The Relative Effectiveness of Different Modes and Media in Informational Presentations on Students’ Recall of Concrete and Abstract Prose

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The Relative Effectiveness of Various Modes and Media of Presentation on Students’ Recall of Concrete and Abstract Information

By Stephen E. Gareau—Buffalo State College—November 2, 2007

Purpose of Study
To compare the effectiveness of various modes and media on the recall of information among freshmen undergraduate students of differing reading abilities.

- Modes compared:
  - (1) text only
  - (2) text + visuals

- Media compared:
  - (1) print medium
  - (2) computer (digital) medium

Research Questions
- **Primary:** What is the relative effectiveness of various modes and media of presentation on the recall of information among freshmen undergraduate students of differing reading abilities?
- **Secondary:** What is the relative effectiveness of these various modes and media of presentation on the recall of concrete and abstract information among freshmen undergraduate students of differing reading abilities?

The Use of Media in Instruction
- Debate began in 1983 with Richard Clark’s claim that “media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition” (Clark, 1983).
- Since 1983:
  - Various positions and theories have been put forth.
  - Despite extensive changes and improvements in media capabilities, “the debate has remained frozen in time” (Hastings & Tracey, 2005).
- Also, modern technology has turned Clark’s ‘delivery truck’ into ‘a supersonic jet’ (Hastings & Tracey, 2005).

Theories of Media Effectiveness
- Audiovisual theory (Dale, 1946)
- Dual coding theory (Paivio, 1971; 1986)
- Single channel theory (Travers, 1985)
- Media as ‘one variable among many’ theory (Clark, 1983)
- Media attribute theory (Kozma, 1991)

Research Approach and Design
- **Research approach:** Quantitative and qualitative quasi-experimental research
- **Research design:** Randomized, 2 X 2 factorial, posttest-only comparison group design, using intact groups

2 x 2 Factorial Design

<table>
<thead>
<tr>
<th>Type of Medium</th>
<th>Type of Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Print</strong></td>
<td>Text-only</td>
</tr>
<tr>
<td><strong>Computer (digital)</strong></td>
<td>Group 1 (8:00 a.m. class)</td>
</tr>
<tr>
<td><strong>Group 3</strong></td>
<td>Group 4 (11:00 a.m. class)</td>
</tr>
</tbody>
</table>
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Population and Sample

- **Target population:** All freshmen undergraduate students in New York State.
- **Accessible population:** All freshmen undergraduate students at a New York State public comprehensive university.
- **Sample:** 124 freshmen undergraduate students taking a 100-level ‘Computer Fundamentals’ course at the university.
- **Sampling method:** Convenience sampling
- 4 intact classes—approx. 30 students in each class—were randomly assigned to the 4 different treatments.

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Procedure

- **Pretest:** Wednesday, February 22, 2006.
- Students given 30 minutes to complete pretest.
- **Treatment:** Monday, March 13, 2006, from 8:00 a.m. to 12:50 p.m. in a campus computer lab.
- Same sections of a fiction story presented to each group in one of four different media/mode formats.
- Students given 25 minutes to read story.
- **Posttest:** Administered immediately after the treatment.
- Students given 20 minutes to complete posttest.
- **Data Analysis:** Factorial Analysis of Covariance (ANCOVA)

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No Main Effects and No Interaction Between the Two Variables (Adjusted Scores)

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Marginal Difference: Text + Visuals versus Text-only on Posttest Concrete Scores

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Summary of Results

- No significant main (treatment) effects were present among the two variables—media and modes.
- No significant interaction effects were present between the two variables.
- These results apply to both types of information presented, including concrete and abstract information.
- **Exception:** With modes, marginally significant differences existed between visual + text mode and text-only mode concrete scores (F(1,90) = 3.25, p = .07), with visual + text mode providing marginally better results.
- Also, the presence of technology was generally a motivating factor. Yet, at the same time, technology had the potential to be a distracting element.

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Implications of Results

- Provide some support to Clark’s (1983) view that “media do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition”. 
- Supports Laanpere’s (2000) view that “most media may be used effectively for the attainment of different objectives, although most objectives may be achieved through any of a variety of media”. 
- Results run somewhat counter to approaches to instructional design that stipulate the necessity of design, development, and use of multiple forms of information representation.

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