

INATEL's experience on remote training and future challenges

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Santa Rita do Sapucaí

Located in the Southern region of Minas Gerais, Brazil and known as the Electronics Valley, it is a city of 45,000 inhabitants that stands out in:

- First technical level electronics school in Latin America (ETE FMC);
- First engineering college in Brazil to offer a higher education course in Telecommunications (INATEL);
- Electronic Industry;
- Agribusiness;
- Eco-tourism;
- Religious tourism.



Santa Rita do Sapucaí – Electronics Valley

The region provides an environment conducive to the development of innovative businesses, with a strong network of educational institutions such as universities and technical schools that produce skilled labor for the technology industry:

- 160+ Technology-based companies;
- Over 14,500 manufactured items;
- Over 14,000 jobs;
- Annual revenue of 1.5 billion Brazilian reais;
- Global scope.

INATEL

The first engineering college in Brazil to offer a Telecommunications degree, which is considered one of the most traditional and respected in the country. Inatel has graduated many qualified professionals who have contributed to the development of the telecommunications industry in Brazil and abroad.

- Electrical engineering
- Computer engineering
- Telecommunication engineering
- Control and Automation Engineering
- Production engineering
- Software Engineering
- Biomedical engineering
- Specialization courses (lato sensu)
- Master's and Doctoral degrees in Telecommunications
- MBA in Management
- Continuing Education
 - Consultancy
 - Cooperation for technical analysis and discussions, advice and research, focusing on problem-solving or investment direction.
 - Training
 - Application of technical training, both EaD or In- Company, customization of content to optimize results.

The Pandemic Challenge

During 2020, Inatel faced the pandemic challenge: offering all its courses and activities online. Various actions were taken, including:

- All synchronous and recorded remote classes
 - Mandatory frequency control;
 - Course support material;
 - Organized and standardized repository (Teams Platform);
 - Required content review;
 - Teacher must appear on video in all classes, to increase contact with students.
- Vary/alternate methods in classes
 - Don't just do remote expository classes;
 - Seek active participation from students;
 - Support from the New Methods department.

The Pandemic Challenge

During 2020, Inatel faced the pandemic challenge: offering all its courses and activities online. Various actions were taken, including:

- Assessments Synchronous tests and on the test schedule
 - Remote assessments using the Teams Platform;
 - 1h40min for the test + 20min to send it to the professor;
 - Internet Access problems - ask for a new test;
- Standardize the way students send tests
 - Use Teams Platform;
 - Using CamScanner;
- How to stop cheating on the assessments?
 - Assessments with defined time and duration (synchronous) with teacher supervision;
 - Use of tools to vary questions. If it is objective, it can shuffle alternatives;
 - Tests in which students cannot find ready-made solutions on the Internet;
 - Ask for explanations and justifications when feasible and applicable.

INATEL On Line

The Inatel Online platform was launched in 2020 to serve individuals and companies that seek knowledge and/or want to update themselves in the professional field; deepen skills and technical knowledge; stand out in the job market and/or seek new opportunities for professional work.

- Courses on 17 areas, including technology, administration, economy, entrepreneurship and management;
- More than 18 thousand active users;
- More than 31 thousand course registrations;
- 26 training trails, totaling 127 courses, including:
 - 23 free courses and
 - 104 paid courses.

INATEL On Line Challenges

Although the platform has positive points, for example, it is functional, has many users, deals with interesting topics and has good content, the challenges are still many:

- Attract more students to paid courses;
 - Is the problem the price or the content?
- Increase student engagement to complete courses;
 - Courses length? Teaching method? Gamefication?
- To keep the portfolio updated and interaction with the participants;
 - Need dedicated specialized team
- Rethink the teaching method;
 - Short videos, extra reading material and forum discussions
- Create new business models to serve individuals and legal entities;
 - Discounts and “frequent flyer” program

INATEL & ITU

The partnership between Inatel and ITU has already lasted eight years, with four more to come! The objective is strengthening the capacities of policymakers responsible for designing and implementing policies and strategies to lead their countries through digital transformation, as well as other ICT sector professionals who require knowledge and skills in the area of digital technologies. Some data from the last 4 years:

- 16 Courses delivered
 - Know 4G
 - 4G cellular technology – LTE
 - Main use cases of 5G and IoT technology
 - 5G and the Internet of Things Trends and Applications
 - Introduction to Satellite Communications
 - Digital TV Systems
 - 5G Essentials (New!)
- 900+ registered participants
- 500+ certified participants

Distance learning challenges

1. Lack of face-to-face interaction

- Absence of direct, in-person interaction between students and instructors. This can impact the quality of communication, feedback, and collaboration, which are important aspects of the learning experience.

2. Limited student engagement

- Without the physical presence in a classroom, students may struggle to stay motivated, participate actively, and maintain a sense of connection with their peers and instructors.

3. Technical issues and digital literacy

- Connectivity problems, software glitches, limited access to devices and students with limited digital literacy skills can hinder the learning process.

