

Mobile Learning

Creation, delivery & evaluation of eBooks

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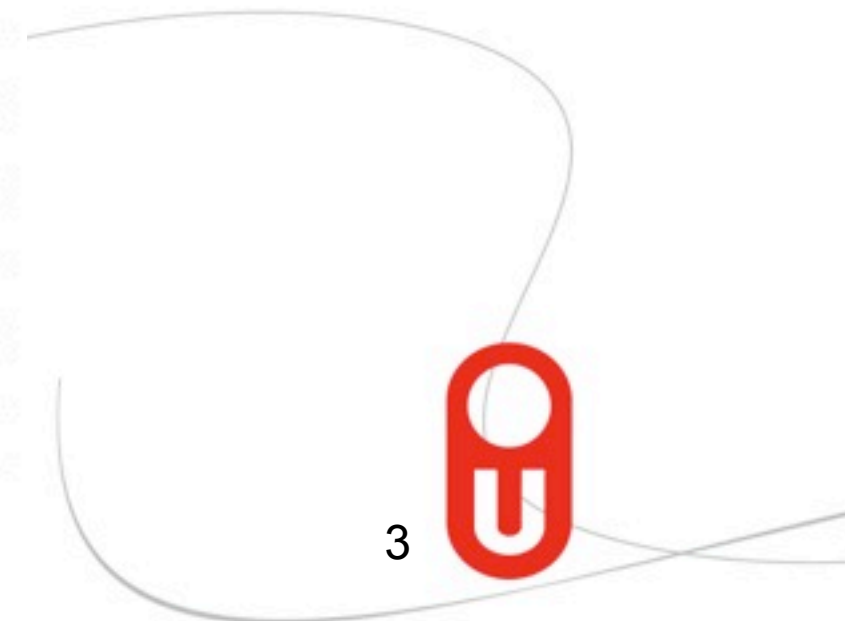
Structure

- Mobile lifelong learning
- State of the art: Market & academic studies
- iPad pilot study
- Technological trends: PLE & ePub 3
- The end of the book as we know it
- New authoring environments



Eurostat, Adult Education Survey, 2009

| | Total | | Male | | Female | |
|---------------------------|-------|------|------|------|--------|------|
| | 2004 | 2009 | 2004 | 2009 | 2004 | 2009 |
| EU-27 | 9.3 | 9.3 | 8.7 | 8.5 | 10.0 | 10.2 |
| Euro area (EA-16) | 7.3 | 8.1 | 7.2 | 7.7 | 7.5 | 8.5 |
| Belgium | 8.6 | 6.8 | 8.7 | 6.4 | 8.5 | 7.2 |
| Bulgaria | 1.3 | 1.4 | 1.2 | 1.3 | 1.3 | 1.5 |
| Czech Republic | 5.8 | 6.8 | 5.5 | 6.5 | 6.0 | 7.0 |
| Denmark | 25.6 | 31.6 | 22.1 | 25.6 | 29.1 | 37.6 |
| Germany | 7.4 | 7.8 | 7.8 | 7.8 | 7.0 | 7.7 |
| Estonia | 6.4 | 10.5 | 5.1 | 7.6 | 7.5 | 13.2 |
| Ireland | 6.1 | 6.3 | 5.1 | 5.7 | 7.1 | 7.0 |
| Greece | 1.8 | 3.3 | 1.8 | 3.2 | 1.8 | 3.3 |
| Spain (2) | 4.7 | 10.4 | 4.2 | 9.6 | 5.1 | 11.3 |
| France | 7.1 | 6.0 | 7.0 | 5.6 | 7.1 | 6.4 |
| Italy | 6.3 | 6.0 | 5.9 | 5.6 | 6.7 | 6.4 |
| Cyprus (2) | 9.3 | 7.8 | 9.0 | 7.8 | 9.6 | 7.8 |
| Latvia | 8.4 | 5.3 | 5.7 | 3.6 | 10.8 | 6.9 |
| Lithuania | 5.9 | 4.5 | 4.2 | 3.6 | 7.4 | 5.4 |
| Luxembourg (2) | 9.8 | 13.4 | 9.5 | 13.4 | 10.1 | 13.5 |
| Hungary | 4.0 | 2.7 | 3.4 | 2.5 | 4.6 | 3.0 |
| Malta | 4.3 | 5.8 | 4.8 | 5.6 | 3.8 | 6.0 |
| Netherlands | 16.4 | 17.0 | 16.1 | 16.5 | 16.8 | 17.5 |
| Austria | 11.6 | 13.8 | 10.9 | 12.8 | 12.2 | 14.7 |
| Poland | 5.0 | 4.7 | 4.3 | 4.3 | 5.7 | 5.1 |
| Portugal | 4.3 | 6.5 | 4.1 | 6.2 | 4.4 | 6.8 |
| Romania | 1.4 | 1.5 | 1.3 | 1.3 | 1.4 | 1.6 |
| Slovenia | 16.2 | 14.6 | 14.8 | 12.9 | 17.6 | 16.4 |
| Slovakia | 4.3 | 2.8 | 3.8 | 2.2 | 4.8 | 3.3 |
| Finland | 22.8 | 22.1 | 19.2 | 18.5 | 26.4 | 25.9 |
| Sweden (2) | : | 22.2 | : | 16.1 | : | 28.5 |
| United Kingdom (2) | 29.0 | 20.1 | 24.9 | 16.8 | 33.1 | 23.3 |
| Iceland | 24.2 | 25.1 | 19.6 | 20.4 | 28.9 | 30.0 |
| Norway | 17.4 | 18.1 | 16.3 | 16.8 | 18.6 | 19.5 |
| Switzerland | 28.6 | 24.0 | 29.7 | 22.8 | 27.4 | 25.2 |
| Croatia (3) | 1.9 | 2.3 | 1.8 | 2.4 | 2.0 | 2.1 |
| FYR of Macedonia | : | 3.3 | : | 3.2 | : | 3.4 |
| Turkey | 1.1 | 2.3 | 1.5 | 2.4 | 0.8 | 2.1 |



(1) Refer to the Internet metadata file (http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/lfsi_edu_a_esms.htm).

(2) Break in series, 2007.

(3) 2009 male and female rates, unreliable or uncertain data.

