Development of inverse pedagogy through the implementation of a wireless response system: lessons learned from the Geomatics course

Daniel PAEZ and Luis RUBIO, Colombia

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FIG WORKING WEEK 2017

Helsinki Finland

29 May - 2 June 2017

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- The **UN-GGIM Academic Network** **will be a coalition of recognized universities, research and education centers** or equivalent involved in the research, development and training on geospatial and land information and related matters.
- The **Academic Network** **will be a platform** for the academic community to provide input and to support UN-GGIM in achieving its vision and goals by generating a platform for academic community to input to the UN-GGIM process in the form of strategic knowledge, research, education and training, and **will be a strategic arm** to empower UN-GGIM to achieve their vision and goals.
- The **Academic Network** will provide both **research and education capabilities** for UN-GGIM and affiliated members to identify and response to challenges and opportunities in which UN-GGIM and related UN offices can achieve their visions.

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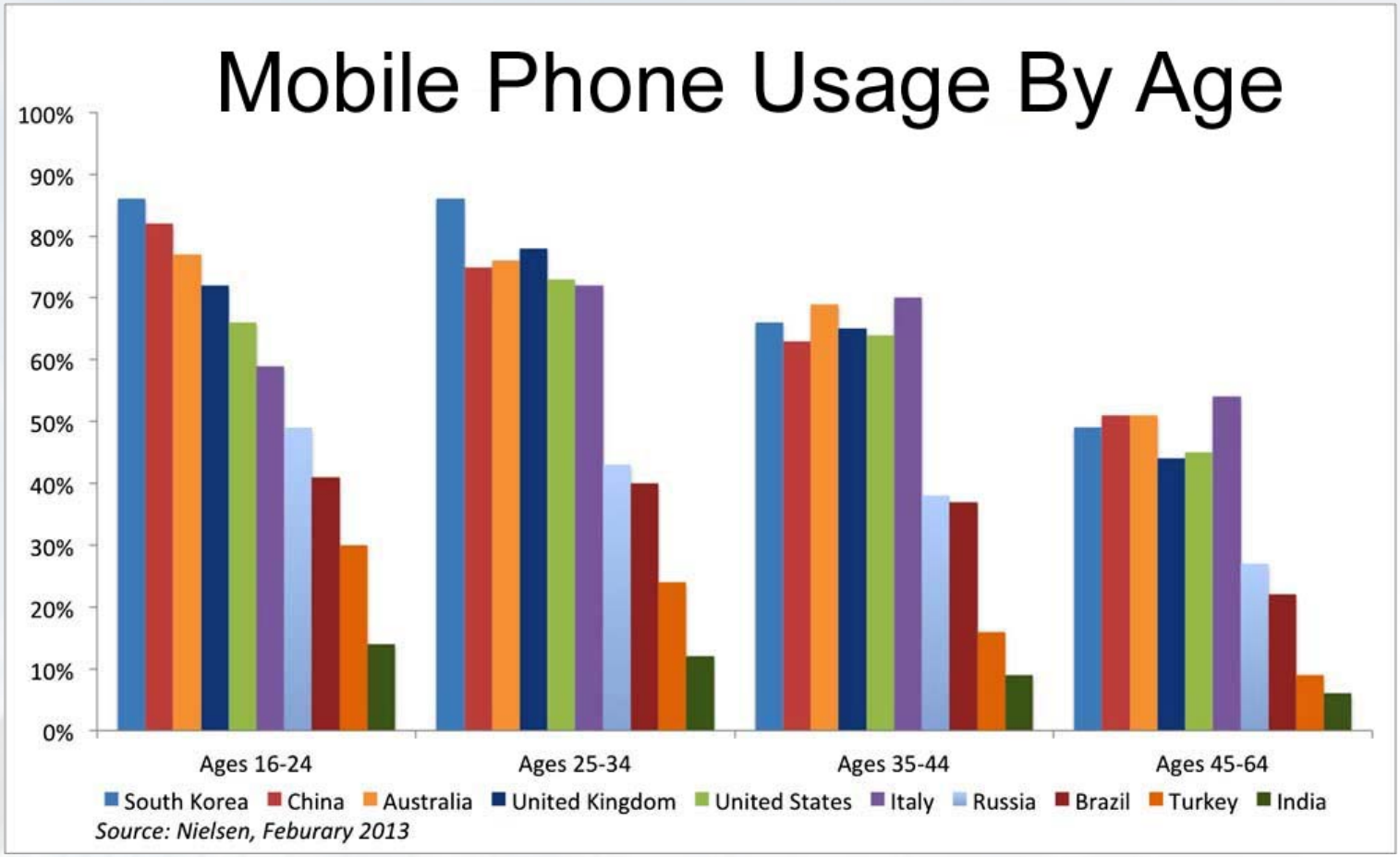
Have you seen this?


