An eBook Instructional Model in Early Literacy: Findings on Functionality and Usability in Preschool

Kathleen Roskos, Karen Burstein, BK You, and Jeremy Brueck

University of Akron
USA

EETC 2011
EARLY EDUCATION AND **TECHNOLOGY** FOR **CHILDREN**

An e-Book Instructional Model in Early Literacy
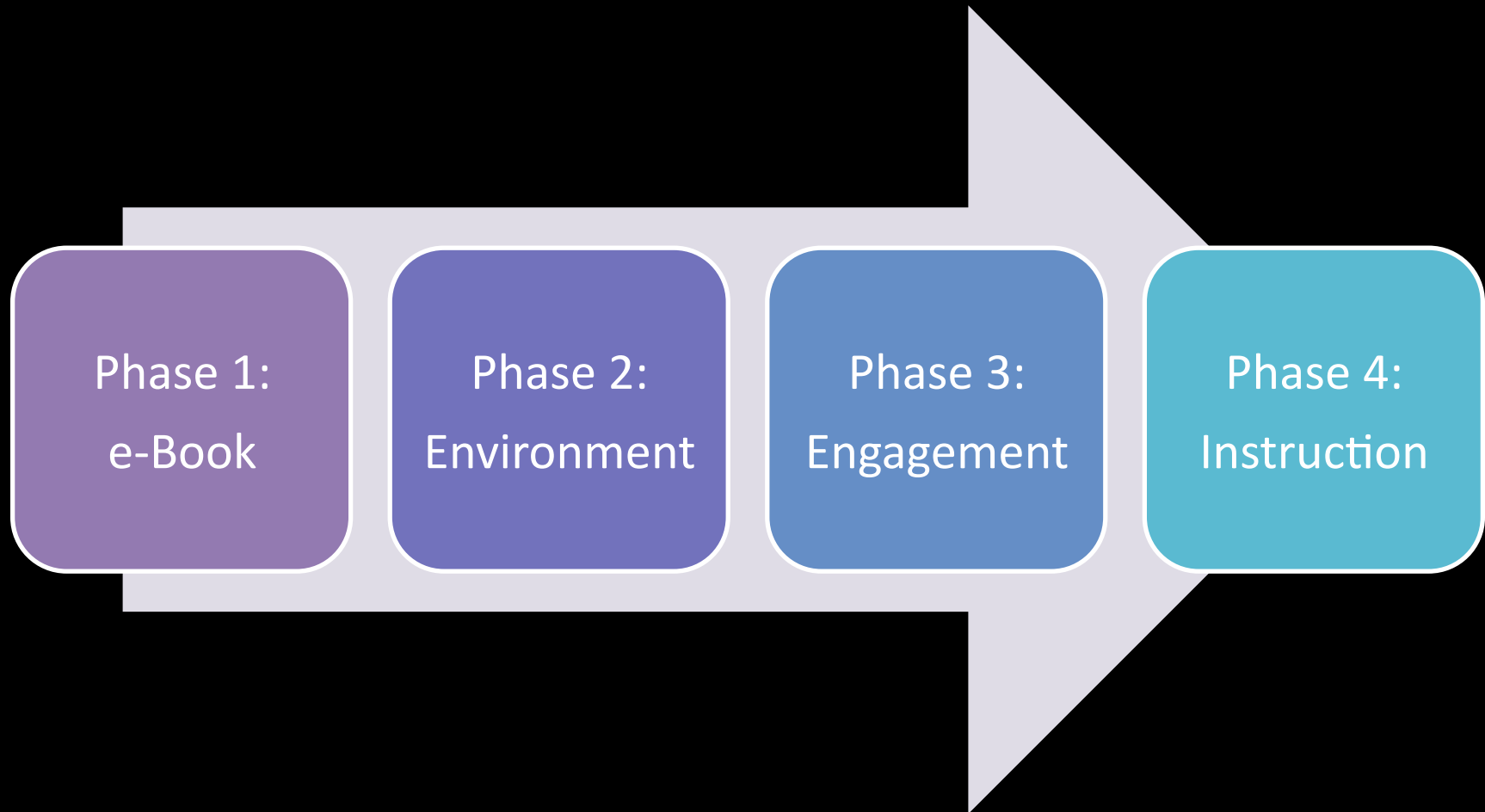## Findings on Functionality & Usability in Preschool

