

# Technology and Nutrition: Interactive Strategies for Children to Learn Nutrition

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# Agenda

- \* **Introduction and Background**
- \* **Literature Review**
- \* **Discussion**
- \* **Recommendations**
- \* **Conclusion**

# Purpose

- \* To describe how nutritional education and mobile technologies can be infused together to promote learning among children

# Introduction and Background

- \* Nutrition and its importance
  - \* Beneficial for overall health
- \* Contributes to optimal:
  - \* Cognitive
  - \* Physical
  - \* Social
  - \* Emotional happiness and growth
- \* What proper nutrition does:
  - \* Growth and daily functioning
  - \* Fulfills the body's needs

# Malnutrition

- \* Definition
- \* 74.5 million children in the U.S
- \* Prevalence of malnutrition
  - \* 12.5 million children are obese
  - \* 15.8 million live in food insecure households
  - \* 14.7 million children live in poverty

(Childstats.gov, 2012)  
(Feeding America, 2015)  
(Merriam-Webster, 2015)  
(Project Healthy Children, 2012)  
(Saunders & Smith, 2010)

# Malnutrition (Cont'd)

- \* Influential factors
  - \* Socioeconomic status
  - \* Geographic location
  - \* Genetic predispositions
  - \* Lack of proper diet in response to disease or illness
  
- \* Consequences
  - \* Death
  - \* Disease, illness
  - \* Stunted growth
  - \* Poor cognitive function

(Bell, Rogers, Dietz, Ogden, & Schuler, 2011)  
(Project Healthy Children, 2012)  
(Saunders & Smith, 2010)

# Technology

- \* Technology is ubiquitous
- \* Used in environments for learning
  - \* Home
  - \* School
  - \* Playground, etc.
- \* Enhances communication

