

Preparing Future Teachers for Strategic Uses of Educational Technology: A Project-Based Approach

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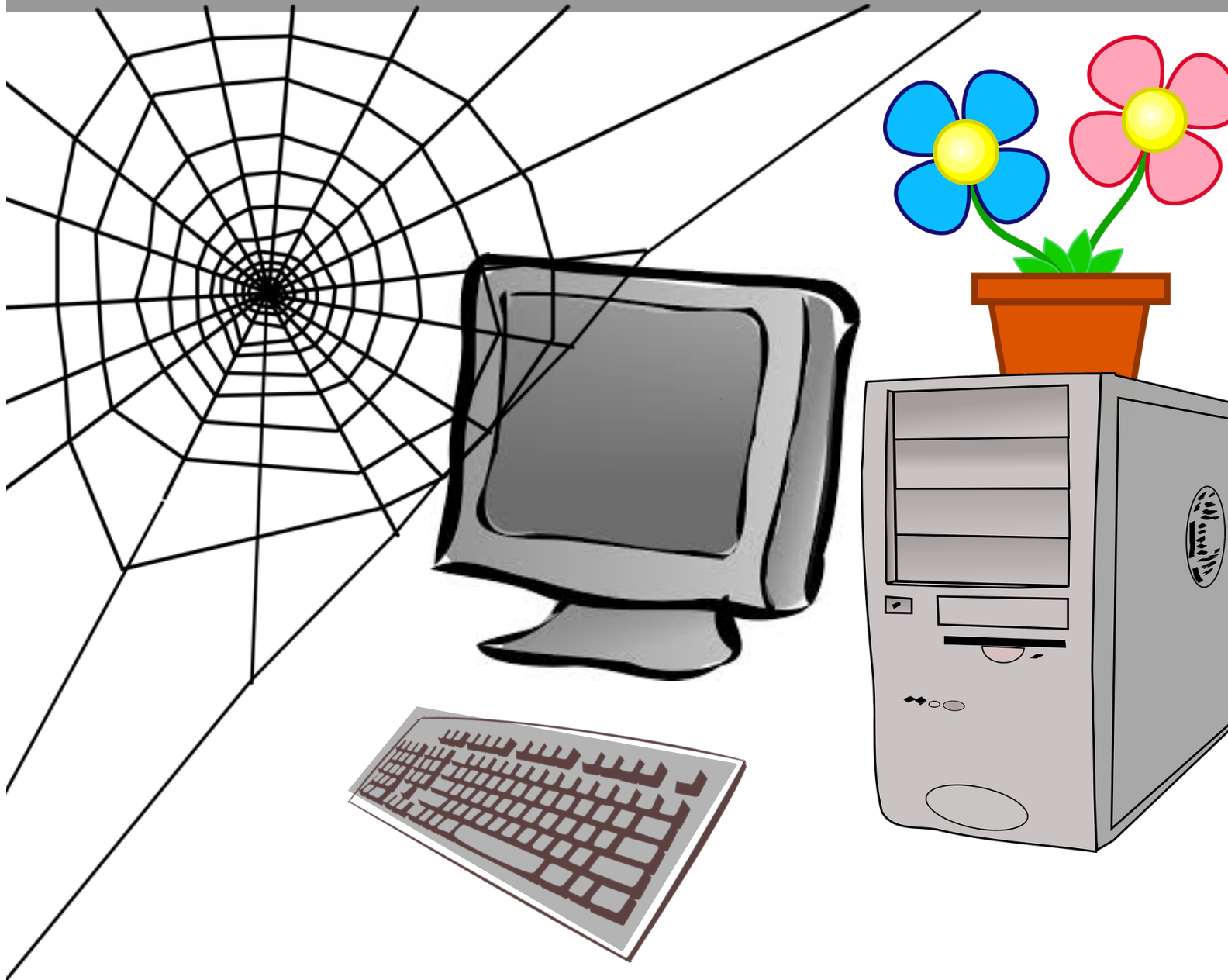
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Inspired by the visions of future education and learning