Mobile Phone Usage By Age
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Ages 16-24
Ages 25-34
Ages 35-44
Ages 45-64
South Korea
China
Australia
United Kingdom
United States
Italy
Russia
Brazil
Turkey
India
Source: Nielsen, Feburary 2013

INTRODUCTION

This article describes and evaluates **INVERSE PEDAGOGY** in two undergraduate student classes taking the Geomatics course at Universidad de los Andes.

In the case of Universidad de los Andes:

- the Geomatics course is mandatory in the Civil Engineering and Environmental Engineering curriculums
- Covers basis surveying and spatial analysis
- an average semester has 90 students in each class
- 3 lecture hours and 3 practice hours per week, for 15 weeks.

METHODOLOGY

Ensure that courses are comparable

- Size, content, instructor

Choose the tools:

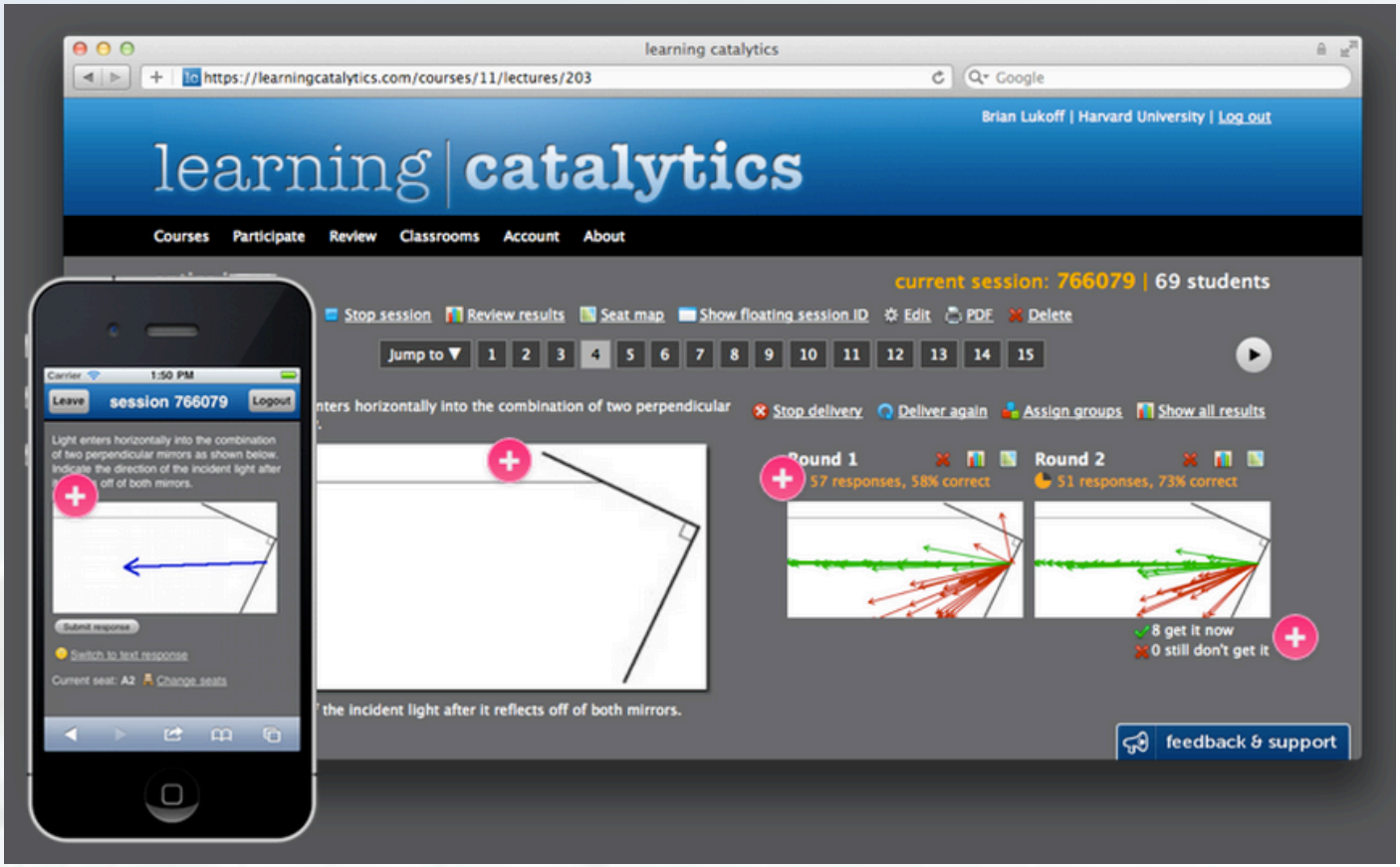
- Videos, clickers, forum

Apply a survey

- Satisfaction, interactive class, commitment, learning perception


learning catalytics
https://learningcatalytics.com/courses/11/lectures/203
Brian Lukoff | Harvard University | Log out
learning | catalytics
Courses Participate Review Classrooms Account About
current session: 766079 | 69 students
Stop session Review results Seat map Show floating session ID Edit PDF Delete
Jump to 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Stop delivery Deliver again Assign groups Show all results
Round 1
57 responses, 58% correct
Round 2
51 responses, 73% correct
8 get it now
0 still don't get it
Carrier 1:50 PM
Leave
session 766079
Logout
Light enters horizontally into the combination of two perpendicular mirrors as shown below. Indicate the direction of the incident light after
off of both mirrors.
Submit response
Switch to text response
Current seat: A2 Change seats
the incident light after it reflects off of both mirrors.
feedback & suppor

