Herramientas de analítica del aprendizaje
Más allá de datos y dashboards

Grupos de Trabajo de Formación Online y Tecnologías Educativas
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Abelardo Pardo (@abelardopardo)
Division of Information Technology, Engineering and the Environment
slideshare.net/abelardo_pardo
The student experience

Feedback

Scaling
The student experience
Executive Summary

This moment is ripe for change in higher education. Scores of technology entrepreneurs, foundations, and policymakers are already trying to shape what the future looks like for both learners and institutions. The message for colleges and universities is clear: they can either sit idly by or join in to design their own destiny.

As a selective public institution with a history of educational innovation, the Georgia Institute of Technology sits squarely in the middle of the forces shaping higher education. It is uniquely positioned to model what the university of the future might look like.

This report of the Georgia Tech Commission on Creating the Next in Education (CNE) is an effort to draw with broad strokes the nature of education that defines the technological research university of the year 2040 and beyond. The Commission was formed because many within the institution are convinced that by the second half of this century Georgia Tech will be different from the university that matured and prospered in the nineteenth and twentieth centuries. Georgia Tech’s mission seems to demand that the Institute examine the choices that lie ahead and make plans for a future that, however uncertain, is bound to present opportunities and challenges that cannot be understood as incremental changes in the status quo.

Drivers of Change

In a prior report titled Discovering the Drivers of Change in Higher Education (Georgia Tech 2016), the Commission outlined the forces likely to affect Georgia Tech, including a new and accelerating revolution characterized by technology-driven disruptive change throughout society, shifting public attitudes about the role of public universities, and demographic trends that challenge long-held assumptions about
Recommend: Commitment to a Lifetime Education

- Redefine approach: eliminate artificial barriers college-precollege, flexible pathways and credentials, reinvent physical presence, provide advising and coaching networks
- Some Initiatives
  - Whole-person Education: need cognitive skills, interpersonal skills, intrapersonal skills
  - Technology-enhanced, personalised advising for a New Era
Simple information transfer is not working

“... robust correlations between **student involvement** in a subset of ‘educationally purposive activities’, and **positive outcomes of student success and development**, including satisfaction, persistence, academic achievement and social engagement”

Blended Learning

Frontier between physical and virtual spaces is blurring
“… teaching in higher education will necessarily **shift the balance of its efforts towards a greater investment in design** as a way of coping with otherwise intolerable pressures on staff and resources.”

“People make good choices in contexts in which they have experience, good information, and prompt feedback”

“There is no such thing as a neutral design”

• Understand human memory and learning

• Know useful techniques to study

• Know how to monitor

• Understand existing biases

The student experience

Feedback
If You Could Choose One...

- More than 500 meta-analyses of student achievements
- 100 factors with potential influence
- Feedback in top five
- (74 meta-analyses) Most effective form: video, audio, **computer-assisted** instructional feedback, and/or related goals

Hattie, J. A. (1999). Influences on student learning. Inaugural professorial address, University of Auckland, New Zealand
Feedback Levels

1. Task Level (understanding, performance)

2. Process Level (what to do to understand, perform)

3. Self-regulation level (detecting and directing effort)

4. Self level (personal evaluation and affect)

“Feedback is a process to positively influence how students engage with their work in a learning experience so that they can improve its overall quality with respect to an appropriate reference and increase their self-evaluative capacity.”

The allure of dashboards

- Information density
- Assumed expertise
(1) methodologies for learning analytics dashboards feedback currently based on performance indicators only, (2) **feedback automation methodologies** (to our knowledge inexistent).

They do engage with feedback when properly deployed.

Feedback as dialogue

The student experience

Feedback

Scaling
Feedback in technology-mediated scenarios

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Large number of events per user
Combine logs with design

Learner played a video about topic COD during Week 2
Unveiling learning strategies

Support teaching and learning in active learning

Feedback in technology-mediated scenarios

Agent A
(instructor, expert, peer, algorithm)

Agent B
(Learner)

1. Goal
   Task
   Measure

2. Knowledge, beliefs and attitudes

3. Goals

4. Strategies & Tactics

5. Process

6. Regulation

7. Multimodal Evidence
   S
   S

8. Measure & Compare

9. Analysis & Prediction

10. Information & Delivery

Instructor — per task
Technology — per student

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<thead>
<tr>
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<tbody>
<tr>
<td>Goal</td>
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<td>Measure</td>
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<tr>
<td>Indicator</td>
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<td>Q1 Q2 Q3 Q4</td>
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- Q1: *Sentence 1*
- Q2: Sentence 2
- Q3: Sentence 3
- Q4: Sentence 4
Instructor — per task
Technology — per student
Instructor — per task
Technology — per student