| | Health coverage | None within reachabl e distance | Did not No time due to family | Did not have the pre- requis- ites | Too expen- sive, could not afford | Did not like idea of going back to school | Lack of em- ployer support | Conflict with work schedule | Other/ no resp. |
|-----------------------|--------------------|---|---|--|---|---|-------------------------------------|--------------------------------------|--------------------|
| EU | 14.8 | 20.8 | 40.2 | 15.6 | 31.2 | 14.9 | 18.4 | 38.7 | 26.8 |
| Belgium | 21.8 | 13.1 | 38.4 | 9.5 | 17.9 | 4.8 | 14.7 | 33.1 | 10.6 |
| Bulgaria | 11.5 | 29.7 | 28.8 | 16.3 | 56.7 | 6.2 | 11.6 | 24.1 | 7.7 |
| Czech Republic | 11.9 | 16.1 | 38.5 | 7.8 | 19.7 | 2.1 | 22.5 | 36.8 | 3.6 |
| Denmark | . | . | . | . | . | . | . | . | . |
| Germany | 12.1 | 24.9 | 33.9 | 24.1 | 43.7 | 11.1 | 32.8 | 36.9 | 13.3 |
| Estonia | 18.2 | 34.5 | 38.8 | 2.9 | 53.1 | 8.5 | 8.8 | 32.6 | 42.6 |
| Ireland | . | . | . | . | . | . | . | . | . |
| Greece | 10.5 | 19.1 | 48.3 | 7.5 | 33.4 | 9.7 | 9.7 | 43.0 | 19.0 |
| Spain | 5.8 | 8.5 | 41.2 | 7.5 | 13.4 | 2.7 | 4.7 | 32.5 | 27.7 |
| France | . | . | . | . | . | . | . | . | . |
| Italy | 19.7 | 16.8 | 49.5 | 19.2 | 26.2 | 16.6 | 15.2 | 44.1 | 12.4 |
| Cyprus | 9.3 | 12.0 | 67.9 | 5.2 | 16.2 | 4.8 | 5.2 | 42.1 | 12.3 |
| Latvia | 11.9 | 24.1 | 40.1 | 11.2 | 50.8 | 11.9 | 29.7 | 36.8 | 11.4 |
| Lithuania | 13.2 | 19.6 | 34.3 | 3.2 | 45.6 | 4.9 | 16.2 | 48.4 | 13.5 |
| Luxembourg | . | . | . | . | . | . | . | . | . |
| Hungary | 12.5 | 32.4 | 37.5 | 13.9 | 42.3 | 18.9 | 39.9 | 53.2 | 15.0 |
| Malta | . | . | . | . | . | . | . | . | . |
| Netherlands | 23.8 | 13.0 | 29.9 | 4.2 | 25.1 | 13.5 | 20.1 | 17.6 | 22.8 |
| Austria | 6.3 | 22.4 | 42.3 | 7.1 | 34.6 | 2.8 | 16.1 | 39.5 | 15.8 |
| Poland | 9.1 | 31.0 | 29.2 | 9.2 | 61.3 | 17.5 | 20.4 | 31.4 | 11.5 |
| Portugal | 6.8 | 34.2 | 34.5 | 11.8 | 22.7 | 4.1 | 20.0 | 26.5 | 18.9 |
| Romania | . | . | . | . | . | . | . | . | . |
| Slovenia | 15.5 | 30.2 | 37.7 | 7.6 | 48.5 | 7.3 | 22.3 | 55.5 | 8.8 |
| Slovakia | 10.8 | 30.9 | 35.5 | 56.5 | 39.3 | 3.0 | 25.2 | 40.7 | 3.7 |
| Finland | 17.1 | 25.6 | 31.0 | 11.6 | 22.2 | 7.2 | 24.0 | 43.7 | 21.4 |
| Sweden | 23.7 | 22.0 | 23.0 | 5.8 | 32.5 | 6.9 | 19.1 | 32.4 | 20.5 |
| United Kingdom | 17.0 | 25.9 | 42.5 | 20.8 | 33.8 | 24.1 | 22.6 | 43.9 | 56.5 |
| Norway | 19.5 | 13.6 | 25.8 | 4.3 | 17.6 | 9.2 | 21.1 | 32.2 | 15.7 |
| Croatia | 11.0 | 26.7 | 48.7 | 14.9 | 53.8 | 4.2 | 17.1 | 28.8 | 8.6 |

Eurostat, Adult Education Survey, 2009



Seamless Learning Support

- (MSL1) Encompassing formal and informal learning;
- (MSL2) Encompassing personalized and social learning;
- (MSL3) Across time;
- (MSL4) Across locations;
- (MSL5) Ubiquitous knowledge access
- (MSL6) Encompassing physical and digital worlds;
- (MSL7) Combined use of multiple device types (including “stable” technologies such as desktop computers, interactive whiteboards);



Seamless Learning Support

- (MSL8) Seamless switching between multiple learning tasks (such as data collection + analysis + communication).
- (MSL9) Knowledge synthesis (a combination of prior + new knowledge, abstract + concrete knowledge, and multi-disciplinary learning);
- (MSL10) Encompassing multiple pedagogical or learning activity models

Looi et al., 2010



Hype and reality



Electronic Books as one of the future trends within the next 2 to 3 years





Fig. 2 Comparison of the suitability of different reading devices for eBooks

PWC (2010): Turning the page. The future of eBooks.



Market study

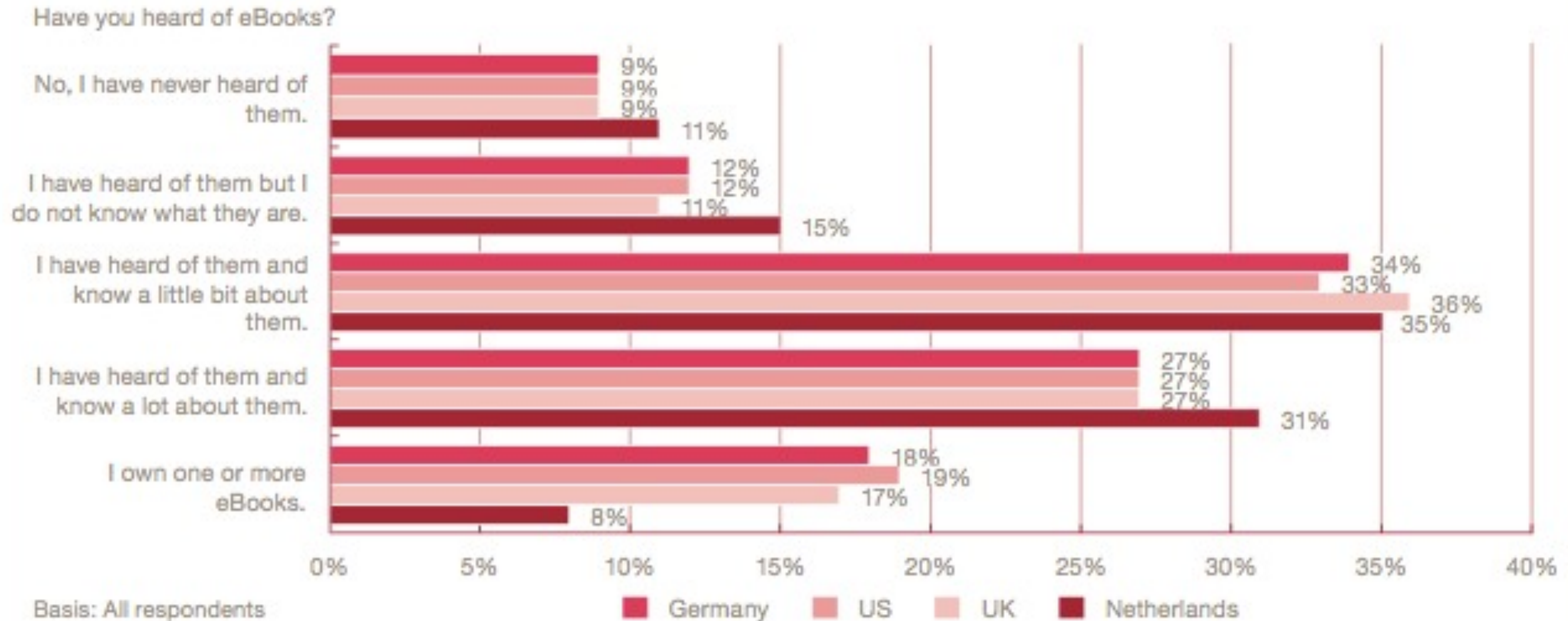
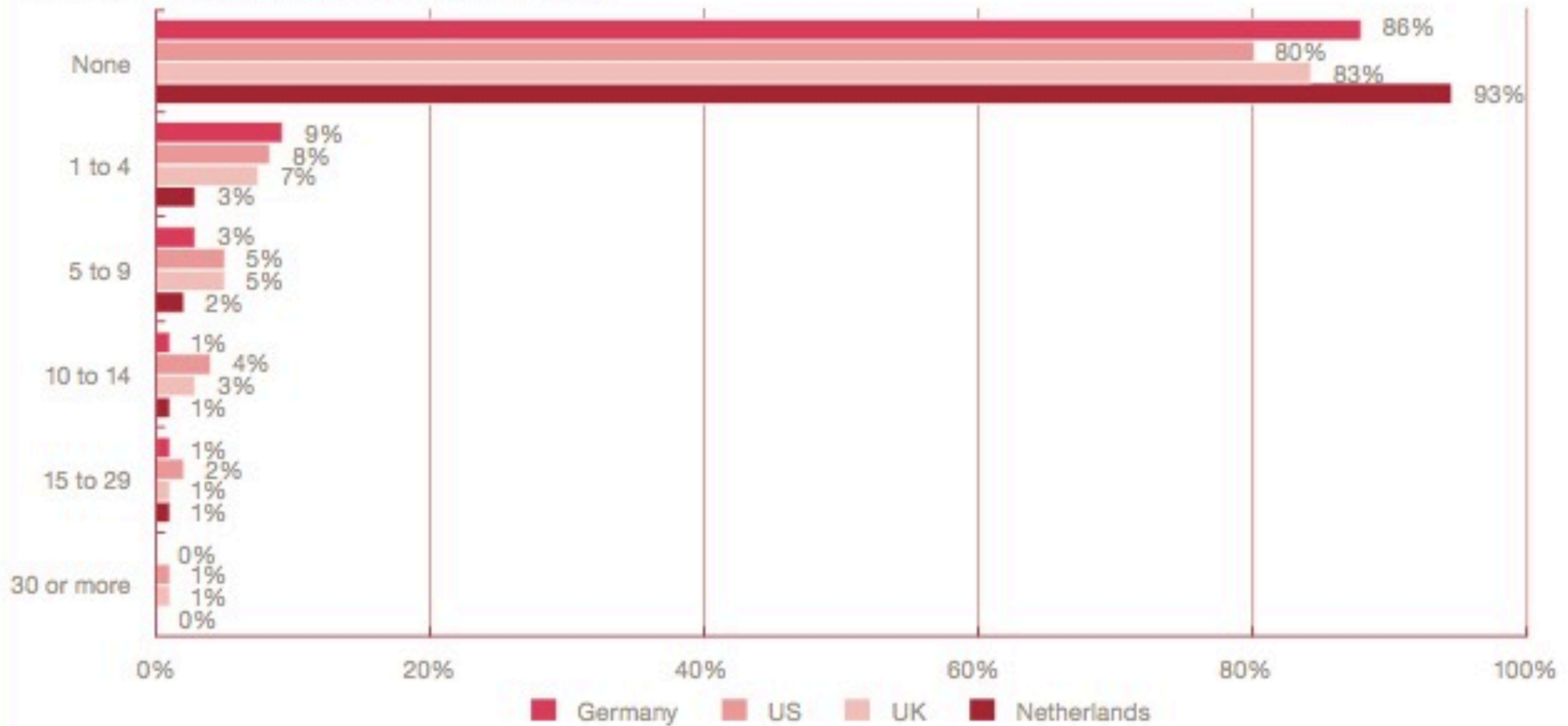