EETC 2011

March, 2011

http://akronreadysteps.ning.com/

Design Process: Four Phases

Phase 1: e-Book | Phase 2: Environment | Phase 3: Engagement | Phase 4: Instruction

Design Process: Four Phases

4 phase study in progress;
each phase for 6 weeks
8 ERF classrooms (8 T; 8 TA; 24 children)

Phase 1:
e-Book

Phase 2:
Environment

Phase 3:
Engagement

Phase 4:
Instruction

The goal of 'putting the lens down on each component' and in the process developing tools that can help us look more systematically at each component.

Phase 1 Study: e-Book

Research Goal: to design an effective and usable tool for early childhood teachers

Research Goal: to design an effective e-book physical environment for early childhood teachers & children

Phase 3 Study: Engagement

Research Goal: to investigate teachers' and children's engagement during e-book reading sessions

Research Goal: to examine fidelity to instructional protocol (Say-Tell-Do), target word use by teachers and children, & target vocabulary gain/loss by children (CBDM pre/post tests)

Blueprint Key

Learning Object Architecture
Blueprint Key

ASSETS

▲ Image   🟧 Text

⬟ Video   ◆ Audio

● Combined Asset

NAVIGATION

Up 1 Level   Down 1 Level

Defined Navigation (Button)   Pop-Up Navigation
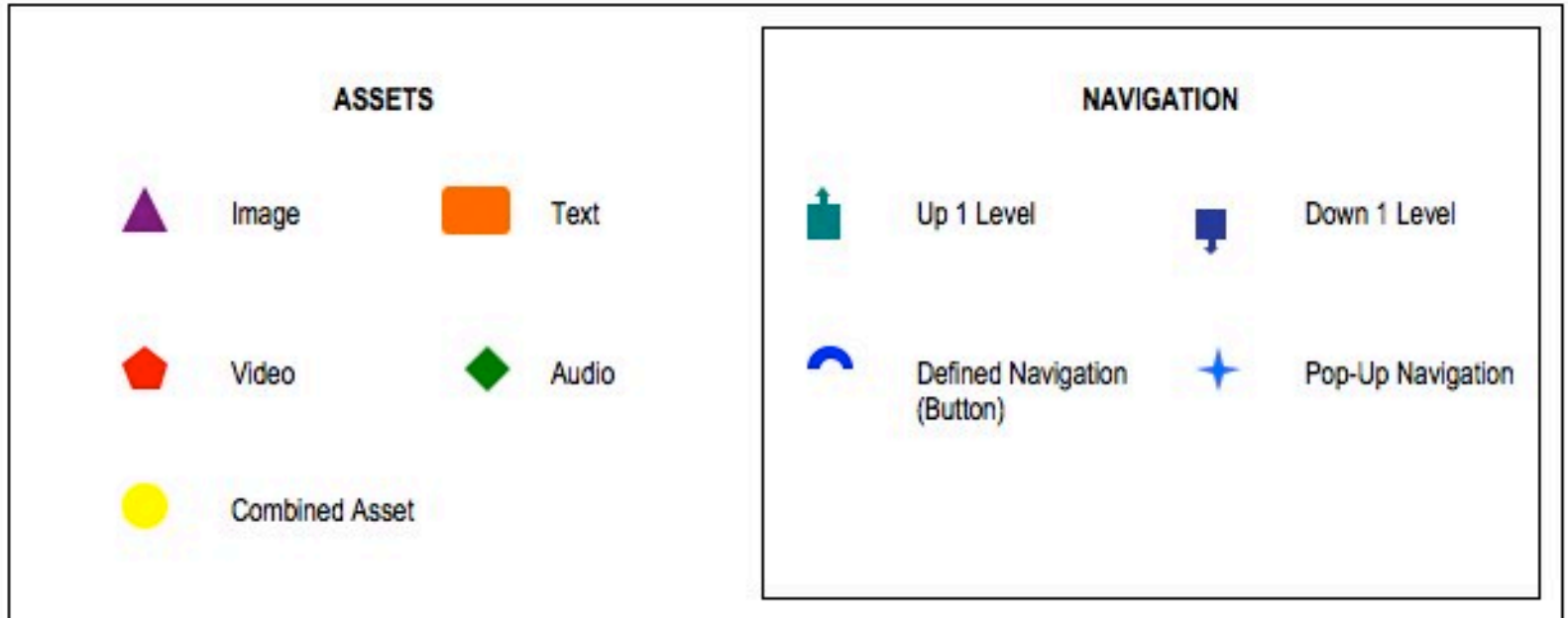
Focuses on digital assets (audio, video, text) as the unit of analysis in an effort to identify the learning-oriented assembly at the screen-page level.

