

Putting the “education” in educational apps

A journey towards knowledge mobilization
and the science of learning

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The Problem: How do we select “good” apps

- The “American Band Stand” methodology
- “My friend says there’s this really good app”
- Expert panel rating

An estimated 80,000 “educational apps” available, and no reliable rating system to evaluate them.

The real work was already done!



Putting Education in “Educational” Apps: Lessons From the Science of Learning

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Summary

Children are in the midst of a vast, unplanned experiment, surrounded by digital technologies that were not available but 5 years ago. At the apex of this boom is the introduction of applications (“apps”) for tablets and smartphones. However, there is simply not the time, money, or resources available to evaluate each app as it enters the market. Thus, “educational” apps—the number of which, as of January 2015, stood at 80,000 in Apple’s App Store (Apple, 2015)—are largely unregulated and untested. This article offers a way to define the potential educational impact of current and future apps. We build upon decades of work on the Science of Learning, which has examined how children learn best. For this work, we select two sets of principles for app developers. First, we identify the

Applying lessons

- The article offers a way to define the potential educational impact of current and future apps.
- Builds on recent evidence from the “science of learning” which studies how children learn best.
- To guide researchers, educators and app developers in evidence-based app design.
- To set a new standard for evaluating and selecting the most useful existing children’s apps.

The Framework

Active Learning

Engaged Learning

Meaningful Learning

Social Interaction

A supported learning goal



Active Learning

- *Active learning happens when students do not simply observe what is going around them and copy it, or wait for others to teach them.*

- *Hirshman & Bjork, (1988)*
- *Zhang & Linn, (2011)*
- *Borun, Chambers, & Cleghorn, (1996)*
- *James & Swain, (2011)*
- *Sesen & Taylor, (2010)*



Active Learning

The app requires appropriate thinking skills to complete	+1
The app requires physical or intellectual manipulation to complete	+1
The app is built around “minds on” activities that require thinking and intellectual manipulation to complete.	+4



