Towards a strategic integration of digital technologies into classrooms

Robert A.P. REUTER
THANK YOU...

- for inviting me to Malta,
- for giving me the chance to share some of my expertise with you,
- for offering me the opportunity to discuss your project on “Game based learning for early school leavers” with you,
- for sharing your thoughts on the integration of ICT into education.
ABOUT ME

- Ph.D. in Psychology & Education
- University of Luxembourg: founded in 2003, moved to a new campus in 2015
- Senior Lecturer: Educational Technology, Educational Research, Learning Sciences
- Vice-Head of the Institute of Applied Educational Sciences
LUXEMBOURG

![Map of Europe with Luxembourg highlighted]

**Area**
- Total: 2,586.4 km² (168th)
- Water (%): 998 sq mi, 0.60%

**Population**
- April 2015 estimate: 562,958[1]
- 2001 census: 439,539
- Density: 194.1/km² (60th), 501.3/sq mi

**GDP (PPP)**
- Total: 2016 estimate, $58.234 billion[2] (94th)
- Per capita: $100,991[2] (2nd)

**GDP (nominal)**
- Total: 2016 estimate, $60.176 billion[2] (71st)
- Per capita: $104,359[2] (3rd)

https://en.wikipedia.org/wiki/Luxembourg
### Area

- **Total**: 316 km² (207th)
- **Water (%)**: 122 sq mi
- **Water (%)**: 0.001

### Population

- **2011 census**: 416,055[^2]
- **Density**: 1410[^2]/km² (7th)
- **Density**: 4,077/sq mi

### GDP (PPP)

- **Per capita**: $33,215[^4]

### GDP (nominal)

- **2014 estimate**: $10.582 billion[^4]
- **Per capita**: $24,876[^4]

[https://en.wikipedia.org/wiki/Malta](https://en.wikipedia.org/wiki/Malta)
Towards a strategic integration of digital technologies into classrooms
AVOIDING THE SUB-OPTIMAL USE...
AVOIDING THE SUB-OPTIMAL USE...
AND THE NON-USE...
- Filling a real gap between current state and wished for future state
- Based on a realistic analysis of the current state
- Addressing an identified problem / issue
- Oriented towards clear targets
- In line with a chosen vision
- Goal-oriented
- Leading to a plan-of-action
- Well planned, not random
- Beyond mere wishful thinking
- Practically sound & realistic
- Effective in reaching a target
- Theoretically founded
- Daring, audacious & a bit foolish
MODELING THE PROCESS

- NEEDS / CHALLENGES / ISSUES / PROBLEMS
- EXISTING SOLUTIONS
- CONCEPTION OF A NEW SOLUTION ("on paper")
- DESIGN & IMPLEMENTATION ("in the classroom")
- DOCUMENTATION
- EVALUATION & REGULATION

Adapted from: Formation pédagogique LabSET - ULG

REUTER - Workshop on “Game based learning for early school leavers" (GBL4ESL) - 22-06-2016 - MITA, MALTA
START WITH THE PROBLEM

- Analyse your current needs
- Define the challenges you want to address
- What issues are you struggling with?
- Why does the identified problem exist?
- Is the identified problem worth solving?
- How urgent is it to solve it?
- What (pleasant and unpleasant) side-effects of solving this problem do you expect?
TRY TO UNDERSTAND CURRENT PRACTICES

AND THEIR HISTORY

CONSIDER THE LARGER “ECOSYSTEM” CONTEXT, LOOK BEYOND THE INDIVIDUAL CLASSROOM, SCHOOL,…

WHO ELSE WANTS THIS ISSUE TO ADDRESSED?

DO OTHER STAKEHOLDERS SHARE YOUR ANALYSIS?

WHO WOULD BENEFIT FROM A SOLUTION?

WHO WOULD SUFFER IF THE PROBLEM IS SOLVED?
SEARCH FOR EXISTING SOLUTIONS

- Analyse existing solutions to your problem or to similar problems.
- Try to look beyond specific tools & media, consider the underlying pedagogical methods & models.
- Analyse if existing solutions could fit into your “educational ecosystem”, in terms of socio-cultural and material characteristics.
- What are the advantages & disadvantages?
- How easy / cheap are these solutions to implement?
- Adapt to your context, don’t just simply copy!
CONCEPTUALIZING A NEW SOLUTION

- DRAFT AN ORIGINAL, INNOVATIVE SOLUTION
  - SPECIFIC ADDED VALUE? SAMR MODEL ANALYSIS (PUENTEDURA, 2013)
- ADAPTED TO YOUR SPECIFIC NEEDS AND YOUR CONTEXT
  - EDUCATIONAL OBJECTIVES (ANDERSON & KRATHWOHL, 2001)
  - EDUCATIONAL METHODS & TOOLS (LECLERCQ & POUMAY, 2005)
  - EDUCATIONAL ASSESSMENTS (PROCESSES — OUTCOMES)
  - TRIPLE CONSISTENCY TEST
- FOUNDATIONS ARE IMPORTANT
  - LEARNING THEORIES: HOW PEOPLE LEARN
  - TEACHING MODELS: HOW WE CAN TEACH
The SAMR Model
enhancing technology integration