Blueprint Key

Learning Object Architecture
Cat in the Hat

Text

Image animates to depict word dripping

Audio cue of dripping water

"I know it is wet
And the ☀ is not sunny.
But we can have
Lots of good fun that is funny!"

"I know it is wet
And the ☀ is not sunny.
But we can have
Lots of good fun that is funny!"

ASSETS

▲ Image ■ Text

⬟ Video ◆ Audio

● Combined Asset

NAVIGATION

Up 1 Level Down 1 Level

Defined Navigation (Button) Pop-Up Navigation
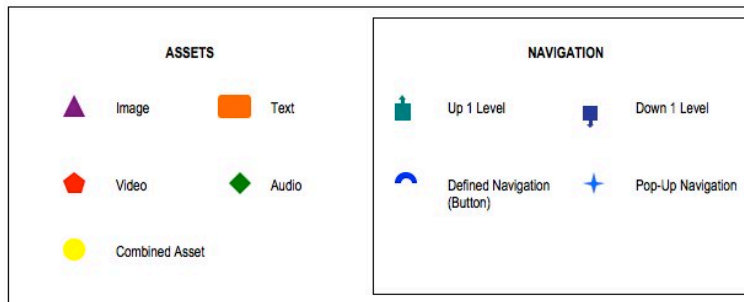
Probes navigation elements most often associated with a graphical user interface (GUI), the part of a computer program that sends messages to and receives instructions from the end user.

Analytic Tool I

TEXT - Text is displayed *
- ☐ Present
- ☐ Not Present

TEXT - Visual Text Tracking *
- ☐ Present - Full
- ☐ Present - Partial
- ☐ Not Present

TEXT - Text Tracking synced with Audio *
- ☐ Present
- ☐ Not Present

TEXT - Hyperlinks from Text *
- ☐ Present
- ☐ Not Present

IMAGES - Icons to navigate to PREV/NEXT page *
- ☐ Present
- ☐ Not Present

IMAGES - HOME icon *
- ☐ Present
- ☐ Not Present

MULTIMEDIA - Animated illustrations *
- ☐ Present
- ☐ Not Present

MULTIMEDIA - Supplemental animated illustrations to enhance schema/under
- ☐ Present
- ☐ Not Present

MULTIMEDIA - Supplemental video representation of text/word *
- ☐ Present
- ☐ Not Present

Adapted from the coding categories of de Jong and Bus (2003) and focused primarily on multimedia/ interactivity design features.

Analytic Tool II

MULTIMEDIA: static/animated graphics *
0 - Not Present

MULTIMEDIA: subcode descriptive *
d - decorative
- d - decorative
- rp - representational
- o -organizational
- rl - relational
- t - transformational
- i - interpretive

corresponding graphics *

CONTIGUITY: synchronize audio with corresponding [print] *
0 - Not Present

REDUNDANCY: spoken text co-occurs with printed text *
Audio should sync with WORD
0 - Not Present

COHERENCE: avoid extraneous audio *
It is extraneous if it is not reinforcing concepts that are in the text.
0 - Not Present

Derived from principles of instructional design described by Clark and Mayer (2008). The design goal of these principles is focused on learning in the online environment.