Figure 1. Family Technology Ownership and Child Use, Pre-K–12

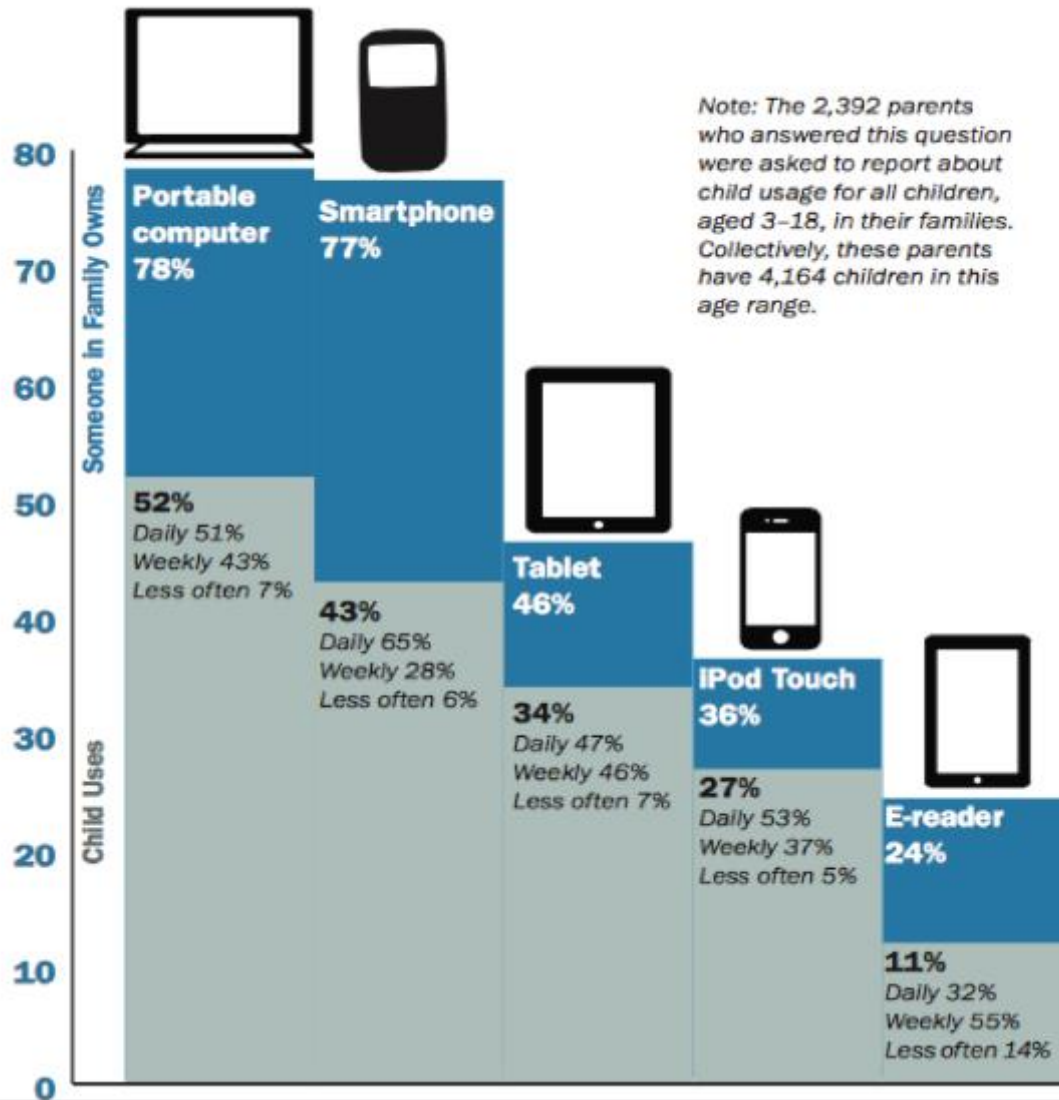


Figure 1. “Child Uses” appears in gray on the bottom while “Someone in Family Owns” is at the top in blue. The devices are listed from highest to lowest for family ownership and children. Percentages in black indicate the average use among all children, with further breakdowns according to daily, weekly and less than weekly usage. Adapted from “Living and Learning with Mobile Devices,” by Grunwald Associates, Learning First Alliance, & AT&T, 2013. Grunwald Associates LLC, p. 6.



# Technology History

- \* 1960's- Mainframes
- \* 1970's- Available in work environments
- \* 1980's-DRG's and reimbursements
- \* 1990's- Tied in health care system
- \* 2000's- Available bedside patients

# Technology and Children

- \* Develops skills in children
- \* Video games
- \* Consequence

# Benton (2010)

- \* Who: Children under 2 years
- \* What: Dietary nutrients that are necessary for the first 2 years
- \* Where: Developing countries (Southeast Asia, Africa)
- \* When: 2009
- \* Why: Deficiencies in micronutrients inhibit proper growth

# Raush (2013)

- \* Who: School age children 6-16, 5,398 children
- \* What: Relevance between dietary intake and academic performance
- \* Where: United States
- \* When: 2013
- \* Why: Inadequate diet can lead to poor academic performance

# Gale, et.al. (2009)

- \* Who: 241 children 4 years of age
- \* What: intelligence measures
- \* Where: Southampton, UK
- \* When: 2009
- \* Why: Relation between diet in infancy and IQ scores

(Gale, Martyn, Marriott, Limond, Crozier, Inskip, Godfrey, Law, Cooper, Robinson, & the Southampton Women's Survey Study Group, 2009)

# Gewa, et.al. (2009)

- \* Who: First graders of various ages from 12 schools
- \* What: dietary Fe, Zn, and B vitamins with children, study food intake
- \* Where: rural Kenya
- \* When: 1998-2000
- \* Why: relationship between vitamins, certain foods and test scores

(Gewa, Weiss, Bwibo, Whaley, Sigman, Murphy, Harrison, & Neumann, 2009)

# Summary

- \* Benton (2010) and Raush (2013)
- \* Gale, et.al. (2009) and Gewa, et.al. (2009).

(Benton, 2010)

(Gale, Martyn, Marriott, Limond, Crozier, Inskip, Godfrey, Law, Cooper, Robinson, & the Southampton Women's Survey Study Group, 2009)

(Gewa, Weiss, Bwibo, Whaley, Sigman, Murphy, Harrison, & Neumann, 2009)

(Raush, 2013)

# Important Nutrients

- \* Carbohydrates, proteins, fats
- \* Vitamins (A,D,E,K) and (B, C)
- \* Minerals: (calcium, iron, magnesium, potassium, zinc)
- \* Nutrition Tips

BabyCenter Medical Advisory Board (2013a,b,c,d,i)  
(Colorado State University, 2014)  
(Harvard School of Public Health, 2015)  
(Institute of Medicine of the National Academies, 2005)  
(Radcliffe, 2014)  
(U.S. Food and Drug Administration, 2015)



# Nutrition & Interactive Gaming

- \* Helps children succeed in the classroom
- \* Interactive Gaming
  - \* MyPlate Match Game
  - \* Mission Nutrition
  - \* AwesomeEats
  - \* HealthyHero

(Dairy Council of California, 2015)

(KidsHealth, 2015)

(Lu, Kharrazi, Gharghabi, & Thompson, 2013)

(Whole Kids Foundation, 2014)

(Yogome, 2013)

# The Importance of Technology

- \* “When we ban, rather than embrace, real-world technologies, we leave students ill-equipped to know how to harness the power of technology for learning, unprepared to develop a respectable digital footprint, and without adequate knowledge to safely navigate the web.” - Lisa Nielsen

Figure 2. My Plate Match Game

## My Plate Match Game

Build the plate by putting each food group shape in the correct spot.

