
3D in Schools

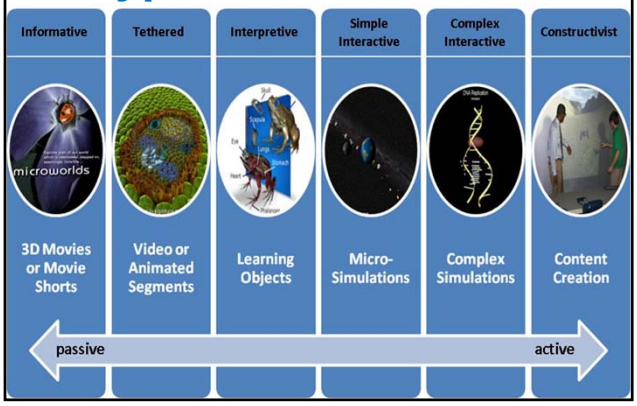

An ad I recently received


Reminded me of this...


3D in the Classroom
Len Scrogan
Director, Instructional Technology
Boulder Valley School District
Boulder, Colorado
• 55 schools
• 30,000 students
• 500 square miles
• DLP projectors in most classrooms

About 3D Educational Content

Types of 3D Content



About 3D's Benefit in School Settings

It's all about visualization

It's all about visualization

Past Research in K-12

- Illinois Dept of Education
  Dr. Lloyd Kilmer 2007
- UC Davis Tahoe (TERC)
  Dr. Steven Yalowitz 2010
- Various older NSF studies

Current Research

BVS³D Study
Dr. Carol Hruskocy and
Dr. Sandra Foster, 2012
570

LiFE 1 (Eur)
Dr. Anne Bamford 2012
740

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-Limitations-

Common Findings

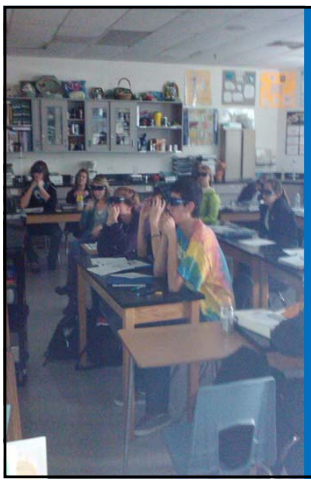
Positive Student Reaction

Improved Behavior

Focus

Retention

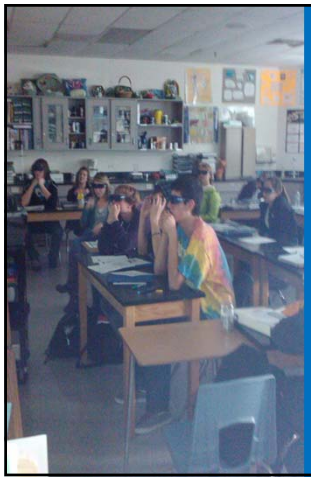
Special Education



BVS^{3}D Findings

11% performance bumps on AP essay tests

No difference on multiple-choice tests



BVS^{3}D Discoveries

Mental Reconstruction

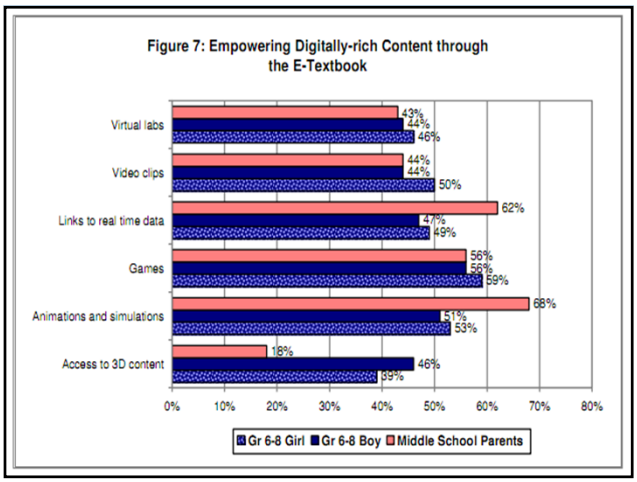
Learning Replay

New Research

BVS3D Year 3
Dr. Carol Hruskocy with Dr. Sandra Foster, Regis University

University of Kansas
Dr. Terry Slocum 2013

About the Future of 3D in the Classroom



New Research Questions

What is the difference in achievement and learning when visualized content is presented in 2D versus stereo 3D?

How does 3D visualization contribute to deeper understanding of [science, math, or geography] in essay writing?

How does 3D visualization contribute to building or manipulating physical models, and how does that connection contribute to learning achievement?

Does 3D visualization affect how students reconstruct images in the mind's eye? (Mental Reconstruction)

- **Does 3D visualization cause students to request more access to the content? (Learning Replay)**
- **Does using 3D visualization help us learn the same amount of content in less time? Or does it help us learn more content in the same amount of time? (Learning Efficiency)**
- **What are the social, psychological, and learning effects of 3D stereo visualization in more challenging environments, such as prisons, detention centers, and institutions?**

Where to Learn More…

•3D in the Classroom Blog:

FutureTalk

http://future-talk.net

Q & A

BVS^{3}D Year 3

We focused on the differences between 2D images and 3D images, using an abstract concept such as DNA Replication and protein synthesis. Students in the control class only saw 2D pictures and animations. The experimental group received 3D animations instead. Keeping with previous results, we didn't see a difference in multiple choice averages, but did see increased higher-level thinking and detail in the experimental group's essay writing. We also did a video assessment. Students used manipulatives (tinker toy sets) to build DNA and represent other molecules) to explain the processes such as DNA replication, and used their cell phones to tape mini-movies.

BVS^{3}D Year 3

Students who using 3D were better able to put molecules in relationship to one another in the 3D space and they had a higher level of understanding of the processes. They included more details in addition to just relating terms and steps of the process. The class with the 3D performed better on their essays and there were less misconceptions evident in their video assessments.

Our Case Study Schools

Monarch High School
- High performing school
- Focus: Advanced Science
- Three classrooms

Douglass Elementary
- High performing school
- Three 4th grade classrooms
- Focus: Science / math

Casey Middle School
- Low socio-economic school
- Second–language school
- Focus: Science

Halcyon
- Day Treatment Center
- Grades 6-12
- Science / Math

Student-created Content

- Shoot HD movies and photos in 3D and 2D formats
- View movies and photos in 3D on the 3.5" 3D LCD without glasses
- Connect to view movies and photos on your 3D TV system with an HDMI cable

3D Cameras

3D Movie Cameras

3D Document Cameras