4. Time management and self-discipline

- Students are required to manage their time effectively and stay disciplined to complete coursework and assignments independently. Without a structured schedule and physical presence of instructors, some students may struggle with time management, leading to procrastination and reduced learning outcomes.

5. Assessment and feedback

- Assessment and timely feedback can be more challenging in distance learning. Traditional assessment methods may need to be adapted to the online format.

Moore, M.G., Kearsley, G. (2012). Distance education: a systems view of online learning. Cengage Learning.

Opportunities to overcome challenges

1. Lack of face-to-face interaction
 - Enhance online communication and collaboration tools to establish a sense of community in the virtual learning environment.
2. Limited student engagement
 - Incorporate interactive and multimedia elements. These elements can enhance student engagement and make the learning process more dynamic and enjoyable.
3. Technical issues and digital literacy
 - Provide technical support and digital literacy training. Institutions can offer technical support services to help students troubleshoot technology-related issues and offer digital literacy training programs.
4. Time management and self-discipline
 - Foster a supportive learning community. Promote peer-to-peer collaboration and establish online study groups or forums where students can interact, share experiences, and provide mutual support. The instructor/teacher must provide clear guidelines and deadlines.
5. Assessment and feedback
 - Utilize technology for varied and timely assessments. Online platforms offer diverse assessment options, such as online quizzes, interactive assignments, discussion participation, and multimedia project submissions to foster a more comprehensive and continuous assessment process.

Digital tools for distance learning

1. Communication and Collaboration Tools:

1. Zoom: Video conferencing tool for virtual classes and meetings.
2. Google Meet: Video conferencing and collaboration platform.
3. Microsoft Teams: Communication and collaboration hub for virtual classrooms.
4. Google Docs: Online document collaboration for group projects and assignments.

2. Learning Management Systems (LMS):

1. Moodle: Open-source LMS for creating online courses, assignments, and assessments.
2. Canvas: LMS with features for content delivery, assessment, and student engagement.
3. Blackboard: LMS with tools for content management, communication, and assessment.

3. Content Creation and Sharing Tools:

1. Google Drive: Cloud storage and document sharing for collaborative work.
2. Padlet: Virtual bulletin board for sharing ideas, resources, and discussions.
3. Flipgrid: Video discussion platform for interactive student engagement.
4. Edpuzzle: Tool for creating interactive video lessons with quizzes and assessments.

4. Assessment and Feedback Tools:

1. Kahoot!: Game-based learning platform for quizzes and interactive assessments.
2. Quizizz: Gamified assessment platform with quizzes and self-paced learning.
3. Edmodo: Social learning platform with features for assessment, feedback, and grading.
4. Turnitin: Plagiarism detection tool for academic integrity and feedback on written assignments.

5. Virtual Reality (VR) and Augmented Reality (AR) Tools:

1. Nearpod VR: Virtual reality lessons and interactive experiences for immersive learning.
2. CoSpaces Edu: AR and VR platform for creating interactive virtual experiences.
3. Google Expeditions: Virtual field trips and 360-degree immersive experiences.



Trends and innovations in distance learning

1. Microlearning:

- Microlearning breaks down learning content into small, easily digestible units, such as short videos, quizzes, or interactive modules. It allows learners to access targeted information in bite-sized formats, promoting flexibility and just-in-time learning.

2. Data Analytics and Learning Analytics:

- Data analytics and learning analytics provide insights into student progress, engagement, and performance. Institutions can utilize these analytics to identify areas of improvement, track learning outcomes, and personalize the learning experience further.

3. Open Educational Resources (OER):

- OER are freely accessible and openly licensed educational materials that can be used, shared, and modified. They promote affordability, accessibility, and collaboration in education.

4. Mobile Learning:

- With the increasing use of smartphones and tablets, mobile learning allows learners to access educational content on-the-go. Mobile apps, responsive design, and mobile-friendly platforms enable flexible and convenient learning experiences.

5. Virtual Reality (VR) and Augmented Reality (AR):

- VR and AR technologies provide immersive and interactive learning experiences, allowing students to explore virtual environments, manipulate objects, and engage in simulated scenarios.

Trends and innovations in distance learning empowerment

1. The use of Artificial Intelligence

- Personalized Learning adapting content and resources to individual needs and learning styles.
- Intelligent Tutoring Systems providing personalized guidance, feedback, and adaptive instruction to students.
- Automated Grading and Feedback saving time for instructors and providing timely feedback to students.
- Virtual Assistants and Chatbots to provide support, and deliver quick answers to common questions, enhancing student engagement and support.

2. 5G Networks in Distance Education

- Enhanced Connectivity providing seamless connectivity for distance learners, enabling smooth video streaming, interactive collaboration, and real-time communication.
- Immersive Learning Experiences supporting virtual reality (VR) and augmented reality (AR) in distance learning, creating immersive and interactive learning experiences.
- Remote Laboratories and Simulations: 5G to access remote laboratories and simulations in real-time, conducting experiments and practical learning activities from anywhere.
- Mobile Learning with fast and reliable internet access, allowing students to engage in learning activities on their smartphones or tablets.

Thank You!

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