



INTERNATIONAL
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DISTANCE EDUCATION



Educational Data Mining to promote active methodologies: analysis of learning patterns in Syphilis courses at AVASUS

Arthur Henrique Garcia Rêgo
researcher at LAIS/UFRN
Brazil



Introduction

- E-Learning in Brazil
 - Increase of 500 times (students and enrollments)
- Growth reasons
 - Information and Communication Technologies (ICT)
 - The Internet
 - Learning Management System (LMS)

Introduction

"data from the Statistical Synopsis of Higher Education, produced by the National Institute of Educational Studies and Research (INEP abbreviation in Portuguese), which show that between the years 2000 and 2005 the e-learning increased from 5,287 admissions to 127,014, reaching 431,597 in 2011 and 515,405 in 2013"

Introduction

- E-Learning expansion
 - Not only higher education
 - Technical areas
 - Training
 - LMS Modernization
 - New elements
 - New methodologies
 - AI
- Not just virtual interaction and content availability tools, but analysis and mining of large data to understand the forms of teaching and learning

Introduction

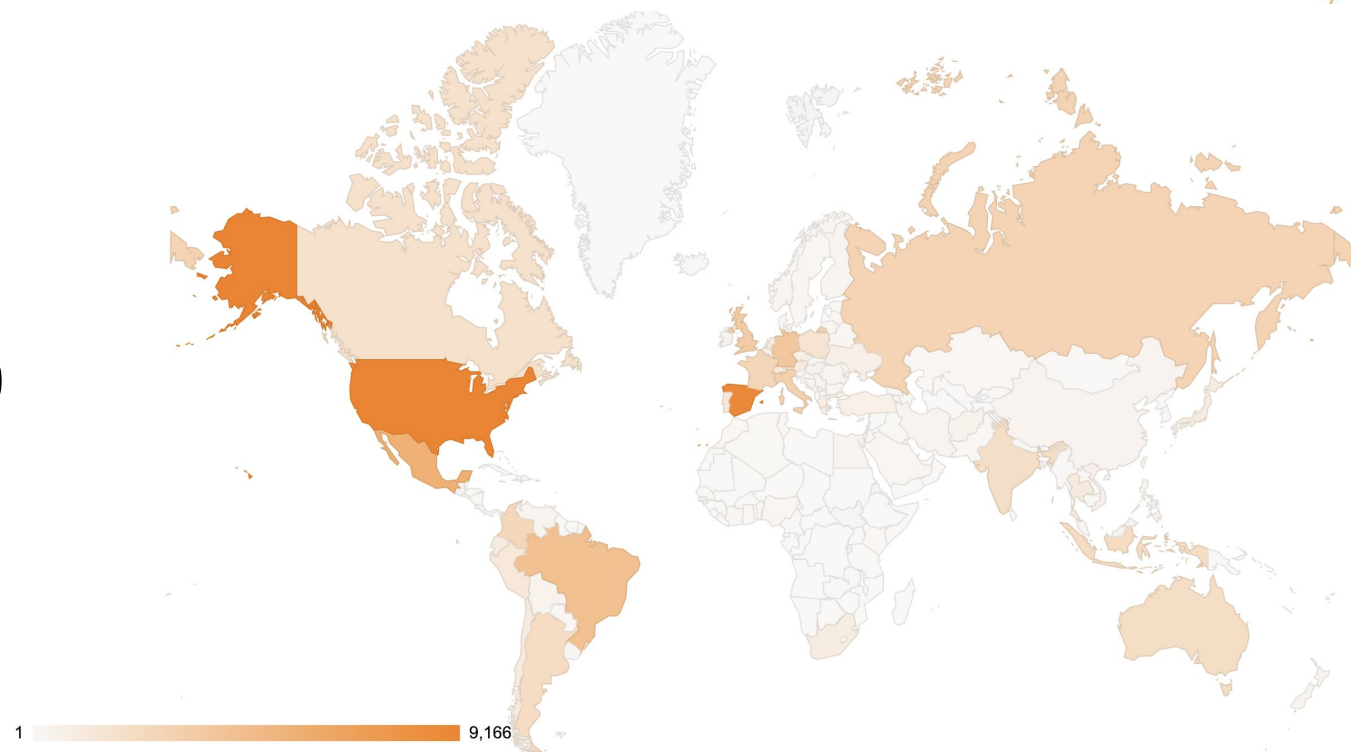
- The Federal University of Rio Grande do Norte (UFRN abbreviation in Portuguese) and the Distance Education Secretary (SEDIS abbreviation in Portuguese)
 - At the forefront of e-learning in Brazil (since 2003)
 - Undergraduate and postgraduate courses
 - Emphasis on Human, Exact and Biological Sciences
- The Laboratory of Technological Innovation in Health (LAIS abbreviation in Portuguese)
 - The partnership between LAIS and SEDIS/UFRN resulted in creation of AVASUS

