WHAT'S GAME-BASED LEARNING?

Professor Alf Inge Wang
Norwegian University of Science and Technology
Co-Inventor/Composer/Game designer Kahoot!

Agenda

- Motivation
- Why use games in learning?
- What makes things fun to learn?
- One successful example
- Experiment

Motivation

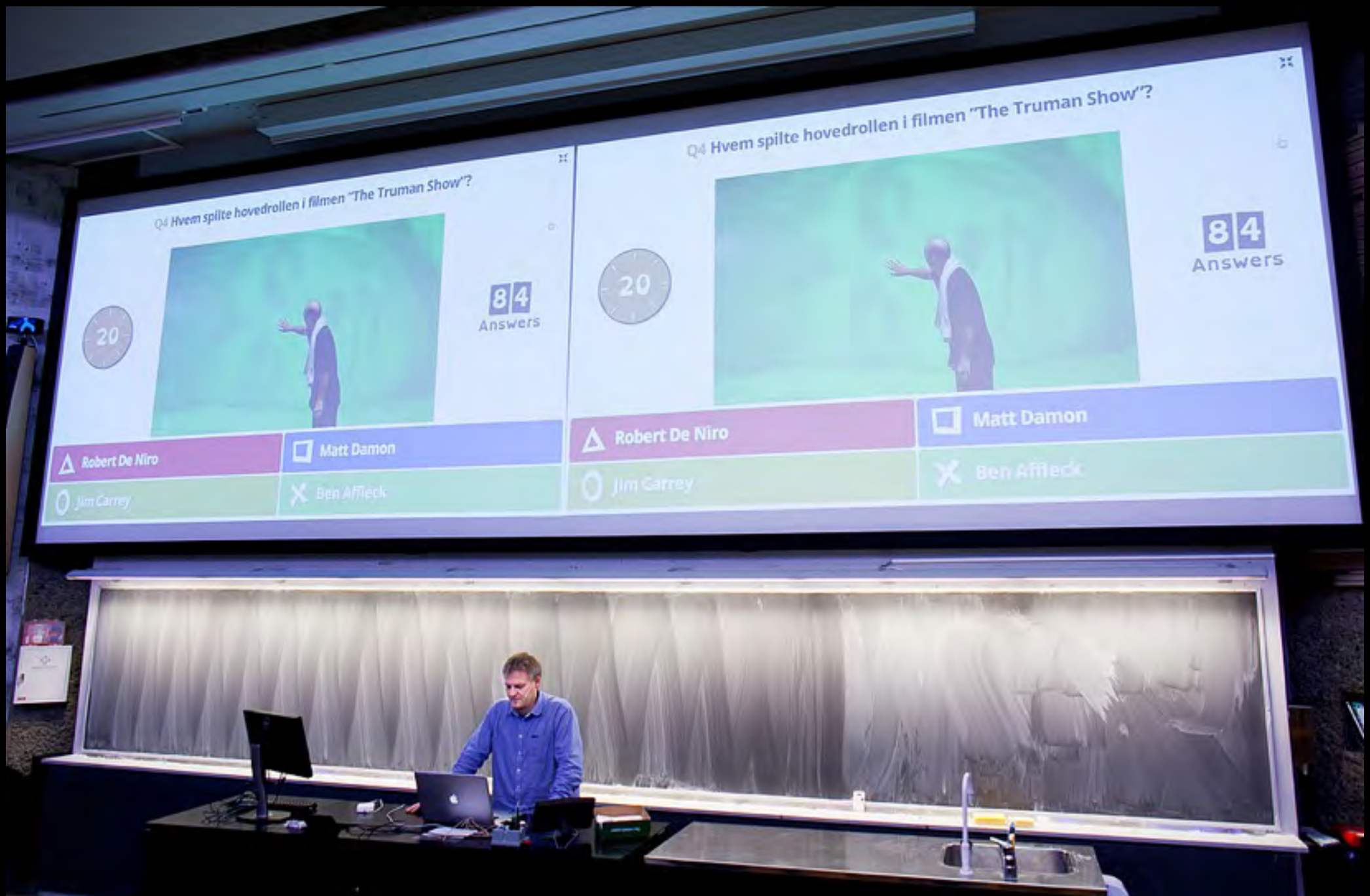
Transform unengaged, passive students...

