Social Media and Mobile Devices in Nutrition Education

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Whole Grain Summit, 2015
Session 6: Technology and New Tools in Nutrition Education
Thursday, June 25th, 2:00-3:30pm
Stealth Health Project

Youth Innovation, Mobile Technology, and Online Social Networking and Informal Learning to Promote Physical Activity

National Research Initiative Grant #2009552150518 from the USDA Cooperative State Research, Education & Extension Service
**i-Challenge!, a pilot program**

**Objectives:**

- To implement smart phone based nutrition and physical activity as part of a physical education class at a junior high school
- To evaluated participation in an 8-week program in youth using smart phone vs. paper version
Timeline

Four team-based activities: treasure hunt, mapping, earth drawing, & tag

Walk Across Arizona: 8-weeks walking program

Parent Consenting meeting

Safety Training: smart phone, mapping & internet

Week 0

Week 1

Week 2: Start

Week 2-9

Week 10

Baseline measurements

Daily nutrition & physical activity facts

Post measurements

Baseline measurements
Study Design

- **Experimental group:** (Sequoia Pathway Academy, Maricopa, AZ)
  - Used smart phones during activities
  - Recorded daily walking miles using cell phone
  - Received weekly Newsletters on their cell phones
  - Instant scoreboard updates of total walking miles for each team

- **Control group:** (Hohokam Middle school, Coolidge, AZ)
  - No smart phones
  - Recorded daily walking miles on hard-copy sheets
  - PE teacher gave weekly Newsletters
  - PE teacher update the total walking miles for each team
Participants

- Total 49 youths in two schools participated
- Over 70% of enrolled students were participating in free or reduced meals program
- 11-14 years old, with 20 girls and 29 boys
- Experimental group (n=30), Control group (n=19)

Experimental group
wt:47.7±9.2kg, BMI:18.8±2.4

Control group
wt:57.5±14.8kg, BMI:24.3±5.2
Measurements

- Baseline & post-intervention measurements
  - Weight, Height, BMI
- Physical Activity: Pedometer
- Feedback survey after each team-based activity

Yamax Digi-Walker, SW200 pedometer
Post-Activity Feedback Survey

Walk Across Arizona: i-Challenge Treasure Hunt
Post-challenge questionnaire

1. Your WAAZ User Name: ___________________________

2. Did the i-challenge Treasure Hunt activity encourage or motivate you to be more physically active?
   □ Yes
   □ No

3. Was it fun?
   □ Yes
   □ No

4. Were the directions for using phone easy to follow?
   □ Yes
   □ No

5. How many steps did you have during the challenge today? ______ steps

6. Any comments or suggestions?

Thank you very much for your participation!!!
Smart Phone & Apps

- T-Mobile® myTouch 3G Slide™
- Android platform
- GPS capabilities
- Unlimited text messages
- The *Stealth Health* Project team: Arizona Research Laboratories, School of Natural Resources and the Environment, and NASA Space Grant Interns developed applications (*GeoKnect* & *GeoSnap*)
Applications

1. **GeoKnect**: GPS-based mapping

2. **GeoSnap**: camera-based that allows to share & find photos & stories near the user
GeoSnap & Project Website

Smart Phone Application created by UA Stealth Health Project

Project Website

Take a hike.
During a hike, you can create a map with GeoKnect and share it through the iChallenge website. You can combine maps of different hiking places and create a Map Mashup.
Daily Text Messages

- Delivered one message per day after school hours
- PE teacher told a message per day
- 40 total messages were sent
  - Carrots were originally purple in color.
  - Vegetables and fruits have zero fat and lots of fiber, making them a good go-to snack!
  - Physical activity can improve your mood and decrease stress, while burning calories.
4 Activities

- Nutrition & physical activity-based activities
  - Treasure Hunt
  - Mapping
  - Earth Drawing
  - Tag

- Delivered during 50-minutes PE class

- Divided into 4 teams at the beginning of *i-Challenge!* program
  - Teams (Experiment): Blue, Yellow, Green, Red
  - Teams (Control): Bamboo, Egyptian, Pima, Upland
Activity 1: Treasure Hunt

When you get thirsty, you should drink this?

Hint: 🌧️

The legend says that Juan Ponce de Leon died in search of the Fountain of Youth in the state of Florida. His statue is in Old San Juan, Puerto Rico. He became the first Governor of Puerto Rico.
Activity 2: Mapping

- Students mapped their favorite places in school.
Activity 2- Mapping – Control group

Mapping with i-Challenge!
Can you find the healthy food?

To hang out!

Bamboo  Upland  Egyptian  Pima
Activity 3: Earth Drawing

- Draw images on a ground.
- Vitamin Version – Vitamins A, C, D, and E.
- Fact sheet - “Vitamin C is found in fresh vegetables and fruits, such as oranges, watermelons, broccoli, kiwi, tomatoes, green peppers, and strawberries. This vitamin, also known as ascorbic acid, serves as an antioxidant that improves iron absorption and resistance to infection, playing a significant role in protecting the body against viruses and colds and boosting immune system function.”
Earth Drawing
Activity 4: Tag

- **Tag**: relay race concept where nutrition & physical activity messages represented the baton. ~20 minutes, moderate to vigorous activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Average Steps Walked</th>
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<tbody>
<tr>
<td>Treasure Hunt</td>
<td>763</td>
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<tr>
<td>Mapping</td>
<td>754</td>
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<tr>
<td>Earth Drawing</td>
<td>1,603</td>
</tr>
<tr>
<td>Tag</td>
<td>648</td>
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</tbody>
</table>