Engaged Learning

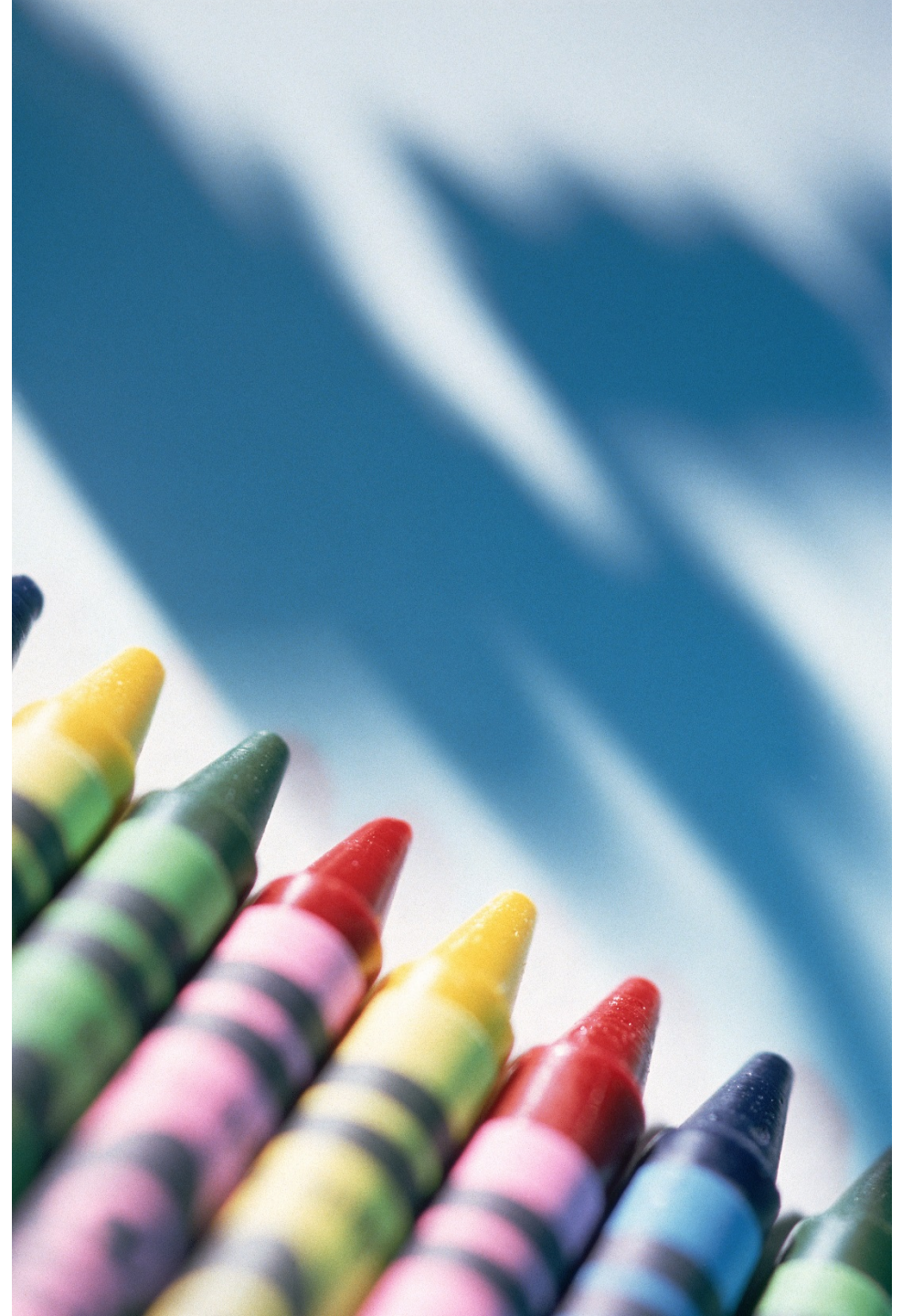


- *The educational quality of apps depends on their ability to support student's engagement with the learning process.*

- *Fredrick, Blumefield & Paris (2004)*
- *Zelazo, Muller, Frye, & Markovitch (2003)*
- *Tare, Chiong, Ganea, & DeLoache (2010)*

Engaged Learning

The app uses sights and sounds as appropriate cues or rewards, not as interruptions.	+1
The app encourages students' behavioral engagement (i.e. rule-following, effort, persistence, participation in programs)	+1
The app encourages students' emotional engagement (i.e. identifying with characters, encouraging affective responses)	+2
The app encourages students' cognitive engagement (i.e. investment in learning, flexibility in problem solving)	+2



Meaningful Learning

- *Meaningful learning occurs when we make connections between new material and related content we already know.*

- Brown et al. (2014)
- Bransford et al. (1999)
- Chi, M. (2009)



Meaningful Learning

The app focuses on drill and practice to build a base of knowledge and skills in the area of focus	+3
The app goes beyond rote learning by tapping into the child's personal history, by activating prior knowledge of a subject, or by building a rich narrative.	+3



Social Interaction



- *The benefits of collaborative learning, in which students work together toward a common learning goal have been known for decades.*

- Csibra & Gergely (2009)
- Saffran, Aslin, & Newport (1996)
- Saffran & Wilson (2003)
- L. Smith & Yu (2008)

Social Interaction



The app builds “social contingency” through immediate response to input or swipe

+3

The app builds collaborative learning through “real-time” communication with other students working on the same problem or lesson.

+3

A supported learning goal



- *An app that supports scaffolded exploration, questioning, and discovery in relation to well-defined learning goals, is more likely to result in significant learning.*

- Hirsh-Pasek & Golinkof (2011)
- P. Gray, (2013)
- Alferi, Brooks, Aldrich & Tenenbaum (2011)

A supported learning goal

The app is clearly linked to well-defined learning goals	+12
The defined learning goals are closely aligned with the curriculum expectations for the students who will be using the app.	+12



Scoring

Active Learning	+6
Engaged Learning	+6
Meaningful Learning	+6
Social Interaction	+6
A supported learning goal	+24