... to active and inspired in own learning

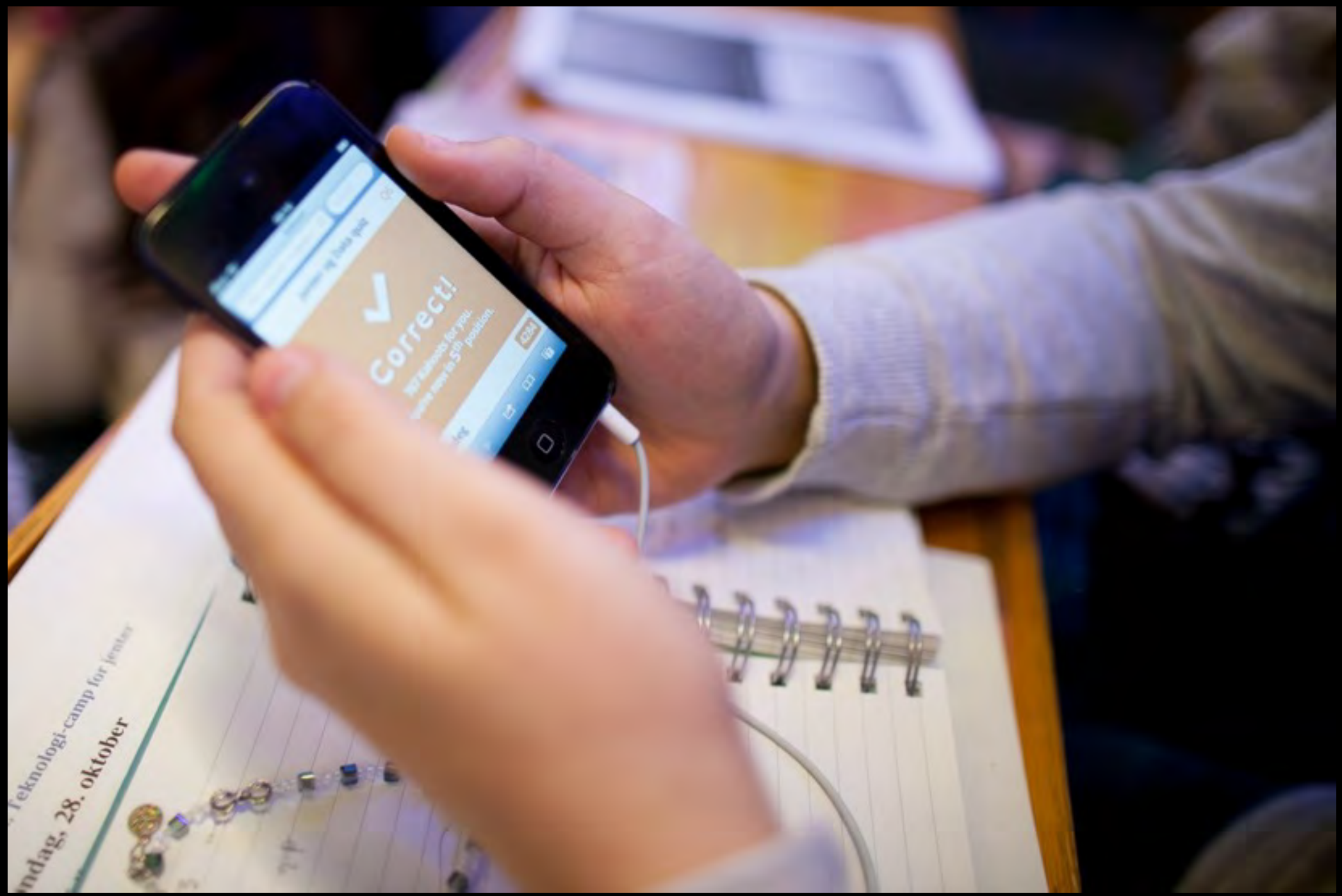
From one-way communication

...to two-ways interaction

Provide useful feedback to instructors



Provide useful feedback about what you have learned



Why use games in learning?

What games used to be…

Gradual and subtle introduction to complexity

Audio visual feedback on players (in)/correct actions

Open new opportunities as the player learns more

What makes things fun to learn?

An overall goal

Explore a story

VS

Points

Fantasy integrated with what you should learn

Intrinsic

VS

Extrinsic

Adjusted progression of difficulty

Increase speed/enemies

More difficult puzzles

Several levels of difficulty

Dynamic

VS

Static

Uncertain outcomes

Consequences

Trial & error

Several ways of winning

Linear gameplay

VS

Sandbox gameplay

Well defined progression
Awards related to progression

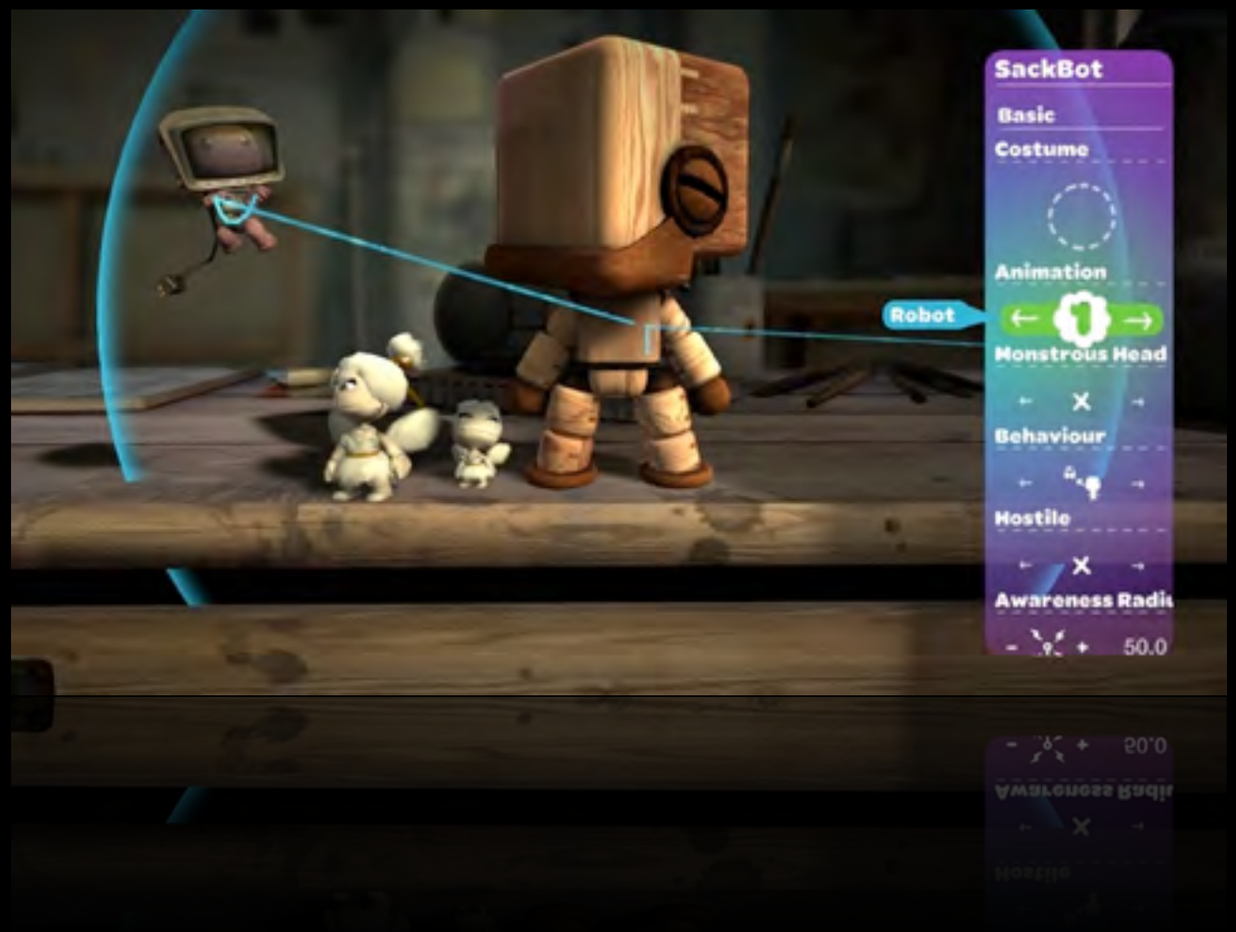
Trophies

Points / score

Statistics

Opportunities to create new content

Create gameplay



Create structures

Provide hints and not give direct answers

Camera / focus

Dialogue / text

Challenges related to Game-based Learning?

- Find the perfect balance between learning and entertainment
- Small budgets due to low volumes
- Best learning games made for specific learning goals - little reuse
- General learning games result in less learning, but can be reused in several domains (quiz)

One Successful example

Kahoot! is a basically BYOD gameshow in the classroom

Q1 Who used the argument "I think, therefore I exist"?

