Emerging ICT and Pedagogical Developments in Open and Distance Learning (ODL) System

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Broad Structure/ Outline

- Horizon reports for 2011, 2012 and 2013
- Tablets and Mobiles
- Personal Learning Environments
- MOOCs
- Educational Apps
- Learning Analytics
- Open Education Resources
- 24/7 Help-desk
- Educational uses of 3D Printing
- A quick glance at other Technologies

Horizon Report Predictions on use of Technology in Education

Time to adoption horizon one year or less:

- **2011:** Electronic Books ; Mobiles
- **2012:** Mobile Apps ; Tablet Computing
- **2013:** Massively Open Online Courses ; Tablet Computing

Horizon Report Predictions on use of Technology in Education

Time to adoption horizon 2 to 3 years:

- **2011:** Augmented Reality; Game Based Learning
- **2012:** Games Based Learning; Learning Analytics
- **2013:** Games and Gamification; Learning Analytics

Horizon Report Predictions on use of Technology in Education

Time to adoption horizon 4 to 5 years:

- **2011:** Gesture Based Computing; Learning Analytics
- **2012:** Gesture Based Computing; Internet of things
- **2013:** 3D Printing ; Wearable Computing

Range and Varieties of Handheld Devices

- Basic phone / Feature phone
- Smart phone
- Tablet/ Phablet
- Netbooks/ Notebooks
- Ultrabooks
- Laptops

Capabilities of Handheld Devices

- It is a phone/ audio player

- It is a camera

- It is a TV/ video player

- It is a reading-writing-calculating device
- It is a communication device

6 Reasons: Why Tablets are ready for use in class?

- Tablets are the best way to provide knowledge
- Students are ready for Tablets
- Classrooms are ready for Tablets
- Tablets fit into student lifestyle
- Tablets are a great way to access the web
- Tablets are becoming more affordable (with built-in phone).

New Pedagogy

- All pedagogical principles were developed in the context of young learners in a classroom for pre-defined learning outcomes.
- Then there was ‘andragogy’ by Malcolm Knowles for adult learning.
- We are now in the situation of life-long learning and development of generic skills of learning and thinking.
- We have named this new methodology ‘**Live Learning**’.

In 5 years from now, the best education will come from the web.

Bill Gates (6th August 2010)

The Disruptive Innovation in Education is Personalisation

- By creating a Personalised Learning Environment for each learner
- Speaking Mathematically it is a function of 3 variables: PLE (Parent, Learner, Educator)
- PLEs allow learners to draw connections amongst a matrix of resources that they select and organize to direct their own learning.
- PLEs emphasize metacognition enabling students to consider and reflect upon the tools and resources that facilitate their learning.