Tool used


learning catalytics
https://learningcatalytics.com/courses/11/lectures/203
Brian Lukoff | Harvard University | Log out
learning | catalytics
Courses
Participate
Review
Classrooms
Account
About
current session: 766079 | 69 students
Stop session
Review results
Seat map
Show floating session ID
Edit
PDF
Delete
Jump to
Stop delivery
Deliver again
Assign groups
Show all results
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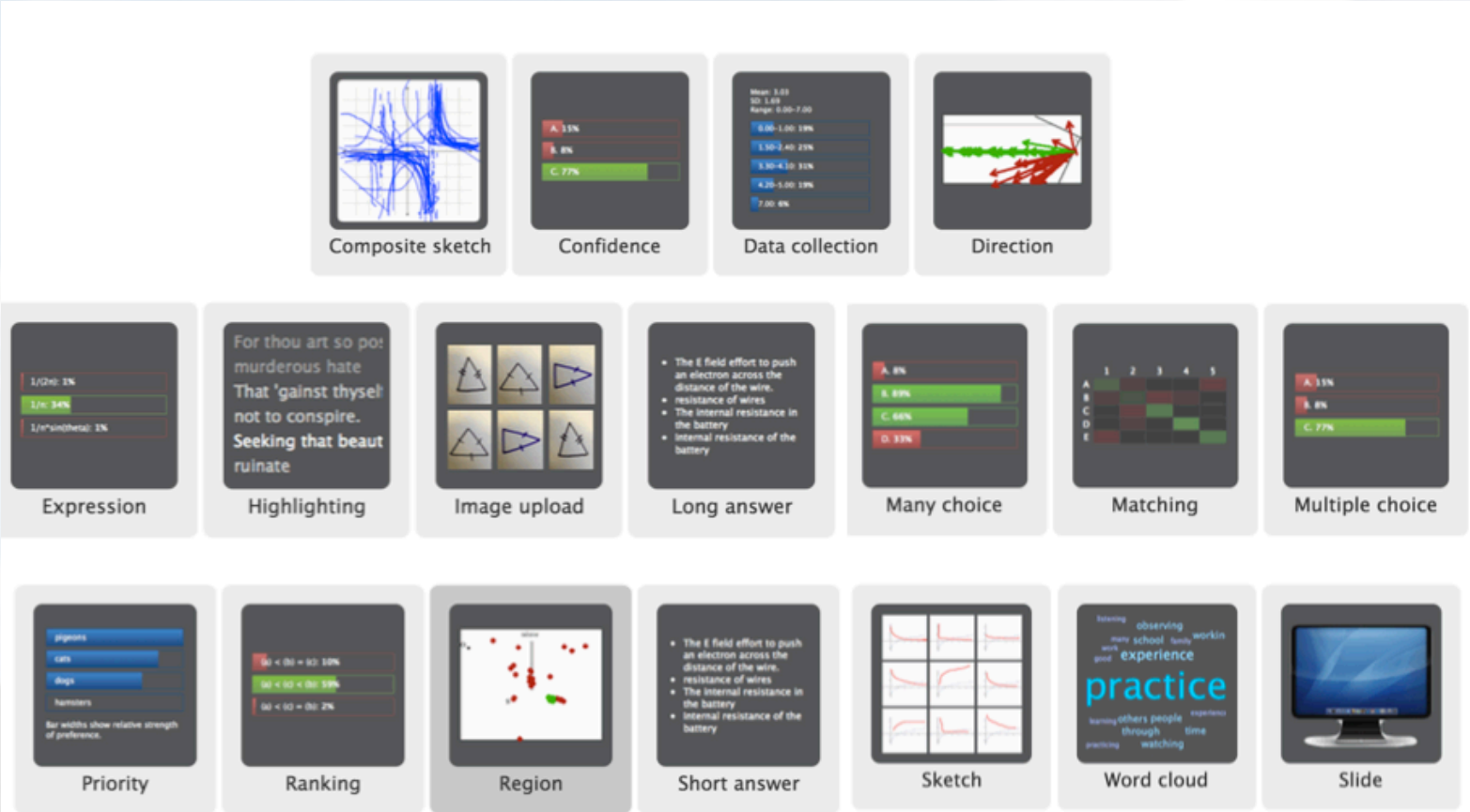
Composite sketch
Confidence
Data collection
Direction
Expression
For thou art so po
murderous hate
That 'gainst thysel
not to conspire.
Seeking that beaut
ruinate
Highlighting
Image upload
The E field effort to push an electron across the distance of the wire.
resistance of wires
The internal resistance in the battery
internal resistance of the battery
Long answer
Many choice
Matching
Multiple choice
Priority
Ranking
Region
The E field effort to push an electron across the distance of the wire.
resistance of wires
The internal resistance in the battery
internal resistance of the battery
Short answer
Sketch
observing
school
experience
practice
others
people
through
time
watching
Word cloud
Slide