18

Next

0
Answers

Plato

Descartes

Leibniz

DEMO

Results so far…

- Used by 35,000,000+ in over 150 countries in schools, colleges, universities, businesses, churches, governments, organizations.
- More than 2 million public quizzes created

Use games in the classroom

- Variate teaching
- Socialization
- Fun repetition of important key points
- Test pre-knowledge and retention
- Run questionnaires
- Input to improve teaching plans/teaching
- Spark discussions
- Have students make game content

Results so far…

- Significant improvement in engagement and motivation
- Improved test scores (+10%)
- Shy and invisible students get noticed

Improved learning

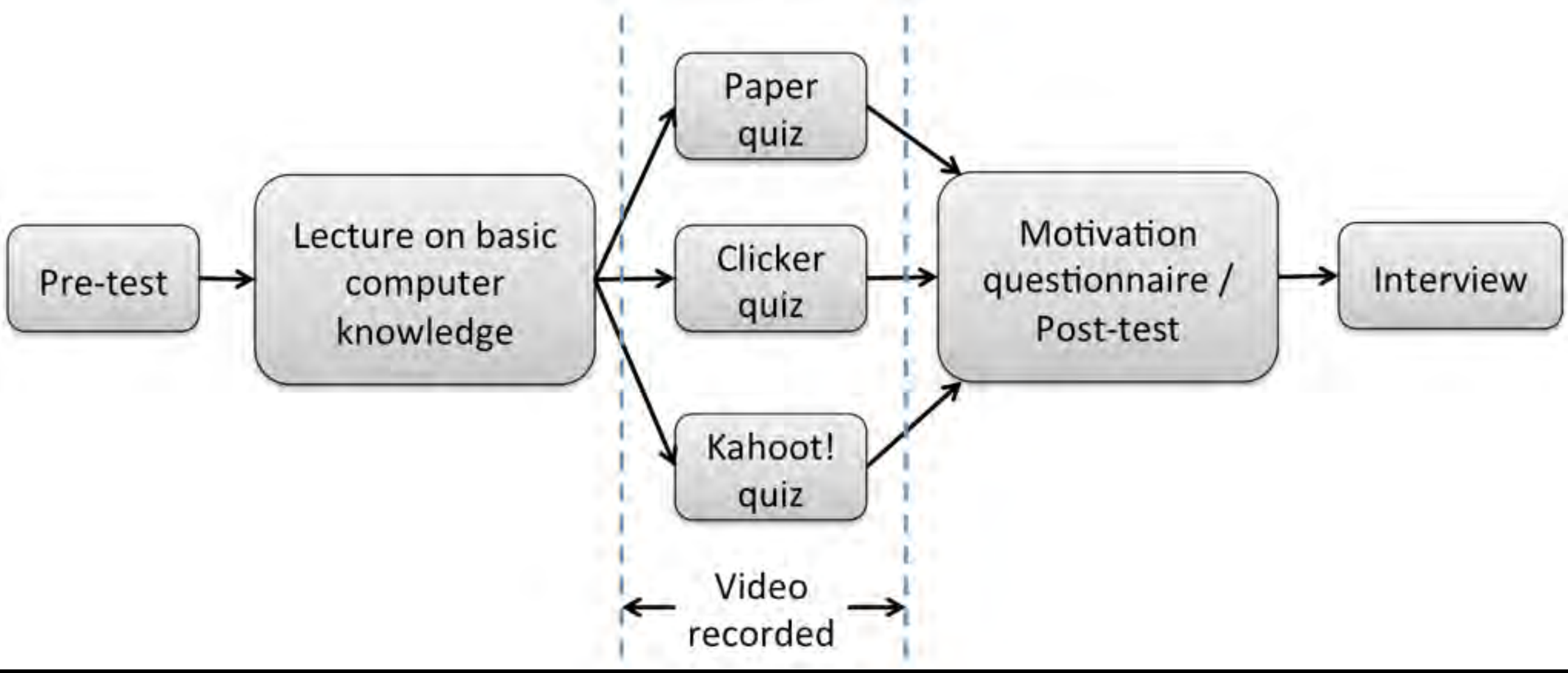
- More focused on learning when taught knowledge will be used immediately
- Acknowledgement on understanding
- Teacher can elaborate weak spots
- Important points easier to remember in the game/competition setting
- More positive towards lectures!

Experiment

Research results: Paper vs SRS vs GSRS

Experiment:
Same lecture taught in 3 parallels:
1. Used paper form quiz to review
2. Used simple student-response system (SRS) to review
3. Used Game-based SRS to review