A PLE Transforms the Attitude of the Learner

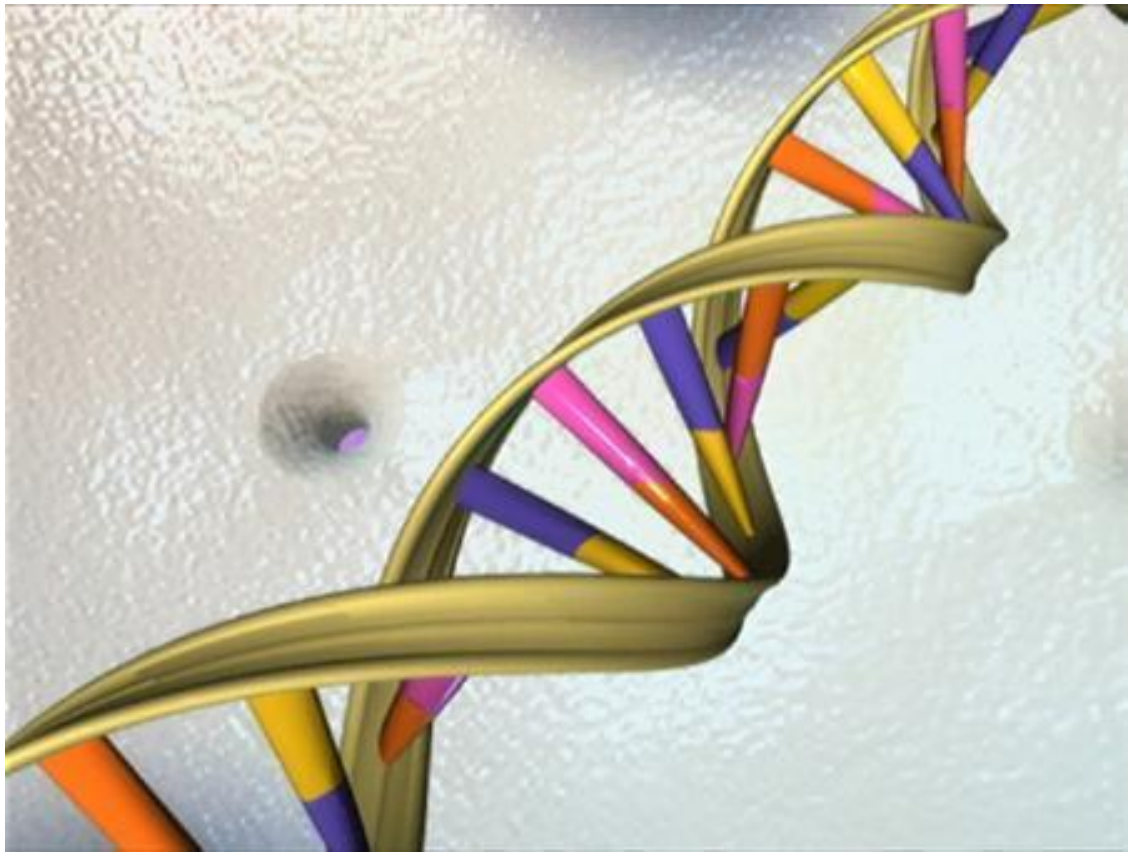
- A terrified learner (petrified)
- A reluctant learner
- A hesitant learner
- An interested learner
- An enthusiastic learner
- An excited learner
- A passionate learner
- A gifted learner

The Personalized Learning Experience Creates Teachable Moments

- An aha moment
- A jaw dropping moment
- The epiphanic moment
- The Eureka moment
- The Sputnik moment

Education for the 2nd Strand

- Altruism
- Character
- Coping with failure
- Courage
- Curiosity
- Empathy
- Grit
- Optimism
- Perseverance



The Soul of a ‘Great' Education?

- An ordinary education prepares a person for known roles.
- A great (quality) education prepares the learner to succeed, flourish, prosper and thrive in an unknown and uncertain future.
- Once the learner enters the orbit of self-learnability he can be put in various orbits of knowledge complexity and his trajectories managed by a ‘mission control’.
- The learner is thus a life-long learner continuously guided by not just one, but a community of ‘educators' who are not only discipline based academic experts, but also psychologists, neuro-scientists and data and information specialists as well.

What is an App?

- App is a noun, and it's short for "application."
- An App typically refers to software used on a smartphone or mobile device such as the Android, iPhone, BlackBerry or iPad.
- In January 2011, the American Dialect Society named "app" the word of the year for 2010, signifying that the term is trendy and popular.

What are Educational Apps?

- As more and more learners use tablets and mobile phones for Internet access, the role of educational Apps may become very important.
- Educators have a very important and enriching role in developing this field and being able to create educational Apps would be very useful.
- Only a small fraction of the millions of Apps available have ' educational value‘.

What are the Platforms for Mobiles and Tablets?

iOS 6 iOS for iPhones and iPads

Android

BlackBerry Blackberry

Windows 8

Some of the App Stores

Apple's App Store

Google Play

Nokia's App Store

Specialised niche stores

What are the Characteristic Attributes of a Good Educational App?