The AVASUS

- Built based on Moodle
 - One of the most popular LMS in the world
- Why Moodle?
 - Modular
 - Open source (GNU General Public License)
 - Great scalability
 - a few users to millions

Moodle in numbers

- Sites 106,173
- Courses 19,000,000
- Users 164,000,000
- Enrolments 756,921,990
- Countries 232



<https://stats.moodle.org/>

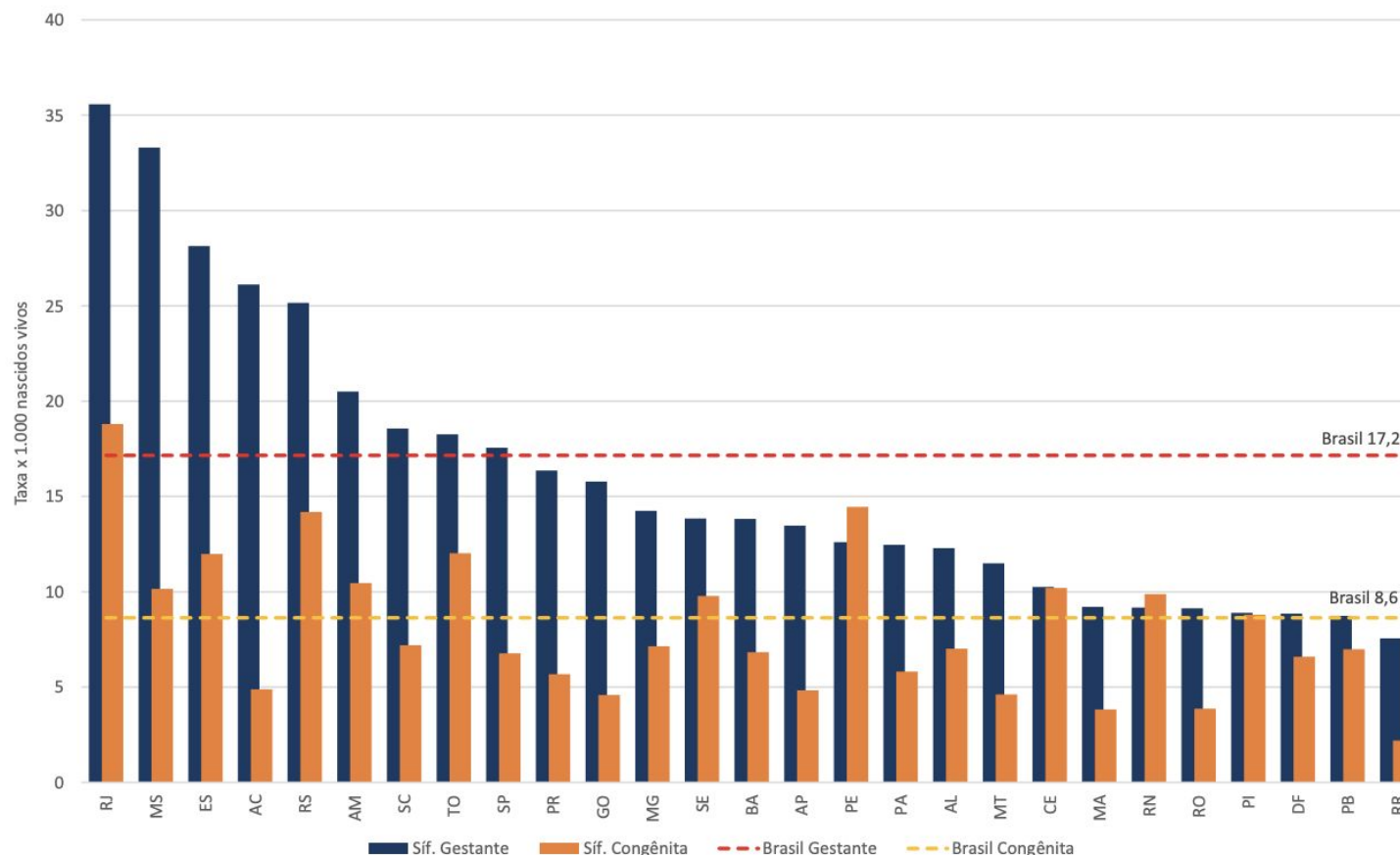
The AVASUS in numbers

- Currently in version 2.0
 - A new version is coming
- More than 416,000 registered users
- 192 active courses
- The number of enrollments are close to reach 900,000
- More than 400,000 certificates issued
- Serving all 27 states in Brazil

