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Video-Mediated Opportunities for Self-Directed Learning in Undergraduate Research Methodology Courses

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This course is a general introduction to research intended to equip first and second year undergraduate students with the skills needed in their studies. Topics covered include the purposes of research, defining research and research problems, defining a hypothesis, problem solving and knowledge discovery, methods of quantitative and qualitative research, conducting literature reviews, designing appropriate methodologies, evaluating outcomes, analysis and communicating the results.

RSCH 202 Course Goals

This course gives students a thorough introduction to research processes and techniques, equips them to learn other techniques and do research in future courses and their professional lives, and provides them with the knowledge to evaluate research done by others.

Prerequisite(s): ENGL 123 or ENGL 221, and MATH 211 or MATH 222.

IGNITE!

QEP

U.S. Department of Education – Spellings Report:
“Policymakers and educators need to do more to build America’s capacity to compete and innovate by investing in critical skill sets and basic research.”

- Chalkboard - - - > Whiteboard
- Overhead Transparencies
- Videotapes
- CD-ROMS
- DVDs
- Digital Projection – PowerPoint
- Smartboards
- Internet
- Individual Computers
- Tablets/Handheld Devices

- Generally heralded as having a positive effect on learning and retention
- Higher student satisfaction and motivation
- Higher levels of student engagement with the material
- Positive effect on the achievement of learning objectives

- Several studies have questioned the efficacy of these instructional strategies
- Studies comparing a teaching design including multimedia instruction with two alternative formats yielded mixed results
- Student surveys indicated an overwhelming positive response from the students using the multimedia
- However, no subsequent gains in scores on assessment measures

Borokhovski et al. (2015) meta-analysis of technology integration

“Even development and introduction to educational practice of much more sophisticated computer tools and applications have not impacted students’ learning outcomes impressively enough to consider the issue unequivocally resolved in favor of proponents of educational technology”

Rackaway (2012) blames the lack of attention and effort focused on determining best practices and effective use of multimedia in classrooms leading to haphazard and partial implementation for the lack-luster results of evaluative studies.

Potential Advantages

Multimedia provides for the accommodation of multiple learning styles that better engage students in course materials (Rackaway, 2012)

Thoughtful inclusion of multimedia based on addressing specific learning goals, problem areas or deficiencies (Williams & Harkin, 1999)

- Use based on intentional pedagogy with a clear and focused purpose
- Particularly advantageous for learning complex topics and dynamic processes that unfold over time
- Quality media material results in better cognitive encoding and subsequent easier retrieval, leading to increased comprehension and retrieval (Ludwig, Daniel, Froman & Mathie, 2004)

In the early days videos were difficult and resource-intensive to produce

“Low-cost educational videos,” characterized by the ease of production, short length and limited focus, have emerged as popular instructional strategies

Various studies assessing the use of low-cost educational videos, aimed at supporting independent learning have concluded that they address the previous problems related to video inclusion and represent an effective learning tool (Allen & Smith, 2012; Hsin & Cigas, 2013; Kay, 2012; Lloyd & Robertson, 2012; Rackaway, 2012)

Identified Problem Areas

- Process of Research
- APA/Plagiarism
- Literature Review & Revising/Editing Writing
- Variables – Categorical vs Numerical
- Sample Selection
- Research Question
- Formulating and Testing Hypotheses
- Choosing a Statistical Test
- p-Values and Confidence Intervals

Identify
problem areas
in the courses
you teach that
might benefit
from
supplemental
tutorials

How?

Technical Considerations:

SnagIt

Panopto

Kaltura

Other Considerations:

Length

Generic or specific

Faculty member visibility

Who?

Selecting pilot courses

Modality

Instructor “quality”

How many courses?

“Main” terms vs. online-only terms

Securing instructor buy-in

Weekly emails

Announcements

Survey links

Enthusiasm

Where?

Embedding vs. YouTube channel

Ensuring self direction

Rewards for completing surveys?

Keeping it optional

SurveyMonkey vs. End-of-course evaluations

Where?