- An effective app is one that does what you need it to do.
- And it's even better if it does it an inexpensive and engaging way.
- There probably isn't an app that would receive all checks on the following list, but in general, the more checks, the better the app is for education.
- We can build on the following list to develop our own checklist:

A Rough and Ready Checklist

- Help or tutorial is available in the app
- Content is appropriate for the student
- Information is error-free, factually correct, and reliable Content can be exported, copied, or printed
- App's settings and/or content can be customized
- App promotes collaboration and idea sharing
- App provides useful feedback

India can be the hub for Educational Apps

- We are almost uniquely placed to develop the new education model for the whole world.
- An opportunity for individuals, organisations, both Indian and foreign, to join in this wonderful and exciting opportunity
- We need to create an Eco-system to make this happen
- Our strong domestic market mirrors the global market

Template for a Course App

- The About/Syllabus Page is designed to give basic information.
- The Professors Page is a menu style page designed for you to post a professor's name and then his / her department or the classes taught.
- **Schedule:** Let your students and parents know about upcoming events or assignments through the Schedule Page.
- This feature is possibly one of the most valuable pages for schools and teachers.
- The Appointments Page enables you to create a form that students can use to be sent directly to the e-mail address you provide.

Template for a Course App (Cont…)

- **Videos:**Through the Videos Page, you can share videos from YouTube or in MP4 format with your students and parents.
- **Social Links Page:** In this technology-centered generation, being in constant contact is necessary to achieve your goal, your students learning.
- **The Contact Page contains your basic contact information:** school address, phone number, e-mail address and website information. With most smartphones, the app will enable your users to one-touch-dial your number or one-touch e-mail straight from the app, making it easy for them to contact you when needed.

Capacity Building in Educational Apps

- Orientation program in adopting Apps for learning
- Initiating innovative methods for generating Ideas for Apps
- Evolving a framework and process for User Interface Deign as well as the learning experience.
- Defining Rubrics and checklists for good educational Apps

The Educational Apps Ecosystem

- Curating and rating existing Educational Apps
- Endorsing Apps and Tablets for Learning: LearnTab, LearnPad
- Developing and putting in place a marketplace for Educational Apps.
- Implementing a testing and quality assurance team as well as continuous improvement based upon user feedback.

LearnTAB™

PORTABLE LEARNING

Screen Size : 7 inch (LCD)
Resolution : 800 × 480
Platform : Android 2.3 Gingerbread
Processor : 1.2 Ghz "triple core"
Internal Memory : 4 GB, support upto 32 GB
RAM : 512 MB
Connectivity : Wi-Fi, external 3G dongle support
Camera: 1.3 MP front camera
Battery life: 4 hrs.
Weight : 400 grams