Instructor

Goal
Task 1
Measure

Indicator
Q1 Q2 Q3 Q4

Q1 Sentence 1
Q2 Sentence 2
Q3 Sentence 3
Q4 Sentence 4

Goal
Task 2
Measure

Indicator
Q1 Q2 Q3 Q4

Q1 Sentence 1
Q2 Sentence 2
Q3 Sentence 3
Q4 Sentence 4

Goal
Task 3
Measure

Indicator
Q1 Q2 Q3 Q4

Q1 Sentence 1
Q2 Sentence 2
Q3 Sentence 3
Q4 Sentence 4

Technology

John
Sarah

Dear {{ Given Name }}

Here are some comments about the activities for this week.

* Task 1
  
  SENTENCE 1

* Task 2
  
  STENTENCE 3

* Task 3
  
  SENTENCE 2

Let us know if you have any further questions.

Kind regards.
Abelardo Pardo
Course Coordinator
Here are some comments and feedback about your lecture preparation in ELEC1601 during Week 2.

**Activity VIDEO: Encoding in base 2, 8 and 16**

- Make sure you review again the whole content explained in the video of the activity. You could use a piece of paper and try to replicate the developments that are explained in the video.
- Give another round to the questions next to the video in this activity until you answer all of them correctly at the first attempt and without looking at the solutions.

**VIDEO: Review of natural and integer number encoding**

- Make sure you review again the whole content explained in the video in the activity. Encoding naturals is a procedure that you will be using very frequently in the following weeks.

**VIDEO: Encoding Integers**

- Review again the 2s complement encoding explained in the video in the activity. Repeat the procedure until you are able to do it very fast.
- You should give it another try to the questions next to the video in this activity. Try to work in the encoding until you have no incorrect answers in a full round.

**Read about the floating point representation**

- Good work with the questions in the section. You may take some of them and create variations (change number of bits for example) to make sure you fully understand the concepts.
- You should give it another try to the questions about range, accuracy and precision in section 2.7.2.
- Good work with the questions in section 2.7.3.

**Sequence of problems about information encoding**

- Good work with the exercises in the sequence. You may want to review it in a few days, or perhaps before the midterm.

Regards
Influence — Personalised dialogue
Data driven — Situated Sense-making
At scale — Automatic (?)
Comment lecture preparation activities

Filter learners: Only those with one video missing (10 learners of 12)

Text Conditions

- Select a subset of learners
- Arbitrary expression on any column value

Conditions to include/ignore text

Replace by column value

Text included only if condition No_Video_1 is true

Preview the content for each learner
Dear {{ first_name }}

Here are some comments about the preparation:

{%= if No_Video_1 %}
{%= andif %}
{%= if No_Video_2 %}

**Genes and Proteins Activity**

This video explains the role of the genes to synthesise proteins in the cell. It is very important to see the connection between the proteins and the rest of processes occurring in the cell.

{%= andif %}

**STEM Cells**

This video show how stem cells are a fundamental building block of how cellular organisms evolve. There are very valuable descriptions in this video about the mechanisms that are involved in this specialisation.

{%= andif %}
Helpful feedback

Effect size (Cohen’s d) = 0.49
Medium positive effect

Midterm Scores

Effect size (Cohen’s d) = 0.21
Small positive effect

Focus groups

• “It helps me to validate where I am; do I need to freak out right now?”

• “…gives you a nudge — Stop procrastinating and playing games!”

• A reminder to study “across the board” (flow-on effect)

• “The wording makes you want to do it. Like an encouragement.”
Personalised set of suggestions
Propagate actions to other platforms
• Support instructors to manage personalised feedback processes

• Simple rule-base knowledge encoding

• Provide appropriate view of data sources

• Scale to large and highly diverse cohorts

• Open-source project

• Pilots in 2018 running

• Contact us if interested

ontasklearning.org
Conclusions

- Blended Learning calls for new design approaches
- Embrace the coach role to support students
- Target decision-making processes
- Feedback is one vehicle to provide effective support
- Technology can help to explore conceptual exoskeletons
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