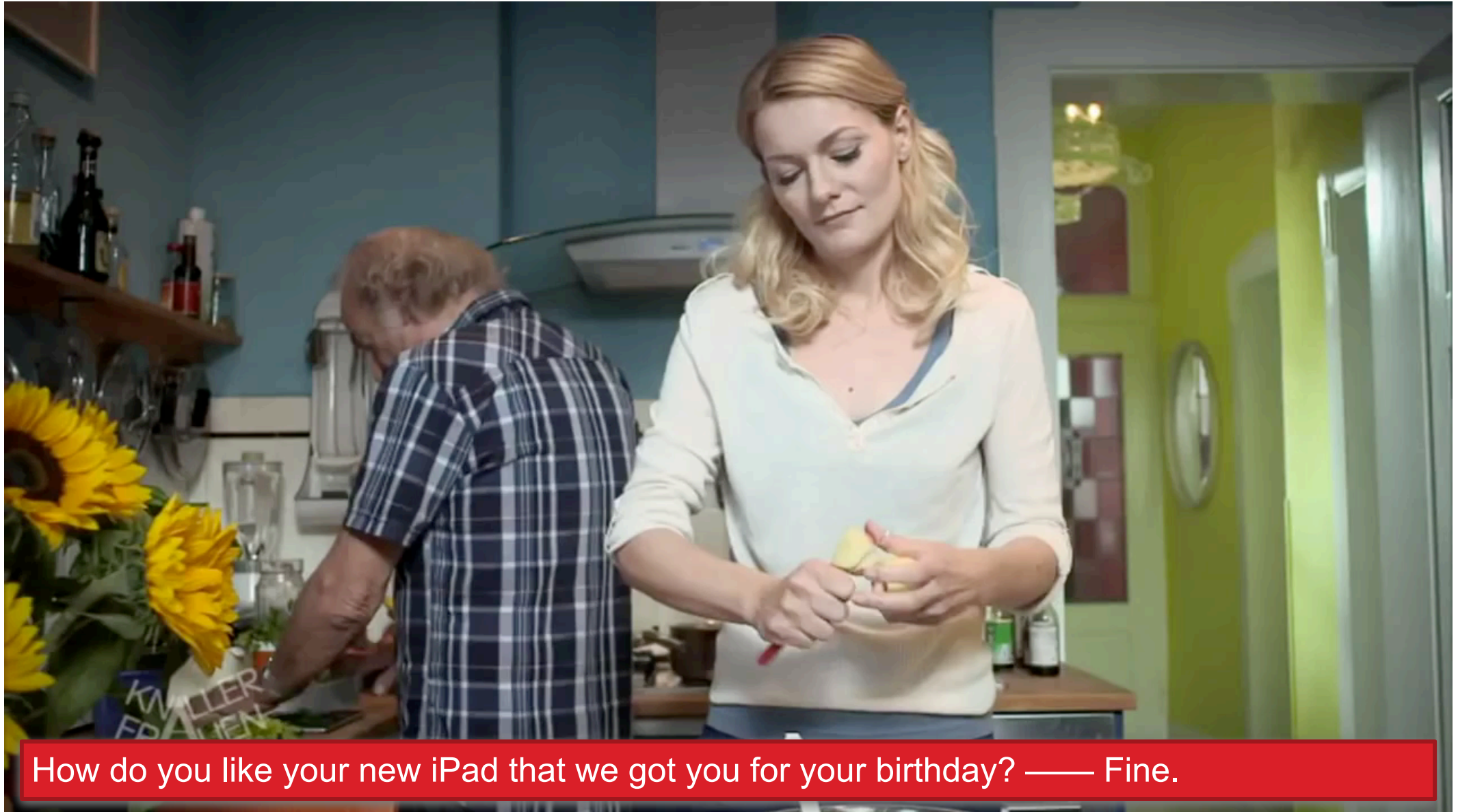


- 1. Need for teachers who are willing and able to design, implement and reflect meaningful and successful educational technology practices in schools (cf. national Digital Education strategy)**
- 2. Current rarity of strategic uses of ICT in education in Luxembourgish schools, the self-declared lack of competencies and the low confidence of teachers when it comes to teaching with ICT (Reuter, Busana & Linckels, 2016)**

AVOIDING THE NON-USE...