Experiment set-up



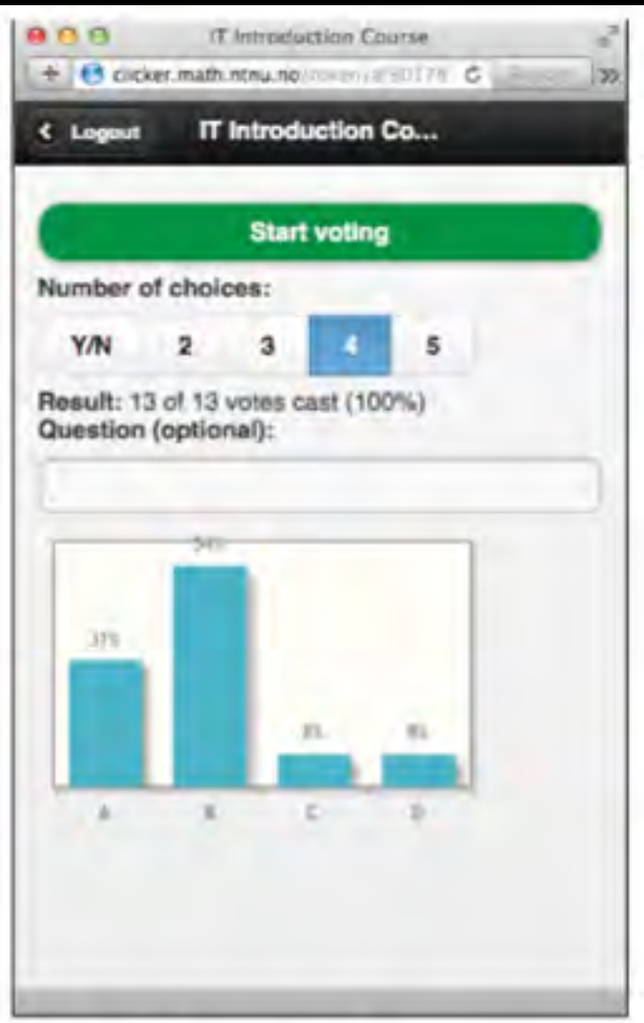
Paper forms

Clicker - Student-response system

a) Enter classroom

b) Choose choices

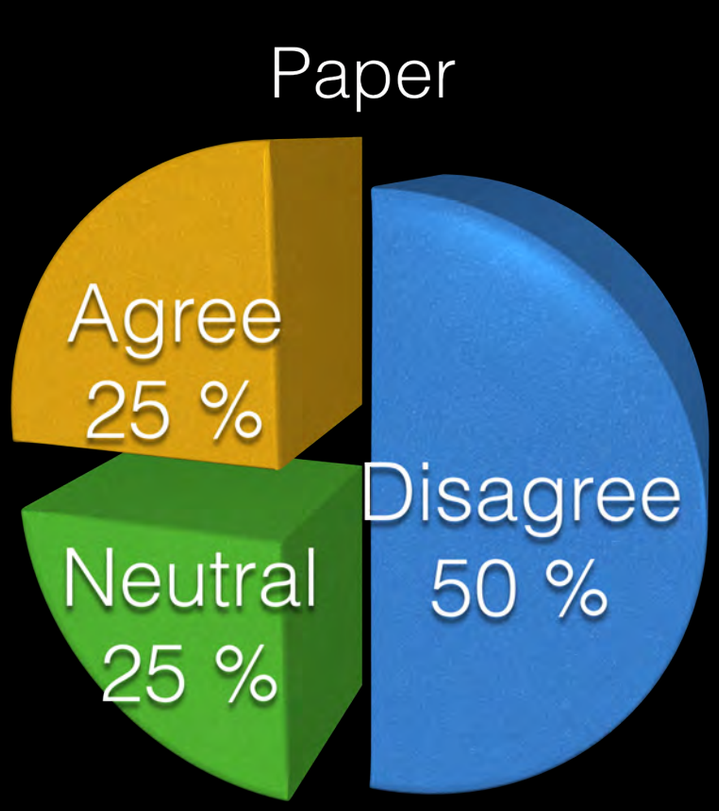
c) Collect votes

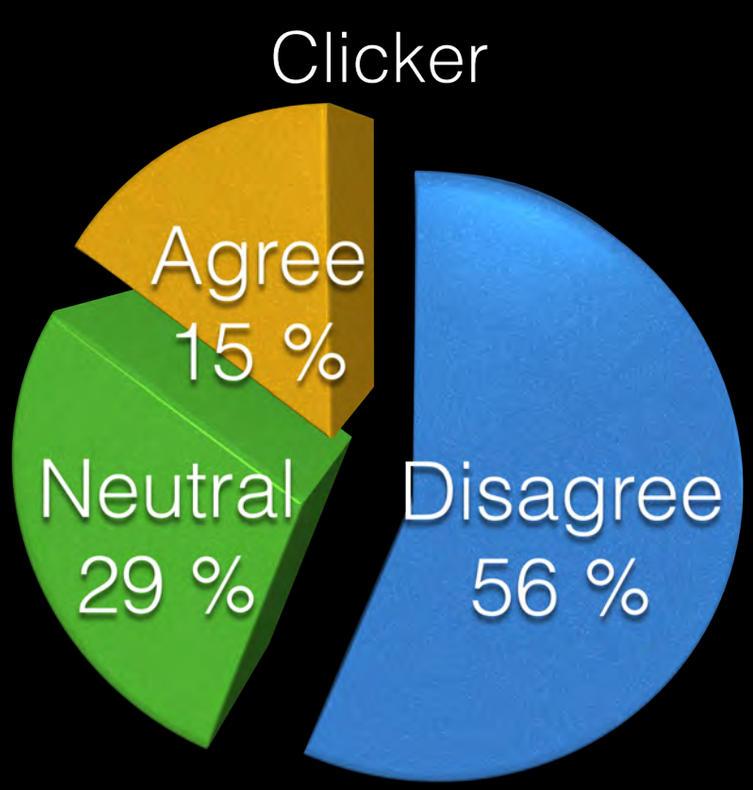


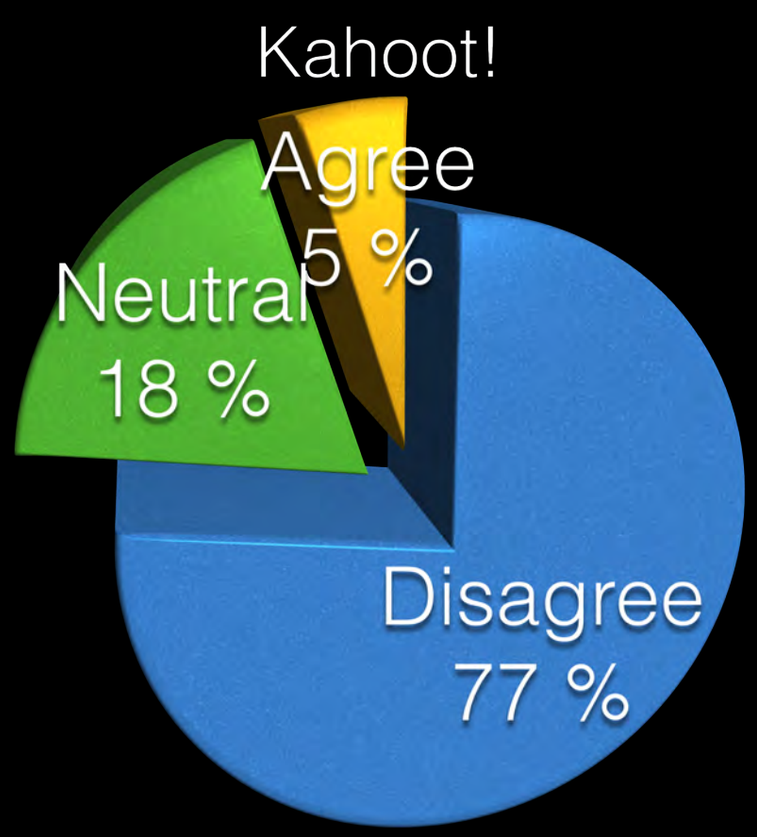
d) View results

Kahoot! - Game-based student response system

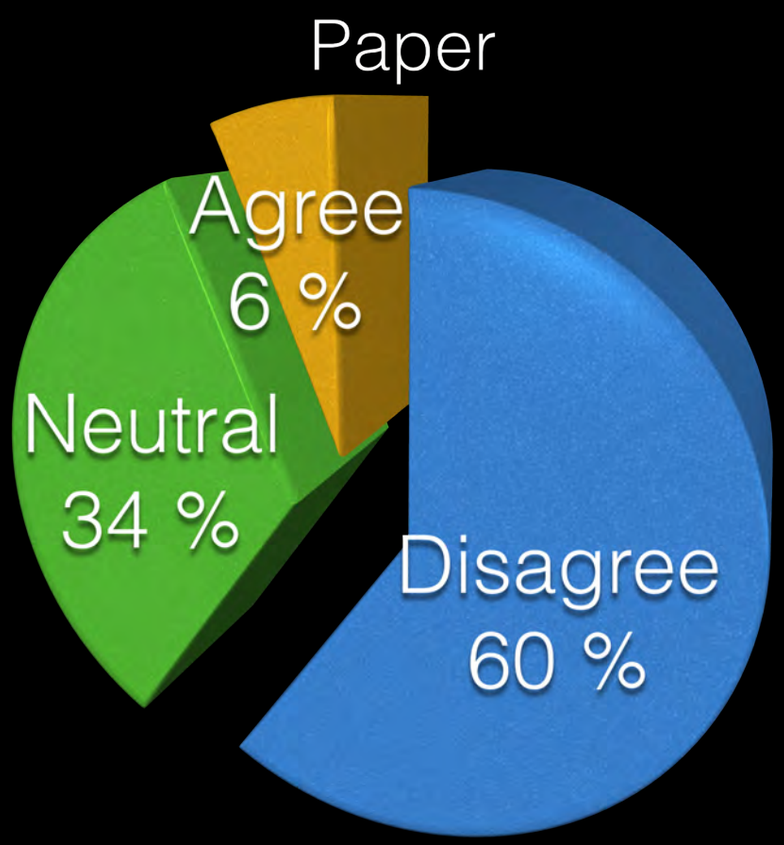
“I did the quiz only because the teacher told me to”