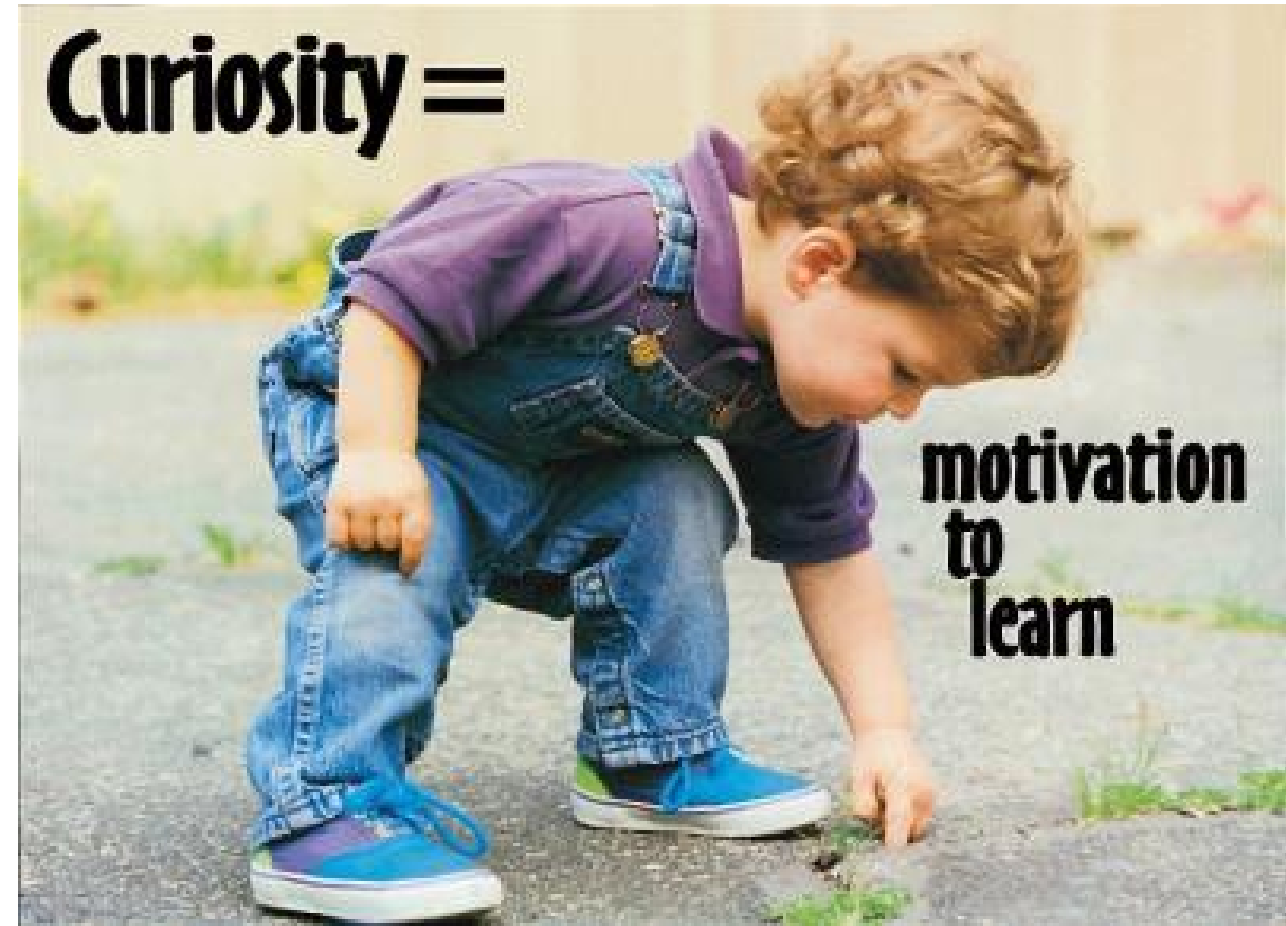
What Motivates Students?

Principle 9:

Students tend to enjoy learning and to do better when they are intrinsically motivated rather than extrinsically motivated.

Principle 10:

Students persist in the face of challenging tasks and process information more deeply when they adopt mastery goals rather than performance goals.





What Motivates Students?

Principle 12:

Setting goals that are short term (proximal) , specific, and moderately challenging enhances motivation more than establishing goals that are long term (distal), general, and overly challenging.