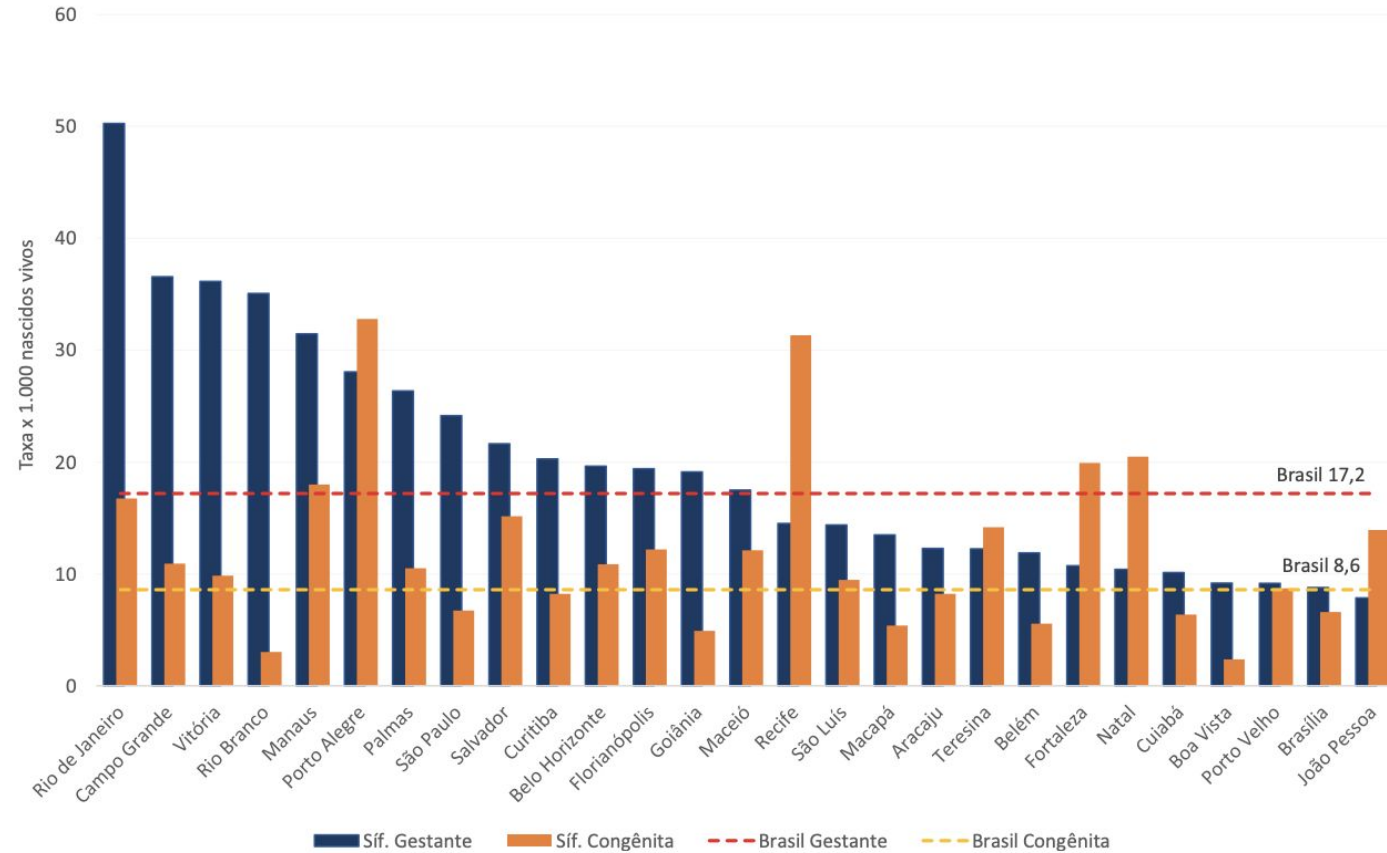
"Sífilis Não!"

