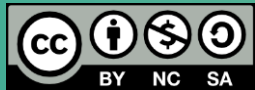


Playing Bingo to learn Boolean operators

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uOttawa

Bibliothèque
Library

Outline

- Game-based learning (GBL) in library instruction
- Project overview and methodology
- Playing BIBLIOBINGO
- Results and discussion
- Limitations and next steps
- Your questions and experiences

GBL in instruction

- Achieve learning outcomes
- Enhance motivation and student engagement
- Address different learning styles
- Enable self-discovery of information
- Build on prior knowledge
- Increase retention

Best practices for GBL

- Minimal instruction and complexity
- Engaging content and elements of fun
- Built around rules, goals and challenges
- Tied to learning outcomes
- Assessing prior and post-game knowledge

Best practices for GBL

- Immediacy of feedback
- Ability to learn from failure
- High level of participation, low level of frustration
- Targeted shorter games may be more effective
- Student involvement during game development

Research project overview

- To determine whether playing a game increases students' learning of Boolean logic
- Limited research on specific info lit skills
- To inform local teaching practices and encourage the use of games to enhance learning and increase enjoyment

Research questions

- Does playing a Boolean-themed game affect student performance in using Boolean operators to build search strings?
- Does reported enjoyment of the game correlate with higher performance in using Boolean operators for building search strings?

Research project context

- Most instruction at uOttawa is done through one-shot, 80-minute sessions at all levels
- Challenge of motivating students is prevalent
- Limited use of games as a learning activity
- SCS 1150 course was targeted for this study
- Conducted in Fall 2017 and Winter 2018

Methodology

- Pre- and post-test experimental design
- Convenience sampling
- Students were randomly assigned to groups
- Session structure
 - Instruction
 - Pre-test
 - Game
 - Instruction
 - Post-test
 - Post-test

Methodology

- Focusing on a specific skill – Boolean logic
- Using non-linguistic representation
- Note – research ethics approval obtained

**Let's play
BIBLIOBINGO**

Results and discussion

Response rates, overall

- 165 students participated (214 enrolled)
- Response rate =
valid responses / enrollment
- Overall responses: 77.1%
(including incompletes)

Response rates, per test

- Pre-test: 73.4%
- Post-test (1): 71%
- Post-test (2): 77.6%
- Question about “fun”: 57%

Means of experimental and control groups

GROUP	PRE-TEST	POST-TEST 1	POST-TEST 2
Experimental	46.4	49.5	50.2
Control	49.1	47.1	51.5

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Research question #1

- Does playing a Boolean-themed game affect student performance in using Boolean operators to build search strings?
 - Experimental group appeared to make higher gains
 - BUT
 - no *statistically significant* difference between the means of both groups

Research question #2

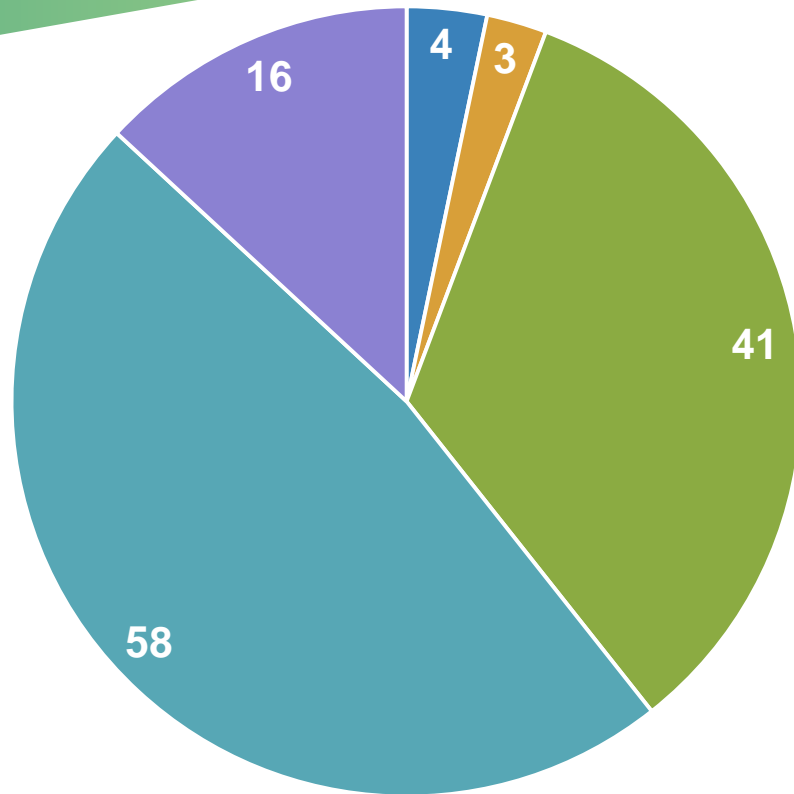
- Does reported enjoyment of the game correlate with higher performance in using Boolean operators for building search strings?

“Fun” variable survey question

- “Which answer best describes your feelings about the following statement?”
 - “I found playing BiblioBingo fun.”
 - Strongly disagree
 - Disagree
 - Neither agree nor disagree
 - Agree
 - Strongly agree

“I found playing BiblioBingo fun”

- strongly disagree
- disagree
- neither agree nor disagree
- agree
- strongly agree



Research question #2

- Does reported enjoyment of the game correlate with higher performance in using Boolean operators for building search strings?
 - 60.7% agreed or strongly agreed game was fun
BUT
 - no *statistically significant* correlation between amount of “fun” reported and scores

Limitations and next steps

- Sampling method
- Incentives/motivation to participate

Limitations and next steps

- Experimental design
 - Changing order of administration (Latin square design)
 - AND operator conceptually present in control cards
 - Next steps: isolate results for questions relating to OR/NOT

Concluding remarks

- GBL in instruction has increased significantly with mixed results
- Trying something new to energize the one-shot while improving student learning
- Disappointing results overall, but maintaining a positive outlook for future applications
- Learning opportunity to enhance methodology

Additional information

- Link to supplemental material - <http://bit.ly/bibliobingo>
- Acknowledgement: Riva Lieflander for advice on and assistance with methodological questions and statistical analysis
- Presentation template: [SlidesCarnival](#)

Questions and comments