- Different analytic tools, we observed, revealed different design features of an e-book, and we concluded that to judge e-book quality may require a multi-purpose tool that examines both the *e* (electronic features) and the *book* (text features) of an e-book.

Quality Rating Tool 1

EASE OF USE

Home Page

	1 - Poor	2 - So-So	3 - Adequate	4 - Very Good	5 - Excellent
Access is quick & easy	○	○	○	○	○

Start/Stop/Paus

Large & easy to					

Previous/Next b

Large & easy to					

MULTIMEDIA

Print font size

	1 - Poor	2 - So-So	3 - Adequate	4 - Very Good	5 - Excellent
Sufficiently large & age-appropriate	○	○	○	○	○

Amount of text pe

Age appropr avoids informa over			

Print highlights

Synced with narration at paragr sentence or word l		

INTERACTION

With text (sentences, words, letters)

	1 - Poor	2 - So-So	3 - Adequate	4 - Very Good	5 - Excellent
Dictionary option with pictures, animations or oral explanations	○	○	○	○	○

With educational content

	1 - Poor	2 - So-So	3 - Adequate	4 - Very Good	5 - Excellent
Disciplinary content in one or more areas, including vocabulary	○	○	○	○	○

Drawing on this professional knowledge base, we developed a matrix to guide the design of a prototype tool for evaluating the *e* dimension of the early childhood e-book.

Missing Piece
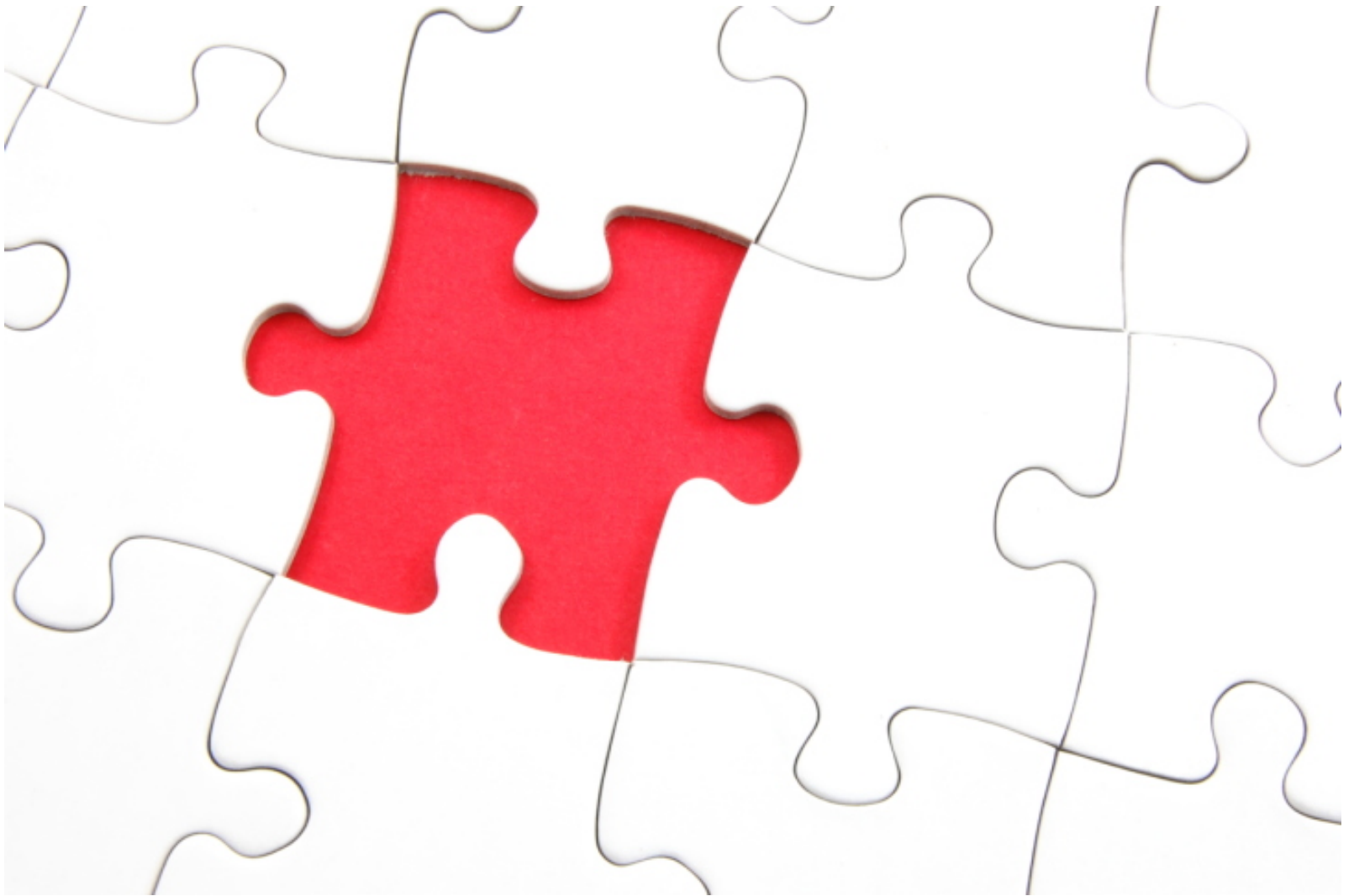
Tool 1 presented challenges in establishing inter-rater reliability, which we determined was due to fuzziness in directions and the technical nature of the vocabulary.