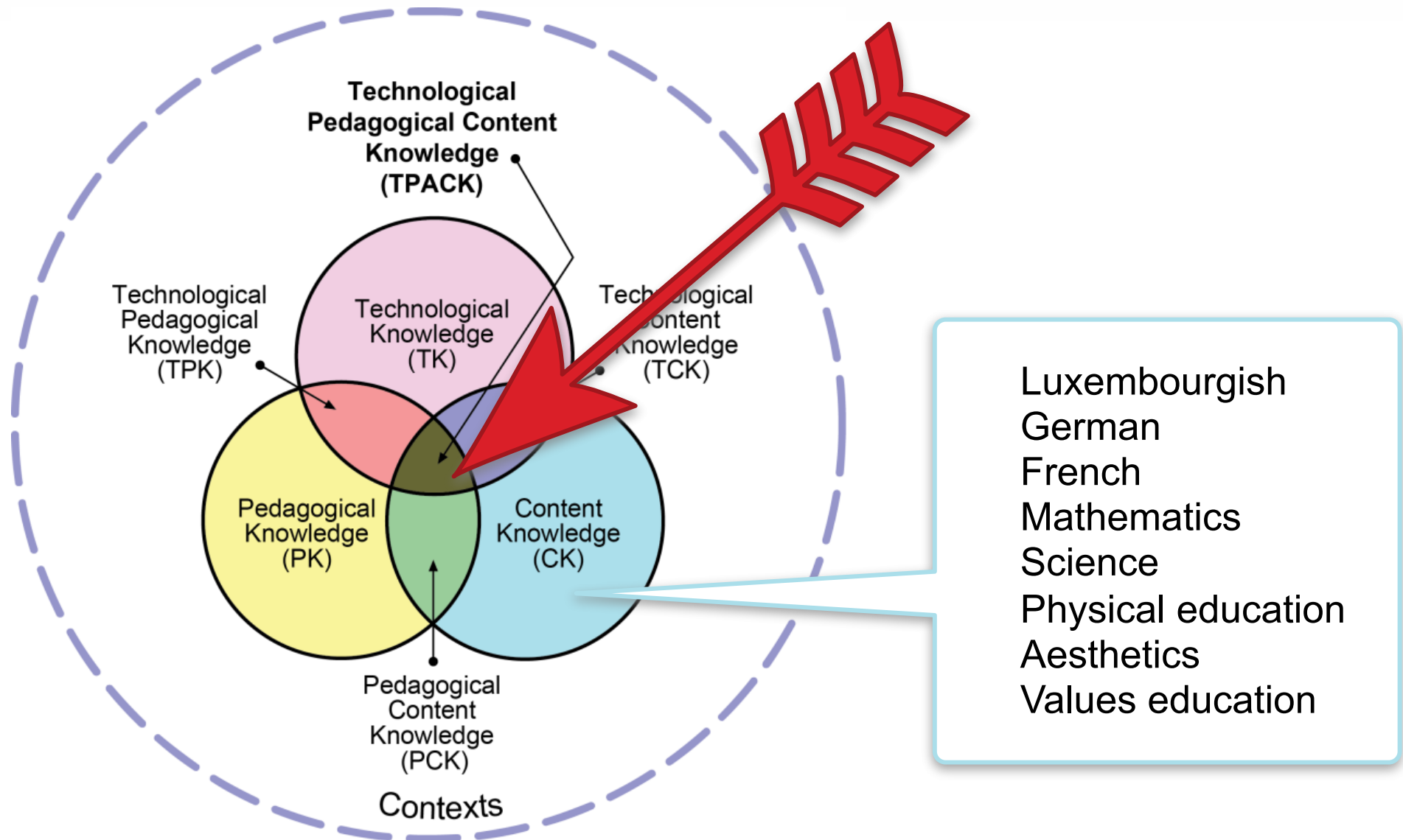


AND THE SUB-OPTIMAL USE...



How do you like your new iPad that we got you for your birthday? — Fine.