- Why is this project important?
 - Has shown an increase of approximately 5,000% in their cases
 - Extremely high transmissibility data
 - Overcoming many other types of epidemics
 - Overloads the public health system
 - Increase in pregnant women
 - Increase in congenital syphilis

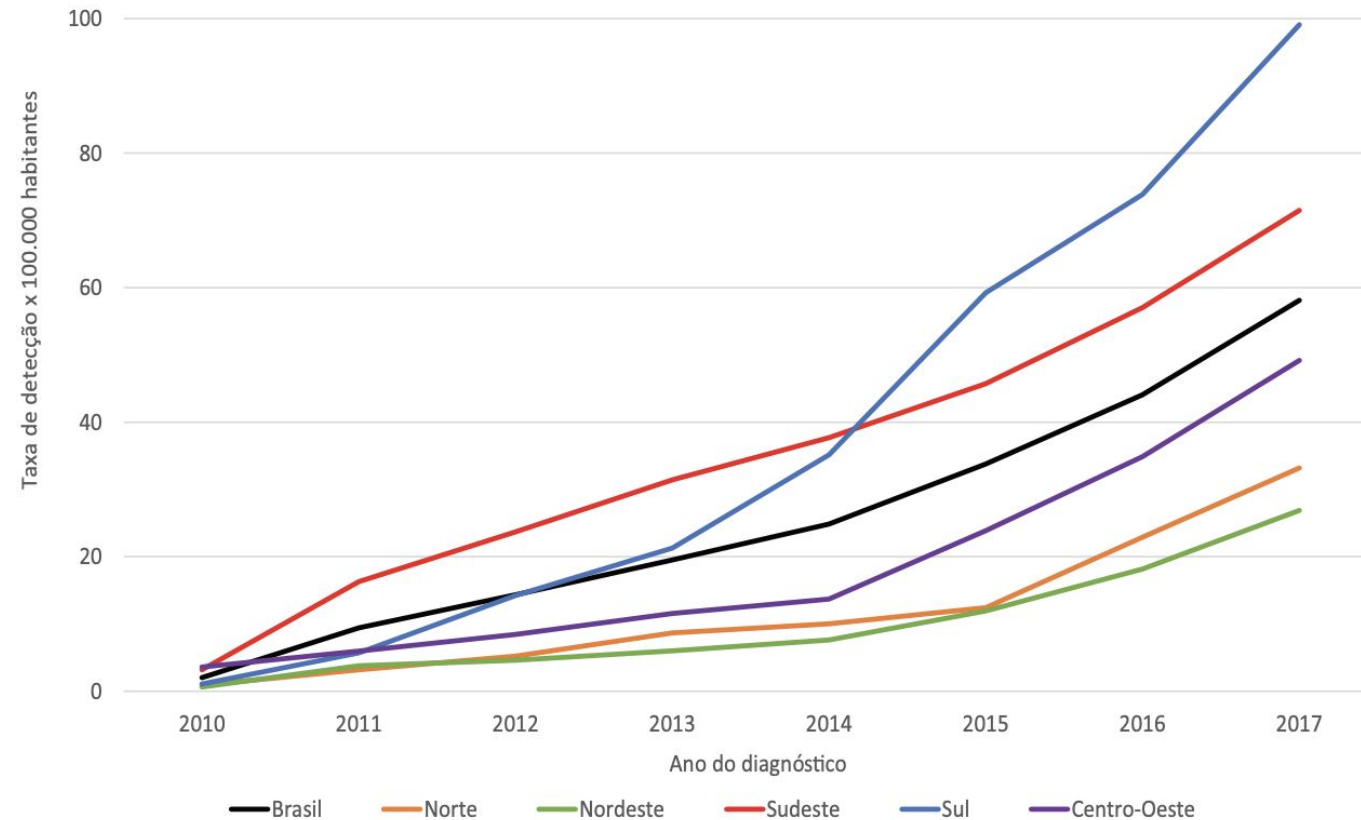
Rates of congenital syphilis by State (2017)



Growth rate of congenital syphilis compared to maternal syphilis by State (2017)



Growth rate of all types of syphilis in Brazil since 2010



Syphilis combat by courses

- Strong health strategy to support health professionals to fight against sexually transmitted diseases with a focus on prevention, treatment and knowledge about the disease, and transmission
- Project of training, development and follow-up of courses directly related to the general proposal to combat syphilis

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INFORMATION!

Syphilis combat by courses

- Currently 7 courses focused on or related to Syphilis
- **Primary Health Care, Family Health Strategy and Territorialization**
 - 30-hour workload
 - 1501 enrolled students
 - Addresses the work process in family health care, reflecting on the process of territorialization, bonding, coordination of care, and the attached population
- **National LGBT Comprehensive Health Policy**
 - 45-hour workload
 - 5201 students enrolled
 - Organized in a partnership between the Ministry of Health and the State University of Rio de Janeiro through the UNA-SUS, contributing with health professionals and SUS workers to carry out their care, promotion and prevention actions with quality, guaranteeing the LGBT population access to integral health