LearnPAD™

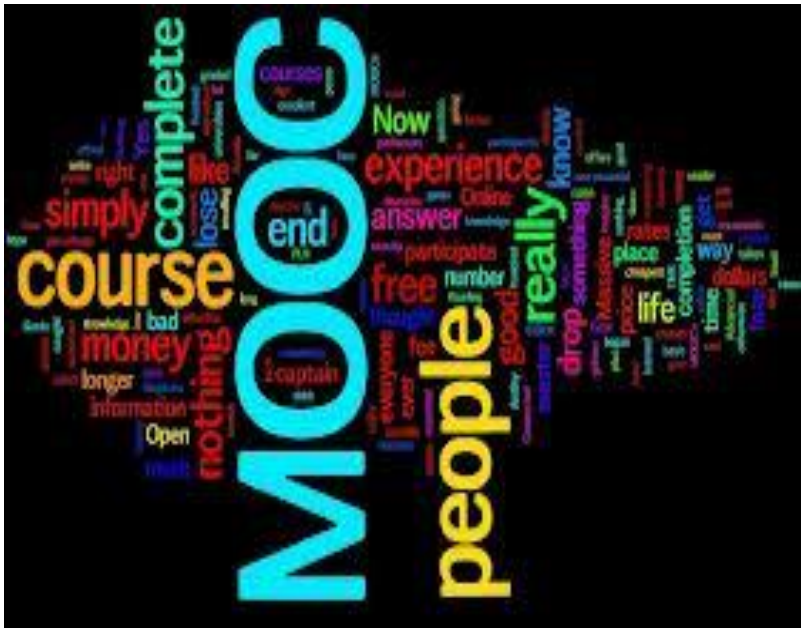
KNOW EVERYTHING. LEARN ANYWHERE

IN-DASH LEARNING PROGRESS

Screen Size : 10 inch (LCD)
Resolution : 1024 × 600
Platform : Android Honeycomb 3.1
Processor : Unknown
Internal Memory : 16/32/64 GB
RAM : 512 MB
Connectivity : Wi-Fi, 3G, GPS
Camera: 0.3 MP
Battery life: 8 hrs.
Weight : 675 grams

MOOCs as the new Paradigm for ODL

- The term MOOC was coined in 2008 during a course called "Connectivism and Connective Knowledge"
- 25 tuition-paying students in Extended Education at the University of Manitoba
- Another 2,300 students from the general public took the online class free of charge.



How was the first MOOC implemented?

- * All course content was available through RSS feeds, and learners could participate through threaded discussions in Moodle, blog posts, Second Life, and synchronous online meetings.
- The course was designed by Dave Cormier of the University of Prince Edward Island, and Senior Research Fellow Bryan
- Alexander of the National Institute for Technology in Liberal Education in response to an open online course designed and led by George Siemens of Athabasca University and Stephen Downes of the National Research Council (Canada).

Many other MOOCs followed

- Jim Groom from The University of Mary Washington
- Michael Branson Smith of York College, City University of New York, adopted this course structure and hosted their own MOOCs through several universities.
- Early MOOCs departed from formats that relied on posted resources, learning management systems, and structures that mix the learning management system with more open web resources
- MOOCs from private, non-profit institutions emphasized prominent faculty members and expanded open offerings to existing subscribers (e.g., podcast listeners) into free and open online courses.

Stanford University

- In the Fall of 2011 Stanford University launched 3 courses, each of which had an enrollment of about 100,000.

Some well known MOOCs or MOOC like

- Coursera
- Udacity
- edX
- Academic Room
- Canvas Network
- CourseSites
- Academic Partnerships (a company that helps public universities move their courses online)
- Udemy
- Straighterline

Instructional Design for MOOCs

- MOOCs require instructional design that facilitates large-scale feedback and interaction.
- There are two basic approaches:
  - Crowd-sourced interaction and feedback by leveraging the MOOC network, e.g. for peer-review, group collaboration
  - Automated feedback through objective, online assessments, e.g. quizzes and exams
- Connectivist MOOCs rely on the former approach; broadcast MOOCs such as those offered by Coursera or Udacity rely more on the latter.

5 Key Challenges for MOOCs

- It feels chaotic as participants create their own content
- It demands digital literacy
- It demands time and effort from the participants
- It is organic, which means the course will take on its own trajectory (you have got to let go).
- As a participant you need to be able to self-regulate your learning and possibly give yourself a learning goal to achieve.

Classrooms of 10,000

- MOOCs are Large scale.
- Traditional classes have a small ratio of students to teacher, but MOOCs are designed to have a "massive" number of students.
- Other features are typically open licensing of content, open structure and learning goals, community-centeredness, etc. but may not be present in all MOOCs

Classification of MOOCs

- As MOOCs have evolved, there appear to be two distinct types: those that emphasize the Connectivist philosophy, and those that resemble more traditional and well-financed courses, such as those offered by Coursera and edX.
- To distinguish between the two, Stephen Downes proposed the terms "cMOOC" and "xMOOC".
- The short lecture format used by many MOOCs developed from "Khan Academy’s free archive of snappy instructional videos."