RATE THAT APP!

- On-line tool to collect rating information about educational apps.
- Ratings collected will be shared on publically accessible web site.
- App rating is only one part of the approval process. Also need to assess cost, privacy issues, and compatibility.

RATE THAT APP!

Have you got a favorite educational app that you'd like to recommend to other teachers?

Would you like to influence the apps that are added to the HWDSB app library?

If so, Rate That App is an easy, quick way for you to share your evaluation of an educational app. Go to the web site below, or scan the QR code with your smart phone, and share your expertise with others!

<http://bit.ly/1PWgy7R>



Next steps

- Reaching critical mass
 - Enough apps to make it worth searching
 - Enough ratings to make the results credible
- Reporting results
 - Can we automate some of this process?
- Future Research
 - Do highly rated apps actually produce better outcomes?

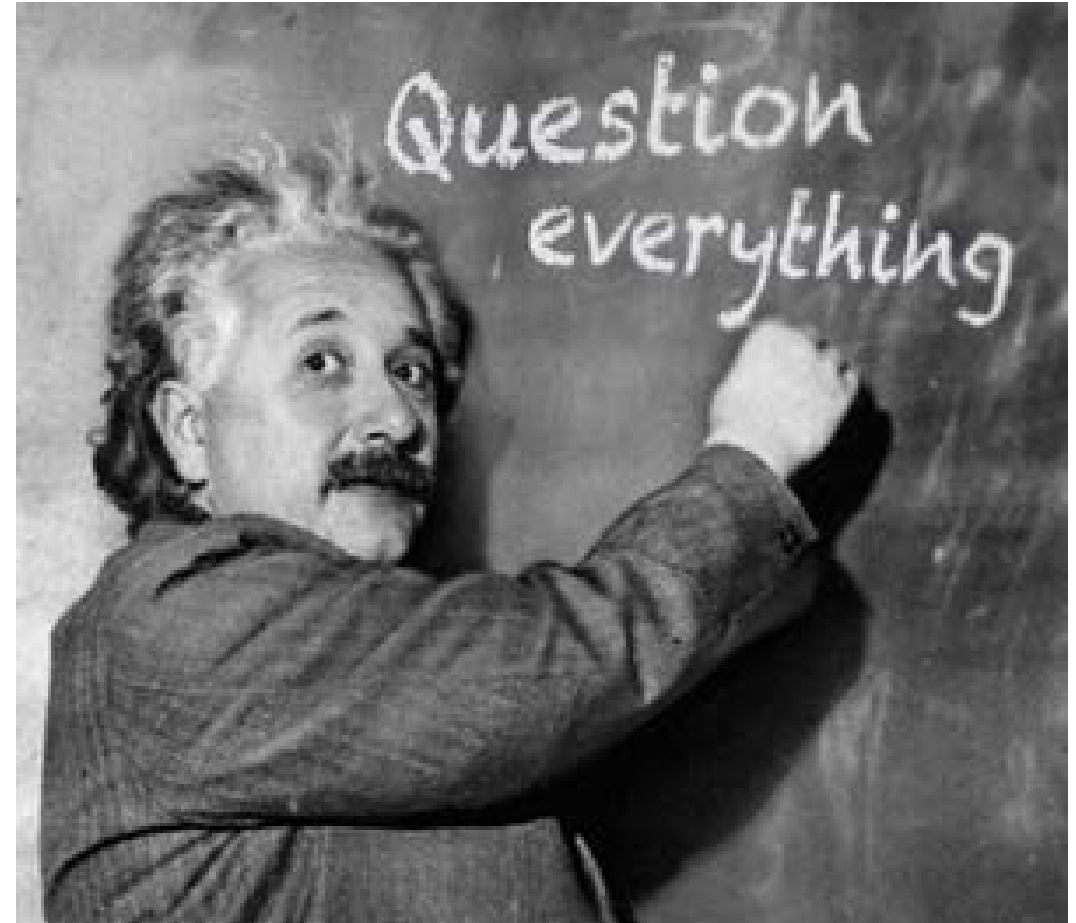


Questions?

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RATE THAT APP

<http://bit.ly/1PKs84u>



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