Syphilis combat by courses

- **Expanded Clinic and Matrix Support**

- 30-hour workload
- 7104 students enrolled
- Discuss the expanded conception of health and also its organization of the work process, together with clinical management tools, as well as the concept of Matrix Support and its application by the teams of the Family Health Support Centers and the Support Centers Psychosocial, in addition to the concept of Unique Therapeutic Project

- **Observation in the Health Unit**

- 30-hour workload
- 649 students enrolled
- In it is presented to the student how the Health Unit works in the organizational structure of the Unified Health System, SUS

Syphilis combat by courses

- **Syphilis: Have a seat here comes information!**
 - 5-hour workload
 - 821 students enrolled
 - It is a module that brings together the ten episodes of the web series "Senta que lá vem informação!" Produced for the Sífilis Não Project. There are interviews and conversations that present information about Syphilis, as well as the correct way to diagnose and treat it
- **The care of people with HIV/AIDS in Primary Care**
 - 120-hour
 - 8527 students enrolled
 - Designed to train health professionals from the basic network for shared care of people living with HIV/AIDS, focusing on Primary Care, linking it to other points of attention of the SUS network

Syphilis combat by courses

- **A Virtual Visit to the 2nd International Conference on Health Innovation**
 - 45-hour workload
 - 170 students enrolled
 - Highlights the debates held at the 2nd International Conference on Health Innovation promoted by the LAIS, focused on the evolution and modernization of solutions for health systems and combating diseases and endemics, such as the problem of syphilis, and thereby promote the reduction of costs and investments both at the national and global levels
- In all these courses the entries are continuous and without specific calendar
- In addition, students do not have specific deadline to finish the courses and their workload has no daily limit, nor monthly, only full term

Syphilis combat by courses

- Enrollments and completions from Syphilis area's courses (June 2019)

Course	Enrollments	Completed
A Virtual Visit to the 2nd International Conference on Health Innovation	249	80
The care of people with HIV/AIDS in Primary Care	8,616	4,559
Syphilis: Have a seat here comes information!	930	513
Observation in the Health Unit	658	356
Expanded Clinic and Matrix Support	7,123	3,941
National LGBT Comprehensive Health Policy	5,232	3,075
Primary Health Care, Family Health Strategy and Territorialization	1,595	850
Total	24,403	13,374

AVASUS and Learning trails

- Analyze and customize the journey of each student
- Interpret
 - Individually the course
 - The difficulties
 - The habits of studies
- Educator
 - Take pedagogical decisions
 - New practices
 - Measuring the impact of pedagogical changes