Connectivist Design Principles

- Aggregation: MOOCs provide a massive amount of content to be produced in different places online, which is later aggregated as a newsletter or a web page accessible to participants on a regular basis; in contrast to traditional courses, where the content is prepared ahead of time.
- The second principle is remixing, that is, associating materials created within the course with each other and with materials elsewhere.
- Re-purposing of aggregated and remixed materials to suit the goals of each participant.
- Feeding forward, sharing of re-purposed ideas and content with other participants and the rest of the world.

Some 12 benefits of MOOCs

- You can organize a MOOC in any setting that has connectivity (which can include the Web, but also local connections via Wi-Fi, e.g.)
- You can organize it in any language you like (taking into account the main language of your target audience)
- You can use any online tools that are relevant to your target region or that are already being used by the participants
- You can move beyond time zones and physical boundaries
- It can be organized as quickly as you can inform the participants (which makes it a powerful format for priority learning in e.g. aid relief)
- Contextualized content can be shared by all

Other 6 benefits

- Learning happens in a more informal setting
- Learning can also happen incidentally thanks to the unknown knowledge that pops up as the course participants start to exchange notes on the course's study
- You can connect across disciplines and corporate/institutional walls
- You don't need a degree to follow the course, only the willingness to learn (at high speed)
- You add to your own personal learning environment and/or network by participating in a MOOC
- You will improve your lifelong learning skills, for participating in a MOOC forces you to think about your own learning and knowledge absorption

Launching a MOOC in a few easy steps

- Pick a topic of personal interest and expertise that requires discussions
- Preferably a topic that you already teach ; just do it in the open
- Focus on audience: Students, Faculty, Life-long learners
- Use team teaching : have a colleague to teach with, from a different perspective
- Bring in guest speakers, video interviews
- Treat content as the starting point of the learning conversation, articles, videos, interactive presentations, conference recordings/proceedings etc.
- Leave room for learners to create/share

Subject areas for which MOOCs have been offered

- Mathematics at College level
- Computer Science subjects
- English literature
- Philosophy

Some Major concerns regarding MOOCs ?

- How to you certify the identities of the learners?
- How do you assess the learning acquired by large number of learners?
- What about 'currency' and credit transfers?

Learning Analytics

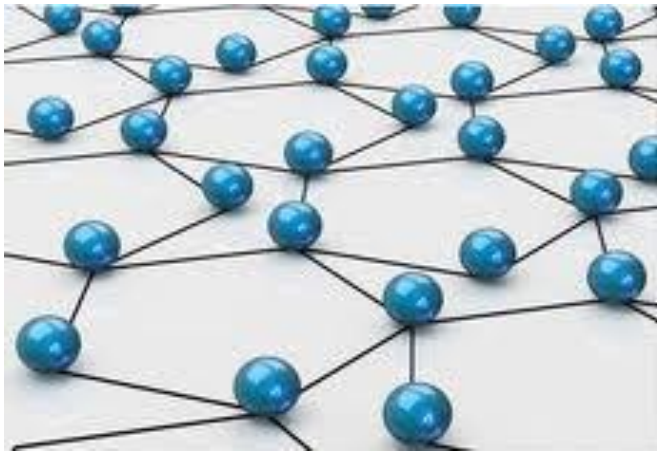
- Learning analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs
- A related field is educational data mining.

The Drivers of Learning Analytics

- The increasing interest in 'big data' for business intelligence
- The rise of online education
- Emergence of Virtual Learning Environments (VLEs), Content Management Systems (CMSs), and Management Information Systems (MIS) for education
- Manifold increase in digital data regarding student background (often held in the MIS) and learning log data (from VLEs).

The Techniques and Methods of Learning Analytics

- Learning Analytics uses several techniques and approaches from different disciplines.
- Mathematical techniques (network and graph theory),
- Sociological approaches to social networks
- Statistical methods for predictive modeling of successful learner behaviour.



Learning Analytics is:

- Application of 'business intelligence' techniques to educational data
- The optimisation of systems to support learning
- About getting to know whether a student is engaged/understanding even if we can’t see them?