Fig. 6 Popularity of eBooks

Market study

How many eBooks did you buy in the last 12 months?



Basis: All respondents

Fig. 8 Number of bought eBooks in the last twelve months

PWC (2010): Turning the page. The future of ebooks.



LOCAL U.S. WORLD **BUSINESS** SPORTS ENTERTAINMENT HEALTH LIVING TR

MONEY & CO. TECHNOLOGY PERSONAL FINANCE SMALL BUSINESS COMPANY TOWN

IN THE NEWS: CLIPPERS-GRIZZLIES | VIKINGS STADIUM | COLE HAMELS | JOHN TRAVOLTA | MA



Technology

THE BUSINESS AND CULTURE OF OUR DIGITAL LIVES,
FROM THE L.A. TIMES

Amazon: consumers buying more Kindle eBooks than print books

Related studies

- Pre-tablet era/Tablet-era
- Three different studies:
 - Media-comparison studies
 - Reading/Literacy studies
 - Changing learning practices



Media-comparison

- Woody, Daniel & Baker (2010): Preference for traditional books, no effects on learning results
- Rockinson-Szapkiw, Holder, & Dunn (2011): Higher motivation to study instructional material for eBook-group



Table 2
Means, standard deviations, and univariate statistics for participants' self-reported use of special features and satisfaction with e-books and print books.

| Measure | E-book | Print books | Tukey significance |
|--|-------------|-------------|--------------------|
| How often they used the activities or online resources | 4.76 (2.14) | 4.44 (2.42) | $p > .05$ |
| How often read section summaries | 5.61 (2.33) | 6.13 (2.07) | $p > .05$ |
| How often answer study questions | 4.76 (2.37) | 5.26 (2.07) | $p > .05$ |
| How often read captions and charts | 4.93 (2.07) | 5.94 (1.92) | $p < .05$ |
| Satisfaction | 5.33 (2.07) | 6.83 (1.53) | $p < .01$ |

Note. Participants used a 9-point scale (1 = never, 9 = always) to respond to questions.

Reading/Literacy studies

- Korat (2010) shows significant effects of eBooks for word reading and story comprehension (kindergarten level)
- Jones & Brown (2011) show no significant effects of eBooks for comprehension tests with 3rd graders



Changing learning practices

Nie et al. (2011) study: 28 students of masters's programme occupational psychology & education

Table 7. Summary of key advantages of e-book readers in curriculum delivery.

| Finding | Key points |
|--|---|
| Enhanced flexibility in curriculum delivery to meet mobility demands | Students used their e-book readers in different places (at home, in the office, in public places and on the move) to access all essential course readings. |
| Better use of time | Students found it easy to take the e-book reader anywhere and read whenever an opportunity arises. They filled in the gaps during the day for study purposes. |
| New study strategies | Some students changed their strategies for reading, keeping notes and approaching assignments. Some students opted for the e-book reader for reading while on the move, the iPhone™ for a quick check, and printed material for note-taking and highlighting. |
| Cost savings for students | As a direct result of the availability of the e-book reader, some students were less dependent on printed material and more selective when printing materials out. |

iPad pilot study

- Small-scale, longitudinal study (n=12)
- September 2011 - August 2012
- iPad 2 WiFi
- 4 courses (7 modules)
- Mixture of textbooks & study books
- Mixture of ePub & PDFs
- Cooperation with publishers (Kluwer, Boom, SDU)



iPad pilot study

| Sample Characteristics | Results |
|-------------------------------|--|
| Gender | Male 50% Female 50% |
| Study context | 75% Part time 25% Full time |
| Age | Mean 32.25 |
| Experience | 85% Have experiences with using an app store 100% use a portable computer at least weekly 50% have experiences with tablet computers |
| Voluntariness | 85% intrinsically motivated 15% extrinsically motivated |





