

Digital Libraries



A New Way of Doing
Business in Science
Education

Digital Libraries and Physics Departments



- New tools for meeting existing goals
- New opportunities
- Rethinking goals and relationships

Traditional Departmental Goals



- Preparation of the 21st Century workforce
 - Scientists, engineers, teachers, policy makers, others
 - Drawing on the full diversity of our population
- Scientific research
- Processes of inquiry and discovery; critical-thinking, scientific habits of mind...
- Promoting excellence in SMET education
- Strong physics education for the institution
- Science in service to the broader community

A Changing Landscape



- New Emphasis on Life Long Learning in our Society
- Shifting Economic and National Agenda
- Changing Relationships with Industry and Government
- New Research on Learning
- Technology Changing the Classroom and Academia

Digital Libraries



- Building on the tradition of libraries as a community resource
 - Collecting, organizing, preserving
 - Sharing
 - Services for Users
 - A Community Center
 - Providing a Meeting Place



UNITED STATES

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HEALTH INFORMATION

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Find answers to your health questions

MEDLINE@PubMed

References and abstracts from 4300 biomedical journals

ClinicalTrials.gov

Provides information for patients about clinical research studies

DIRLINE

Directory of health organizations

LOCATOR@NLM

Catalog of books, journals, and audiovisuals in the NLM collections

NLM Gateway

A single Web interface that searches multiple NLM retrieval systems

PubMed Central

A digital archive of life sciences journal literature

Additional Information by Subject

AIDS/HIV

[HIV/AIDS facts, tutorials, clinical trials, etc.](#), provided by NLM's Specialized Information Services

Arctic Health

[Arctic Health](#), an information portal to issues affecting the health and well-being of our planet's northern most inhabitants

Bioethics

[BioethicsLine](#) for ethics and related public policy issues in health care and biomedical research

Cancer

[CancerNet](#), the National Cancer Institute's (NCI) many sources of cancer information including CANCERLIT

Chemical Substances

[Chemical information](#) on drugs, pesticides, environmental pollutants and other potential toxins

Health Services Research & Health Care Technology

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Education Digital Libraries



- Web-based discovery of available learning resources
- Supporting services for effective creation and use
 - (e.g. help, review, customized aggregations, professional development)
- Data access for inquiry based instruction
- People networks

A New Way of Doing Business



- Broad Sharing of Reusable Learning Resources
- Data Aggregation and Sharing for Science and Education
- Specialized Communication Networks
- National and International Coordinated Community Action

Central role of Physics Departments in Education

- Depts are at the nexus of relations among all interests of the educational spectrum
 - Receiving students from K-12 systems
 - Teacher preparation
 - Undergraduate content mastery and skill development; service courses; scientific literacy
 - Professional training (graduate) and continued professional development
 - Outreach to the community (media, museums...)
- Depts are defined by people and their relationships

New (or expanded) Roles for Departments



- Creating and supporting an exciting, engaging learning environment;
- Creating an integrated learning community;
 - curricula vs. collection of courses
 - shared instructor-student-community experiences
- Providing opportunities for personal growth
 - faculty and students alike; career advising; mentoring
- Develop and maintain relations
 - With other disciplines/departments, agencies, industry

Departments as Interface to the Real World



■ Showcase

- curriculum, resources, research, programs

■ Management (Coordination)

- of human and physical resources
- effective transfer of cutting edge technology to the classroom
- faculty-industry exchanges; real and virtual;
- student internships; in-class practicums to solve real-life problems

■ Accountability

- to our Science, institutions, peers,
- assess outcomes of student performance

Personalized Learning



- Ability to navigate
 - As deep into a topic as need and interest dictate
 - To related topics, overarching concepts, applications; exploring interfaces
- Personal responsibility for learning outcomes
- User-specified learning opportunities; integrating content, tools, data
- Mastery may be achieved and measured outside of traditional courses, in life experiences, drawing from external resources.

New Experiences for Students



- Multiple pathways to the same learning goal can be explored, according to different learning styles, personal experience, local setting...
- Ability to form extended networks with peers, mentors, experts
- Linking content (coursework) with opportunities (e.g. REU, internships...)
- More opportunities to engage *authentic* coursework;

New roles for faculty



- As mentors—guiding inquiry and discovery
- As co-discoverers
- Critically evaluating what is important to learn/do
- Create, adopt, adapt, repurpose resources;
- Form and contribute to information networks;
 seek support, offer advice, share resources
- Linking content to best educational practice
- Assessment of learning; creation and use of
 metrics and tools.
- Continuing and increasing need for professional
 development

An Invitation to You



- Learn from our experience in developing the Digital Library for Earth System Education (DLESE)
- Use National SMETE DL infrastructure for physics library
- Explore and share our common scientific interests across traditional disciplines.



Examples



- DLESE
- MERLOT
- SMETE
- Math Forum
- Eisenhower National Clearinghouse
- ERIC
- GEM
- TeachNET