GOAL: DEVELOP TPACK



Project-based approach to the development of practice-oriented TPACK in pre-service teachers in 7th semester:

- Define an educational problem they want to solve,
- Explore existing pedagogical and technological solutions
- Design an original solution that involves the strategic use of ICT (theoretically grounded and practically meaningful).
- Implement the designed learning & teaching scenario in a classroom,
- Document the teaching & learning processes,
- Analyse, evaluate and critically reflect them.
- Structured report about their project
- Presentation to their peers and to interested teachers from schools.

Adapted from:
BEC-OME-RER by Leclercq & Poumay (2005)

START WITH THE PROBLEM

- ANALYSE A CURRENT NEED FOR CHANGE/IMPROVEMENT
- 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?

ANALYSE THE EXISTING ECOSYSTEM

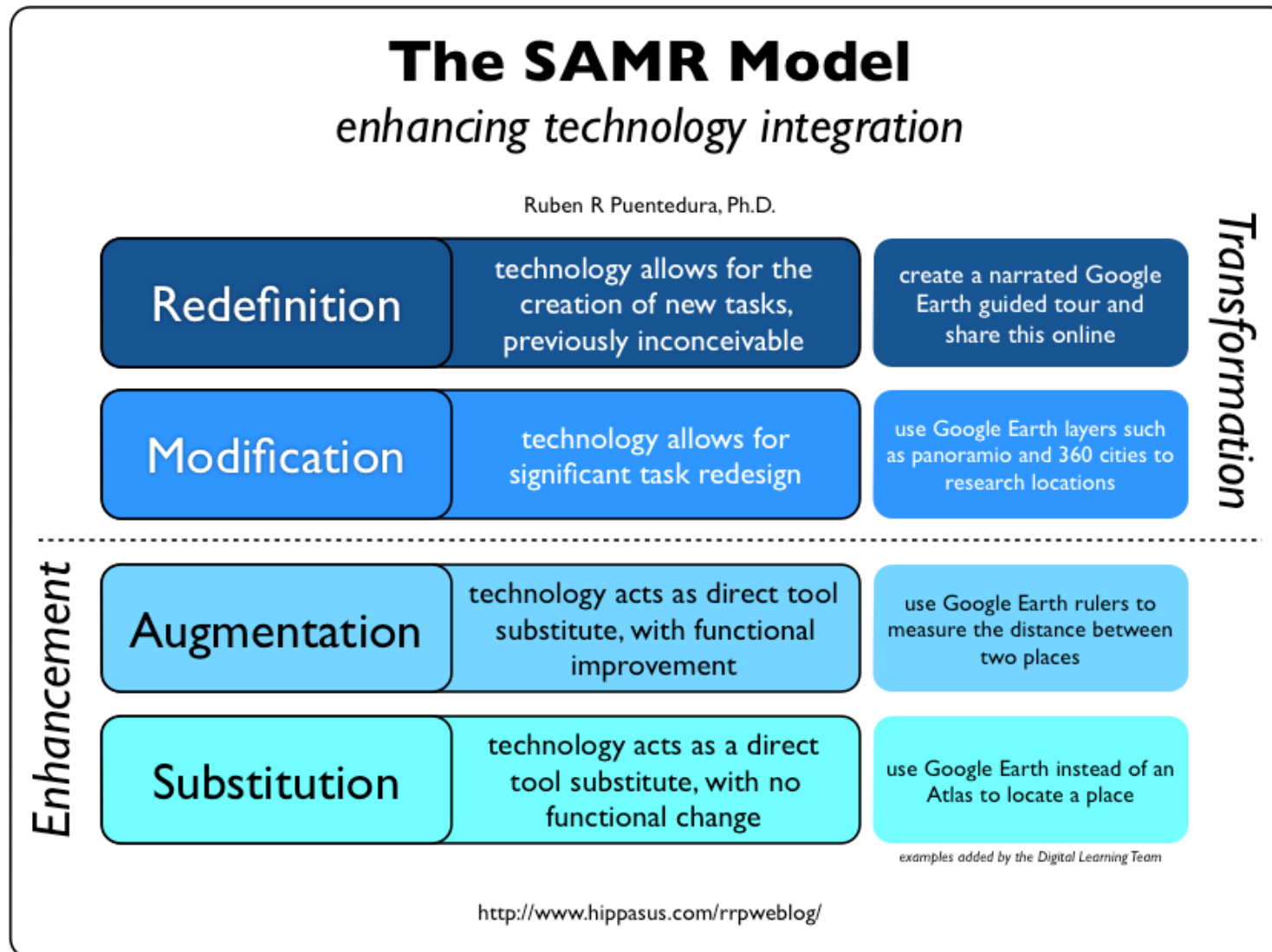
- TRY TO UNDERSTAND CURRENT PRACTICES
 - AND THEIR HISTORY
- CONSIDER THE LARGER “ECOSYSTEM” CONTEXT, LOOK BEYOND THE INDIVIDUAL CLASSROOM, SCHOOL,...
- WHO ELSE WANTS THIS ISSUE TO BE ADDRESSED?
- DO OTHER STAKEHOLDERS SHARE YOUR ANALYSIS?
- WHO WOULD BENEFIT FROM A SOLUTION?
- WHO WOULD SUFFER IF THE PROBLEM IS SOLVED?