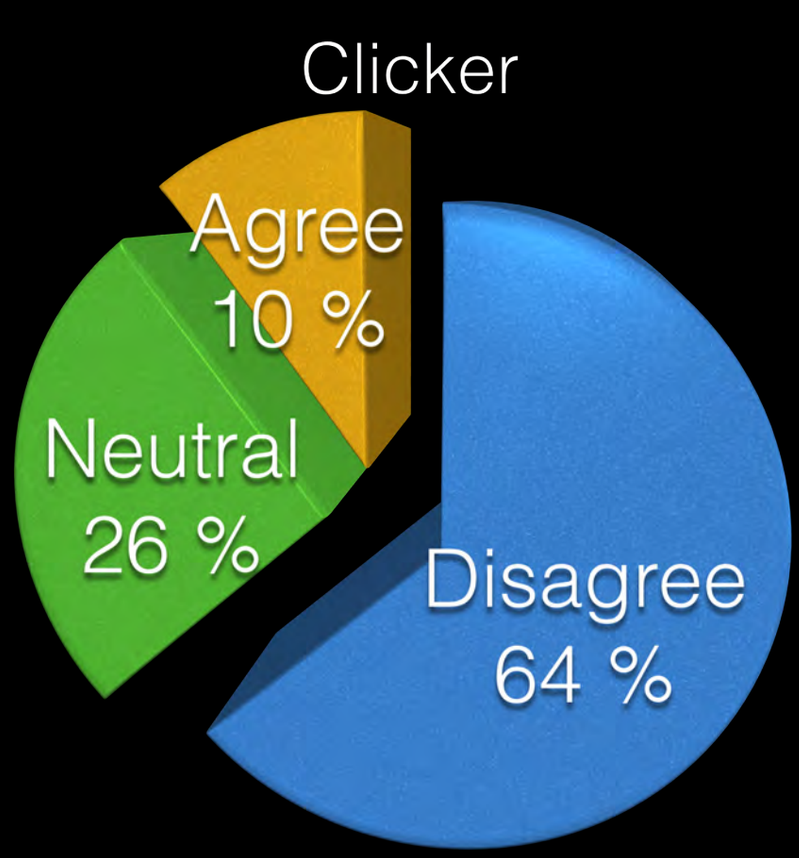


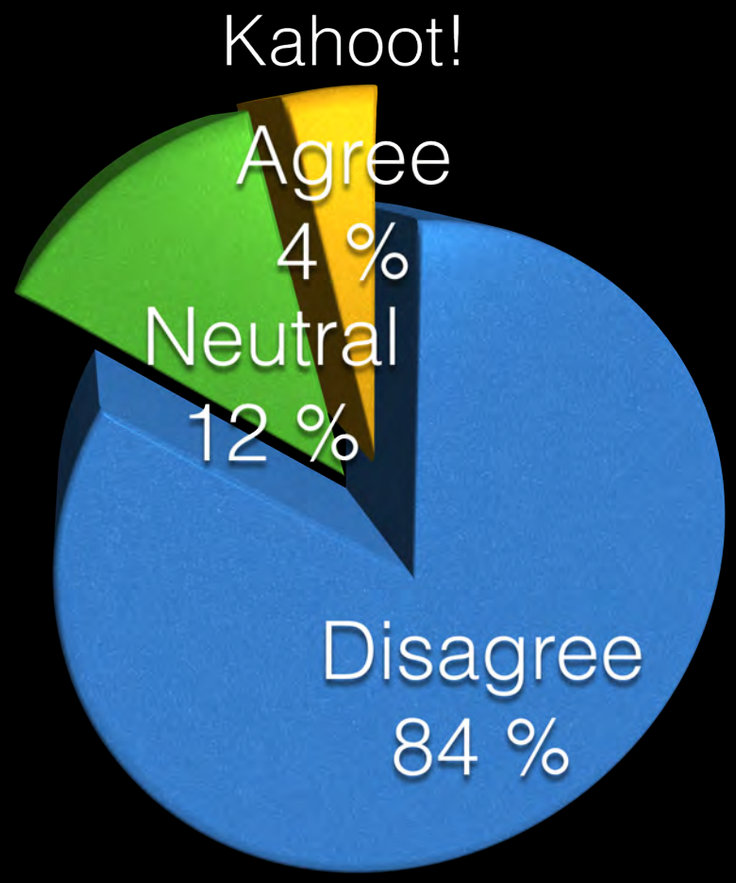




“The quiz was boring and not engaging”

