



Understanding the 3Cs: Child, Content, and Context in Children’s Educational Media

Sonia Tiwari¹

Published online: 20 February 2020

© Association for Educational Communications & Technology 2020

Common Sense Media’s survey of more than 1400 parents from all regions of the U.S. suggests that today almost all children live in a home with one or more types of digital media devices, with an average screen time of 2 h and 19 min a day for children under the age of 8 (Rideout 2016). The screen-viewing hours are even higher for older children, and children from lower-income families. The American Academy of Pediatrics (AAP 2016) recommends parents to limit viewing time for toddlers to 1 h per day and actively mediate children’s learning experiences with high-quality educational programming. This timely recommendation by a professional pediatric association like AAP - makes it crucial for educators, educational researchers, educational content designers, and parents - to understand educational media effects on children.

Guernsey (2007) summarized three key factors that influence children’s learning from media as the 3 C’s: child, content, and context. Research on child factors suggests that children’s learning is best when they draw on their prior knowledge and interests, and when the Amount of Mental Effort (Salomon 1983) taken to comprehend the media is just right - not too easy, not too hard.

Content factors indicate that children’s learning is influenced by content cues on comprehensibility, meaning they engage with media only if they understand what’s going on (Anderson et al. 1981). Moderately novel and complex educational content is considered ideal to support learning, which is challenging for children, but also within their capacity to understand (Rice et al. 1982). Formal production techniques (such as zooming in, transitions, movement etc) can be used to strategically direct children’s attention to key *educational content*, while limiting distraction from *incidental content* (Kirkorian et al. 2008). Researchers also recommend incorporating linguistic and social cues in the educational content,

mimicking real-life communications (Cleveland and Straino 2008; Piotrowski 2014), emphasizing on conflict-resolution more than the conflict itself, and using explicit explanatory statements in the program (Mares and Acosta 2010). It is also helpful to offer the educational cues redundantly through multiple modalities (Leneberger et al. 2010), and in narrative form within the learning capacity of children (Capacity model by Fisch 2000).

Context factors suggest that repeated viewing of the same educational content can offer children the opportunity to learn and imitate the information (Crawley et al. 1999; Lineberger and Vaala 2010). Young children also benefit from co-viewing media with caregivers, so that the adults can interpret and enrich the content by explaining difficult concepts (Fender et al. 2010). Understanding of concepts can also be extended to real life with help from caregivers, so the learned ideas can be put to practice (Fender et al. 2010).

High-quality educational programs such as PBS Kids’ series *Sesame Street*, *Curious George*, *Cat in the hat knows a lot about that*, *Arthur*, *Ready Jet Go*, etc. consider all 3 C’s - they design around a specific educational curriculum, and include formative and evaluative research testing to make sure that children are comprehending the content and engaged with context. A similar holistic approach can be adapted in academic research around children’s educational media, such as paying closer attention to the developmental stage of the child, their interests, their prior knowledge, etc. in relation to the type of media used as a stimulus.

One challenge in this research area is the lack of agreed-upon systems for rating the quality of children’s programming (Lauricella et al. 2013). While the program developers may have specific learning goals and expected experiences, children as viewers are individuals with distinct interests, prior knowledge, personalities and other factors that can make their viewing experiences different, or less effective than intended (Salomon 1983). The boundaries of media and learning may become harder to separate with innovative uses of technology. For example, the straightforward, passive media experience of

✉ Sonia Tiwari
sut224@psu.edu

¹ The Pennsylvania State University, State College, PA, USA

watching television programming can be very different than a Virtual Reality experience. Understanding the nuances of the medium are crucial in generating a full-picture of the learning experience.

Implications of this theoretical understanding in practice can be useful for the development of relevant educational content, and for studying the influence of this media on its intended audience (children). For example, some questions to consider for researchers who study the relationship between children's media and learning, and other professionals such as instructional designers, user experience designers, educational media designers who are actively involved in the creation and study of this field, are:

What are the Characteristics of Children as Viewers?

What prior knowledge do children have in context of the media? As an example, a child watching an episode of *Curious George* building a treehouse may have experience constructing 3D shapes using Lego bricks. What are the child's interests? A child interested in Astronomy may enjoy the show *Ready, Jet, Go*. Developmentally-speaking with reference to age/level of understanding, what type of media content will the child be able to comprehend? Some researchers believe that children's prior knowledge related to the narrative, their verbal ability, and short-term memory, were significantly related to narrative comprehension (Aladé & Nathanson 2016). Studies have also shown that children learn better from media when they engage with others. This joint-media engagement is often initiated by children and learning interactions around media occur more often in social spaces of the home such as living room vs. isolated media room. This joint media experience occurs with other members such as siblings and friends besides parents (Takeuchi & Stevens 2011)

What are the Characteristics of Educational Media?

