Improved Web Support for Physics Teachers

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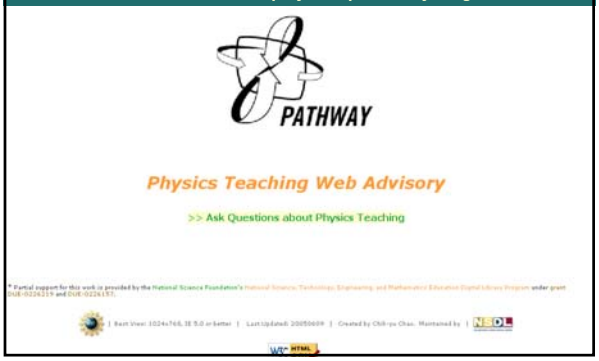
Physics Teaching Web Advisory PATHWAY

- A dynamic digital library for physics teaching
- Combining
  - CMU digital video library technology
  - KSU Physics Education expertise
  - Materials contributed by teachers
- Offering continuously improving web-based assistance and expertise for teachers of all levels

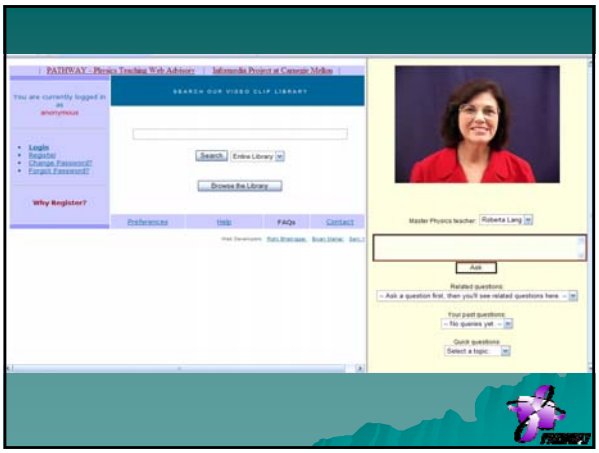
The Old Front End
found at www.physicspathway.org



Updated Front End
found at www.physicspathway.org

PATHWAY Components

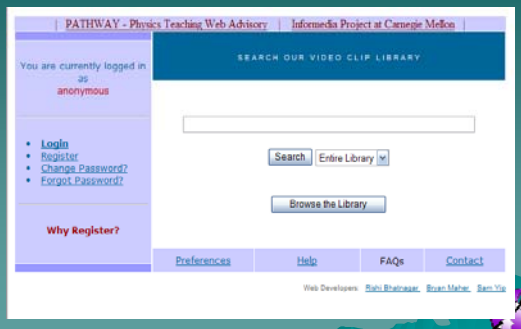
- Synthetic Interviews
- Informedia Digital Video Library
- Connections to
  - National Science Education Standards
  - Research in Physics Education
  - Helpful Web sites



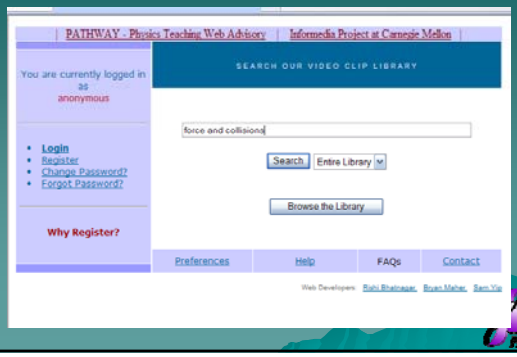
Just the Library

Browsing the Library

Back to the Front of the Library



Search on Force and Collisions

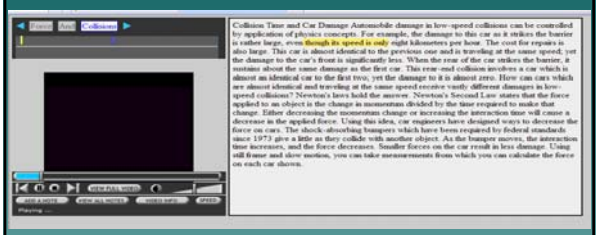


Results

Results

Results

Play the Video

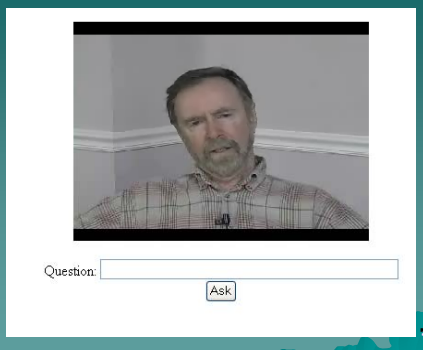


We WANT Hewitt's workshop!