The Focus of Learning Analytics

- Increasing focus on evidencing progress
- This focus leads to a teacher stakehold in the analytics
- An increasing emphasis on the pedagogic dimension
- This pressure is increased by the economic desire to improve engagement in online education for the deliverance of high quality - affordable - education.

Work in Progress

- Sociologists like Wellman and Watts... and mathematicians like Barabasi and Strogatz.
- The work of these individuals has provided us with a good sense of the patterns that networks exhibit (small world, power laws), the attributes of connections (in early 70's,
- Granovetter explored connections from a perspective of tie strength and impact on new information), and the social dimensions of networks (for example, geography still matters in a digital networked world).

Methods for Learning Analytics

- Social network analysis (SNA) - "the mapping and measuring of relationships and flows between people, groups, organizations, computers, URLs, and other connected information/knowledge entities.
- The nodes in the network are the people and groups while the links show relationships or flows between the nodes. SNA provides both a visual and a mathematical analysis of human relationships.
- Management consultants use this methodology with their business clients and call it Organizational Network Analysis [ONA]

Features in Learning Analytics

- Discourse analytics aims to capture meaningful data on student interactions which (unlike 'social network analytics') aims to explore the properties of the language used
- Social Learning Analytics which is aimed at exploring the role of social interaction in learning, the importance of learning networks, discourse used to sense make, etc.
- Disposition Analytics which seeks to capture data regarding student's dispositions to their own learning, and the relationship of these to their learning. For example, "curious" learners may be more inclined to ask questions - and this data can be captured and analysed for learning analytics.

Cont…

- Impact of interaction
- Prediction
- Personalization & Adaptation
- Intervention
- Information visualization, typically in the form of so-called learning dashboards

Some Examples of Learning Analytics Software Tools

- SNAPP - a learning analytics tool that visualizes the network of interactions resulting from discussion forum posts and replies.
- LOCO-Analyst - a context-aware learning tool for analytics of learning processes taking place in a web-based learning environment
- SAM - a Student Activity Monitor intended for Personal Learning Environments
- Software that is currently used for learning analytics applies functionality of web analytics software, to learner interactions with content.

Ethical Issues and Concerns

- Concerns have been raised regarding the ethics of data collection, analytics, reporting and accountability
- Data ownership
- Communications around the scope and role of Learning Analytics
- The necessary role of human feedback and error-correction in Learning Analytics systems
- Data sharing between systems, organisations, and stakeholders

Open Courseware Consortium

- In February 2005, the first meeting of the OpenCourseWare Consortium was held at MIT.
- Extend the reach and impact of open courseware by encouraging the adoption and adaptation of open educational materials around the world.
- Foster the development of additional open courseware projects.
- Ensure the long-term sustainability of open courseware projects by identifying ways to improve effectiveness and reduce costs.

UNESCO Declaration on OER

- The World OER Congress held at UNESCO, Paris on 20-22 June 2012.
- The Universal Declaration of Human Rights (Article 26.1), which states that: “Everyone has the right to education”.
- The International Covenant on Economic, Social and Cultural Rights (Article 13.1), which recognizes “the right of everyone to education”.
- The 1971 Berne Convention for the Protection of Literary and Artistic Works and the 1996 WIPO Copyright Treaty.
- The Millennium Declaration and the 2000 Dakar Framework for Action, which made global commitments to provide quality basic education for all children, youth and adults.

Emphasizing Open Education Resources

- Coined at UNESCO's 2002 Forum on Open Courseware and designates teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions.
- Open licensing is built within the existing framework of intellectual property rights as defined by relevant international conventions and respects the authorship of the work.

Backdrop to Open Education Resources

- 2007 Cape Town Open Education Declaration.
- The 2009 Dakar Declaration on Open Educational Resources.
- The 2011 Commonwealth of Learning and UNESCO Guidelines on Open Educational Resources in Higher Education.
- Noting that Open Educational Resources (OER) promote the aims of the international statements quoted above.