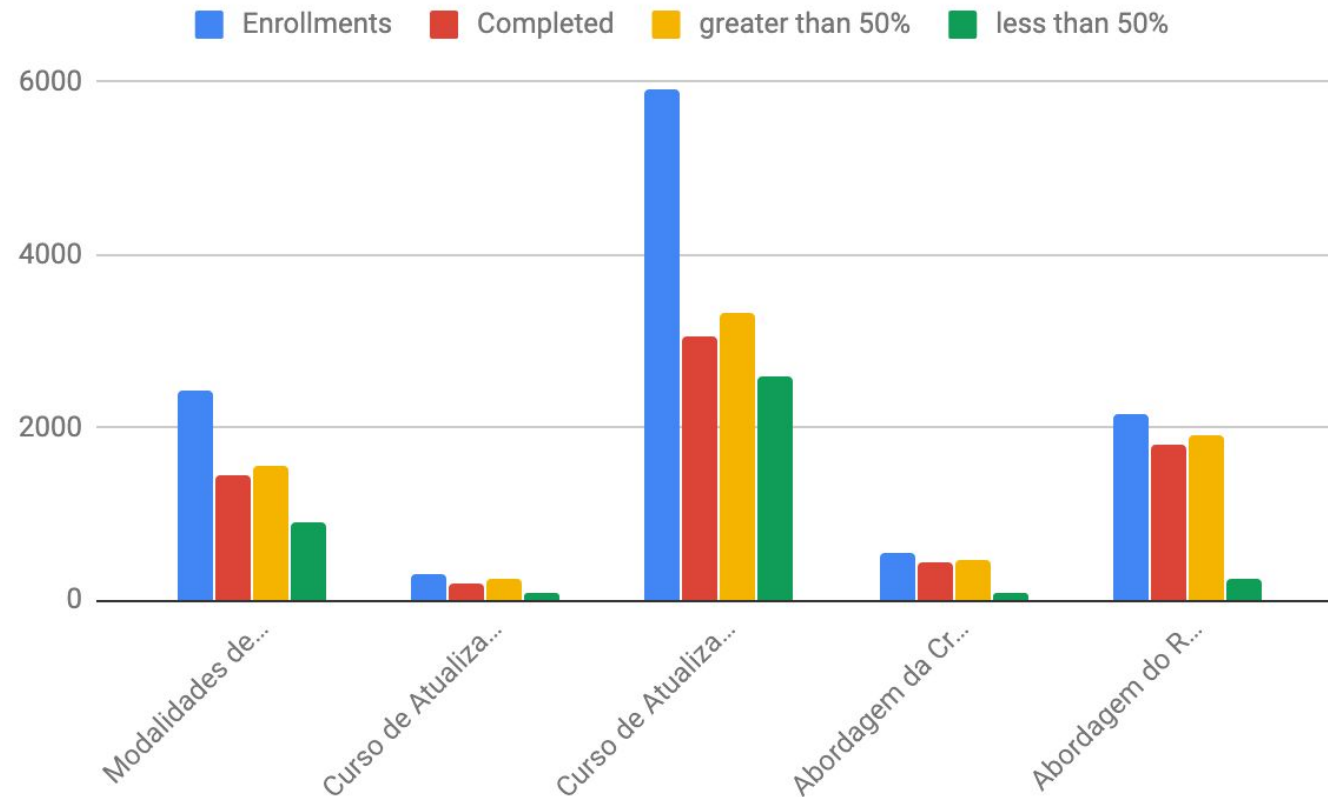
AVASUS and Learning trails

- First intervention
- Change the Moodle API (Application Programming Interface)
 - Deployment of the new functionalities
 - Creation of activity modules
 - Validation of forms
 - Assignment of values to environment constants
 - Adapting the local library
 - Change and create queries
 - Adaptation of SQL queries