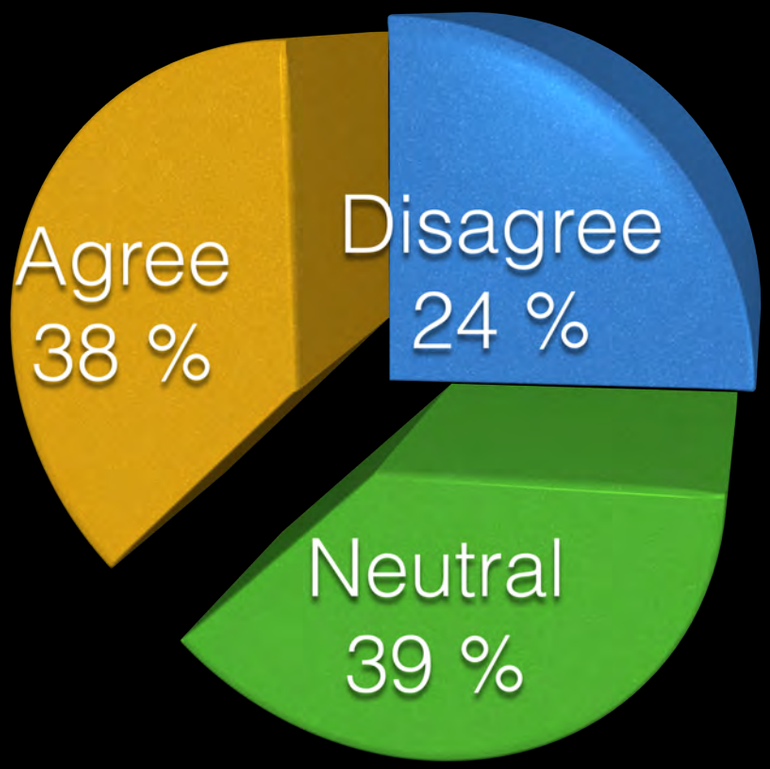




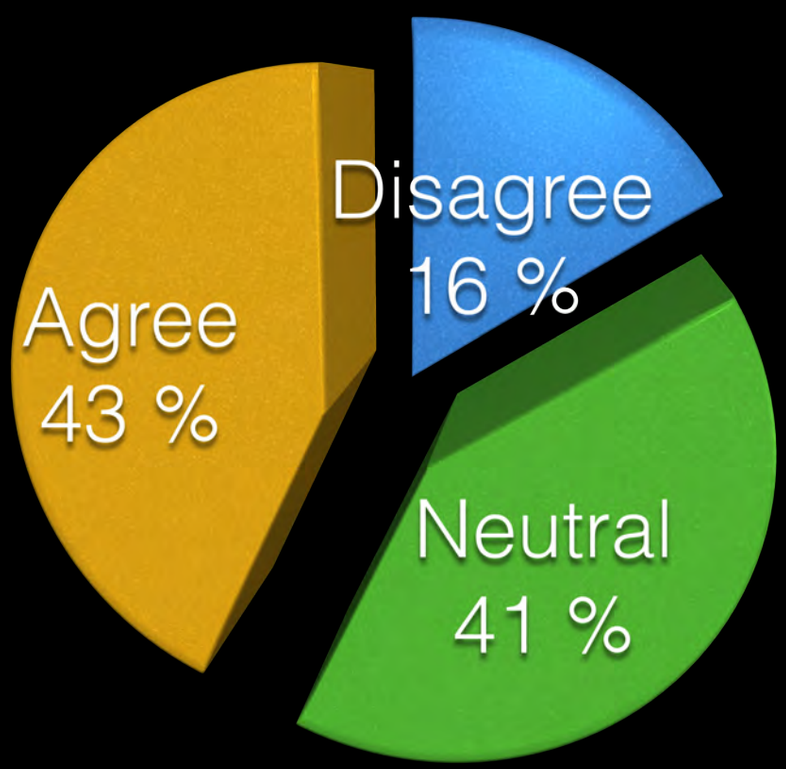


“I want to do better on the quiz than most other students”