Findings led to further refinement of the tool for evaluating the *e* dimension of the early childhood e-book.

Quality Rating Tool 2

EASE OF USE - page 1

This section of the tool will seek to rate how easily the e-Book can be "read" by a child.

Start Page *

The e-Book has a clear Start Page. The Start Page may also be considered the "Cover" or "Title Page" of the eBook.

○ Present

○ Not Present

(« Back) (Continue »)

Powered by Google Docs

EASE OF USE - Start Page

The Start Page contains the e-Book TITLE. *
○ Present
○ Not Present

The Start Page contains the e-Book AUTHOR. *
○ Present
○ Not Present

The Start Page contains the e-Book ILLUSTRATOR. *
○ Present
○ Not Present

It is clear where the child should 'click' in order to return to the Start Page, or "cover," from any point in the story. *

	1 - Strongly Disagree	2 - Disagree	3 - Indifferent	4 - Agree	5 - Strongly Agree
	○	○	○	○	○

(« Back) (Continue »)

We continue to focus on the three main categories from the previous tool, however we have shifted to a branching model to further probe various elements within each category.

Quality Rating Tool 2

MULTIMEDIA - page 7

Animated Content *
The e-Book contains animated content, such as animated pictures or videos, which are not part of the narration of the story or text.

⊙ Present
○ Not Present

« Back   Continue »

Powered by Google Docs

MULTIMEDIA - Animated Content

The animated content can be toggled ON and OFF. *
○ Present
○ Not Present

The animated content matches the story or text in a manner that is supportive of story comprehension for an emerging reader. *

	1 - Strongly Disagree	2 - Disagree	3 - Indifferent	4 - Agree	5 - Strongly Agree
	○	○	○	○	○

The animated content is NOT distracting for an emerging reader. *

	1 - Strongly Disagree	2 - Disagree	3 - Indifferent	4 - Agree	5 - Strongly Agree
	○	○	○	○	○

« Back   Continue »