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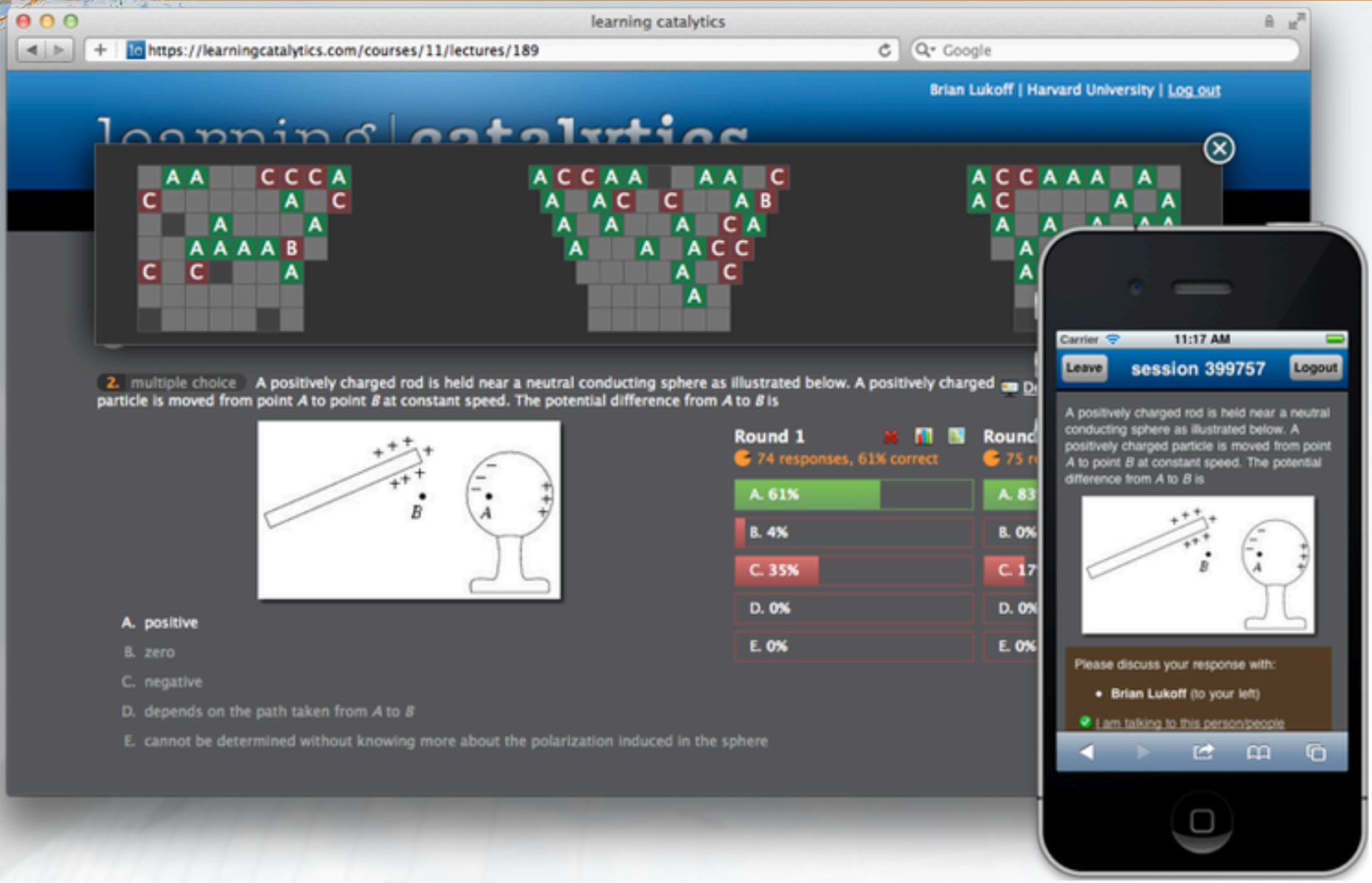

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SURVEY

The survey given to the students asked about specific learning activities. These were based on prior experiences from literature (Conole, 2007; Marcelo, Yot & al., 2014), and covered aspects such as: satisfaction, interactive class, commitment and learning perception.

