INTERNET OF THINGS IN EDUCATION

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**Traditional**

- Physical attendance with teachers
- One-time instruction in one location
- Static, linear content with low control
- Costly instructional resources, "one size fits all"
- Ad hoc decision making

**Modern**

- Scale teachers and best quality of instruction-any device, anywhere
- Scale content recordable and replicable instruction, any time, any venue
- Learn at your own pace, focus on relevant content only, richer, interactive content
- Access to crowd-sourced content, ability to customize curriculum
- Data-driven decision
NEED OF IOT

- Investing to *Improve Quality*
  - Improving student performance measures
  - Increasing research capability and reputation
  - Differentiating the institution

- Investing to *Increase Access*
  - Increasing student access to quality resources
  - Reducing “gaps” across learner segments
  - Increasing educational opportunity
  - Improving services to constituents
  - Enhancing information to parents and the community

- Investing to *Reduce Costs*
  - Becoming more efficient at administrative processes
  - “Doing more with less”
IMPORTANT PILLARS OF EDUCATION

- People,
- Process
- Things
PEOPLE

- Students
- Teachers
- Parents
- Administration
Process

- Most of them are connected to the Internet using multiple devices and social networks.
- predict the channels students will use to connect to the Internet in the future.
- The advent of massive open online courses (MOOCs) is another step toward global education.
- MOOCs are aimed at large-scale interactive participation and open access via the web.
- Some of the world’s leading universities are making their top professors available free of charge, and online forums that are linked to MOOCs
IOT IN EDUCATION

Process

- In K–12, Khan Academy’s 10 free (open) educational resources have spawned the debate on “flipped classrooms” where learners watch videos on the subjects they are studying either at home or elsewhere outside the classroom.
- Teachers then use class time to discuss problems, work on ideas, and encourage group collaboration.
- In many developing countries, access to localized resources is limited, text books are often outdated and expensive, and funds for developing new materials are in short supply.
- Additionally, access to learning beyond basic education is often limited by economic status.
- Therefore, free access to MOOCs and resources like Khan Academy will improve the quality of life for many people who cannot afford a formal education.
MOOQS SITES

- https://www.coursera.org/
- https://swayam.gov.in/
- https://www.khanacademy.org/
- http://www.e-learningforkids.org/
- https://www.schoology.com/
INTERACTIVE SITES

- https://www.edmodo.com/
- https://www.surveymonkey.com
- Google sites
- Research
  - Scholar.google.com
  - Sci-hub
## Available courses

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NUUEC101</td>
<td>Economics - I...</td>
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<tr>
<td>NUUPS101</td>
<td>Political Science</td>
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<tr>
<td>NUEN101</td>
<td>English - I Sp...</td>
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<td>NUUPA101</td>
<td>Public Administration</td>
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<td>NUUMA101</td>
<td>Maths - I - Di...</td>
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<td>NUUSO101</td>
<td>Sociology - I...</td>
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## Calendar

<table>
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<th>Date</th>
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<tr>
<td>Mon</td>
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<td>13</td>
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<tr>
<td>Sun</td>
<td>14</td>
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The image shows a screenshot of the LMS (Learning Management System) interface for Acharya Nagarjuna University. The main page displays available courses such as Economics, Political Science, English, Public Administration, Mathematics, and Sociology. The calendar on the right side shows dates from the beginning of February 2018, starting from 1st February with no classes marked until 14th February, indicating the courses might start from the 15th.
LMS

- Online study
- Online Exam
- Online validation of Exams
- Online student grading
- Online notification
- Online guidelines to the student.
- Online attendance.
SOCIAL MEDIA

- Linked in
- Facebook
- You tube
- Etc.
THINGS IN EDUCATION

- Smart boards
- Smart devices
- Smart phones
- Smart machines/tools
- sensors
THINGS IN EDUCATIONS

RFID for attendance
RFID FOR ACCESS CONTROL
Personalized learning with adaptive eTextbooks

Digital classroom white boards and display

iBeacons

Video recorders for lecture capture

Complete coverage with high performance Wi-Fi

Wearables for athletics and attendance tracking

Supplies and inventory tracking by sensor with auto-reorder

Makerspaces with 3D printers and laser trimmers

Internet of Things-based HVAC

Monitor and display of air quality throughout school

Sensors track buses and verify student passengers

Student devices & eTextbooks
- Notebooks
- Tablets
- Smartphones

International Collaboration and social exchange

Online testing

Sensors on trash receptacles

Robot cleaning

Augmented and virtual reality

Robotics for STEM and remote presence

Surveillance security cameras

Wi-Fi sensors and locks
- Entrances and exits
- Classroom doors

Sensors in parking lot and driveways

File and program storage, local or cloud-based
- Demographics, academics, behavior, interests
- LMS, CMS, SIS
- Educational programs and applications
- Video files: lectures and recorded lab experiments

Network application analytics to monitor devices and network behavior
APPLICATIONS OF IOT

- Automatic tracking of attendance
- Monthly /weekly reports
- Digital administration of test
- Online tracking of transport
- Inventory management
- Track well being with fitness bands
- Monitoring of air/temperature/humidity
- Ebooks and etablets
- Sensors in halls /rooms/spaces to monitor the students
- Virtual and augmented reality head sets
- Smart display/IQ boards
- Preparing Food based on the attendance
- Supply chain management of books
Faster Learning

Digital highlighter wirelessly transfers printed text into an application or web browser -- it is 30 times faster than if you were to write by hand.

This tool does not only apply to education; but it can also be used by lawyers, researchers etc.

http://scanmarker.com/
TEACHERS

- Designing curriculum, to teach, to grade papers and communicate with parents.
- Sharing and collaboration with students is easy and fast.
- Reusability of course materials
- Timely availability of data
- Online attendance
- Avoids manual work.
ASSISTANCE FOR SPECIAL CHILDREN

- Automating text to speech machines to aid visually handicapped.
- IOT for assisting in walking
- Voice assistance in the corridors
STUDENT PROJECTS

- Install IoT sensors on doors.
- Wi-Fi wireless door control limited to a few interior doors.
- Set up interior environment monitoring and control using Wi-Fi temperature and light sensors to track how well the system is performing and even how it correlates to student engagement.
- Program selected classroom or common space lighting (e.g., with Philips Hue or Hue Lux) to vary lighting over the course of the day (dimming bulbs when natural lighting is strong)
- Track the results.
- Monitor activity at a receiving dock or movement in a lobby.
- Put Wi-Fi moisture IoT sensors in office plant pots to provide an alert when plants need watering.
CONCLUSION

- Technology will change the way of life
- Tremendous opportunity to build great careers.
- IOT as part of curriculum encourages students and make them makers.
- Build on the basics, get hands-on and improve in multiple ways.