How complex is the story or content of the media? Does it match with the needs/capacity of understanding for the child? Does the media present educational concept clearly? Is the narrative content and educational content intertwined well? Are the production techniques apt to facilitate learning? Eg. Dora the Explorer and Daniel Tiger 'break the fourth wall' (Ryan 2010), meaning they directly talk to the camera. Young children may enjoy this direct interaction, however older children may not. Do the characters represent diversity (Eg. *Molly of Denali*, *Doc McStuffins*) or are neutral by design to be universally appealing (Eg. *Sesame Street*, *Daniel Tiger*)?

Representation-Wise, what Type of Characters and Plot-Lines will Serve the Audience Better?

Does the content have a prototypical story grammar that the child could easily understand (Story Schema theory by Thorndyke 1977)? Eg. Superhero vs. supervillain, best friends conquer the world - a familiar story structure that children could quickly get on board with. Or, a new and unique story structure could be designed, that breaks the grammar for a specific purpose.

These questions may help to provide clarity on the purpose of children's educational media within the context of their learning experiences, while bridging the gap between theory and practice in the research domains of learning sciences, media effects, human-computer interaction, and psychology.

References

- Aladé, F., & Nathanson, A. I. (2016). What preschoolers bring to the show: The relation between viewer characteristics and Children's learning from educational television. *Media Psychology*, 19(3), 406–430. <https://doi.org/10.1080/15213269.2015.1054945>.
- American Academy of Pediatrics, Council on Communications and Media. (2016). Media and young minds. *Pediatrics*, 138(5), e20162591. <https://doi.org/10.1542/peds.2016-2591>.
- Anderson, D. R., Lorch, E. P., Field, D. E., & Sanders, J. (1981). The effects of TV program comprehensibility on preschool children's visual attention to television. *Child development*, 151–157.
- Cleveland, A., & Striano, T. (2008). Televised social interaction and object learning in 14- and 18-month-old infants. *Infant Behavior and Development*, 31(2), 326–331 Chicago.
- Crawley, A. M., Anderson, D. R., Wilder, A., Williams, M., & Santomero, A. (1999). Effects of repeated exposures to a single episode of the television program Blue's clues on the viewing behaviors and comprehension of preschool children. *Journal of Educational Psychology*, 91(4), 630–637. <https://doi.org/10.1037/0022-0663.91.4.630>.
- Fender, J. G., Richert, R. A., Robb, M. B., & Wartella, E. (2010). Parent teaching focus and toddlers' learning from an infant DVD. *Infant and Child Development*, 19(6), 613–627.
- Fisch, S. M. (2000). A capacity model of Children's comprehension of educational content on television. *Media Psychology*, 2(1), 63–91. https://doi.org/10.1207/s1532785xmep0201_4.
- Guernsey, L., & Seal-Wanner, C. (2007). *Into the minds of babes: How screen time affects children from birth to age five*. New York: Basic Books.
- Kirkorian, H. L., Wartella, E. A., & Anderson, D. R. (2008). Media and young children's learning. *The Future of children*, 39–61.
- Lauricella, A. R., Robb, M. B., & Wartella, E. (2013). Challenges and suggestions for determining quality in children's media. *Handbook on children, adolescents and media*, 425–432.
- Linebarger, D. L., & Vaala, S. E. (2010). Screen media and language development in infants and toddlers: An ecological perspective. *Developmental Review*, 30(2), 176–202.
- Linebarger, D., Piotrowski, J. T., & Greenwood, C. R. (2010). On-screen print: the role of captions as a supplemental literacy tool. *Journal of Research in Reading*, 33(2), 148–167.

- Mares, M. L., & Acosta, E. E. (2010). Teaching inclusiveness via TV narratives in the US: Young viewers need help with the message. *Journal of Children and Media*, 4(3), 231–247.
- Piotrowski, J. T. (2014). Participatory cues and program familiarity predict young Children's learning from educational television. *Media Psychology*, 17(3), 311–331. <https://doi.org/10.1080/15213269.2014.932288>.
- Rice, M. L., Huston, A. C., & Wright, J. C. (1982). The forms of television: Effects on children's attention, comprehension, and social behavior. *Television and behavior: Ten years of scientific progress and implications for the eighties*, 2, 24–38.
- Rideout, V. (2016). Measuring time spent with media: The common sense census of media use by US 8- to 18-year-olds. *Journal of Children and Media*, 10(1), 138–144. <https://doi.org/10.1080/17482798.2016.1129808>.
- Ryan, E. L. (2010). Dora the explorer: Empowering preschoolers, girls, and Latinas. *Journal of Broadcasting & Electronic Media*, 54(1), 54–68.
- Salomon, G. (1983). The differential investment of mental effort in learning from different sources. *Educational psychologist*, 18(1), 42–50.
- Takeuchi, L., & Stevens, R. (2011). The new coviewing: Designing for learning through joint media engagement *The Joan Ganz Cooney Center at Sesame Workshop*.
- Thomdyke, P. W. (1977). Cognitive structures in comprehension and memory of narrative discourse. *Cognitive psychology*, 9(1), 77–110.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.