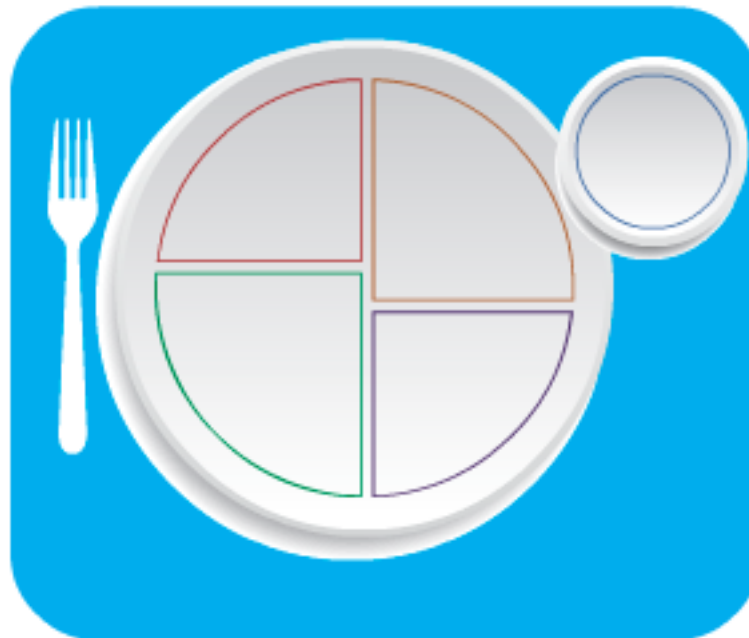


Figure 2. This is an example of how the game first starts. The player has to put all the food groups into portions on the plate. Adapted from “The MyPlate Match Game”, 2015, by Dairy Council of California.

Figure 3.1 Mission Nutrition



Figure 3.1. Note that this is what the game setting looks like. The player has to find specific items from the refrigerator, fruit bowl and cupboard to complete the game. Adapted from "Mission Nutrition", 2015, by Kids Health.

Figure 3.2 Mission Nutrition



Figure 3.2. The quiz question is shown; displaying that the game explains the importance of the question after the correct answer is selected. Adapted from “Mission Nutrition”, 2015, by Kids Health.

Figure 4.1 AwesomeEats

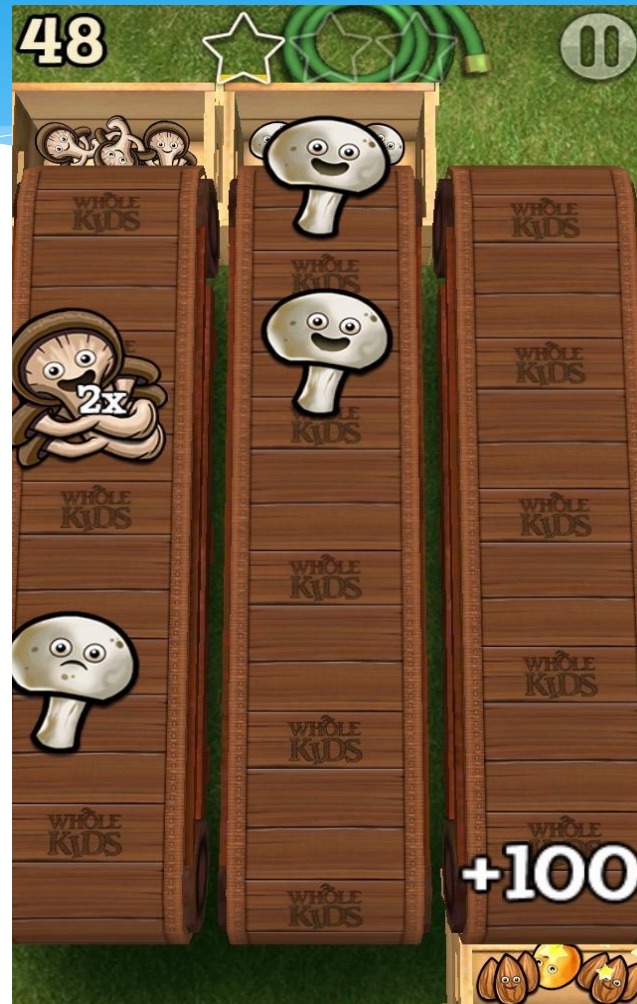


Figure 4.1 The picture displays the main goal of the game, to get all fruits, vegetables and nuts into the appropriate sections. Adapted from “AwesomeEats”, 2014, by Whole Kids Foundation.

Figure 4.2 Awesome Eats



Figure 4.2 displays an Awesome Eats tip. Adapted from “AwesomeEats”, 2014, by Whole Kids Foundation.



Figure 5. HealthyHero



Figure 5. This is the setting of the game. As boxes of food drop down, the player selects the healthy foods to feed the monster, such as granola and raisins. Adapted from “HealthyHero”, 2013, by Yogome.



# Discussion

- \* Benefits
- \* Problematic areas

(Jesper, 2007)

# Recommendations

- \* Exact representations
- \* Focus on nutrition content
- \* Digital clock/Non-physical activities
- \* More questions/levels/options

(Hwuang, Sung, Hung, Huang, & Tsai, 2012)  
(Yang, Hwang, and Yang, 2013)

# Conclusion

- \* Malnutrition remains an issue
- \* Nutrition and technology:
  - \* Increase of knowledge
  - \* Decision-making skills
  - \* Higher incentive
  - \* Create awareness

# Thank You!

\* Questions?



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