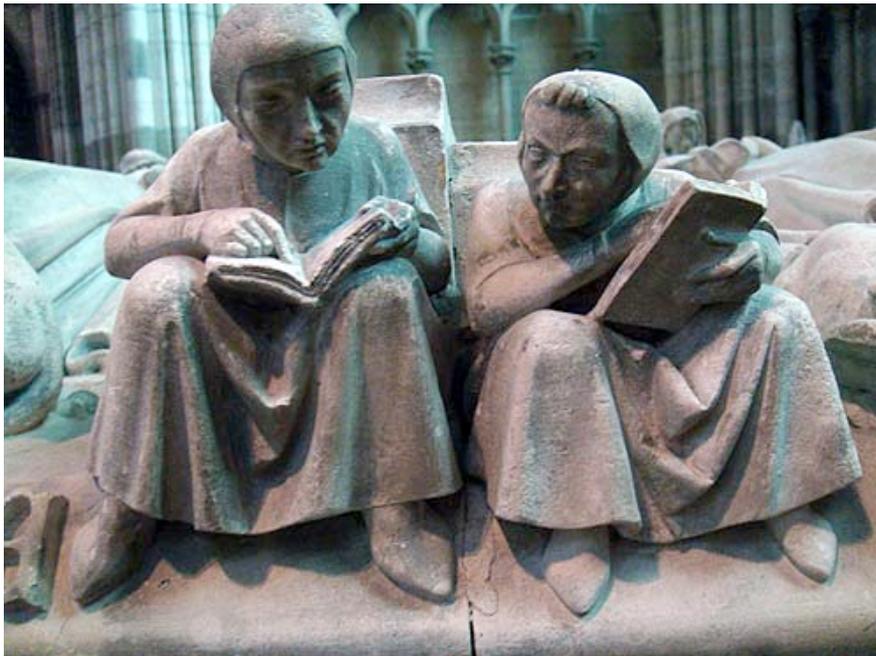
...But the nature of reading
and "readable artifacts" is changing dramatically.

Are students prepared to live in an "all-reading" society?

Reading theories and assessment frameworks

- Mainstream theories define skilled reading as the combination of efficient <u>word decoding</u> and <u>comprehension processes.</u>

- However recent research findings suggest that these theories fail to represent the range of components that make up skilled functional reading.

- Recent cognitive models and frameworks tend to incorporate higher-order strategic processes (see e.g., PISA 2009 and PIAAC reading frameworks).

Why "digital natives" still need to learn a bit:
A typical digital reading scenario

Lisa, a 10th grader, is working on a science project on the issue of « *human activities and climate change* ». She has searched the Web and found a few interesting links:
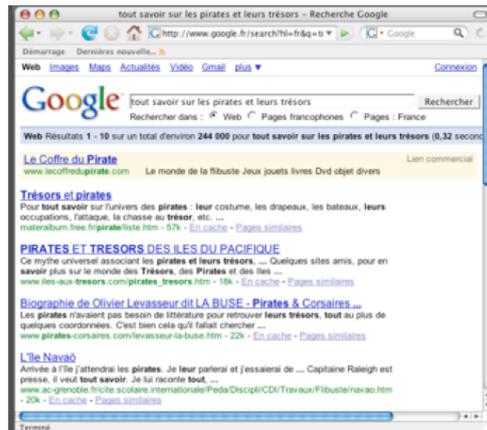
For the next hour or so, Lisa will study these and other related materials, navigating across pages, copying some of the contents, and eventually sketching a draft or her essay that she then submits to her teacher for feedback.

