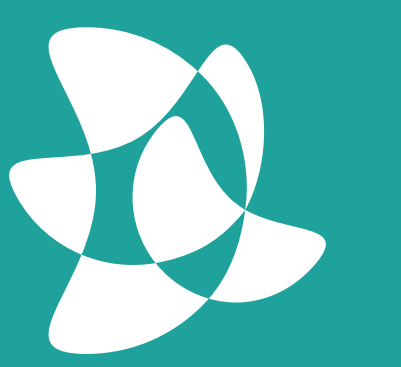


Towards the Education of the Future: Challenges and Opportunities, for AI?



Plan Ceibal

F. Haim, A. Zucchetti, C. Aguerrebere, M.C. Piana, F. Nahmias, C. Bisogno, C. Marconi, E. Lev, G. Capdehourat, F. Bascans, F. Frommel

Plan Ceibal, Avda. Italia 6201, Edificio Los Ceibos, 11500, Montevideo, Uruguay. Contact: fhaim@ceibal.edu.uy, azucchetti@ceibal.edu.uy

Abstract

As in other verticals, the application of data science to education opens up new possibilities. An example is the growing research community in learning analytics. Different goals, such as looking for tools for a more personalized education and the detection of particular difficulties at early ages, are relevant challenges that are being addressed in the area. Furthermore, the creation of Ceibal Foundation in 2014, represents an opportunity to foster the development of research and scientific evidence for education and technology. In this context, we present the case of Plan Ceibal, an institution that assists the education system in Uruguay, providing technological solutions for the support of education.

Ceibal Foundation

- Creating international academic and scientific networks with research centers, governments, universities and experts.
- Capacity building and knowledge transfer initiatives.
- Participation in international research studies.
- Fund Digital inclusion (since 2015 promotes international research).

Website: <https://www.fundacionceibal.edu.uy>

Publications: <https://digital.fundacionceibal.edu.uy/jspui/>

Committee for the Use of Data in Education

Created in August 2018, led by Ceibal Foundation. 3 working groups (30 experts from 15 institutions): AI and algorithmic governance; transparency responsibility of educational institutions; individual society relationship with technology.

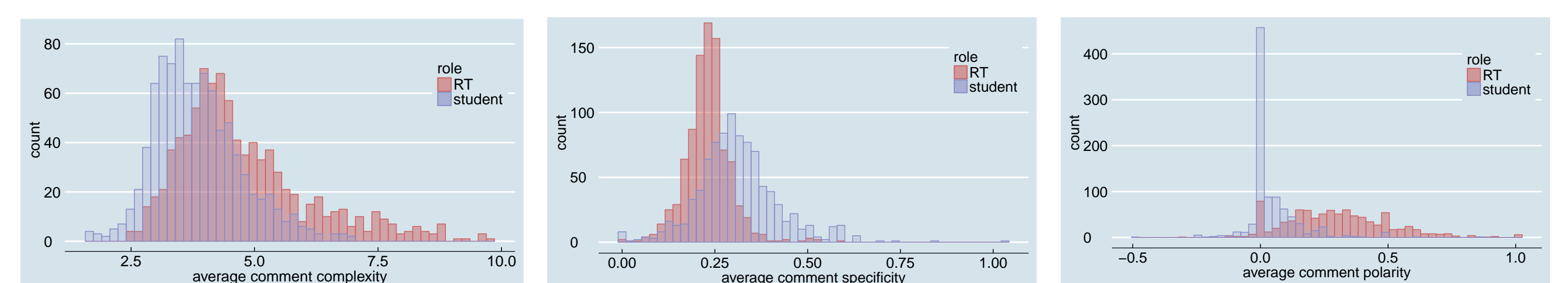
- Moving beyond privacy, data protection and data management.
- Towards a digital ethical governance for education.
- Identifying, assessing and providing recommendations on the ethical challenges related to the use of data for education.
- Promoting the exchange, capacity building and knowledge transfer in digital ethics.

Data Sources

Source	Dimension	Variables
Ceibal core Information system	User's Socio-demographic features	Age Gender Socio-cultural context Location
	Physical Infrastructure	Internet access Device ID Model - laptop Date delivered
	Support service	Ticket Tracking Date of Failure Type of Failure
Monitoring and performance of IT infrastructure	Performance analysis of IT schools infrastructure	Internet traffic VC traffic # Client connections Network availability Connectivity Hardware
	School Servers Logs	Individual internet activities
Tracker System	Computer usage	Time of usage Operating system Applications Number of users
Learning Management System	Performance	Comments posted Submissions Active Users Files Uploaded IP Address
On-line Evaluation	Learning	English Adaptive Test
Ceibal's Math Adaptive Platform	Performance	Exercises completed Topic Success rate Time of usage Autonomous work
Teaching English	Assignment teachers	Institute Remote teachers Class Videos

Online Teachers Feedback

Contribute to the understanding of how teacher feedback influences students' behavior in the online learning management system created for secondary school students who attend the public school system in Uruguay to complement English teaching as a second language.



Data: 27,627 comments / 1074 students / 83 classrooms / 49 public high schools / 18 different states in the country / 35 Remote Teachers.

Remote Teacher Assignment

Assign "most effective" English language remote teachers to groups of 4th to 6th primary students with below average performance in critical socio-cultural quintiles.

Remote teachers effectiveness was estimated based on value-added models built with computerized adaptive test results.