Yamax Digi-Walker, SW200 pedometer
### Post Survey: Motivation & Fun

#### Numbers of steps

<table>
<thead>
<tr>
<th>Activity</th>
<th>% Motivated</th>
<th>% who had Fun</th>
<th># of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasure Hunt</td>
<td>58</td>
<td>85</td>
<td>26</td>
</tr>
<tr>
<td>Mapping</td>
<td>46</td>
<td>89</td>
<td>28</td>
</tr>
<tr>
<td>Earth Drawing</td>
<td>81</td>
<td>89</td>
<td>27</td>
</tr>
<tr>
<td>Tag</td>
<td>74</td>
<td>74</td>
<td>27</td>
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</table>
Summary

- The Earth Drawing activity motivated the most participants (81%) to be physically active
  - During this activity, on average ~1,600 steps (0.80 miles) were recorded
- Earth Drawing & Mapping activities were fun (>90%)
Walk Across Arizona (WAAZ) program

- Community-based walking program
  - Developed as part of university-community partnerships
    - College of Public Health & College of Agriculture & Life Sciences (Cooperative Extension)
  - Started in 2001, in response to a community needs assessment done in retirement community of Green Valley, AZ
    - Goal: “Promote healthier lifestyles using social network (sense of community) and team concepts.
  - Goals of the walking program were then to:
    - Encourage individuals to be more physically active
    - Increase satisfaction with one’s community
Walk Across Arizona is a fun way to get motivated to get fit! Will you "Walk Across Arizona" this year?

**WHO?** Anyone in Arizona

**WHAT?** Join a team & record your miles as you move your way "across" Arizona. Teams can have up to 10 people.

**WHEN?** The 8 week program begins on a different date in each county. Select your county to get more information.

**WHERE?** Anywhere you can walk, run, swim, cycle, move or play.

**WHY?** Meet new people, see new places, feel great and have fun!

Walk Across Arizona is a fun way to get motivated to get fit! Will your "Walk Across Arizona" team walk the 410 miles across Arizona this year? Click on your county to learn how to get started!

http://cals.arizona.edu/walkacrossaz/
Log in miles via website

How to Enter Miles Walked

1. After being logged in, click on “Track Your Miles”.

2. Click on a day from the calendar on which you want to add miles to.

3. Enter the amount of miles, minutes, OR steps you walked on that day. If you did a different activity, please look at the following conversion chart to help convert your activity to miles. Press “Save”.

Create Entry

- Distance:
  - 
- Date:
  - 01/01/07
- Steps:
  - 5611
- Minutes:
  - 0
- Miles:
  - 0
- Convert miles to:
  - 0
## UA Program 2013

### Program Details Page

<table>
<thead>
<tr>
<th>Team Name</th>
<th>Miles Walked This Week</th>
<th>Total Miles Walked</th>
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<tbody>
<tr>
<td>DFM Lifesavers</td>
<td>213.72</td>
<td>4207.31</td>
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<tr>
<td>Caminantes</td>
<td>117.53</td>
<td>3741.56</td>
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<td>Library Heat</td>
<td>201.13</td>
<td>3446.09</td>
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<td>Extension River Walkers</td>
<td>124.50</td>
<td>3131.66</td>
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<td>Library Catwalkers</td>
<td>137.62</td>
<td>2791.79</td>
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<td>Risky Walkers</td>
<td>129.06</td>
<td>2591.90</td>
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<td>Police Beat Feet</td>
<td>158.63</td>
<td>2567.08</td>
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<tr>
<td>Tomatotinis</td>
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<tr>
<td>IT Cat Tracks</td>
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<tr>
<td>Walking Ramblers</td>
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<td>Engineered to Walk</td>
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<td>NUTS about Nutrition</td>
<td>64.38</td>
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<td>Red Sox</td>
<td>15.18</td>
<td>1560.11</td>
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### WAAZ Steps Sheet

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<th>Date</th>
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<th>Tuesday November 29</th>
<th>Wednesday November 30</th>
<th>Thursday December 1</th>
<th>Friday December 2</th>
<th>Saturday December 3</th>
<th>Sunday December 4</th>
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<tr>
<td>Steps</td>
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<tr>
<td>Date</td>
<td>Monday December 5</td>
<td>Tuesday December 6</td>
<td>Wednesday December 7</td>
<td>Thursday December 8</td>
<td>Friday December 9</td>
<td>Saturday December 10</td>
<td>Sunday December 11</td>
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<tr>
<td>Steps</td>
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</tbody>
</table>
Did students keep a log of miles walked on a website more days using smart phone during the program period?
Results & Summary

- 80% of experimental group recorded miles, compared with only 58% of control group did.
- For comparing frequency of recording miles between experimental and control groups, the Chi-squared test gave a p-value of 0.10.
- Since data were highly skewed, used the Wilcoxon rank-sum test.
- The test gave a p-value of 0.1194.
  - At $\alpha = 0.05$ significance level, conclude that association is not significant between 2 groups.
- No significant association between frequency of recording miles and total distance between experimental and control groups.
Conclusions

- Preliminary data suggests that smartphone-based interventions have the potential to enhance physical activity.

- Lack of significance in tracking physical activity may be due to small sample size, so a larger study might find a significant association.

- Further explore nutrition and physical activities using mobile technologies in different populations and programs may contribute to the reduction of obesity risk.
Post-intervention...

- Christmas Door Decorating Contest at the control school

"Don’t eat too much cookies!"
Acknowledgements

- Stealth Health Project Team (Arizona Research Laboratories, School of Natural Resources and the Environment)
- Pinal County School Personnel and Participants
- Arizona Cooperative Extension (WAAZ program)
- NASA Space Grant Interns

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Questions