The MD-TRACE framework (Rouet & Britt, 2011)
1- People read for a purpose

External task statement

Interpretation →

Mental model of the task

READER RESOURCES
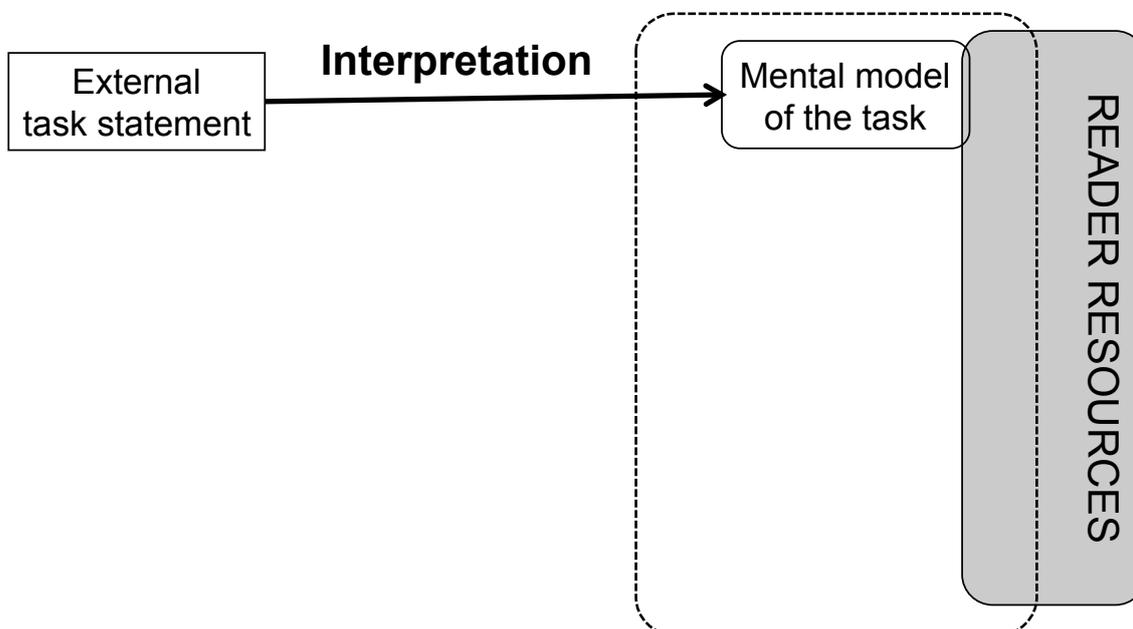
The MD-TRACE framework (Rouet & Britt, 2011)
2- Readers need to find their text

Task statement

Task model

Access

Access devices
(e.g., links)

Relevance criteria

Evaluation

Content
information

READER RESOURCES
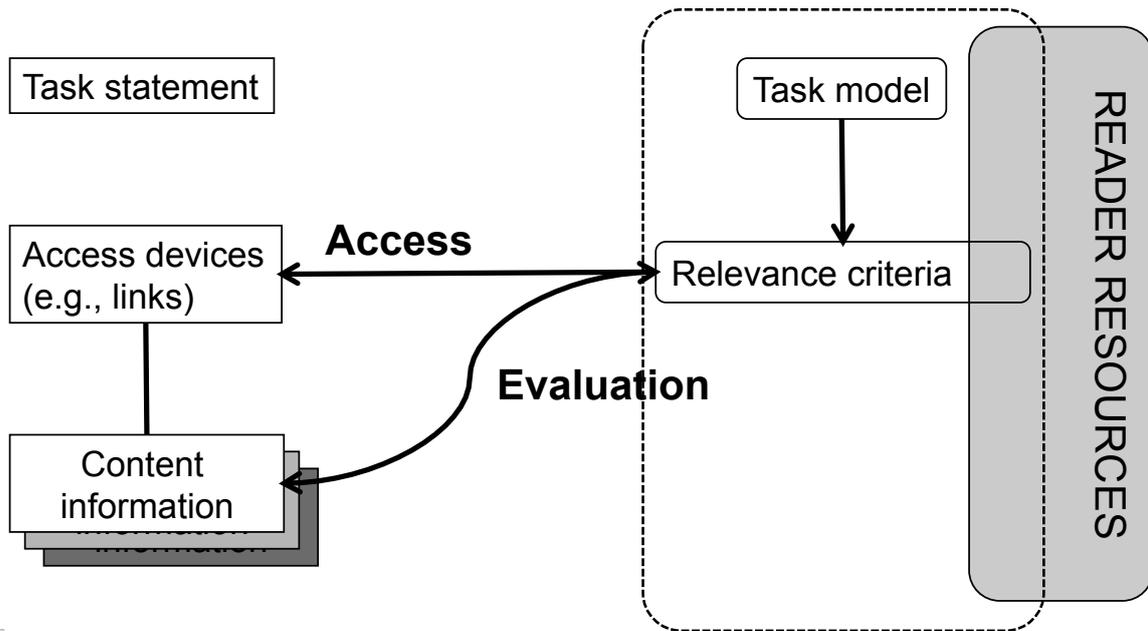
The MD-TRACE framework (Rouet & Britt, 2011)
3- Readers integrate across texts