As strategies to isolate the effects of the use of virtualization and clickers, the following was considered:

- The contents or class themes to be covered should be exactly the same in both sections.
- Tests, as well as their weight in the students' final scores also had to be exactly the same.
- Tests were administered at the same time and under the same conditions for both groups.
- Students in each section were not aware of the differences in the pedagogies used.

RESULTS

Exam #	Section A	Section B
Exam 1	3.12	3.07
Exam 2	3.67	3.65
Exam 3	3.08	3.50

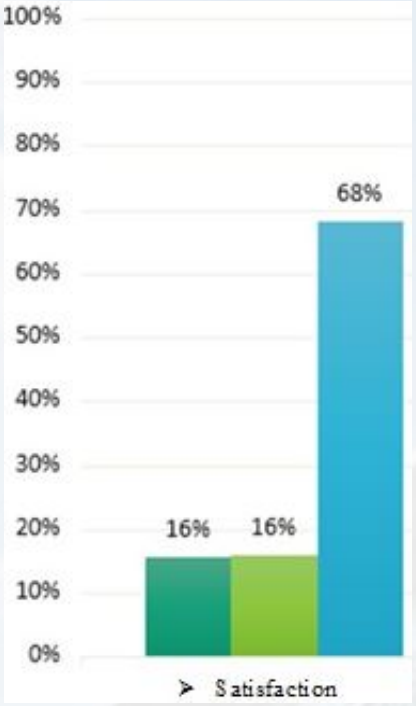
Take-outs: not direct correlation with exam results

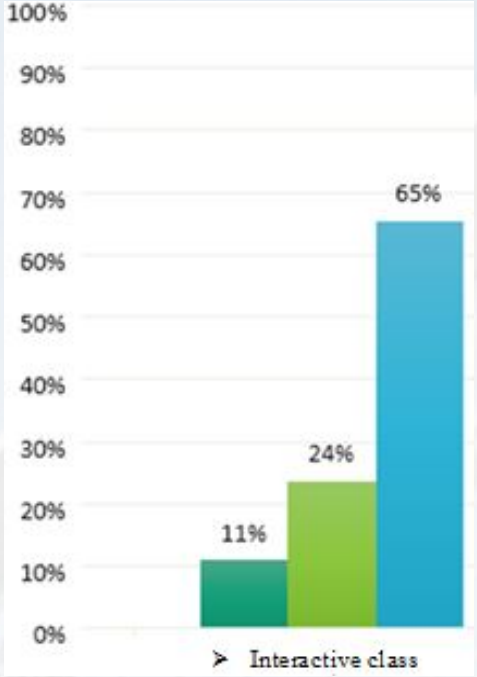
However, the performance of those students who used the Learning Catalitycs tool throughout the semester displayed a