Redefinition
- technology allows for the creation of new tasks, previously inconceivable
- create a narrated Google Earth guided tour and share this online

Modification
- technology allows for significant task redesign
- use Google Earth layers such as panoramio and 360 cities to research locations

Augmentation
- technology acts as direct tool substitute, with functional improvement
- use Google Earth rulers to measure the distance between two places

Substitution
- technology acts as a direct tool substitute, with no functional change
- use Google Earth instead of an Atlas to locate a place

http://www.hippasus.com/rrpweblog/

Ruben R. Puente, Ph.D.
Receives information & task
Explores sources
Creates report
Debates with co-students
Practices presentation
Reflects on process
DESIGN & IMPLEMENTATION

- DESIGN THE SOLUTION
  - BUILD NEW TOOLS, IF NECESSARY
  - RE-USE, RE-COMBINE EXISTING TOOLS, IF POSSIBLE
  - DESCRIBE IT FOR OUTSIDERS

- IMPLEMENT THE SOLUTION
  - TEST IT BEFORE DEPLOYING IT LARGE SCALE
  - PROVIDE (in advance) TRAINING FOR TEACHERS
  - IMPLEMENT THE SCENARIO & THE TOOLS
  - ENSURE ESSENTIAL CONDITIONS ARE FULFILLED (ISTE)
ESSENTIAL CONDITIONS

**Shared Vision**
Proactive leadership in developing a shared vision for educational technology among all education stakeholders, including teachers and support staff, school and district administrators, teacher educators, students, parents, and the community

**Empowered Leaders**
Stakeholders at every level empowered to be leaders in effecting change

**Implementation Planning**
A systemic plan aligned with a shared vision for school effectiveness and student learning through the infusion of information and communication technology (ICT) and digital learning resources

**Consistent and Adequate Funding**
Ongoing funding to support technology infrastructure, personnel, digital resources, and staff development

**Equitable Access**
Robust and reliable access to current and emerging technologies and digital resources, with connectivity for all students, teachers, staff, and school leaders

**Skilled Personnel**
Educators, support staff, and other leaders skilled in the selection and effective use of appropriate ICT resources

**Ongoing Professional Learning**
Technology-related professional learning plans and opportunities with dedicated time to practice and share ideas

**Technical Support**
Consistent and reliable assistance for maintaining, renewing, and using ICT and digital learning resources

**Curriculum Framework**
Content standards and related digital curriculum resources that are aligned with and support digital age learning and work

**Student-Centered Learning**
Planning, teaching, and assessment centered around the needs and abilities of students

**Assessment and Evaluation**
Continuous assessment of teaching, learning, and leadership, and evaluation of the use of ICT and digital resources

**Engaged Communities**
Partnerships and collaboration within communities to support and fund the use of ICT and digital learning resources

**Support Policies**
Policies, financial plans, accountability measures, and incentive structures to support the use of ICT and other digital resources for learning and in district school operations

**Supportive External Context**
Policies and initiatives at the national, regional, and local levels to support schools and teacher preparation programs in the effective implementation of technology for achieving curriculum and learning technology (ICT) standards

iste.org/nets
TRY TO DOCUMENT AS MUCH AS POSSIBLE HOW THE NEW SOLUTION WAS IMPLEMENTED IN CLASSROOMS

MAKE LEARNING VISIBLE: PROCESSES & OUTCOMES

GIVE STUDENTS A VOICE

ALLOW TEACHERS TO REFLECT ON THEIR NEW PRACTICES

ASK OTHER STAKEHOLDERS

INCLUDE QUANTITATIVE AND QUALITATIVE DATA

TEST THE HYPOTHESIS! STAY SKEPTICAL!

IF POSSIBLE, CONSIDER COMPARING WITH A CONTROL GROUP
EVALUATE IN HOW FAR YOUR EDUCATIONAL SCENARIO HAS REACHED THE GOALS YOU HAD DEFINED

- USER SATISFACTION // STAKEHOLDERS SATISFACTION
- COSTS AND SIDE-EFFECTS
- ADDED-VALUE: ENHANCEMENT / TRANSFORMATION (SAMR ANALYSIS)
- CHANGES TO BE MADE
- RE-DESIGN NEW VERSION
- TEST NEW VERSION(S)
EVALUATE IN HOW FAR YOUR EDUCATIONAL SCENARIO HAS REACHED THE GOALS YOU HAD DEFINED

USER SATISFACTION // STAKEHOLDERS SATISFACTION

COSTS AND SIDE-EFFECTS

ADDED-VALUE: ENHANCEMENT / TRANSFORMATION (SAMR ANALYSIS)

CHANGES TO BE MADE

RE-DESIGN NEW VERSION

TEST NEW VERSION(S)

THINK ABOUT ALPHA, BETA & GAMMA PHASES
THANK YOU FOR YOUR ATTENTION!
CONTACT

https://lu.linkedin.com/in/bobreuter

https://www.facebook.com/RReuterPhD/

@bobreuter

http://staff.uni.lu/robert.reuter

robert.reuter@uni.lu
REFERENCES

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