Task statement

Task model

Access devices
(e.g., links)

Relevance criteria

Content
information

Content
model

Integration

READER RESOURCES
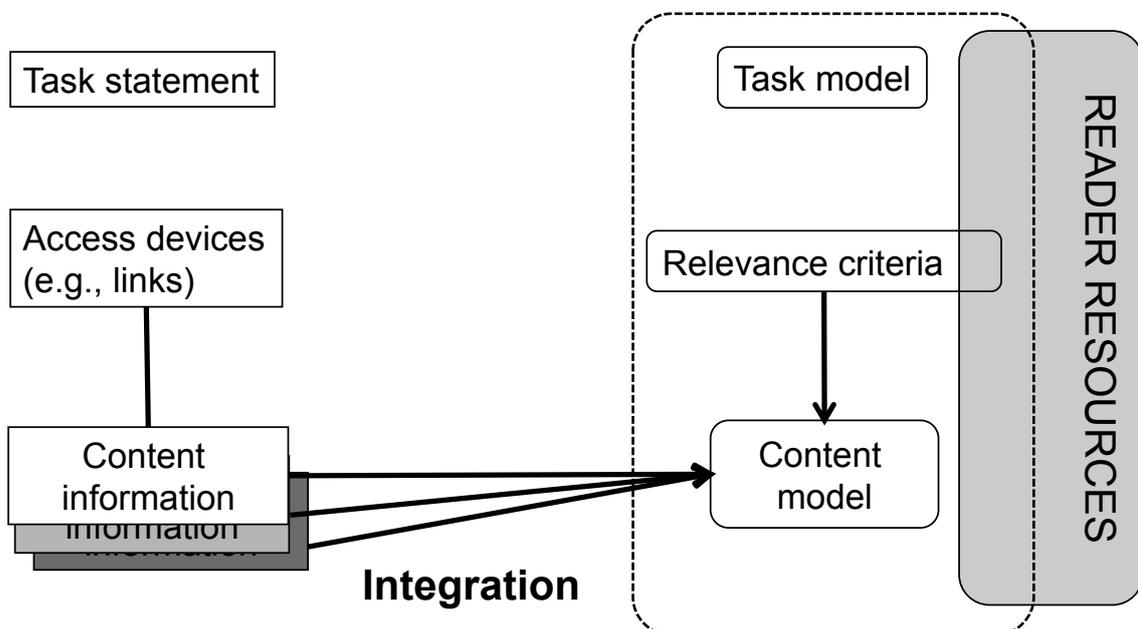
15 year-olds' "*digital reading*" proficiency
(OECD, 2010)

Below 2. Scrolling, locating, simple link navigation. — 100

Level 2. Menu selection, transfer simple information, acknowledge intended audience. — 83

Level 3. Navigate across multiple pages, compare information, evaluate relevance using explicit — 61

Level 4. Evaluate authority and relevance, navigate multiple Web sites under partly implicit directions. — 30

Level 5. Independent navigation across multiple sites, critical evaluation using own criteria. — 08