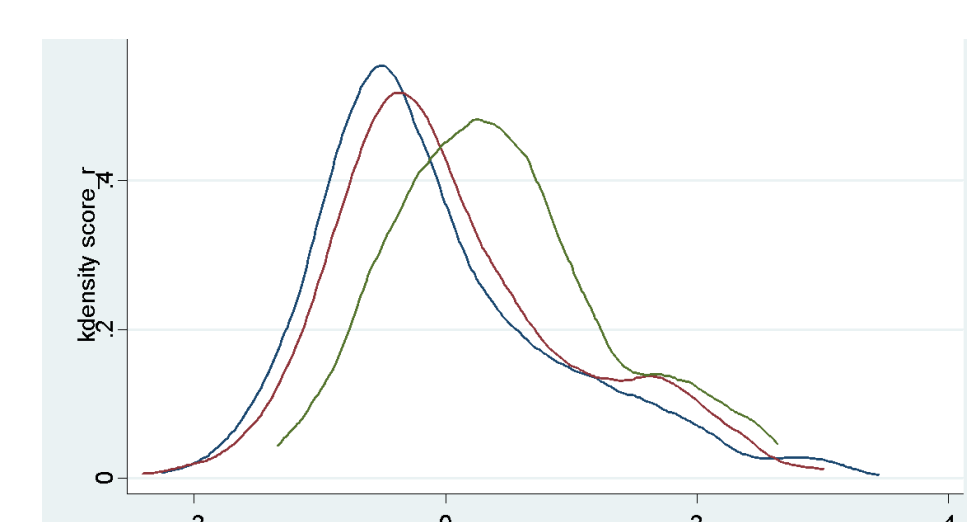
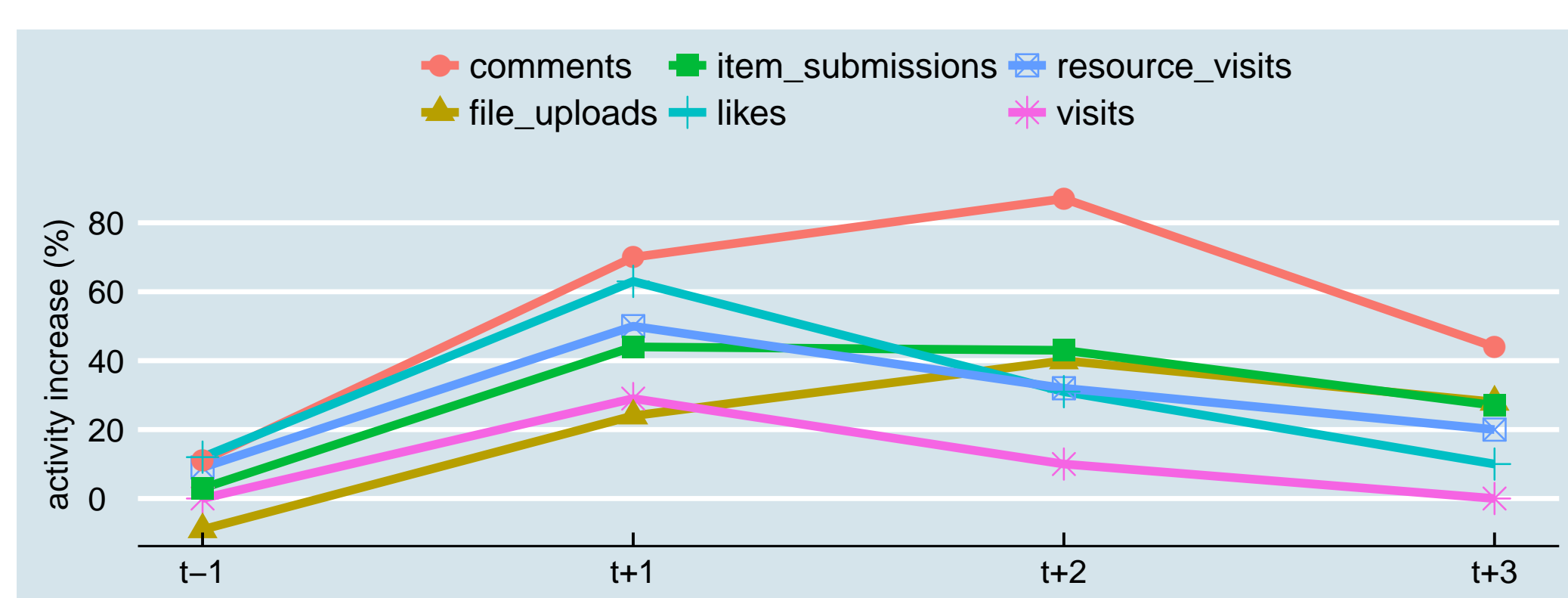


Figure shows Test Score Distributions in the following cases:
 Students with no remote teacher.
 Students with a remote teacher assigned.
 Students with an effective remote teacher assigned.

New Device Deployment Effect

Analyze the effect of new device deployment on students' online learning activity (LMS and Math ITS).



Future Work

Automatic text corrections / Dropout prediction / Bullying detection / Audio class transcription / Teach AI concepts through Plan Ceibal

The ways of learning are very diverse and it is important to be able to understand what each one implies and its impact on those involved. We believe AI is a tool that presents a lot of potential to address this issue.

User Behaviour in Biblioteca Ceibal

<https://bibliotecadigital.ceibal.edu.uy>

Platform which gives access to 5.000 resources (ebooks, audio, video) with different access levels according to different user profiles. Resources can be downloaded or view online. Spread to all the country since December 2018.

Study user behaviour and resource usage in order to determine best platform performance.