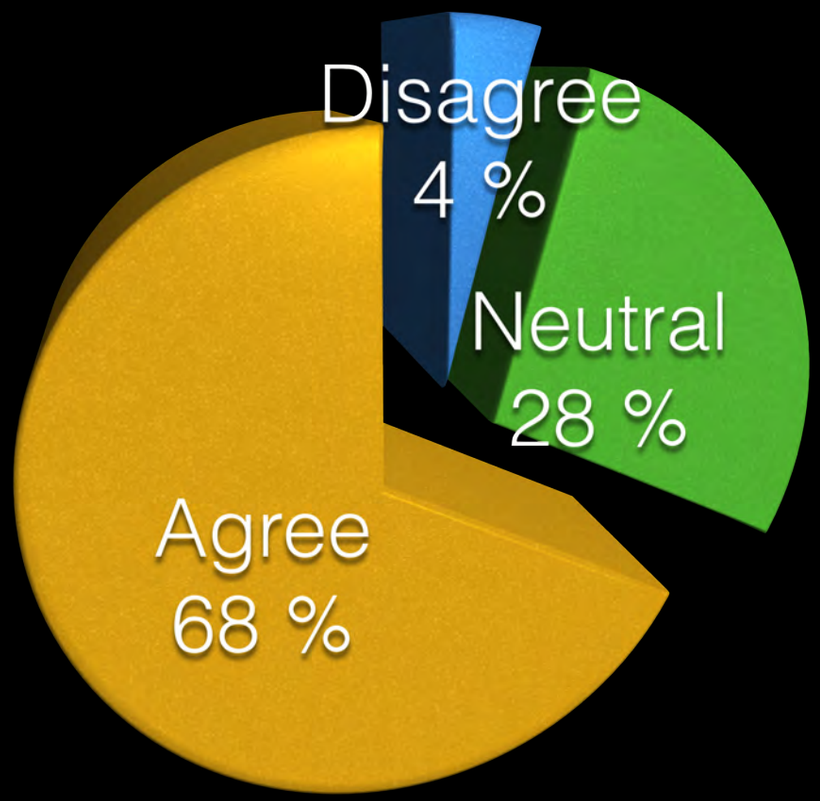
Paper



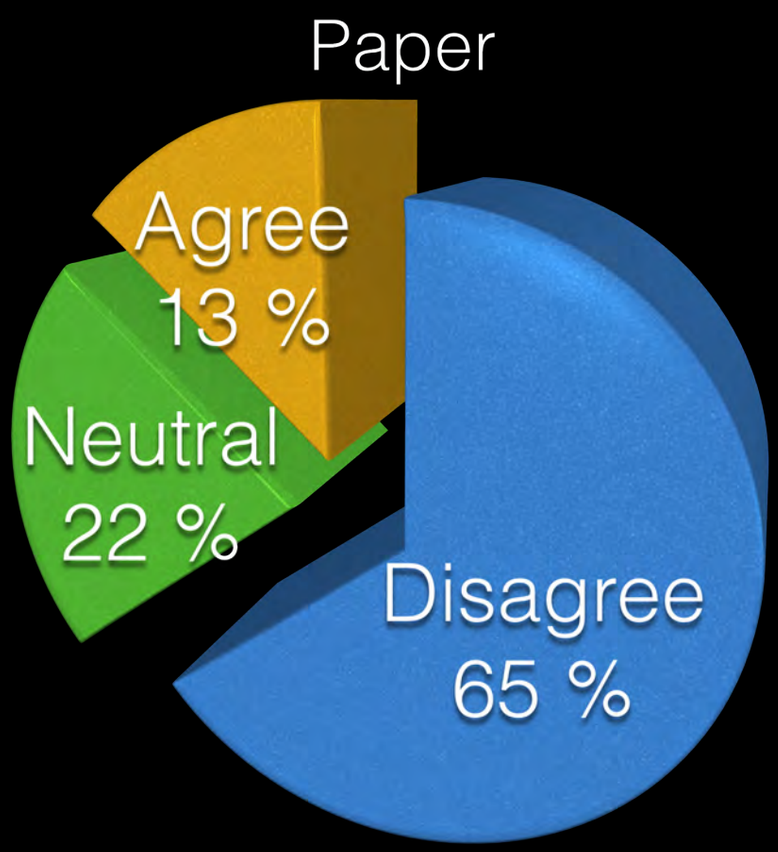
Clicker

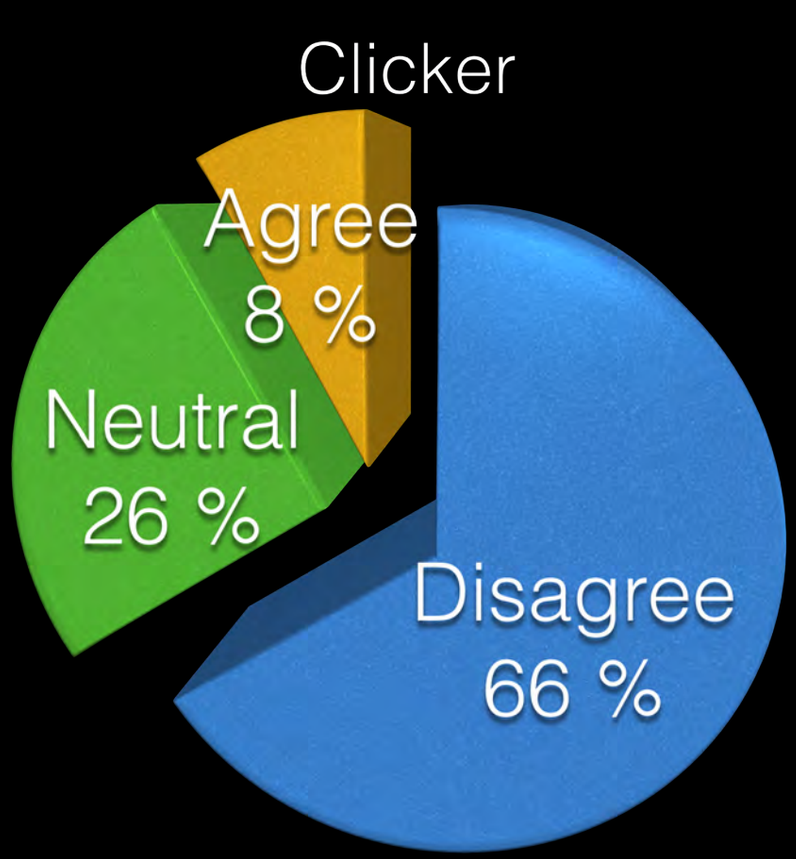


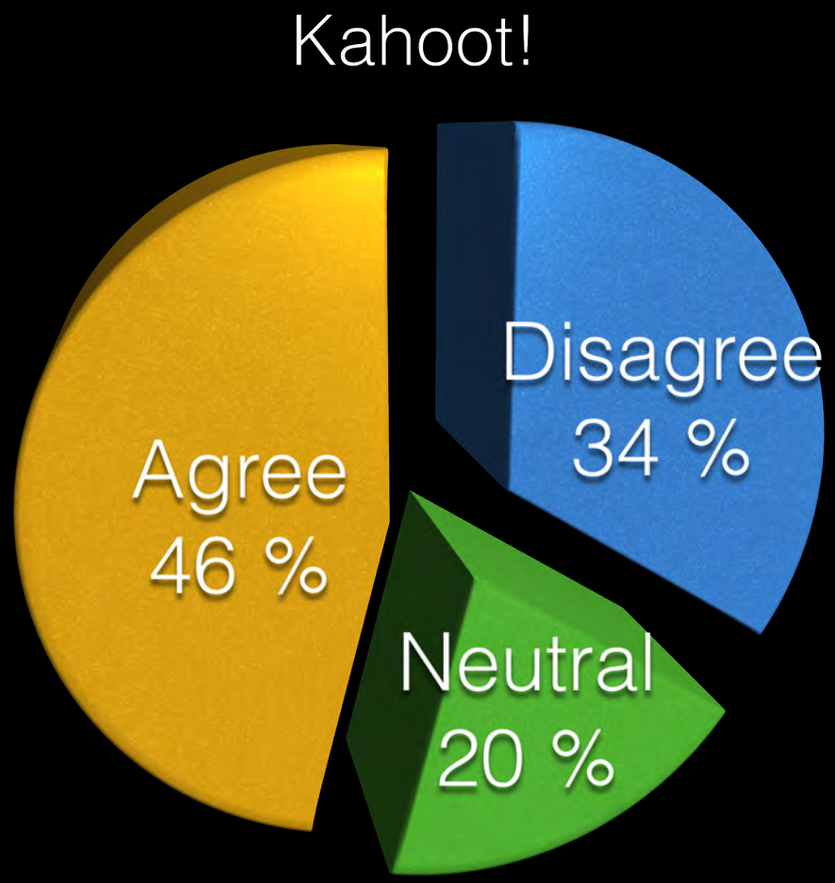
Kahoot!



“I felt increased pulse when answering the quiz”