Axis: 00 20 40 60 80 100

Challenges in accessing and evaluating

- Task statement
- Interpretation → Task model
- Access devices (e.g., links)
- **Access**
- Relevance criteria
- **Evaluation**
- Content information
- **Integration** → Content model
- READER RESOURCES
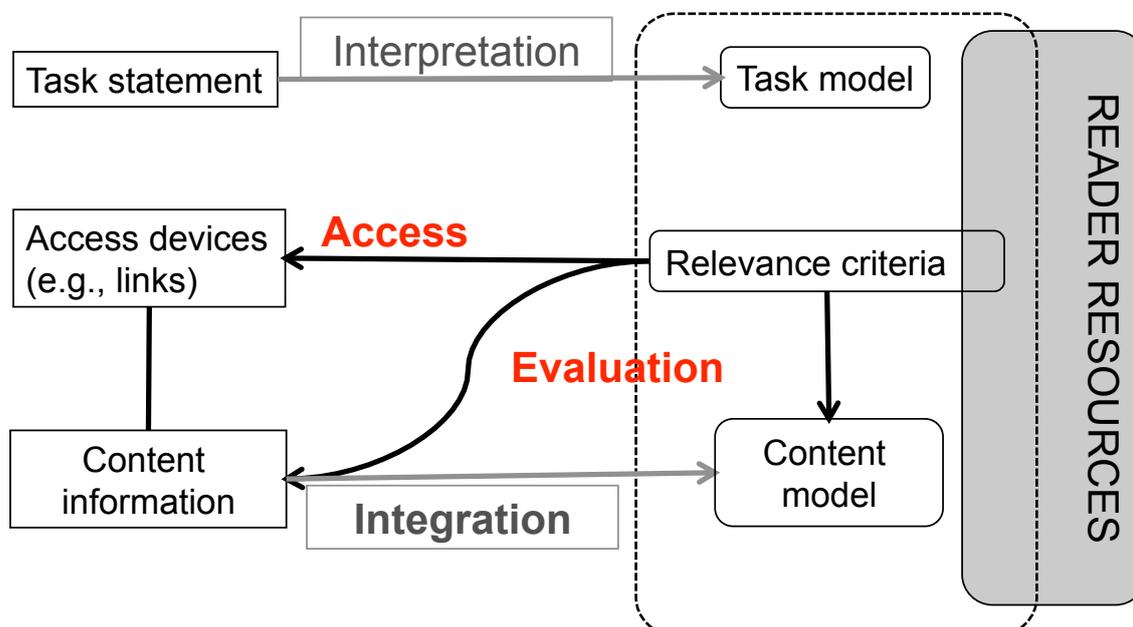
Challenges in accessing the right text
(Rouet et al., 2011, Learning and Instruction)

174 students from grades 5 to 12 performed a series of simple Web-like search tasks.
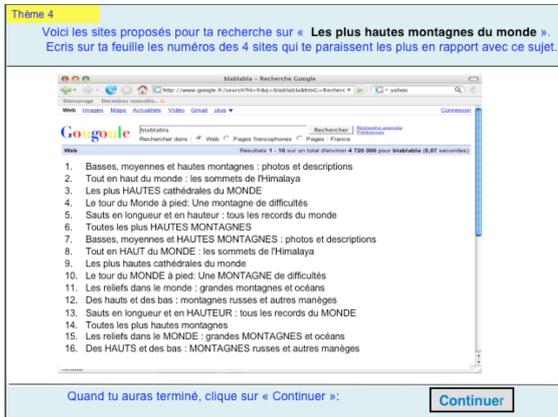
Search topic:
« Highest mountains in the World »

Relevant link:
« All about HIGH MOUNTAINS »

Irrelevant but cued link:
« The HIGHEST railway of the WORLD »

Selections as a function of grade, relevance and cueing
(Rouet, et al., 2011, Learning and Instruction)