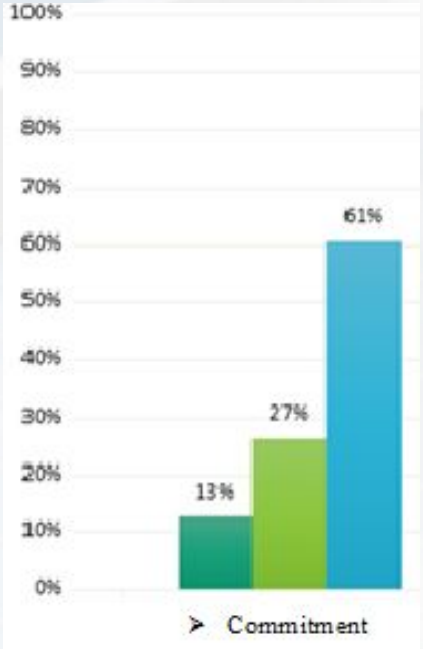
15% improvement

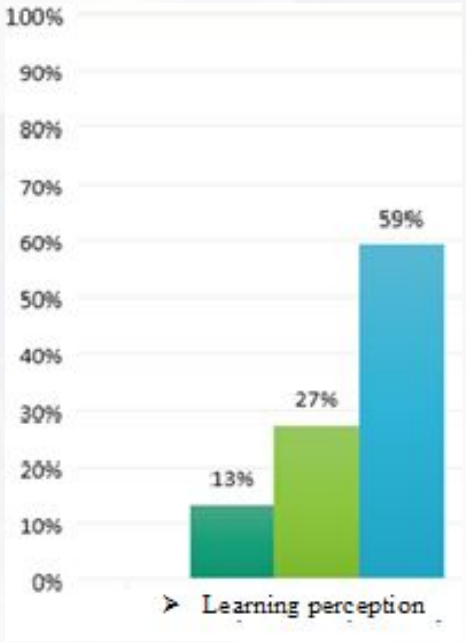
when compared to those who did not use it.

Results from the surveys (only those using tools)