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Ope

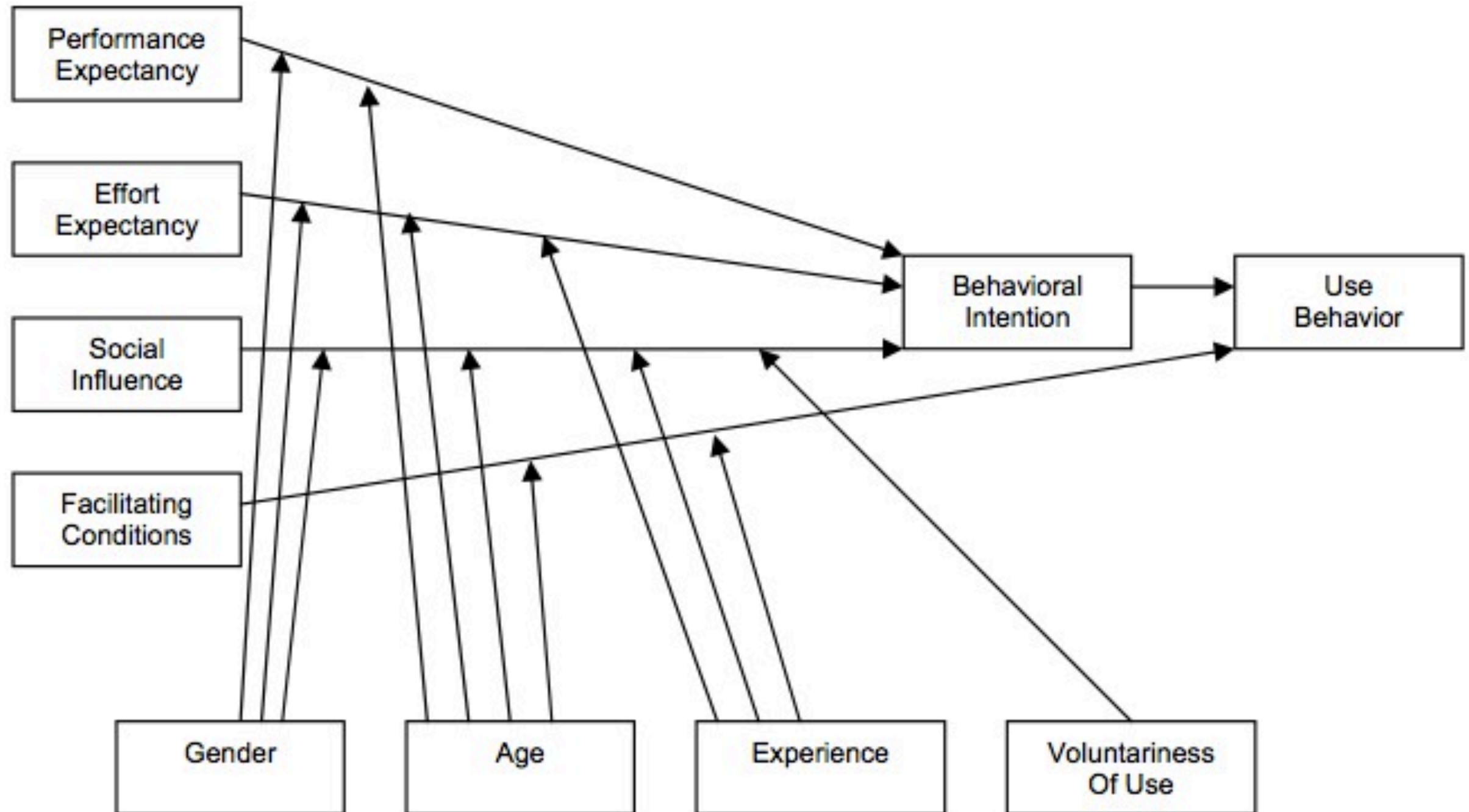


iPad pilot study

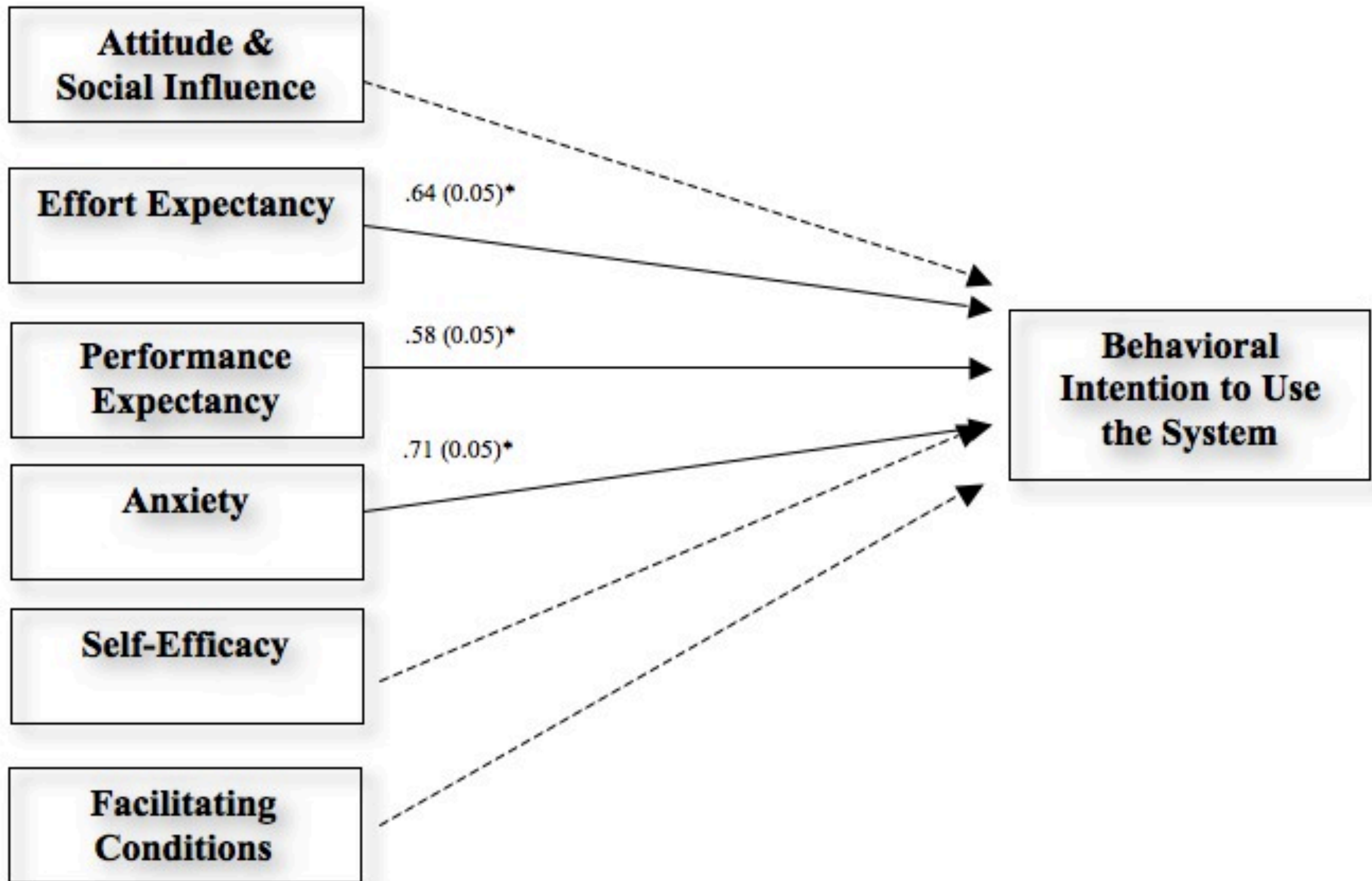
- 3 (4) research questions
 - Which factors influence acceptance?
 - Changing learning practices?
 - Handling & functionality of eBooks
 - Effect on assessment scores?



UTAUT Model



Acceptance model iPad pilot



Changing learning practices

- Additional learning contexts due to weightless learning material
- Use of small time-slots
- Pervasive access to learning material
- Combination of learning resources
- Effects on study strategies (annotations, marking, exchanging)
- Effects on in-class-lectures



Handling & functionality

- Annotations are critical for students
- Pop-up questions are added value
- Clear preference for ePubs
- Problems during lectures with printed versions
- Switching between material problematic
- Integrated video-lectures as add-on, but no social media integration



Effects on test-scores

- No visible effects on test-scores (not really statistically grounded due to the low number of participants)



ePub3 standard

| Area | EPUB 3 Specification | EPUB 2.0.1 Specification |
|--|--|--|
| Overview | EPUB 3 Overview | (throughout) |
| Publication-level Specification & Package Docs | EPUB Publications 3.0 | Open Packaging Format 2.0.1 |
| Content-level Specification | EPUB Content Documents 3.0 | Open Publication Structure 2.0.1 |
| EPUB Navigation Documents | EPUB Content Documents 3.0 | N/A (NCX referenced as DAISY specification) |
| Media Overlays | EPUB Media Overlays 3.0 | N/A |
| Container packaging | EPUB Open Container Format 3.0 | Open Container Format 2.0.1 |
| Changes from previous version | EPUB 3 Changes from EPUB 2.0.1 | (throughout) |