Legend:
- R/M
- R/NM
- NR/M
- NR/NM
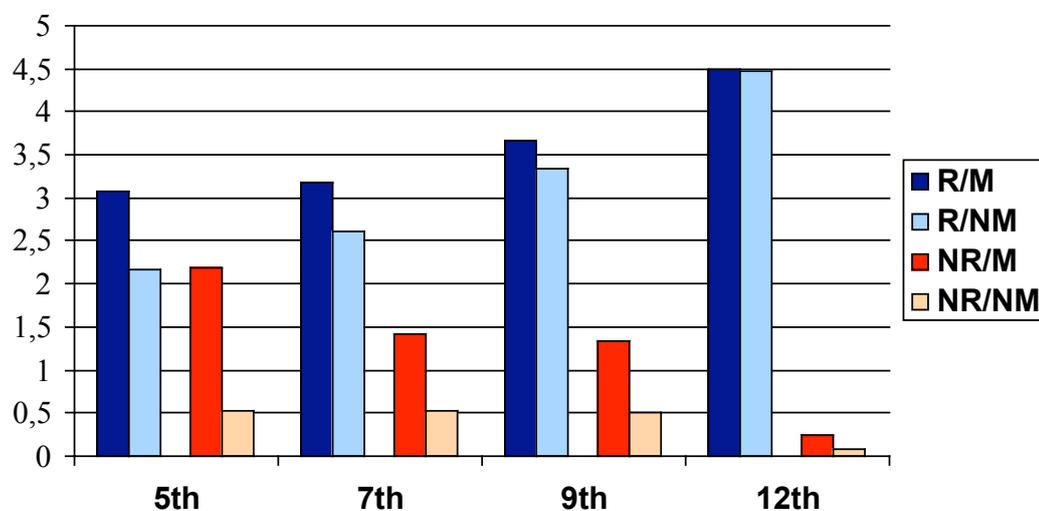
Relevant: "All about HIGH MOUNTAINS"
Irrelevant: "HIGHEST railway of the WORLD"

Challenges in evaluating information

Search the web
Search English and French pages

All news
Blogs

Any time
Past hour
Past 24 hours
Past week
Past month
Archives
Custom range...

Sorted by relevance
Sorted by date

Don't believe the Mayan 2012 end of days hype
Daily Aztec - 6 hours ago
The Mesoamerican, or **Mayan**, Long Count **calendar** distinguished a day ... to **Mayan** legend, is that upon the **end** of the 13 baktun, the **world** as ...

Experts: Mayans did not predict end of world in 2012
Daily Herald - Sep 30, 2012
21, experts on the **Mayan calendar** have been racing to convince people ... indeed have made prophecies, just not about the **end of the world**.

Just In Case: End of the World Survival Kit, designed by ...
Herald Sun - Sep 25, 2012
ACCORDING to the **Mayan calendar**, the **world** will end on December 21, **2012**. With tongue firmly in cheek, a Mexican advertising agency has ...
Mexican ad agency prepares **End of the World** Survival Kit: just in case Perth Now
End of the World Survival Kit for **2012** Visual News
all 5 news articles »

NEWS.com.au

Mayans prophesized, but not end of world
Kuwait Times - Sep 29, 2012
As the clock winds down to Dec 21, experts on the **Mayan calendar** have ... may indeed have made prophecies, just not about the **end of the world**. ... privy to impending astronomical disasters that would coincide with **2012**, ...

Kuwait Times

Inexpert source evaluation:
Naïve attributions and heuristics

- Campers' blog on UFOs more credible than astronomer since "they saw it" (French 6th grader, Rouet et al., in prep.)

- Web page written by a medical doctor has to be credible
  (US 11th grader, Brem et al. 2001)

- Passage from a "science" Web site seems harder to comprehend (US and French undergraduates, Eastin, 2001; Le Bigot et al., 2007)

- One can't challenge the views expressed by the US President
  (US undergraduate, Britt et al., 1999)

- American authors will always try to justify US actions
  (French graduate, Rouet et al., 1997)

- See also studies by Bråten, Strømsø, and Britt (2009); Braasch, et al. (2011); Macedo-Rouet et al. (under review); Stadtler and Bromme (2008).

How can schools prepare students for 21st Century reading?