SEARCH FOR EXISTING SOLUTIONS

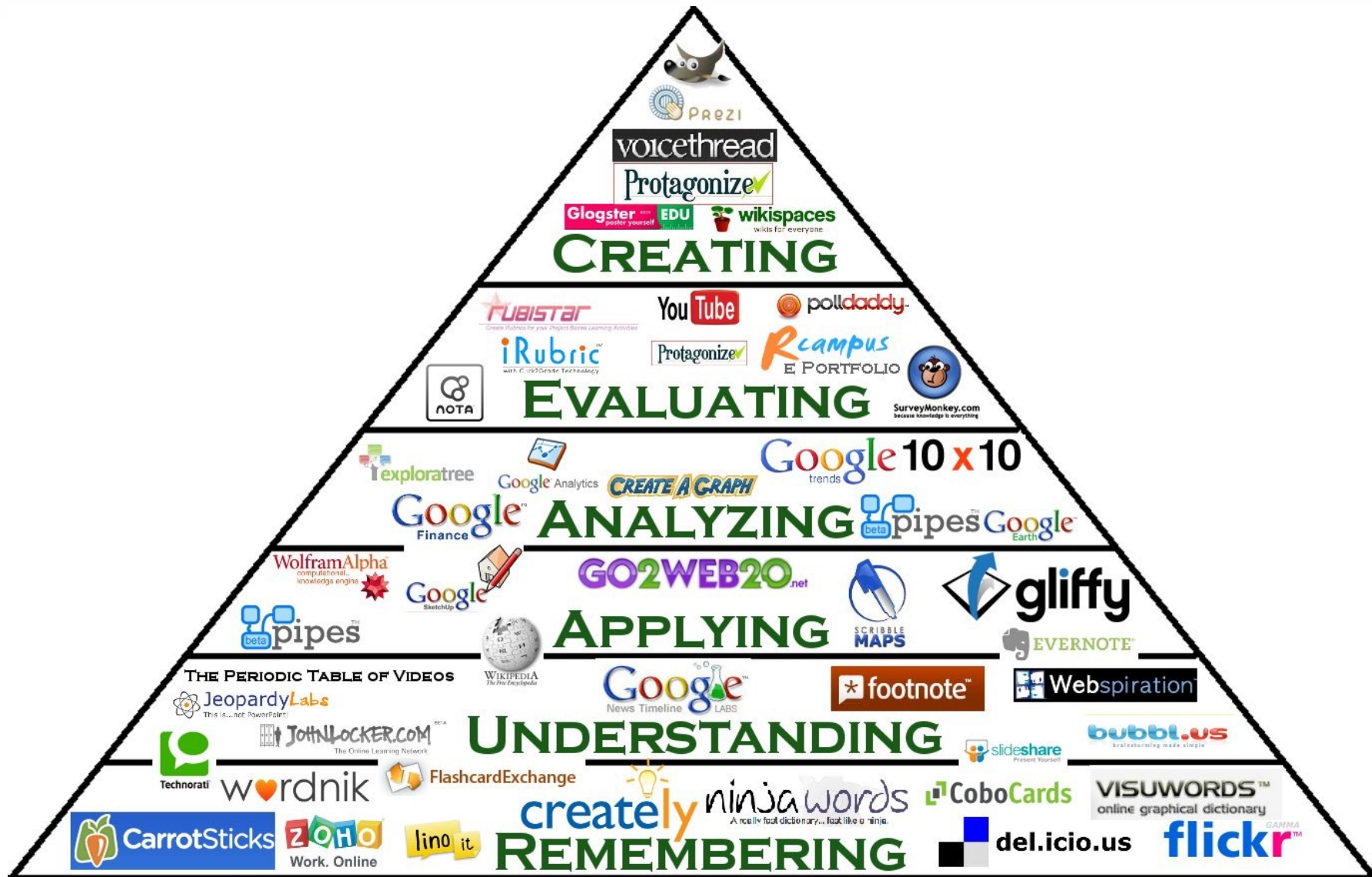
- ANALYSE EXISTING SOLUTIONS TO YOUR PROBLEM OR TO SIMILAR PROBLEMS
- TRY TO LOOK BEYOND SPECIFIC TOOLS & MEDIA, CONSIDER THE UNDERLYING PEDAGOGICAL METHODS & MODELS
- ANALYSE IF EXISTING SOLUTIONS COULD FIT INTO YOUR “EDUCATIONAL ECOSYSTEM”, IN TERMS OF SOCIO-CULTURAL AND MATERIAL CHARACTERISTICS
- 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