ePub3

ePub3

- HTML5
- Media Overlays
- Scripting
- MathML
- Accessibility

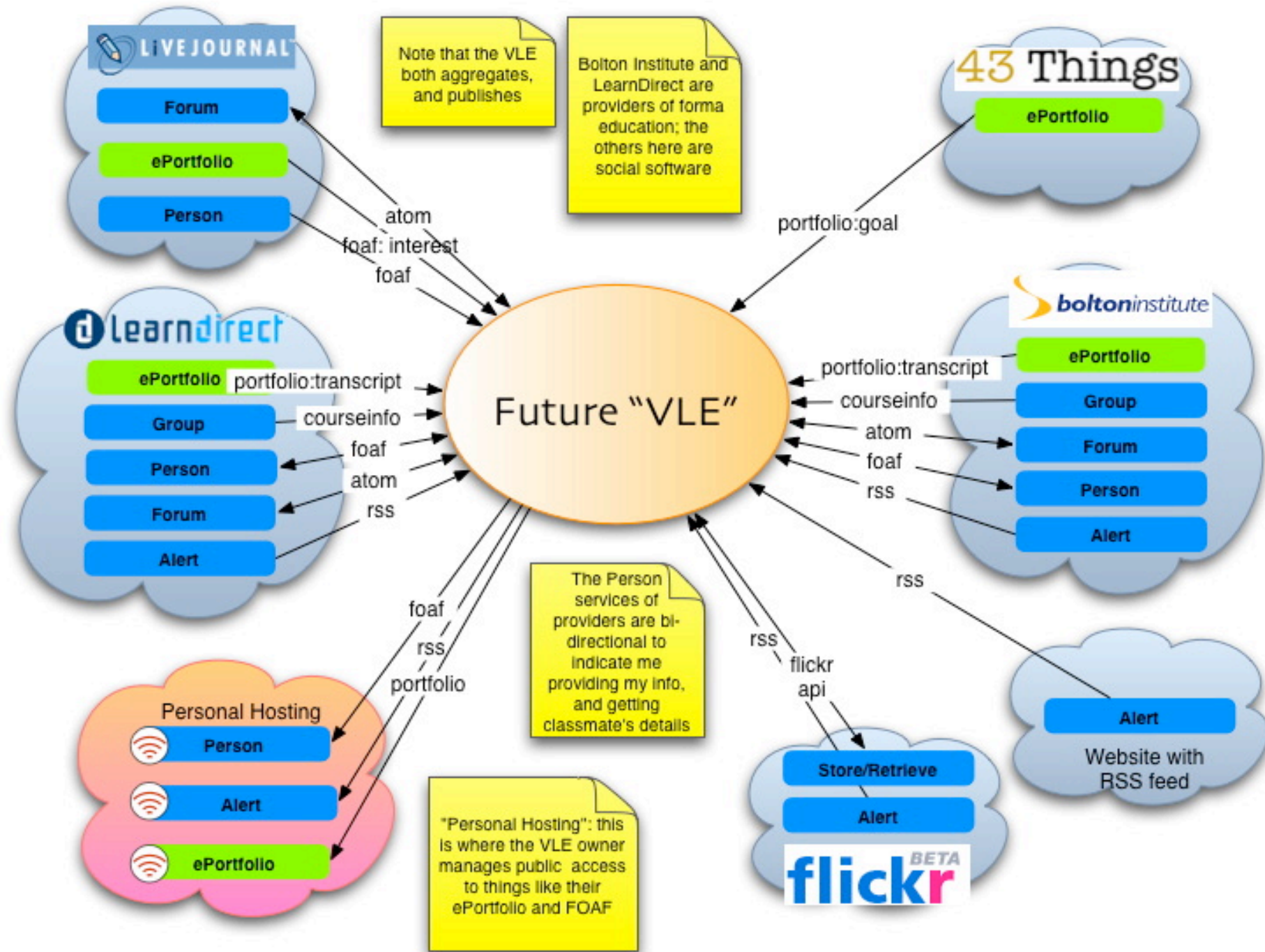
EPUB3: Rich Media Enhancements

- Video & audio support
 - Declarative event triggers (custom controls w/out JavaScript)
- Audio can be synchronized with text
 - SMIL & CSS Speech subsets
- Embedded font support a conformance requirement
 - OpenType / WOFF
- Improved SVG integration

© 2010 Bill McCoy



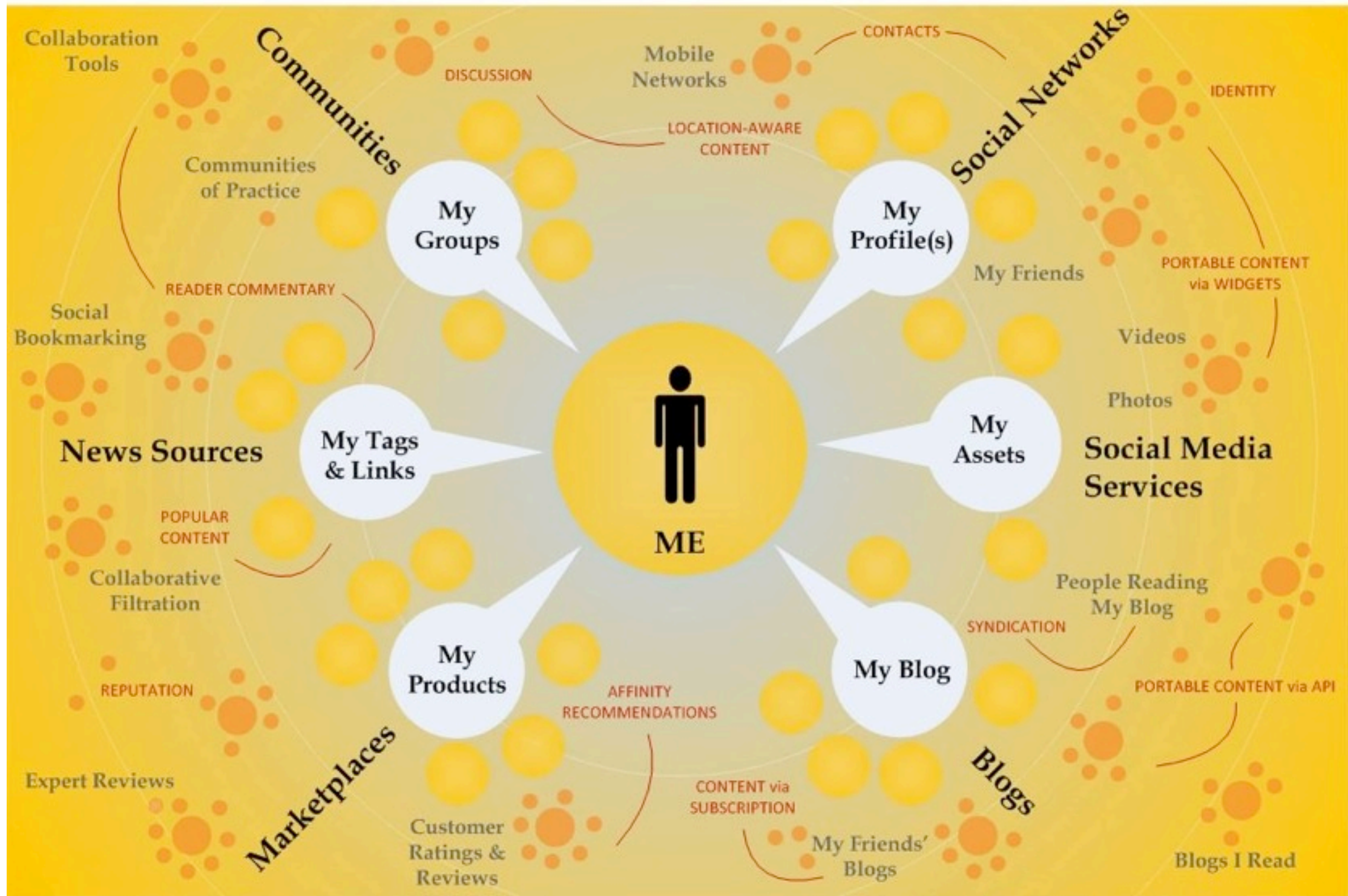
Two trends: PLE & ePub3



Wilson 2005



Two trends: PLE & ePub3



Two trends: PLE & ePub3

“Personal Learning Environments are learning environments where learners can integrate distributed information, resources and contacts and reflect about learning progress and learning products based on standards and interfaces”.

Schaffert/Kalz 2010



The end of the book as we know it...

Matrix — a Taxonomy of Social Reading

| | | | | |
|--|---------|-----------------------------------|----------|------------|
| CATEGORY 1 informal face-to-face discussion | Offline | Synchronous | Informal | Ephemeral |
| CATEGORY 2 informal online discussion | Online | Asynchronous | Informal | Persistent |
| CATEGORY 3 formal face-to-face discussion | Offline | Synchronous | Formal | Ephemeral |
| CATEGORY 4 formal discussion IN the margins | Online | Synchronous or Asynchronous | Formal | Persistent |