Upgrading reading instruction

- Growing awareness of the need to expand reading curricula:
  - Teach reading beyond main idea comprehension
  - Teach reading beyond elementary grades
  - Teach reading across media and social situations
- But the "engineering" of reading instruction faces many obstacles:
  - Reading as a transdisciplinary skill
  - Need to accomodate for individual differences
  - Need to implement both explicit and procedural instruction

ICT-based advanced reading interventions

- Examples of promising R&D projects:

- IStart ("*Interactive Strategy Training for Active Reading and Thinking*"; McNamara et al., 2004; 2007)
- TuinLEC (Gil et al., 2012; Vidal-Abarca et al., subm.)
- Sourcer's Apprentice (Britt & Aglinskas, 2002)
- LIRALEC (Rouet & Goumi, 2010).

Architecture of the Liralec reading software
(Rouet & Goumi, 2004)

L'auteur crée des exercices à partir des sources de son choix et des scénarios proposés dans la base LIRALEC.

SITE LIRALEC sous la responsabilité de Jean-François Rouet Université de Poitiers

L'élève utilise les exercices soit en mode libre, soit selon les séquences conçues pour lui par l'enseignant.

L'enseignant choisit des exercices et les assemble dans des séquences. Il inscrit les élèves et les place dans des "groupes". Il attribue à chaque groupe la ou les séquences qui leur conviennent.

http://spip.univ-poitiers.fr/topinfo/liralec/

Student home page

http://spip.univ-poitiers.fr/topinfo/liralec/Eleve/accueil_eleve.php?seq=569 | Google

Bonjour Antonine

Mes activités :

➤ 1 Programme 1
  1.1. "(863) Tchernobyl" ✗
  1.2. "(877) Le fromage" ✗
  1.3. "(905) La foudre" ✗
  1.4. "(884) La neige" ✗
  1.5. "(888) Le charbon " ✓
  1.6. "(871) Les OGM" ✗
✓ 2 Programme 2

✗ Sequence ou exercice terminé
➤ Sequence non terminée
✓ Sequence ou exercice non commencé

[Exercices] [Quitter]

Mes résultats :

Exercices	Temps	Score	Max
1 - Les dinosa...	39 sec.	0*	8
2 - Le système...	60 sec.	6*	10
3 - Le vote	64 sec.	8*	7
4 - La ruée ve...	34 sec.	6*	5

Temps total : 197 sec.
Score total: **20**

(*) -> l'élève a obtenu le bonus (score double)

http://spip.univ-poitiers.fr/topinfo/liralec/

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Sample reading task

http://spip.univ-poitiers.fr/topinfo/liralec/Eleve/exo2_el.php?numeroEx=1&idEx=863&idSe=569 | Google

Ex 863

Lis attentivement le texte suivant puis réponds aux questions.
il y aura **six** questions.
Attention, tu ne pourras relire le texte que **trois** fois.

Aide

Tchernobyl

Le 26 avril 1986, la centrale nucléaire de Tchernobyl explosait en Ukraine. Des poussières radioactives ont alors traversé l'Europe sous forme de nuages. En France, le chef de l'autorité de la protection nucléaire affirmait que les Français ne risquaient rien. En 2006, cet homme est poursuivi par la justice.
Des poussières radioactives se sont en effet échappées de la centrale nucléaire de Tchernobyl et ont survolé le continent européen. L'Allemagne ou l'Italie ont alors pris des mesures de précaution pour protéger la population. Ces pays ont notamment interdit la consommation de fruits et légumes frais qui étaient peut-être contaminés par le nuage radioactif. Ces aliments auraient alors pu entraîner des maladies graves comme le cancer. La France, elle, n'avait pris aucune décision. Le directeur de l'autorité de la protection nucléaire, Pierre Pellerin, avait même été rassurant. Cet homme avait affirmé à la télévision qu'il n'y avait aucun risque pour la santé des Français.
Cependant, en 2001, 500 personnes, la plupart atteintes d'un cancer, ont porté plainte pour diffusion de fausses nouvelles sur les conséquences de la catastrophe de Tchernobyl. En 2006, la justice reproche à Pierre Pellerin d'avoir caché des informations importantes et d'avoir minimisé le danger. Depuis, Pierre Pellerin est la première personne poursuivie par la justice dans cette affaire.
La centrale nucléaire de Tchernobyl était en mauvais état. Elle était mal entretenue, mal surveillée

Question 1
Quel pays n'a pris aucune précaution ?