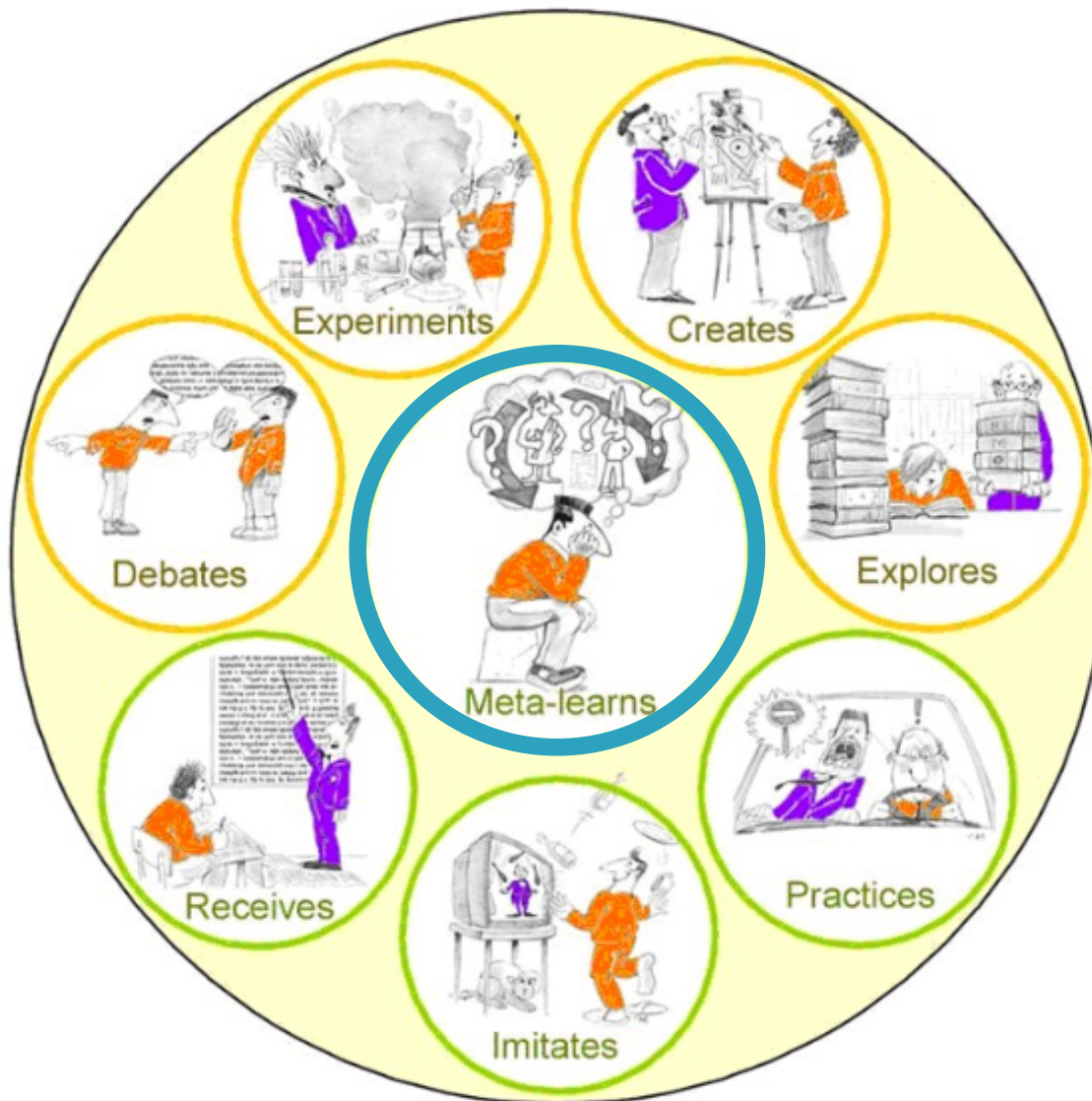
- DRAFT AN ORIGINAL, INNOVATIVE SOLUTION
 - SPECIFIC ADDED VALUE? SAMR MODEL ANALYSIS (PUENTEDURA, 2013)
- ADAPTED TO YOUR SPECIFIC NEEDS AND YOUR CONTEXT
 - EDUCATIONAL OBJECTIVES (ANDERSON & KRATHWOHL, 2001)
 - EDUCATIONAL METHODS & TOOLS (LECLERCQ & POUMAY, 2005)
 - EDUCATIONAL ASSESSMENTS (PROCESSES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