This multi-layered tool is now focused on providing more explicit definitions of categories and "teacher friendly" explanations for each criteria.
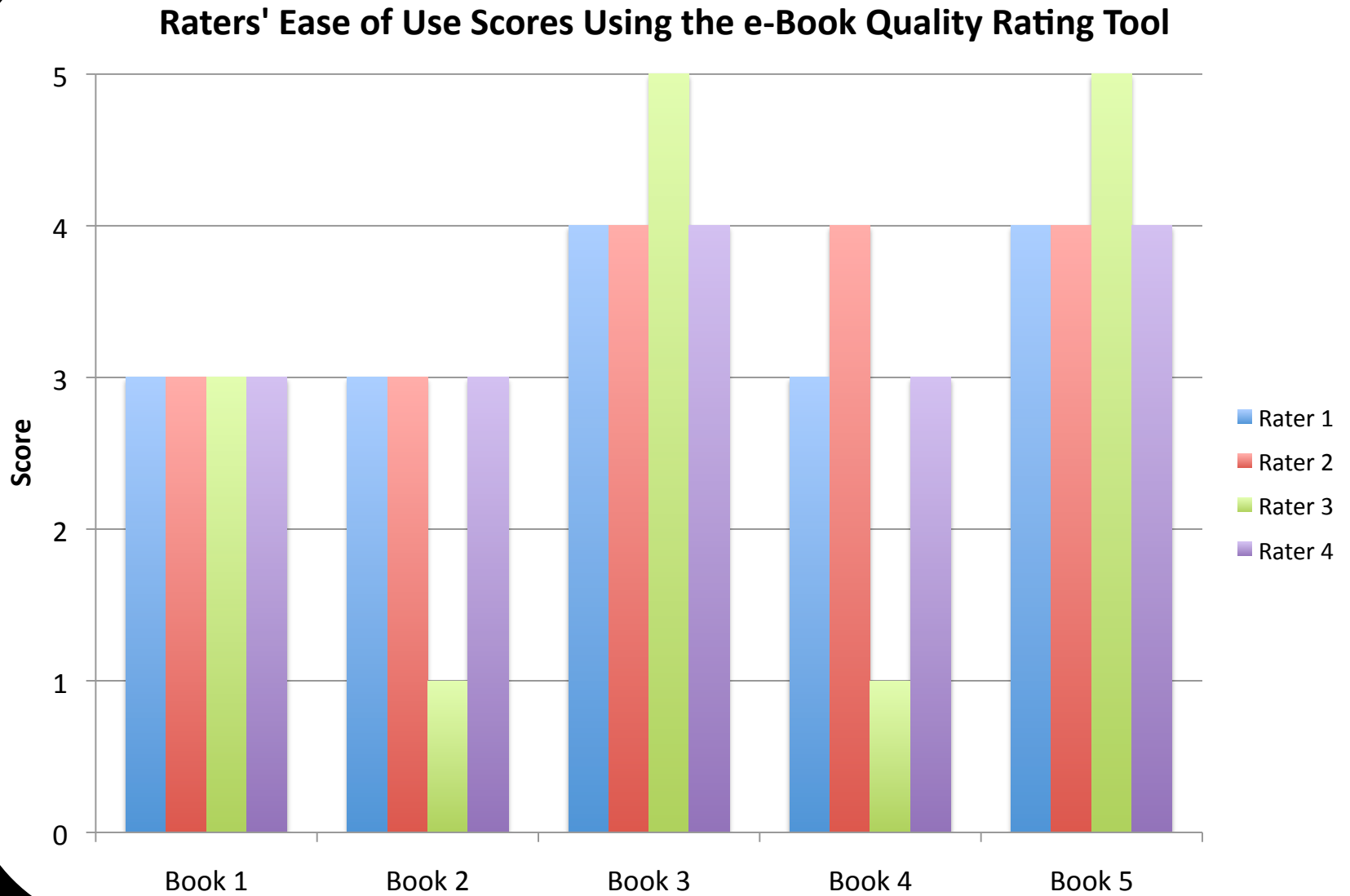
Is Tool 2 Any Better?