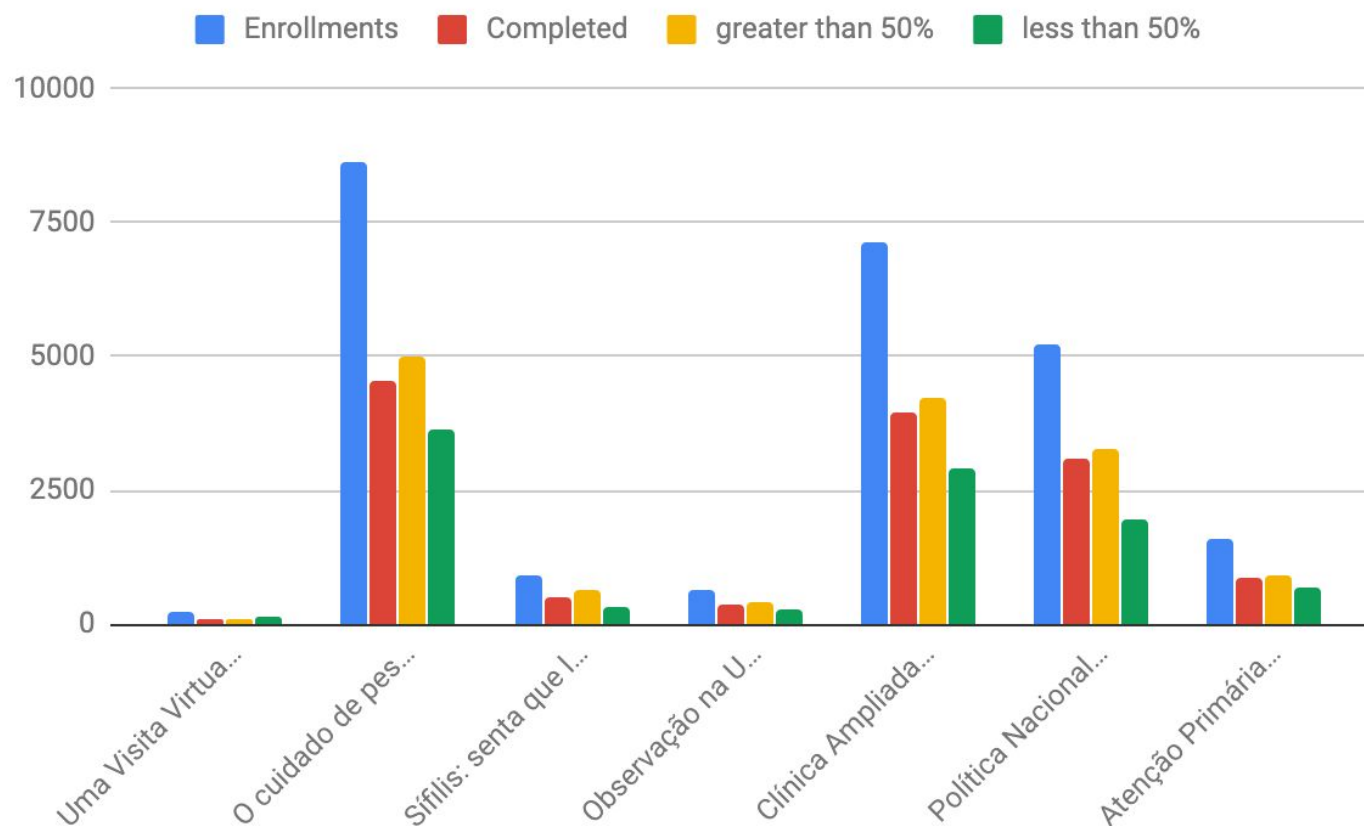
AVASUS and Learning trails

- For this study we considered two blocks of courses
- Block 1
 - Courses that are not within the block of courses to combat syphilis
- Block 2
 - Courses to combat syphilis or related
- Objective
 - Monitor, recognize and analyze the learning difficulty data of students in block 1
 - Change the media and the profile of the courses for students in block 2
 - Analyze the results of improvements
- Understand which improvements have direct influence on learning profiles and not

