Virtual Laboratory in Mechatronics: Access to Remote and Virtual e-Learning

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Introduction to MARVEL

- A European Leonardo da Vinci pilot project
- Focused on vocational training in mechatronics
- Project partners from different sectors
- Special attention to needs of work process oriented e-Learning
  - Integration of e-Learning into practical learning sequences
  - Virtual learning in combination with learning in laboratories, at work places, …
Project partners

1 Vocational/Technical colleges
   - DEL (Germany)
   - HTI (Cyprus)
   - WLC (Scotland)

2 Enterprises
   - ZENON (Greece)
   - FESTO (Germany)
   - BNW (Germany)

3 Qualification authority
   - SQA (Scotland)

4 Universities
   - FEUP (Portugal)
   - Uni Bremen/artec (Germany)

5 Associated partner
   - FEUP (Switzerland)
   - HEV (Switzerland)

Consortium structure

Core team

Advisory board

Associated partners

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artecLab
Example of a learning platform used in MARVEL

- Learning platform “Mixed Reality Laboratory for Mechatronics”
  - laboratory/workshop facilities accessible via the Internet
  - supports collaborative learning between distant sites (home, school, work place laboratory)
  - integration of real and virtual media

- Concept and development
  - Research Centre artec/artecLab: artecLab
  - funded by EU-IST-Projects:

WWW Front-end

- Virtual lab
- Physical (‘real’) lab
Different learning settings

1. Pure virtual setting (virtual lab)

2. Pure 'real' setting (remote lab)

3. Distributed Mixed Reality setting

http://lab.artec.uni-bremen.de
Mixed Reality Web Service
(System architecture)

- Available 24 hours a day
- HTTP/1.1 based
- Multi-lingual content
- Hypermedia based help

User Feedback

- Done several evaluations
- Positive feedback from teachers and students
  - Combination of real and virtual media is good
  - Easy and straightforward connection mechanism
  - Integrated simulation offers new teaching aspects
- Critic
  - Improved virtual component list
  - Additional materials for the experiments
Contact

Learning platform
“Mixed Reality Laboratory for Mechatronics”:
http://lab.artec.uni-bremen.de

MARVEL Home page:
http://www.marvel.uni-bremen.de