Moving beyond the Lecture: Towards Collaborative Inquiry-Based Learning with Big Questions

Case Study

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Research Unit on Education, Culture, Cognition and Society
### Luxembourg

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

**Population**
- April 2015 estimate: 562,958
  - (170th)
- 2001 census: 439,539
- Density: 194.1/km² (60th)
  - 501.3/sq mi

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

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

With the creation of the University in 2003, the „Bachelor en Sciences de l’Education (BScE)“ has been launched only one year later and is designed to prepare students for the teaching profession in fundamental schools in Luxembourg at all levels (K-9 years) in all content domains.

- **Main objective:** reflective practitioner

- The study programme runs over 4 years (240 ECTS)

- 1 semester of mobility is mandatory at bachelor level

- Variety of learning & teaching approaches across the curriculum: lectures, seminars, workshops, projects, etc.
# Bachelor in Educational Sciences

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<tr>
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<th>Learning and development</th>
<th>Teaching and schooling</th>
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<th>Mathematics education</th>
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Courses in *Educational Technology*

- Semester 2: Education in the Digital Age - Seminar
- Semester 7: *Educational Technology* - Project
- 14 key activities in Internships
- Mathematics Education: training & manipulation tools
- Literacy Education: authoring tools
- Bachelor Thesis (if students choose to work on that topic)
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Semester 2: *Education in the Digital Age*

Students should be able to

- define and discuss the implications of the digital revolution and the knowledge society on learning, teaching, educating and schooling;
- define and discuss the mutual relations between technological and socio-cultural evolutions;
- define and discuss national and international “digital education” policies, standards (21st century skills, media & information literacy, digital literacy), frameworks and strategies;
- define policies and initiatives of technology-enriched learning and teaching environments at a national and international level;
- define theories, models and strategies of technology-enriched learning and teaching environments;
- define methods and practices of technology-enriched learning and teaching environments;
- define educational technology tools and their instructional functions.
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- define methods and practices of technology-enriched learning and teaching environments;

- define educational technology tools and their instructional functions.
Semester 7: Educational Technology

Students should be able to

- analyse and evaluate different types of digital media and technologies regarding their didactic-methodical characteristics;
- evaluate different types of digital media and technologies regarding given learning objectives;
- plan & implement the use of digital media and technologies in a meaningful way;
- document and evaluate the use of digital media and technologies in a meaningful way with regard to teaching/learning processes and outcomes.
We had been teaching the first-year course on “education in the digital age” as a lecture for a few years.

The objectives of this course have been to convey theoretical knowledge to our future teacher students.

Students had to take a written exam, testing for knowledge and understanding.

This first-year course provided the “theoretical foundations” for a 4\textsuperscript{th} year project-based course about educational technology integration.
However, we have observed, over the last years, that (1) many students failed to pass the exam and (2) that a lot of them, when in their 4th year, had forgotten most of these theoretical foundations or did not make the connection between the two courses.

We also felt that lecturing students about the need to rethink education in the digital age was not isomorphic.

These considerations have driven us to rethink & redesign our teaching approach and how we assess students learning outcomes.
Our pedagogical approach combines various learning & teaching methods that require students to actively and collaboratively construct meaningful knowledge and share it in a community of learners.

They are given “big questions” (i.e. questions where there are no simple and easy-to-lookup answers) and are instructed to develop meaningful answers, based on resources that (1) we have curated for them (2) and / or resources they have looked up themselves.

These answers are shared with their colleagues (and us) in an online forum and discussed in class.
Big Question - Some examples:

- In how far did and does the Digital Revolution change our relationship to knowledge?
- What does “digital revolution" means in terms of technical, cultural and social aspects?
- What is the impact of the “digital revolution” on education?
- What do Koehler and Mishra mean when they say that teachers in the 21st century need to be designers of technology, pedagogy and content?
- What should schools of the future look like?
- Why do we need to rethink education before designing schools for the digital age?
- What does Michel Serres by saying that a change in media (support) always implies deep transformations in the way we learn and think?
- In how far has the transition from the industrial age to the knowledge age changed the goals that education needs to (try to) reach?
# Teaching Approach

## Discussion

<table>
<thead>
<tr>
<th>Question</th>
<th>Started by</th>
<th>Replies</th>
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<tbody>
<tr>
<td>Which Learning/Teaching Events can we implement with the help of social</td>
<td>Gilbert BUSANA</td>
<td>8</td>
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<td>networks like Facebook? Please explain.</td>
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<td>What is the difference between a technology integration strategy and a</td>
<td>Gilbert BUSANA</td>
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<td>teaching model?</td>
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<td>What is the TRIPLE E FRAMEWORK and what are its recommendations about</td>
<td>Gilbert BUSANA</td>
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<td>integrating ICT into teaching?</td>
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<td>Please explain the &quot;Learning and Teaching Events&quot; model by Leclercq &amp;</td>
<td>Gilbert BUSANA</td>
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<td>Poumay (2005).</td>
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<td>Please explain how Roblyer &amp; Doering define the two main technology</td>
<td>Gilbert BUSANA</td>
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<td>integration strategies.</td>
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<td>In how far is it useful to use the SAMR model (Puentedura) when</td>
<td>Gilbert BUSANA</td>
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<td>integrating digital technologies into our teaching practices?</td>
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<td>Please explain Bloom's &quot;Taxonomy of Learning Objectives&quot; and its</td>
<td>Gilbert BUSANA</td>
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<td>relevance for technology integration practices.</td>
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<td>What are the relationships between learning theories and teaching</td>
<td>Gilbert BUSANA</td>
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<td>practices that integrate digital technologies?</td>
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We have tried to **guide their inquiry-learning process more at the beginning** (requiring them to read / watch learning material in advance to coming to the seminar) and **less at the end** of the semester (inviting them to search for relevant resources online themselves).

They have been **collecting “evidences” of their own learning** in terms of knowledge, understanding and application in their **individual (online) digital portfolio**.
Given that most of our students

(1) have **not** had **extensive experience with active pedagogy methods** before studying at the university and

(2) are **more used to dealing with “small questions”** or with **reproducing answers to questions** (both provided by their teachers),

they have been somewhat struggling with our approach.
However, since we have partially used questions that we previously used as exam questions, we have observed that their answers have largely been much better than those developed by their predecessors.

We see that many students deeply engage with the proposed content and try to understand it and make sense of it.
Moreover, we have been struggling with the online digital portfolio tool we have chosen.

These technical issues have made the portfolio work not very user-friendly and fun for our students and also did not really allow us to have meaningful online conversations with them.
Given our more or less **guided inquiry-learning approach** combined with the fact that students **share their productions online** with the rest of the community of learners,

(1) we have had quite **good insights into their learning processes** and

(2) we were **able to provide corrective feedback** when necessary.

**Learning is much more visible** in our current approach **than it was in the lecture hall**, where it only becomes visible when grading the final written exams, when it is too late to scaffold students learning processes.
Overall, we are quite satisfied with our teaching approach

**BUT** will have to

1. **improve** our **formative assessment** practices and
2. set up a **digital portfolio solution** that is **more reliable** and leads to **greater user satisfaction**.
THANK YOU FOR YOUR ATTENTION!
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