Stein, 2011

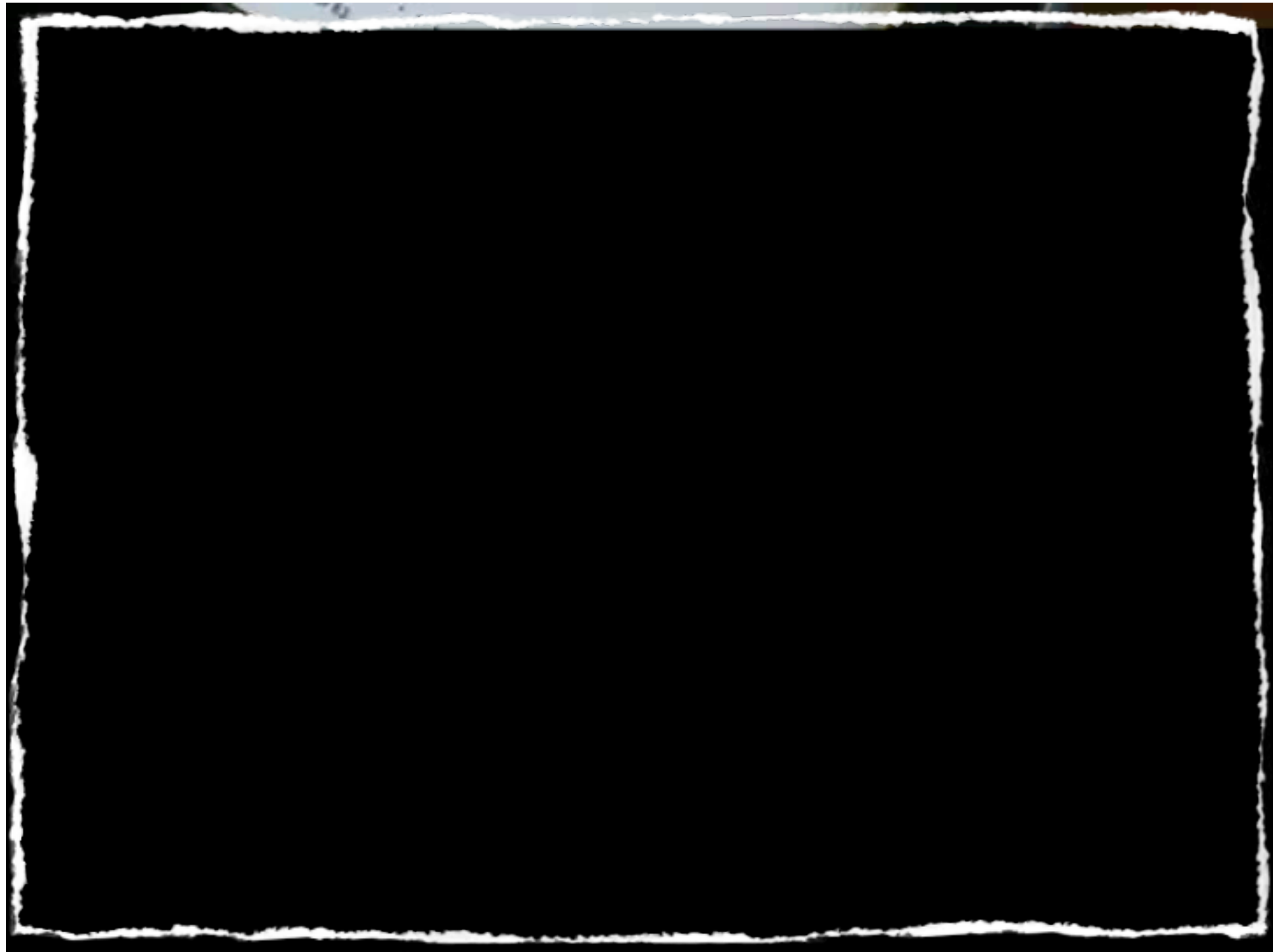


Beyond content delivery

- Portability,
- Social Interactivity,
- Context Sensitivity,
- Connectivity,
- Individuality



The end of the book as we know it...



The end of the book as we know it..

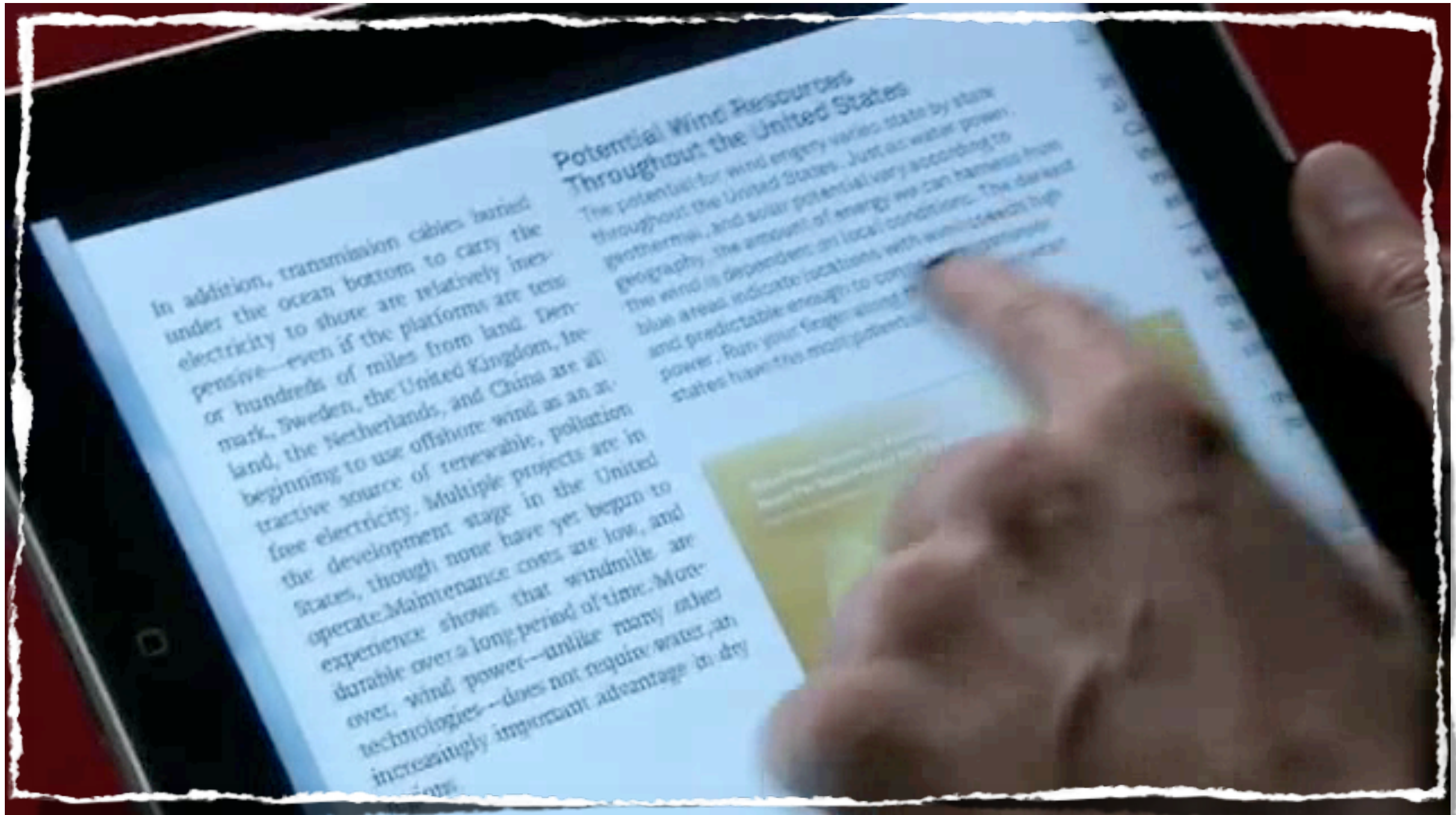


The end of the book as we know it...

Javascript gameplay



The end of the book as we know it..



New authoring environments

iBooks Author



New authoring environments



Baker is a **HTML5** ebook framework to publish interactive books & magazines on **iPad** & **iPhone** using simply open web standards.

Laker beta

OVERVIEW

Laker is a compendium of files, frameworks, styles and tips for designing digital publications in HTML5.



A book?

What widgets does iBooks Author come with?