- L'Allemagne
- **La France**
- L'Italie
- L'Ukraine

[Précédent] [Suivant]

Tu as mis 35 secondes pour faire cet exercice.
Tu as répondu juste à 6 questions sur 6 questions posées.
Ceci est ta première correction donc ton score reste : 12

score double

[Voir les réponses]
[Exercice suivant]
[Quitter]

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Increase in reading comprehension score as a function of reader profile and treatment
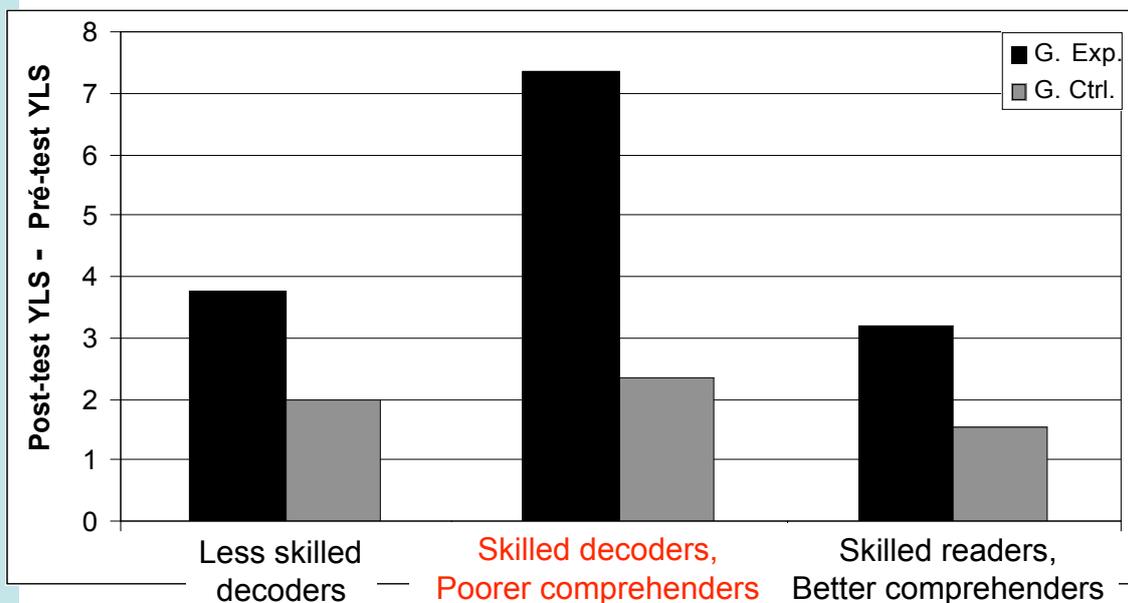
Some conditions for successful interventions

- "Guided practice" instructional approach

- Make quality time for extended training periods

- Fight "poor reader" stereotypes

- Adjust task difficulty, provide feedback

- Emphasize relevance to content area learning

Conclusions and implications

- A digital world means that people read more and for more important purposes.
- Reading online is no less demanding that reading paper-based text
- Increased emphasis on high-level cognitive strategies
- Need to prepare students for 21st Century reading
- Expand reading curricula to include a broader range of reading skills and strategies.
- ICT may be fruitfully used to incorporate advanced training of reading skills in primary and secondary education.

Thank you for your attention!

- "Wow! That stuff is hypermodern! Rich, as light as a laptop, no downloading delay and it works without any power chord... And how did you call that?"
- "A book!"