Recommends that States within their Capacities and Authority

- Foster awareness and use of OER.
- Facilitate enabling environments for use of Information and Communications Technologies (ICT).
- Reinforce the development of strategies and policies on OER.
- Promote the understanding and use of open licensing frameworks.
- Support capacity building for the sustainable development of quality learning materials.

What else is being done?

- Foster strategic alliances for OER.
- Encourage the development and adaptation of OER in a variety of languages and cultural contexts.
- Encourage research on OER.
- Facilitate finding, retrieving and sharing of OER.
- Encourage the open licensing of educational materials produced with public funds.

The Open Education Resources University

- The Open Educational Resource (OER) university is a virtual collaboration of like-minded institutions committed to creating flexible pathways for OER learners to gain formal academic credit.
- The OER university aims to provide free learning to all students worldwide using OER learning materials with pathways to gain credible qualifications from recognised education institutions. It is rooted in the community service and outreach mission to develop a parallel learning universe to augment and add value to traditional delivery systems in post-secondary education.
- Through the community service mission of participating institutions we will open pathways for OER learners to earn formal academic credit and pay reduced fees for assessment and credit.

What does the OER University do?

- Directed by the core principles of engagement the OER university collaboration:
- Will design and implement a parallel learning universe to provide free learning opportunities for all students worldwide with pathways to earn credible post-secondary credentials.
- Offer courses and programs based solely on OER and open textbooks.
  - Design and implement scalable pedagogies appropriate for the OER university concept.
  - Will implement scalable systems of volunteer student support through community service learning approaches.

Highly Relevant to an OPLI

- Infrastructure for Knowledge and Innovation
- Designing the Virtual Organization
- Technology-Enabled Knowledge
- The Ecology and Design of “Open”
- Between Public and Private: Bridges, Fences, and New Terrain
- Pooling and Integration
- Architecting the Knowledge Commons
- Standards Development under Pressure
- Aligning Patents and Knowledge

Some Functional Attributes of an OPLI

- Extensible
- Remixable
- Repurposable
- Service-oriented
- Multi-lingual
- Incremental and architecturally light at its roots
- Interchange on demand
- Human-centered and socio-technical in nature
- Support a spectrum of openness

The Importance of a Help-desk

- Open and Distance Learning students and faculty members need to have their questions will be answered quickly, at ant time of the day.
- It is important that these questions are answered quickly and efficiently by well trained personnel.
- A Help Desk that offers all of this and more is an important component of an ODL system.

The Help You Need When You Need It

- Having a 24 hour help desk is crucial in the world of online education.
- Faculty or students may need support anytime, day or night, and they need a help desk that never closes.
- The Help Desk is open 24 hours a day, 7 days a week, 365 days a year (and 366 days every fourth year, on a leap year)

Technical Support Personnel

- Experienced Technicians work hard to support a range of technologies associated with eLearning
- A variety of OS platforms and range of web browsers
- Firewalls
- ISP
- Cable connections
- High-speed networks
- Bandwidth testing
- Streaming media

Profiles of Support Personnel at Help-desk

- Distance learning Specialists
- Academic Support
- Administrative Support
- Financial & Fee payment facilitation
- Motivational Support

How can 3D printing help in ODL?

- 3D printing has the potential to revolutionize distance learning
- It can provide 3 dimensional visual aids that they can used to illustrate a hard to grasp concept
- 3D printers make it easy for teachers to seize the interest of their students compared to just showing the pictorial representations of objects.
- It enhances hands-on learning and learning by doing.
- Using this prototyping technology, students will be able to produce realistic 3 dimensional mini-models (great for engineering, architecture, and multi-media arts students).
- It provides more room for interactive class activities.
- In biology, for instance, teachers can create a 3D model of the human heart, head skeleten...etc to teach students about the human body.

A quick Glance at other Technologies

- Gamification
- Augmented Reality
- Wearable Computers
- The Internet of things
- Gesture Based Computing

Thank you !

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