

Augmenting Reality in a Plant Science Lab

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Taken with a bird's eye view

Feathers in filmdom's

cap. Rio 2's macaw Tyler Blu latest bird to vie for a perch in Hollywood's avian pecking order



FOCUS

Hollywood's two most famous birds must be Donald Duck and Woody Woodpecker. Between them they've starred in almost 300 films.

This weekend Donald and Woody are joined by Tyler Blu Gunderson, a rare male Spix's macaw, voiced by Jesse Eisenberg making his second big screen appearance in Rio 2. He's joined by a cast of fine feathered friends, including a yellow canary (Jamie Foxx), a rapping red-crested cardinal (will.i.am) and a sulphur-crested cockatoo (Jemaine Clement), as they leave their home in Rio de Janeiro for the Amazon rainforest.

The colourful co-stars in Rio 2 are animated, which nakes them a much more







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What is Augmented Reality?

- Augmented reality is the integration of digital information with the user's environment in real time.
- Unlike virtual reality, which creates a totally artificial environment, augmented reality uses the existing environment and overlays information on

top of it



AR Potential Implications in a Learning Environment

- Yuen et al., 2011
 - ✓ Enhance collaboration between students and instructors and among students
 - ✓ Foster student creativity and imagination
 - ✓ Help students take control of their learning at their own pace and own path
 - ✓ Engage, stimulate, and motivate students to explore class materials from different angles
 - ✓ Help teach subjects where students could not feasibly gain real-world experience (astronomy)



 Determine the impact of using an augmented reality app for mobile devices on content retention of students enrolled in an introductory plant science laboratory



Methodology

- PSS 1313: Plant Science
 - ✓ Spring, 2015
 - ✓ 50 students

- PSS 1313 Lab
 - ✓ 3 lab sections (~16 students/lab)



- Used AR in 3 different lab exercises
 - ✓ Vegetable planting, weed walk, turf tour







zapcode creator

Personal zapcodes

Cmbaldw ADD ACCOUNT

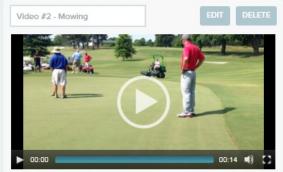
HELP ▼ SETTINGS ▼ →

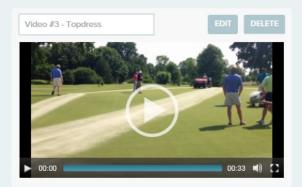


PREVIEW



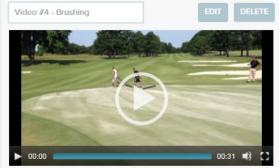


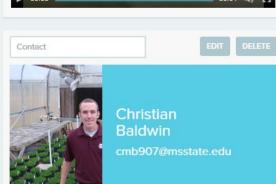




Video #5 - Roll

00:00







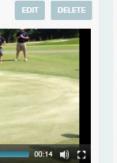


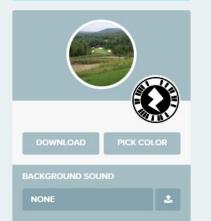
VIDEO YouTube, Vimeo or upload

SOUND

CALENDAR EVENT

WEB LINK











- Two instruments (1-5 scale)
 - ✓ PRE
 - Start of the semester

- ✓ POST
 - End of the semester



- Post lab quizzes (10 points)
 - ✓ "Weed walk" lab
 - Section 1 AR
 - Section 2 No AR
 - Section 3 No AR

Data Analysis

PROC GLM in SAS

✓
$$P \le 0.05$$

✓ All lab sections took a quiz two days later

Student Quiz Scores

Augmented reality vs. professor led laboratory

Lab Section	Vegetable Planting	Weed Walk	Turf Tour
1	6.8a	5.8ab	7.6b
2	6.0ab	6.6a	8.5ab
3	5.6b	5.4b	9.0a

<u>Vegetable Planting</u>: Section 1 used ZAPPAR. Sections 2 and 3 had a traditional laboratory meeting.

Weed Walk: Section 2 used ZAPPAR. Sections 1 and 3 had a traditional laboratory meeting.

<u>Turf Tour</u>: Section 3 used ZAPPAR. Sections 1 and 2 had a traditional laboratory meeting.



Question

¹Level of satisfaction

Instrument

Mean

POST

4.12

¹What is your level of satisfaction with the augmented reality app component of this lab?

²What is the likelihood of you recommending this course, with the use of the ZAPPAR app, to future students?

Scale of 1 to 5, with 1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent

Summary Student comments

Favorite aspects

- ✓ "It is a new way to learn about information and it is fun to learn more through the videos and pictures that were provided"
- ✓ "The information in videos you could access. It is amazing to access that on the fly"
- ✓ "Its interactive and shows material in a more interesting way than a textbook or handout"
- ✓ "Interesting, different way to learn"

Summary Student comments

- <u>Least</u> favorite aspects
 - ✓ "Not being able to just look at a handout"
 - ✓ "Hard for all three of us to hear"
 - ✓ "If you have questions, you can't ask them"
 - ✓ "I don't have streaming for videos"
 - ✓ "Having to hold my device and trying to take notes at the same time"





Summary

- Student content retention
 - ✓ Improved with the use of AR

- Student led presentations
- Student interaction

- Future Research
 - ✓ Impact of AR on the teaching assistant

