Learning Resources for the Future of Engineering Education

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Introduction

• Web-resources
• Re-usable learning objects (RLOs)
• Impetus for Repositories
• National Digital Learning Repository (NDLR)
• Mechanical Engineering Community of Practice
• NDLR Learning Resources

Web resources available

• Unit conversion calculators
• Web dictionaries
• E-books
• PowerPoint presentations
• Images, text, audio and video files
• Computer games
• Sophisticated modelling applications
• You Tube
• Blogs
Other resources

- E-Mentoring via society web-site
  - Student directly in contact with practicing engineer
  - Not limited by geographic boundaries
- Distance learning courses available internationally
  - American Society of Materials
  - American Society of Mechanical Engineers
  - Society of Manufacturing Engineers

Remote Laboratory Virtual Instruments

- Easily be made available via the internet
- Studies show
  - better results achieved when used as a learning aid during the lab
  - remote use produce similar results compared to traditional mode
- Examples
  - Charles University, Prague
  - Dublin City University

Impetus for Repositories

- Central online service
- Hold Reusable learning objects
- Greater range of resources to each lecturer
- Improve educational standards
- Minimise cost to organisations
- Minimise the workload to individuals
Repository Examples

- Canadian repositories: MERLOT, CAREO, POOL, CLOE
- UK: JORUM
- Education Network Australia (EdNA)
- MIT Open Course Ware
- National Engineering Education Delivery System
- EducaNext

Non subscriber catalogue based

- World Lecture Hall
- EEVL
  - including Intute contains 114,689 RLOs
- Bubl Information Service
  - catalogues engineering internet resource

National Digital Learning Repository (NDLR)

- HEA pilot project
- Irish Universities & Institutes of Technology
- Online resource repository
- Sharing of teaching and learning resources
- Encourage collaboration within subject communities
- Quality control by members of the Communities

Using NDLR resources

- Reusable Learning Objects (RLOs): resources that can be reused for teaching and learning purposes
- Learning resources from NDLR can be incorporated into
  - VLE (Moodle, WebCT, Blackboard)
  - Lecture notes
  - Student assignments
  - Student practical
  - Resources can be re-customised

Mechanical Engineering CoP

- Members include everyone who teaches any aspect related to mechanical engineering at higher level
- AIM: Promotion of best practice for development, delivery and sharing of mechanical engineering education
  - Development of RLO’s
  - Sharing of RLOs in NDLR
  - Regular meetings
  - Workshops
  - Events for engineering educators - ISEE 2007: 17th – 19th Sept
  - ISEE 2008: 2nd week Sept – call for papers; deadline: June 2008
**ME CoP Learning Objects**

- Over 50 mechanical engineering resources
- At least 200 resources by Dec 2007
- Remote Laboratories - virtual instruments
- Gear animation - UL
- Solid work tutorial (Fascia) UL
- Temperature Volume diagram for water NUIG

**References**

- ME CoP Coordinator: Dermot.brabazon@dcu.ie
- NDLR Coordinator: Muireann.o'keeffe@dcu.ie
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- ME CoP: http://www.ndlr.ie/mecheng/blog
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- Pegler, Chris. Re-usable learning objects, Teaching and Learning Day; UCD, 2007