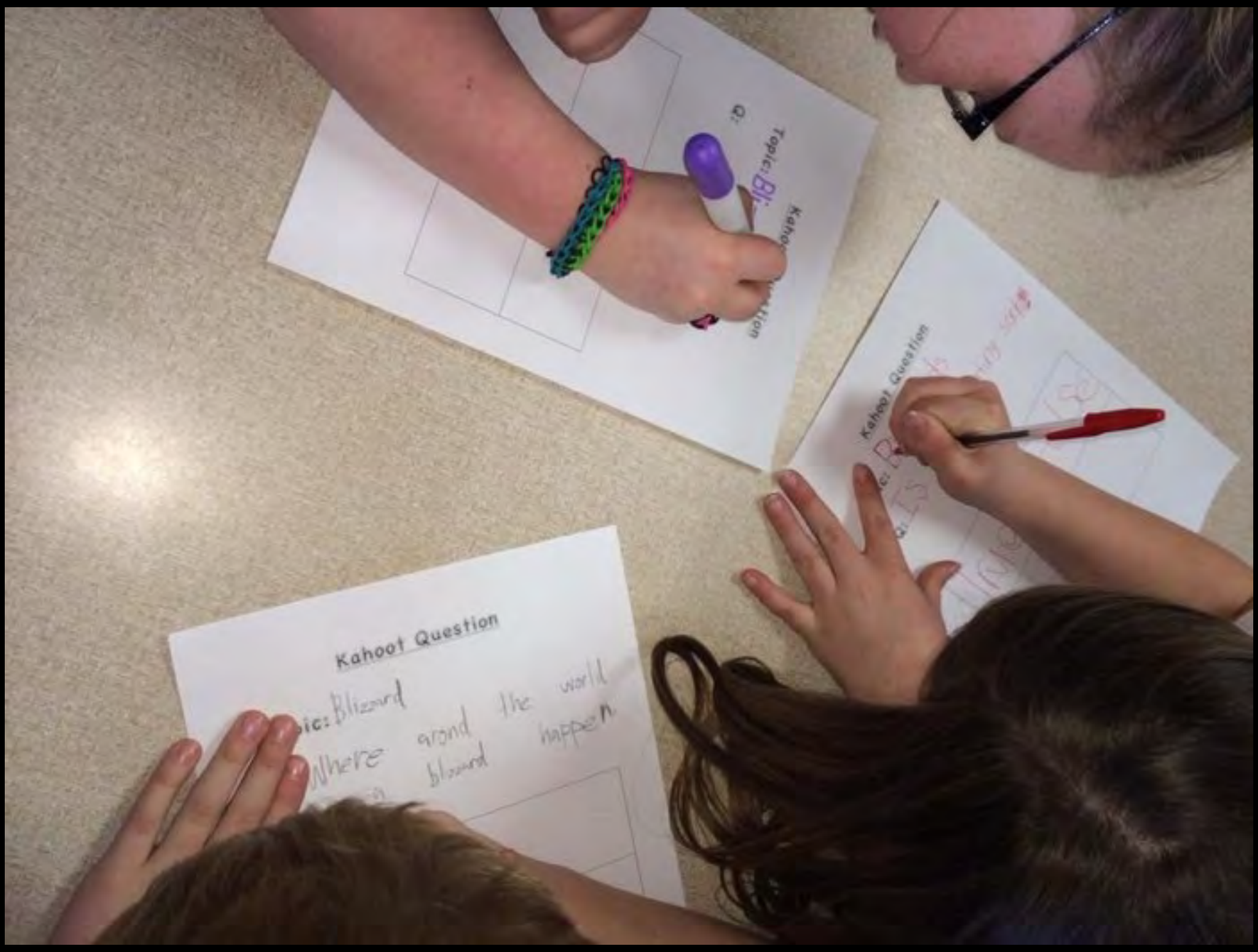


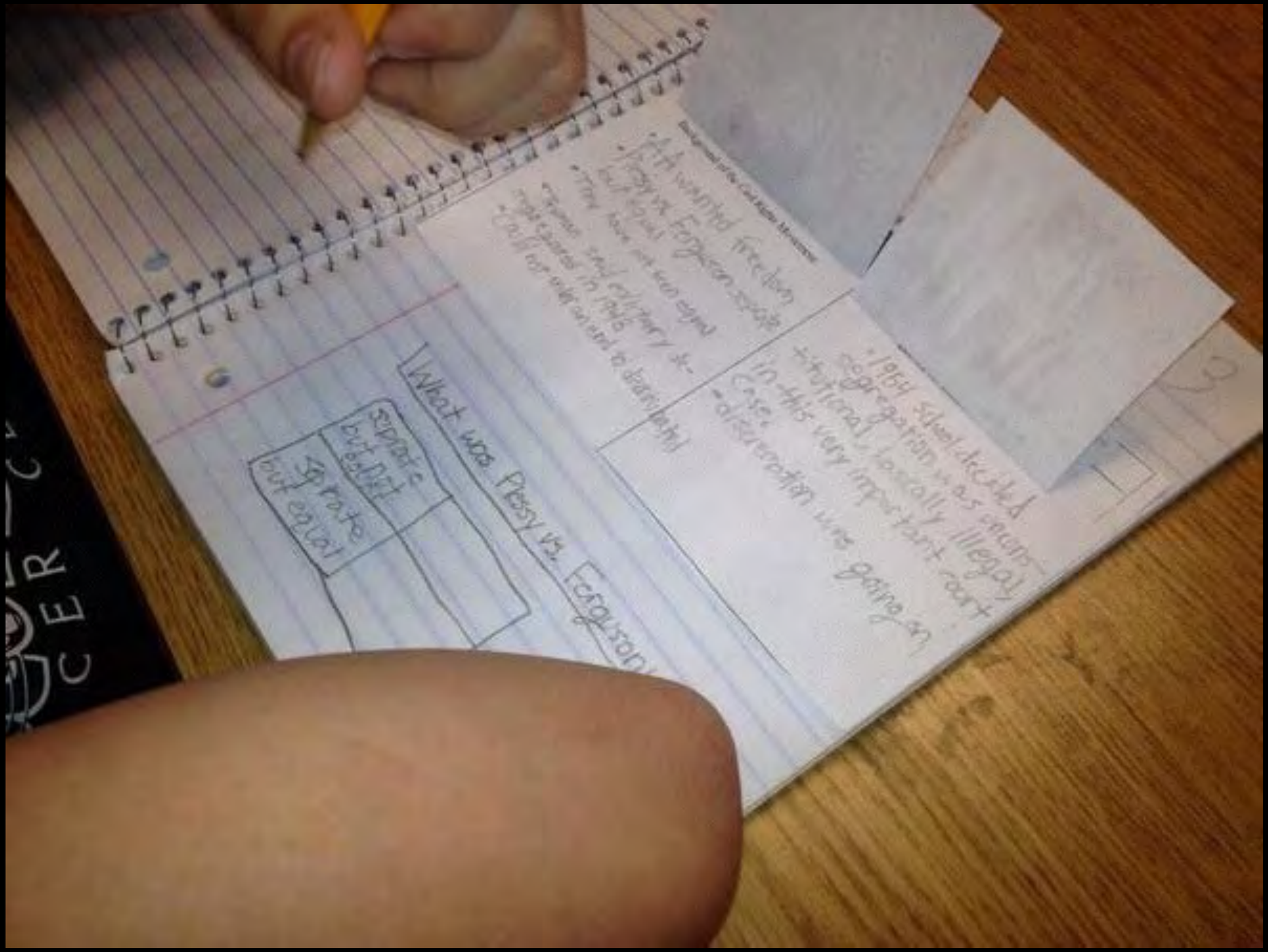


Other results

- Mean learning improvement (post-test - pre-test):
  - Paper: 3.669
  - Kahoot!: 3.817
- Less variation for gender and whether students play video games for Kahoot!
- Most variation for gender and whether students play video games for paper quizzes.

Make students create quizzes on a topic!


Kahoot Question
ic: Blizzard
Where arond the world
blizzard happen


What was Plessy vs. Ferguson
Separate but equal
Separate but equal

Quiz: Polygons and Angles
Question 2
Parallel Lines

ASKING GREAT QUESTIONS

Thanks!

- Email: alf@getkahoot.com
- Web: http://www.idi.ntnu.no/~alfw
- Please try out Kahoot! and share your experiences!

getkahoot.com