The screenshot shows a YouTube channel page with the following elements:

- Navigation Bar:** Includes 'VIDEO MANAGER', 'LIVE STREAMING', 'COMMUNITY', 'CHANNEL', 'ANALYTICS', 'CREATE', and 'Help and feedback'.
- Channel Header:** 'Videos - YouTube' with a search bar and 'Actions' menu.
- Video List:**
 - Where is the Evidence?** (Aug 8, 2016 9:54 AM) - 6 views, 0 likes, 0 dislikes.
 - Courtroom Analogy** (Jun 30, 2016 8:23 AM) - 10 views, 0 likes, 0 dislikes.
 - Aim for the Bullseye** (Jun 30, 2016 8:20 AM) - 5 views, 0 likes, 0 dislikes.
 - Formulating a Hypothesis** (Apr 21, 2016 10:37 AM) - 14 views, 0 likes, 0 dislikes.
 - revising writing** (Apr 12, 2016 7:59 AM) - 17 views, 0 likes, 0 dislikes.
 - Choosing Test** (Apr 12, 2016 7:55 AM) - 29 views, 0 likes, 0 dislikes.
- Video Thumbnails:** Each video has a thumbnail with a duration indicator (e.g., 3:50, 2:40, 2:48, 8:55, 6:29, 6:10).

Why?

Is improvement measurable?

Lackluster student participation?

Did we choose topics wisely?

Are targeted
video lectures
the most
useful route
for your
course(s)?

Initial Surveys

Do you think that your pre-requisite Statistics course prepared you for the statistical tasks in this course?

Definitely agree	Agree	Disagree	Definitely disagree	I did not take MATH 211 or 222 at ERAU
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Do you think that your pre-requisite English course prepared you for the statistical tasks in this course?

Definitely agree	Agree	Disagree	Definitely disagree	I did not take ENGL 123 or 221 at ERAU
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Given all the material and activities in this course, I still had difficulty understanding many of the concepts.

Definitely agree	Agree	Neutral	Disagree	Definitely disagree
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Please rate the ease with which you learned about the following topics in the course.

Very difficult	Somewhat difficult	Neutral	Somewhat easy	Very easy
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What research is				
Annotated Bibliography				
Literature Review				
Research question development				
Testable Hypothesis				
Data types				
Data tests				
Data collection				
Qualitative research				
Quantitative research				
Ethics in research				

Video Surveys

* 1. In what modality are you taking the course?

- Online (not EagleVision... not a classroom lecture... 100% online)
- EagleVision Classroom
- EagleVision Home
- EagleVision Hybrid (EV Home + EV Classroom)
- Lecture in a Classroom (no EagleVision... just a live instructor)

* 2. Which video did you watch?

- Sample Selection

* 3. How much of the video did you watch?

- All of it
- Some of it
- Almost none of it

* 4. This video helped me understand this module's important concepts and/or assignments.

- Definitely agree
- Agree
- Neutral
- Disagree
- Definitely disagree

5. What was most helpful part of the video?

6. How could this video be improved?

Draft some
important
questions to
gather data to
support or
refute your
intuition

- Online students access their courses at various times, from locations all over the world.
- Courses are self paced, but are not designed to be self taught.
- Visual learners do not learn by reading alone.
 - Many complex concepts, especially science concepts, may not be fully understood by simply reading about them.
- Video lectures serve to enhance student learning and provide visual learners the visual contact they need.

Video Lectures Can Improve Student Learning

- Developed online physics and weather courses without lecture videos.
- Students struggled with understanding many concepts and exam results indicated that lack of understanding.
- Recognized the need for students to have video lectures.
- Developed video lectures by chapter, for each course.
- Student understanding improved, based on student comments and performance on exams.
- Lead a horse to water -----

Use the **KISS** principle when developing lecture videos.

More is not necessarily better in terms of video length.

Help the student eat the elephant in small bites.

Most chapters are broken down into sections

15-20 minute videos on a topic/section

Reinforce learning with formative assessments that follow from the videos.

RODE to success – Read, Observe, Do and Evaluate

Read the chapter

Watch the lecture video

Do homework, answer questions, etc.

Evaluate – quizzes, test, exams.

Identify
problem areas

Determine
whether
videos might
work

Draft some
important
questions

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Discussion