DIGITAL BLOOM TAXONOMY



LECLERCQ & POUMAY (2005)



- Receives information & task
- Explores sources
- Creates report
- Debates with co-students
- Practices presentation
- Reflects on process

TRIPLE E FRAMEWORK

Extend

Does the technology create opportunities for students to learn outside of their typical school day?

Does the technology create a bridge between school learning and everyday life experiences?

Does the technology allow students to build grit skills, that they can use in their everyday lives?

Enhance

Does the technology tool aid students in developing a more sophisticated understanding of the content.

Does the technology create scaffolds to make it easier to understand concepts or ideas

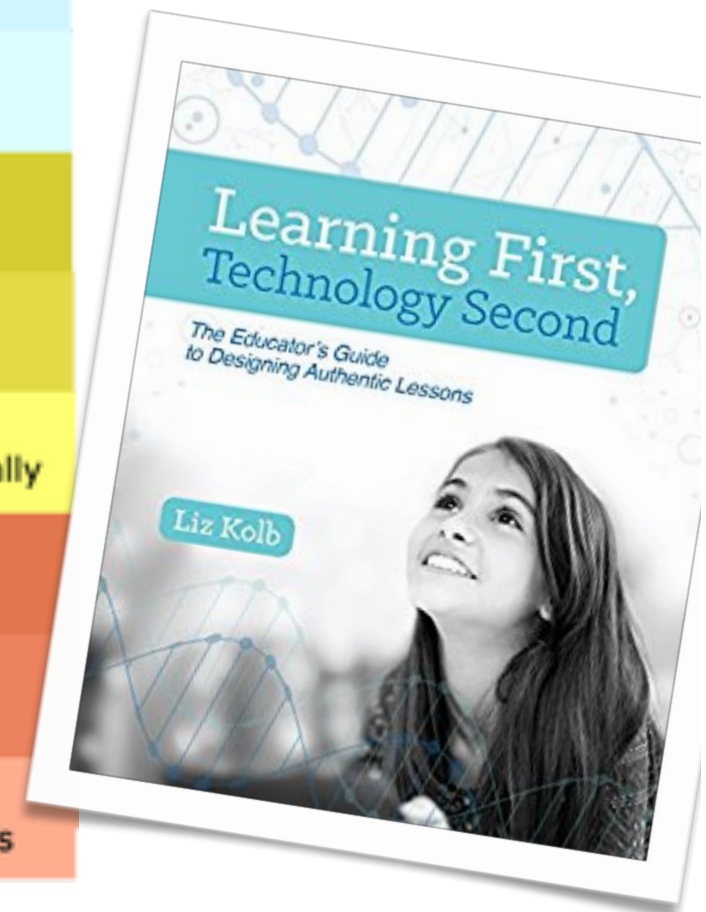
Does the technology allow students to demonstrate their understanding of content that they could not do traditionally