The iBooks Author application comes with some pre-installed widgets, as well as the option to add custom widgets. The widgets which are available in iBooks Author are:

1. Gallery - a widget with a set of images which can be flicked through
2. Media - a widget which presents either video or audio in .m4v or .m4a format
3. Review - a widget which asks test questions and can provide instant results
4. Keynote - a widget that presents a Keynote presentation either in a box or Fullscreen
5. Interactive Image - a widget presenting image with labelled sections to zoom into
6. 3D - a widget which presents a 3D model which can be rotated and examined
7. HTML - a custom widget

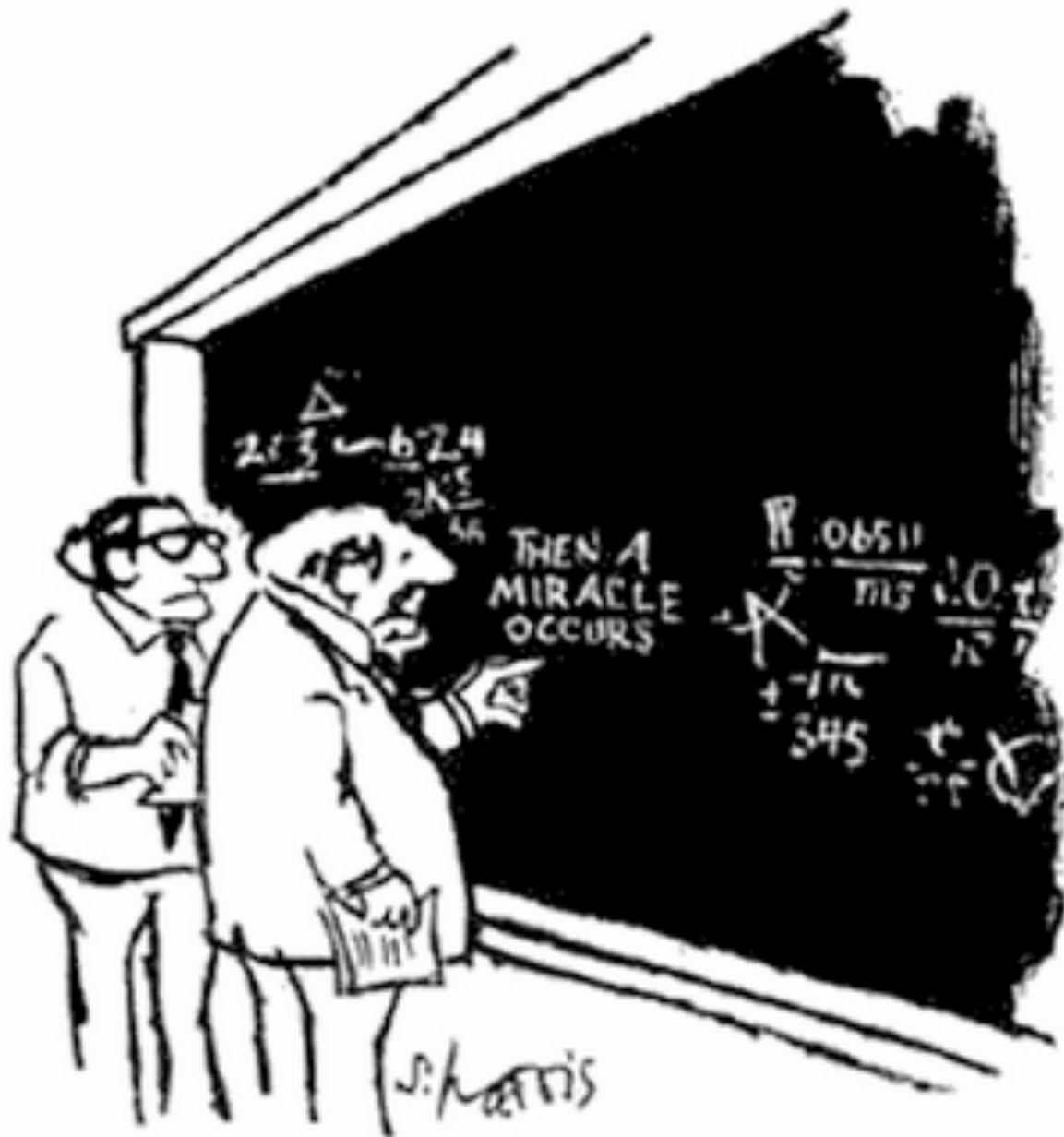


Topic community

Learning Sciences and Technologies
Mobile Learning

<http://portal.ou.nl/en/web/topic-mobile-learning>





"I THINK YOU SHOULD BE MORE EXPLICIT
HERE IN STEP TWO."

© 1985 WETA-TV (KANSAS)

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Thank you for your
attention

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OpenUniversiteitNederland





Mindergie

- Scripted “Serious” Game for OUNL employees
- Goal: Increase of environmental consciousness
- Goal: Decrease of energy consumption on the long run



Basic model

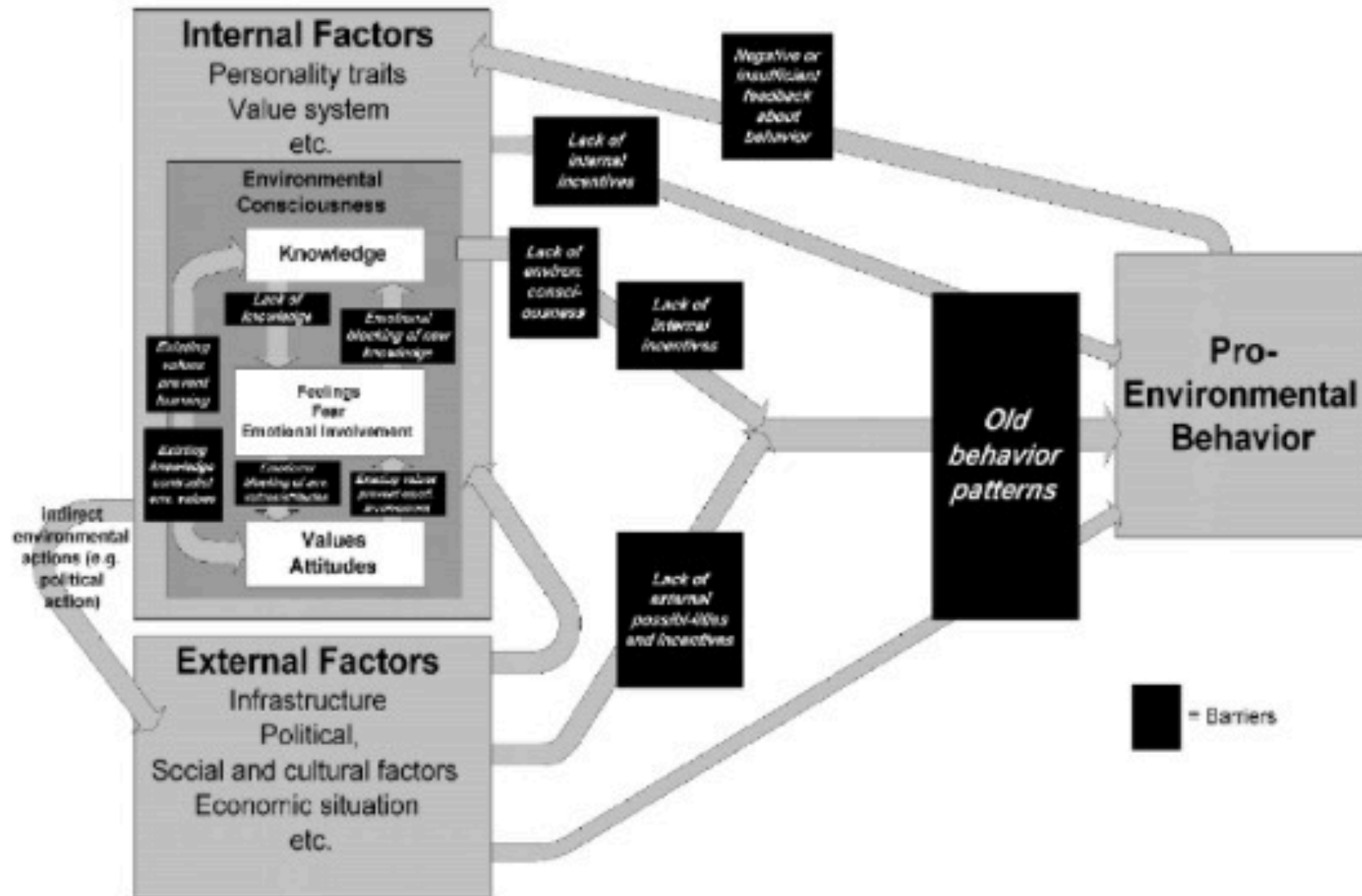


Figure 1. Model of pro-environmental behavior (Kollmuss and Agyeman, 2002)

