Designing Computer Games to Teach Children About Food Safety

Fight BAC! is a registered trademark of The Partnership for Food Safety Education

Judy A. Harrison, Ph.D.
Professor and Extension Foods Specialist
Dept. of Foods and Nutrition
The University of Georgia
Co-Investigators:
Dr. Melissa P. Mixon, Mississippi State University
Dr. Angela M. Fraser, North Carolina State University

Collaborators:

Susan Conley
Director of Consumer Education
U. S. Dept. of Agriculture - Food Safety and Inspection Service

Jo Ann Pittman
Consumers Affairs
U. S. Food and Drug Administration

Dr. Jan Singleton
National Program Leader for Food Science and Food Safety
U. S. Dept. of Agriculture - Cooperative State Research, Education and Extension Service

Special Thanks to The Partnership for Food Safety Education

This material is based upon work supported by the Cooperative State Research, Education and Extension Service, under special project number 00-51110-9746.
Objectives

• To determine features of educational computer games that appeal to children
• To design games, incorporating those features, to introduce children in grades K-3 to foodborne illness and safe food handling principles
• To evaluate the games in elementary schools in a three state area
Methods - Design

- Focus Groups With Children
  - 100 children
  - Grades K-3
  - Diversity of ethnic backgrounds
  - Diversity of academic achievement levels

- Analysis of game features
- Usability testing – 2 occasions

All methods used in this study received IRB approval from the three institutions.
Methods-Design

- Focus Groups With Teachers
  - 15 teachers
  - K-3rd grade

- Analyzing game designs
- Evaluating age-appropriateness for K-3
- Determining compliance with state curriculum standards
Focus Group Results - Design

• **Students’ “favorite” features**
  – Let you “pick things”
  – Let you choose who you want to be
  – Let you shoot
  – Let you print things
  – Do silly things
  – Have music and noises
  – Make silly noises when you do something wrong
Focus Group Results - Design

• **Teachers’ “favorite” features**
  – Comply with curriculum standards
  – Will work on PC and Mac
  – Can be loaded onto central server to allow many kids to play simultaneously
  – Can control sound
  – Want resources that can be used with a variety of academic levels including gifted students
Methods - Development

• Games
  – 6 games with music, voice-over and sounds
  – 3 difficulty levels (easy, medium, hard)
  – 1 & 2 player formats

• Resources
  – BACtionary
  – BAC facts
  – BAClopedia (Kids’ version and Teachers’ version)
Features of the Game CD-ROM
Based on Student and Teacher Input

SMART KIDS FIGHT BAC!

ARCADE

VERY COOL GAMES!

The BAC Show
Match BAC
Write BAC
Find BAC
BAC Man
Zap BAC

HORROR FEATURE!

PLAY MOVIE

TEACHERS' STUDY

QUIT
Methods - Experimental Design

Control vs. Experimental Design

- Control Groups K-3
  - Smart Kids Fight BAC!® animated video
  - Smart Kids Fight BAC!® activity books

- Experimental Groups K-3 (CD-ROM Groups)
  - Smart Kids Fight BAC!® animated video
  - Smart Kids Fight BAC!® activity books
  - Smart Kids Fight BAC!® food safety computer games
Methods – Evaluation Design

- Knowledge pre-test (Day 1)
- Knowledge post-test (Day 14)
- Knowledge post-post test (8 weeks from Day 14)
Methods – Implementation

• Day 1
  – Completed the knowledge pre-test
  – Viewed the animated video

• By day 14
  – Engaged in activities from the activity booklets
  – Completed curriculum (including game play by the experimental group)
  – Completed the knowledge post-test

• 8 weeks later
  – Completed knowledge post-post-test
Results

• The control group (n=614) scored significantly higher than the CD-ROM group (n=620) on the pre-test (p<0.05).
• There was no significant difference between the control group and the CD-ROM group on the post-test (p>0.05).
• By the end of the 8-week period, the CD-ROM group had a significantly greater increase in food safety knowledge over the course of the study than did the control group (p<0.05).
Implications

• Presenting food safety information using computer game technology may stimulate children’s interest in and ability to learn safe food handling principles.
COLORING FRAMES
Choose a Picture to Color

Main Menu
When cooking foods like meats, poultry, and eggs, a temperature of 80°F will kill harmful bacteria.

Pick One Answer:

- a) True
- b) False
Match BAC

Score
2

Try to check your

food
Bac slimed you!
37 + 17 = ?

Score: 3
Timer: 26

Use Arrow keys to move
Use Space Bar to fire

Main Menu
BAC hoped they would forget to wash their hands.
BAC hoped they would forget to wash their hands.
On the way home from school the girls petted Rover.
Death Phase: when more bacterial cells are dying than are multiplying or being made; the number of bacterial cells is getting smaller

Degree: a unit of measure for temperature

Destroy: to kill or do away with

Diarrhea: having to poop a lot and often; usually runny poop

DNA: a chemical that is in all living things and contains the plans for what the living thing will be like
Bacterial Growth Curve

- **Stationary Phase**
- **Log Phase**
- **Death Phase**

**Number of Cells** vs. **Time**
Go ahead…
try to beat me…
if you dare!

the end