Engage

Does the technology allow students to focus on the assignment or activity with less distraction

Does the technology motivate students to start the learning process

Does the technology cause a shift in the behavior of the students, where they move from passive to active learners



- **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
 - IMPLEMENT THE SCENARIO & THE TOOLS

- TRY TO DOCUMENT AS MUCH AS POSSIBLE HOW THE NEW SOLUTION WAS IMPLEMENTED IN CLASSROOMS
- MAKE LEARNING VISIBLE: PROCESSES & OUTCOMES
- INCLUDE QUANTITATIVE AND QUALITATIVE DATA
- TEST THE HYPOTHESIS! STAY SKEPTICAL!

- **EVALUATE IN HOW FAR YOUR EDUCATIONAL SCENARIO HAS REACHED THE GOALS YOU HAD DEFINED**
- **ADDED-VALUE: ENHANCEMENT / TRANSFORMATION (SAMR ANALYSIS)**
- **TRIPLE E FRAMEWORK: Engage / Enhance / Extend**
- **CHANGES TO BE MADE**
- **RE-DESIGN NEW VERSION**
- **TEST NEW VERSION(S)**

- **Collaborative project: students work in pairs**
- **Parallel seminars**
- **10 sessions**
- **Intermediate deliverables**
- **Coaching by us**
- **Final session: project presentation - gallery walk**

CHALLENGES (1)

Given our project-based approach, students working on their scenario according to their own pace during the on-campus sessions, many students feel that they could also work from home.

We thus plan to work on the added-value of on-campus sessions, either by having them present their ongoing project more often to us and their peers, by introducing more peer-feedback activities or by giving them more input and access to resources that they would not have at their disposal at an off-campus location.

CHALLENGES (2)

Given that our students do not have their own classes that they regularly teach, identifying an authentic pedagogical problem is quite challenging to them.

While it is relatively easy to think about general issues in education that are worth solving, these do not necessarily exist in the specific classrooms to which they have access.

Moreover, while we instruct them to first think about the issue before choosing a technology to use, they also need to consider which tools are available in the concrete settings where they will implement their scenario.

They thus often tend to think “technology first, learning second”, which can lead to challenging situations, where the use of ICT does not respond to a real problem and is perceived as a gadget without value. However, this can also lead to interesting surprises, where the use of new tools allows them to reconsider and to rethink existing pedagogical practices.

CHALLENGES (4)

Reporting is still (often) problematic

=> other forms of reporting?

=> support report writing more closely?

Community of Practice

=> Present to teachers, authentic audience?

=> online publication?

=> networking with international partners?

Overall, we observe that while most students become able to design and implement relatively meaningful educational technology practices, they still tend to feel that they are not ready to teach with technology in a more general sense.

Their work was indeed focused on one or two tools and does not give them access to a broader range of meaningful ICT-enriched teaching scenarios for their later professional career.

(1) what are your own experiences with the use of educational technologies in classrooms

<https://padlet.com/bob106/28s14mjz2q00>



(2) What are your experiences with training future teachers to use ICT in education

<https://padlet.com/bob106/jc8i6weaegek>



(3) What is your opinions about our project-based approach, e.g. what do you like about our approach, what do you not like, what would you change and how would you improve it

<https://padlet.com/bob106/3h0nw4k3jzo9>



THANK YOU FOR YOUR ATTENTION!

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