Goals/Components

| Environmental Consciousness | Lack of incentives | Lack of feedback |
|--|--|--|
| <ul style="list-style-type: none">● Knowledge components● Energy statistics | <ul style="list-style-type: none">● Digital Badges● Rewards | <ul style="list-style-type: none">● Testing● Challenges● Public displays at the campus |

Table 1: Problems addressed and solutions





Figure 2. Gamification approaches (Werbach & Hunter, 2012)

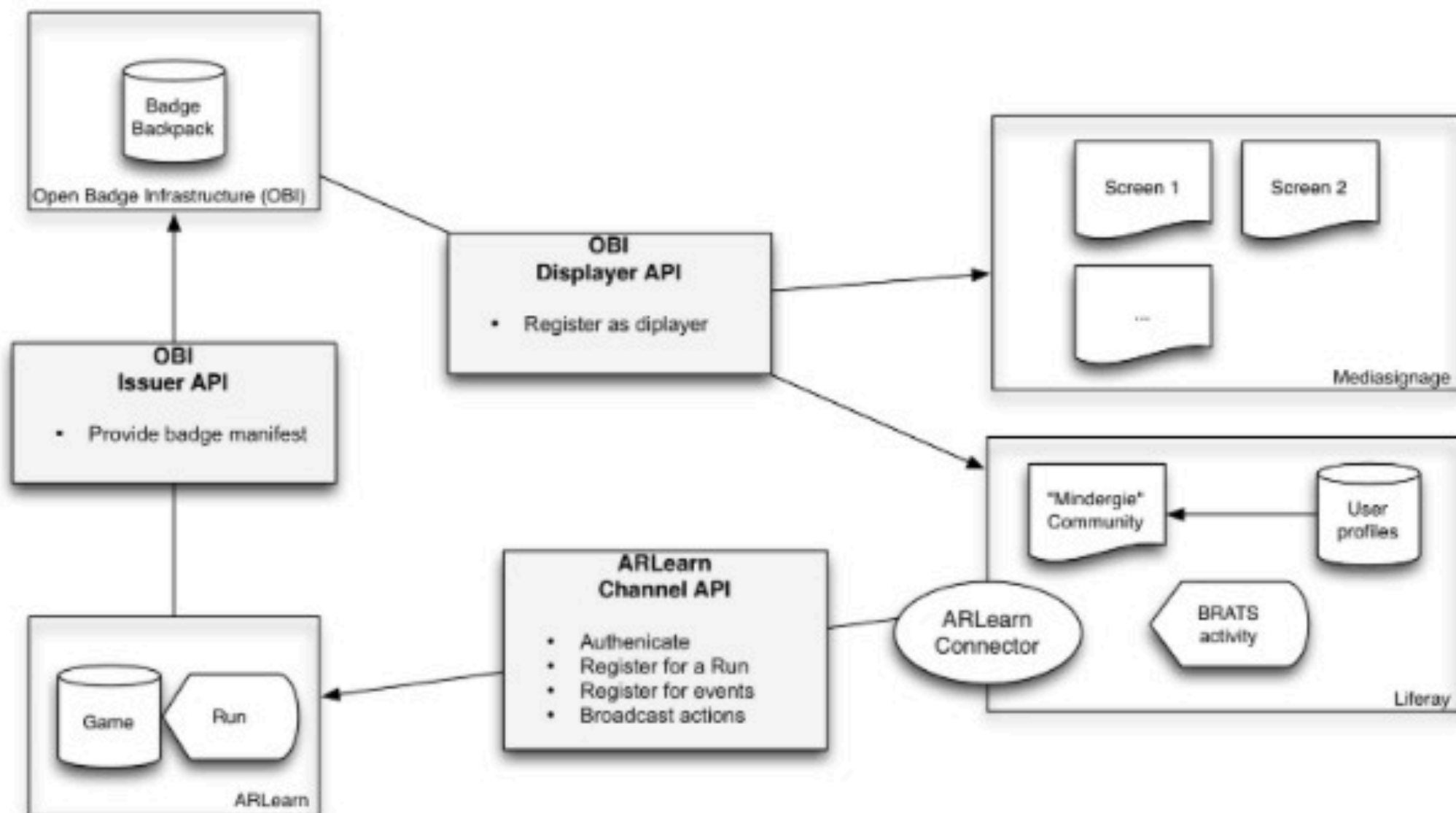


Figure 3. Architecture for the pilot putting together four technologies (Mozilla Open Badges, ARLearn, Mediasignage, and Liferay)



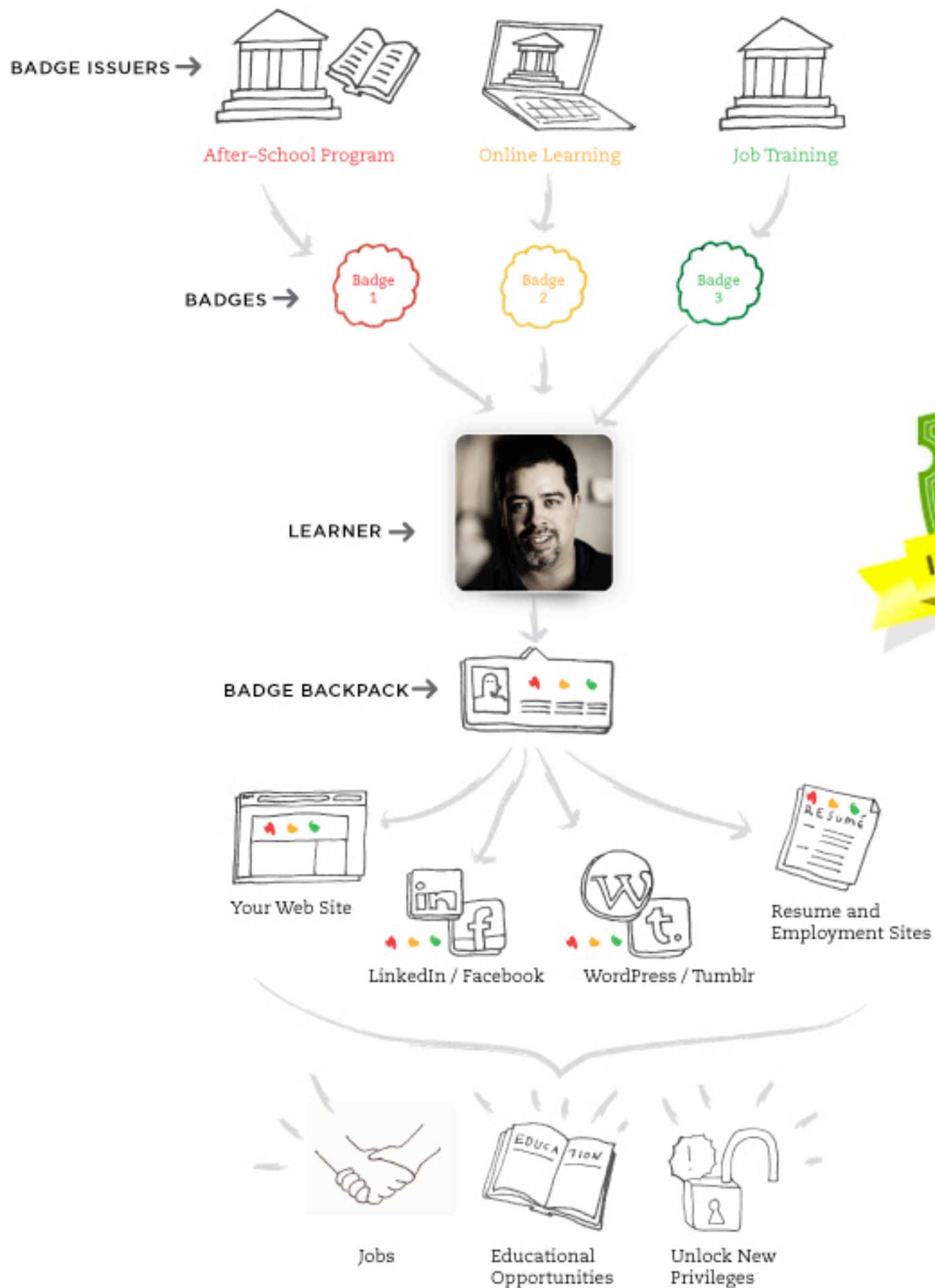




Figure 6. Mediasignage used for participant recruiting and awareness raising