Obstacles to IDVL success

- Transcripts
  - How to generate?
- Segmenting
- Processing
  - Cannot go back to old style

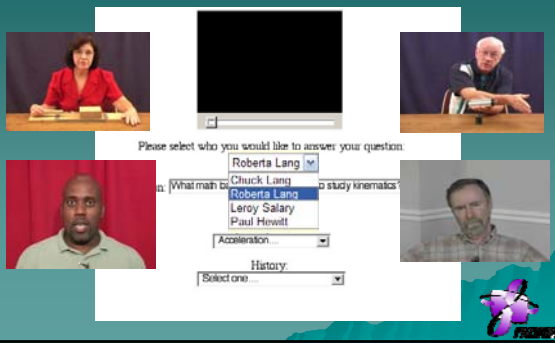
A Synthetic Interview



Synthetic Interviews

- Internet chat rooms are quite popular
- Get a response from a real person
- But experts do not scale and don't want to spend all their time answering questions
- And/Or/But …
- anthropomorphic interfaces can have a strong motivational impact compared to text or traditional multimedia, with users perceiving the persona as being helpful, entertaining, and creating a more positive learning experience (Lester, 1997; van Mulken, 1998)

We Offer Multiple Personalities



Today

Features that work

- Video controls
- Cast your vote
- Question being answered
- "Not Answered" option
- Bibliographic citations
- Asked question does not disappear
- Related Questions
- Past Questions
- Quick Questions

It is even in KSU Purple

To be added

- Education Standards
- Alternate Media
- IDVL links?
- Web sites?
- More experts per topic

Topics on now

- Basic information
  - History
  - Laws and theories
  - measurement (length, time, mass)
  - units
  - significant figures
  - scientific notation

Topics on now

- Tools
  - coordinate systems
  - graphs
  - vectors
  - vector components
  - vector algebra
  - delta notation
  - rate of change
  - free-body diagrams

Topics on now

- Kinematics
  - distance
  - displacement vector
  - motion (uniform motion)
  - relative motion
  - speed (average, instantaneous, constant)
  - velocity vector (average, instantaneous, constant)
  - acceleration vector (avg, inst, const, uniform)
  - kinematic equations
  - acceleration due to gravity
  - one-dimensional motion
  - nonlinear motion
  - projectile motion

Topics on now

- Dynamics
  - Newton's Laws
  - Newton's First Law
  - Newton's Second Law
  - Newton's Third Law
  - inertia
  - fundamental forces
  - force
  - net force
  - weight
  - friction
  - air drag
  - terminal velocity
  - equilibrium (static)
  - inclined planes

Topics on now

- Gravity
  - free fall
  - Newton's Law of Gravitation
  - planetary motion
  - satellites
  - weightlessness
  - gravitational field
  - Kepler's Laws

Topics on now

- Uniform Circular Motion
  - centripetal (radial) force
  - centripetal (radial) acceleration
  - centrifugal force
  - tangential velocity, speed
- Rotational motion
  - torque
  - moment of inertia (rotational inertia)
  - angular momentum

Topics on now

- Momentum (chapter and concept)
  - impulse
  - collisions
    - 1-dimensional
    - 2-dimensional
    - 3-dimensional
  - conservation of momentum

Topics coming soon

- Pressure
- Bouyancy
- Archimedes' Principle

- Followed by Energy topics
- Others will follow swiftly

We would like your help

- Suggest questions to ask the experienced teachers

- Try the system
  - When the survey works

- Give us feedback any time

Questions or Comments?

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- www.physicspathway.org

THANK YOU!