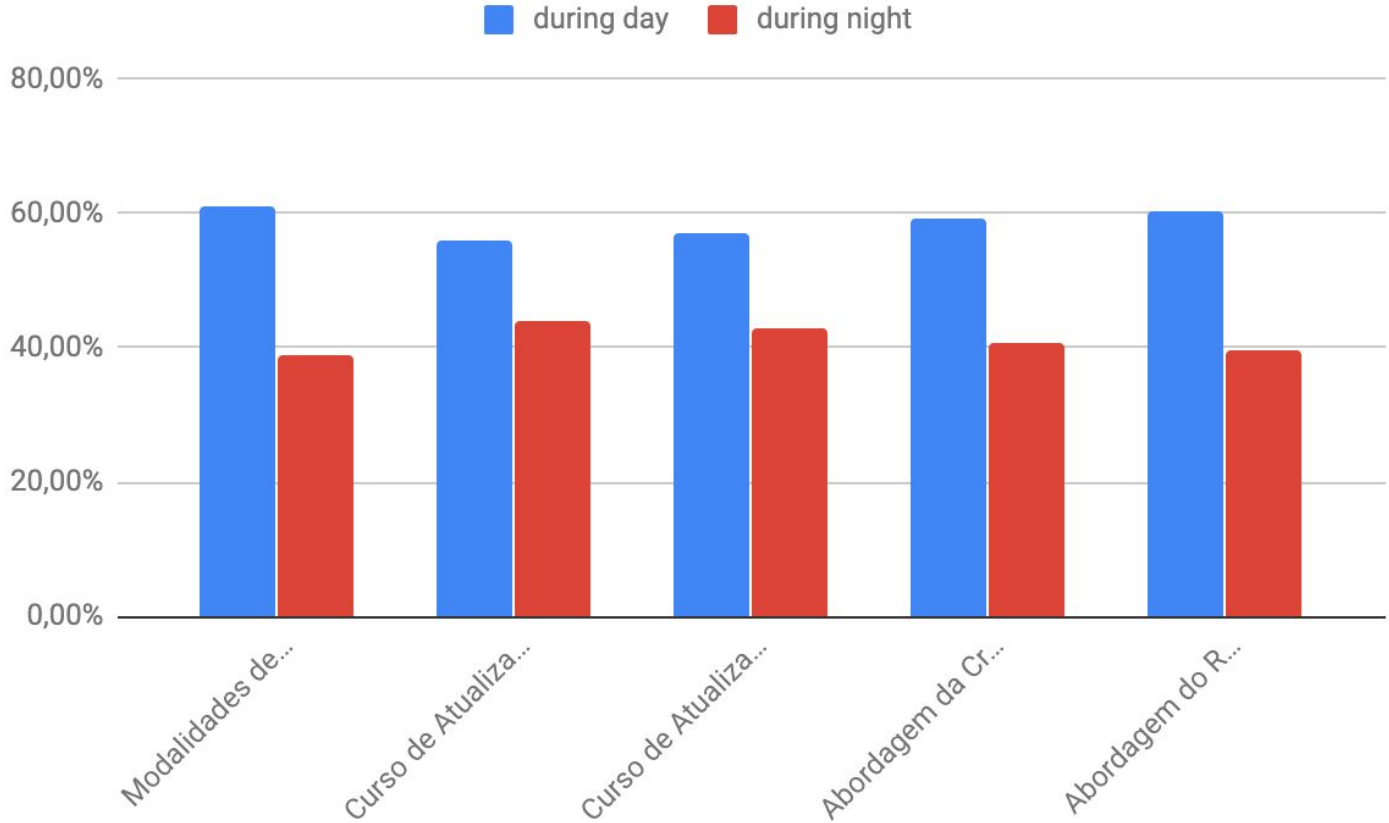
Enrollments and Completion



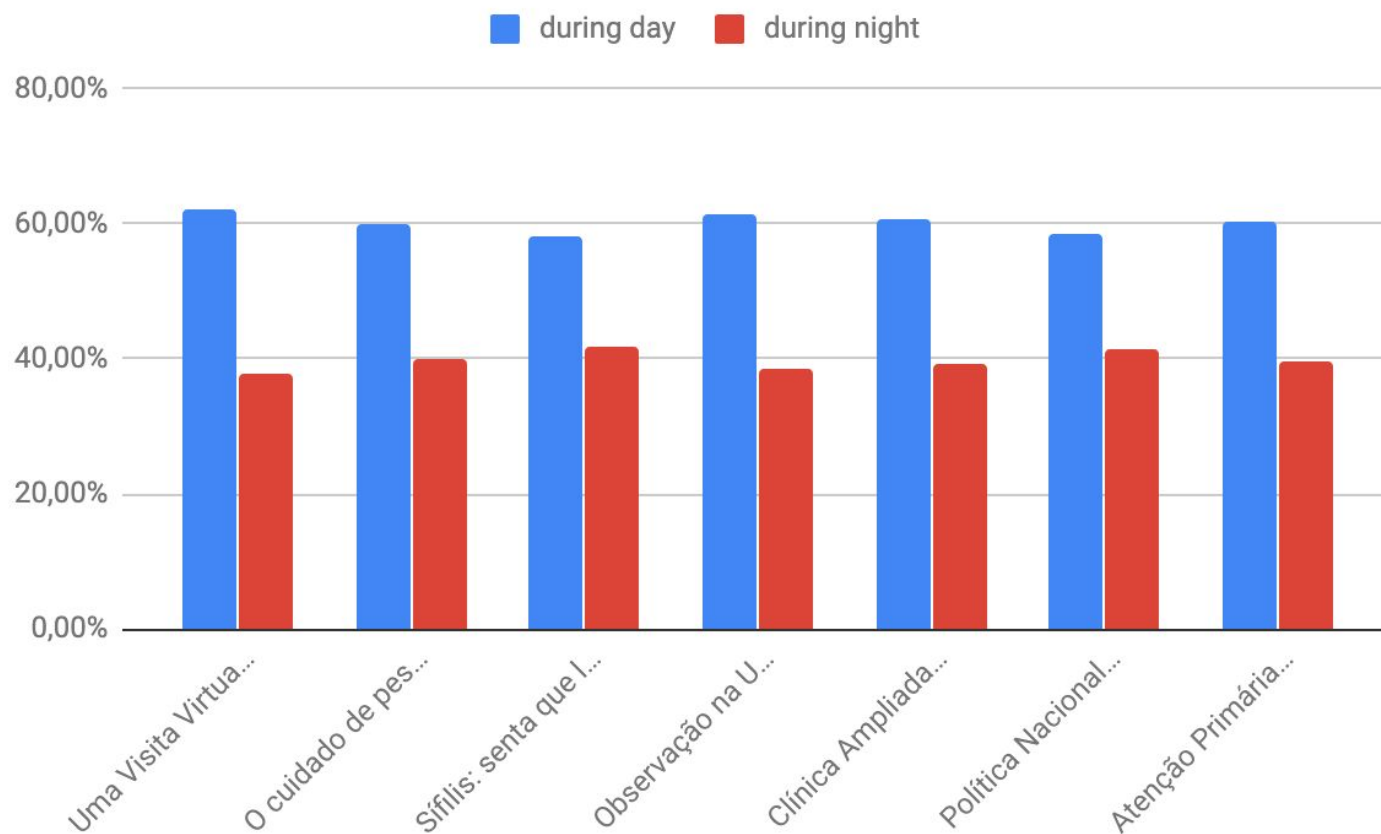
Enrollments and Completion



Access



Access



Results

- More than 24 thousand students analyzed
- More parameters analyzed as content types (video, forum, text...)
- Faster conclusion in Block 2
 - The average completion from the courses from the block 2 was 8,72 days while in the block 1 was 30 days, even with less hours and content.
 - Even in courses with more content, but based on indicative content by profile
 - material diversity
 - Without diversity less access and interruption increasing the average completion time
 - Block 1 worst case was more than 100 days for some scenarios, whereas in block 2 the largest time was 28 days

Thank you!

 arthur.rego@lais.huol.ufrn.br

 [in/arthurhenriquerego](https://www.linkedin.com/in/arthurhenriquerego)