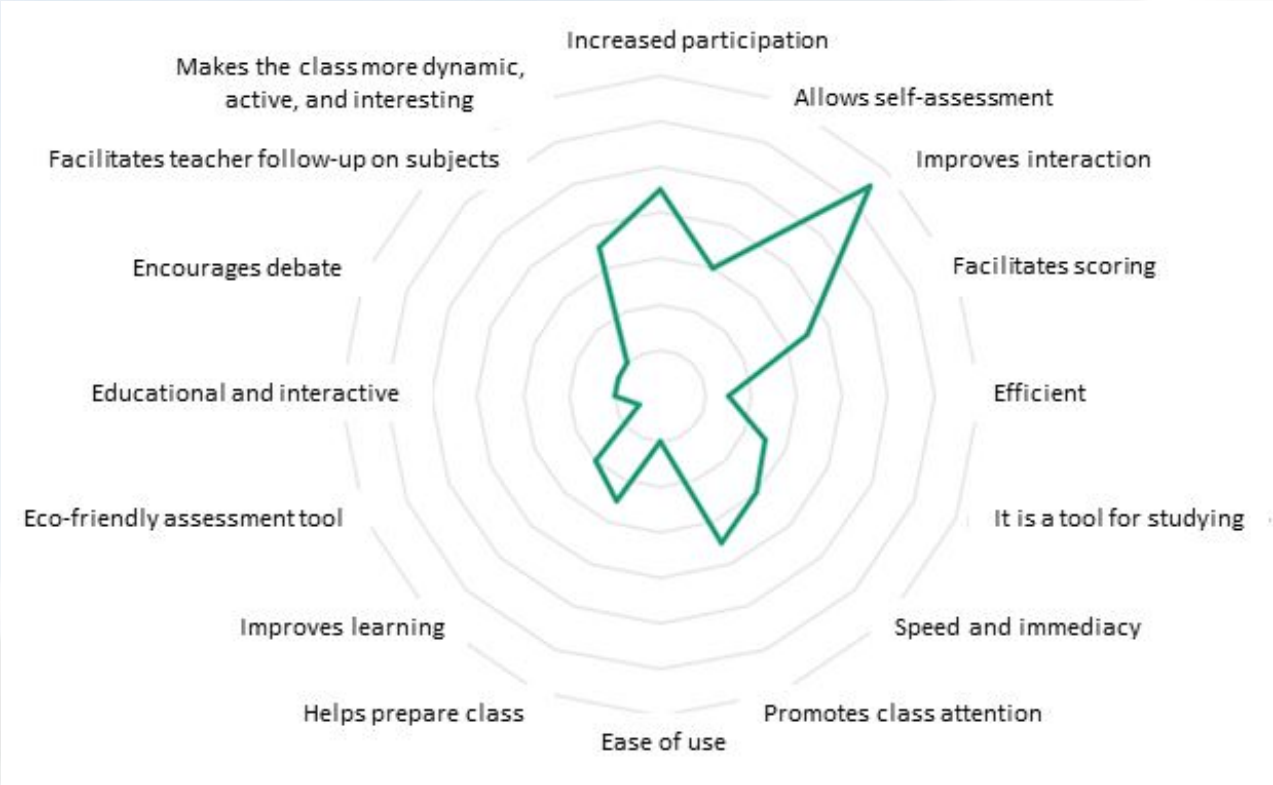






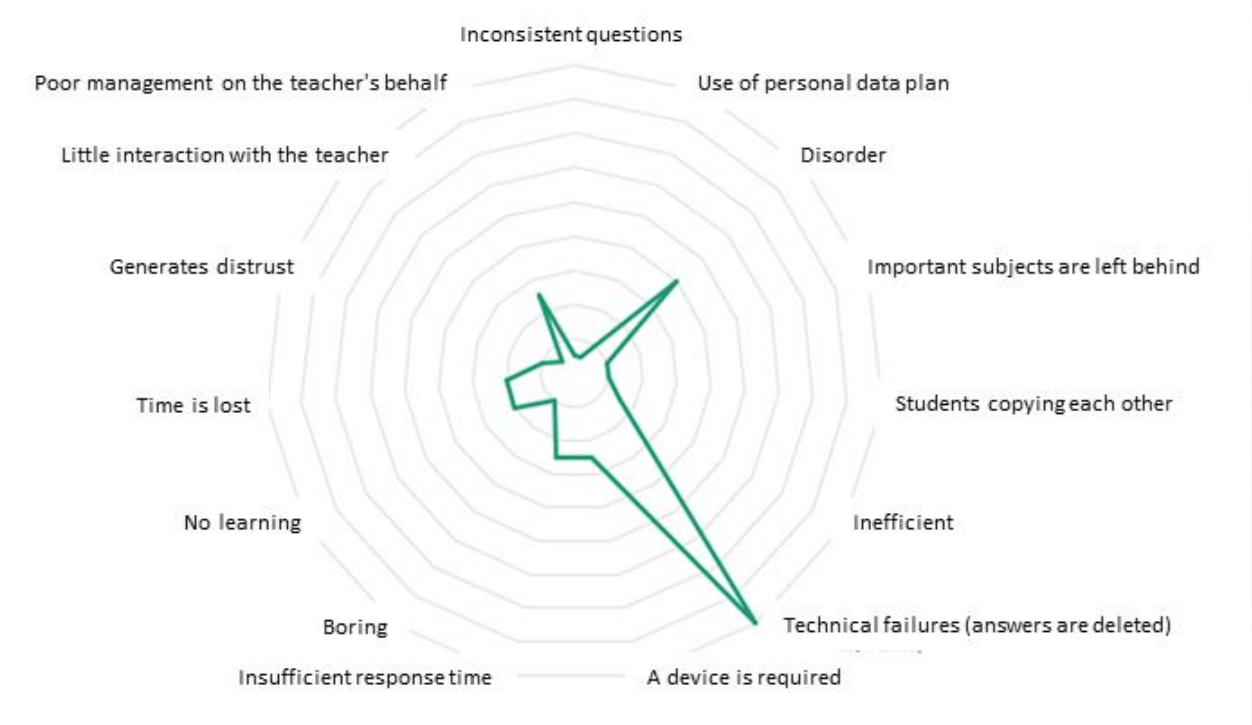


RESULTS



Perceived strengths

RESULTS



Disadvantages

CONCLUSIONS

The study shows that the use of TC tools enables self-learning and promotes interactivity with the teacher in large sized classes. Likewise, Learning Catalytics is a user friendly tool that enables variety and a wealth of learning activities that few tools offer.

In order to use the Learning Catalytics, preparation is required regarding the questions that may contribute, to a larger extent, to a learning environment, in the short time that they are applied. Logistical challenges are inevitable when performing trials; however, once they are solved, it contributes to a reverse pedagogy.

Even though the tool does not generate a significant increase in test scores, it has many other positive effects such as: interaction with the teacher, increase in class engagement, and greater participation.

THANKS