Raters' Ease of Use Scores Using the e-Book Quality Rating Tool

Score

5
4
3
2
1
0

Book 1   Book 2   Book 3   Book 4   Book 5

■ Rater 1
■ Rater 2
■ Rater 3
■ Rater 4

Chart 1 shows strong inter-rater reliability (87%)* for Ease of Use ratings using the e-Book Quality Rating Tool.
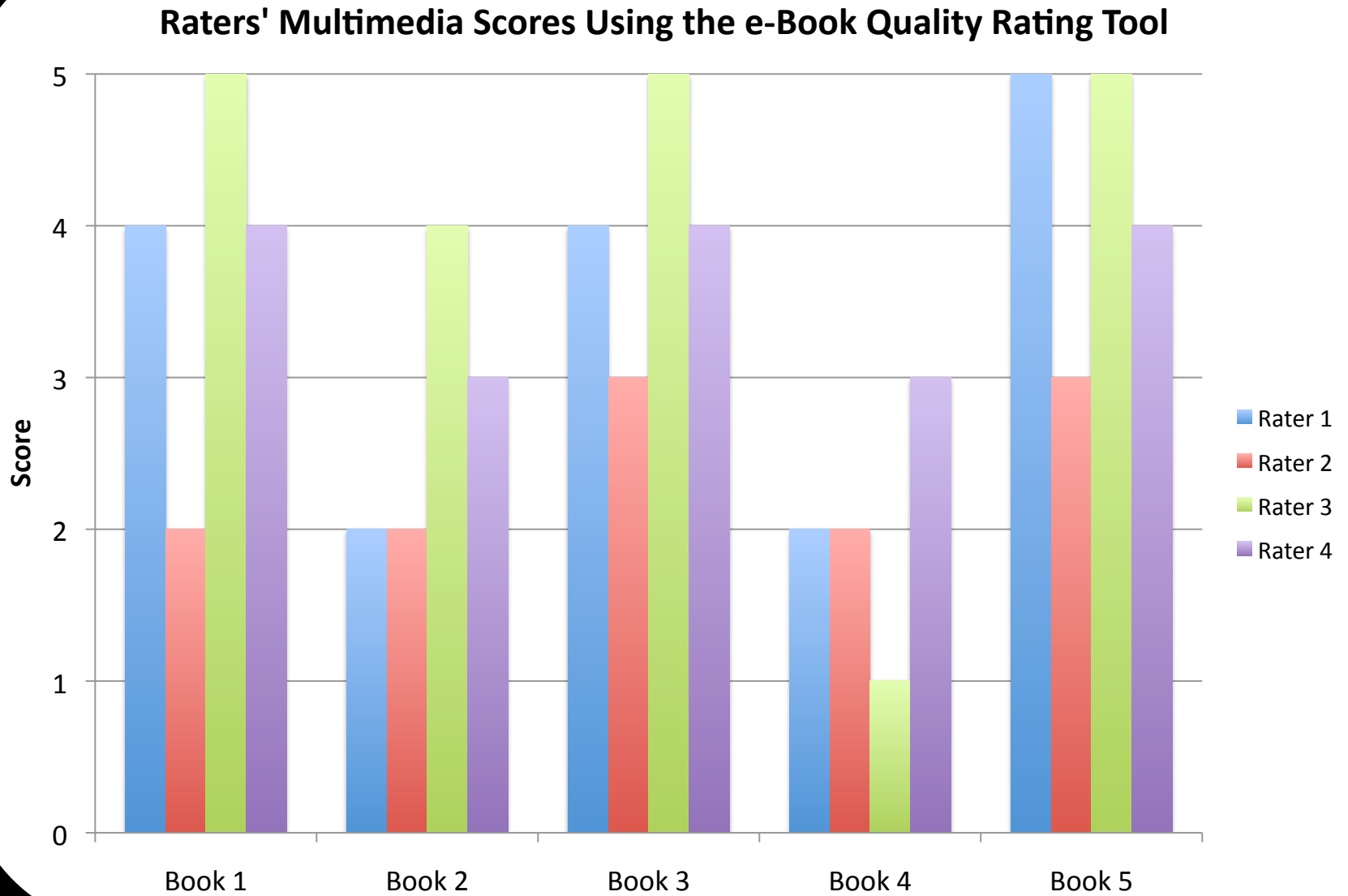
Is Tool 2 Any Better?

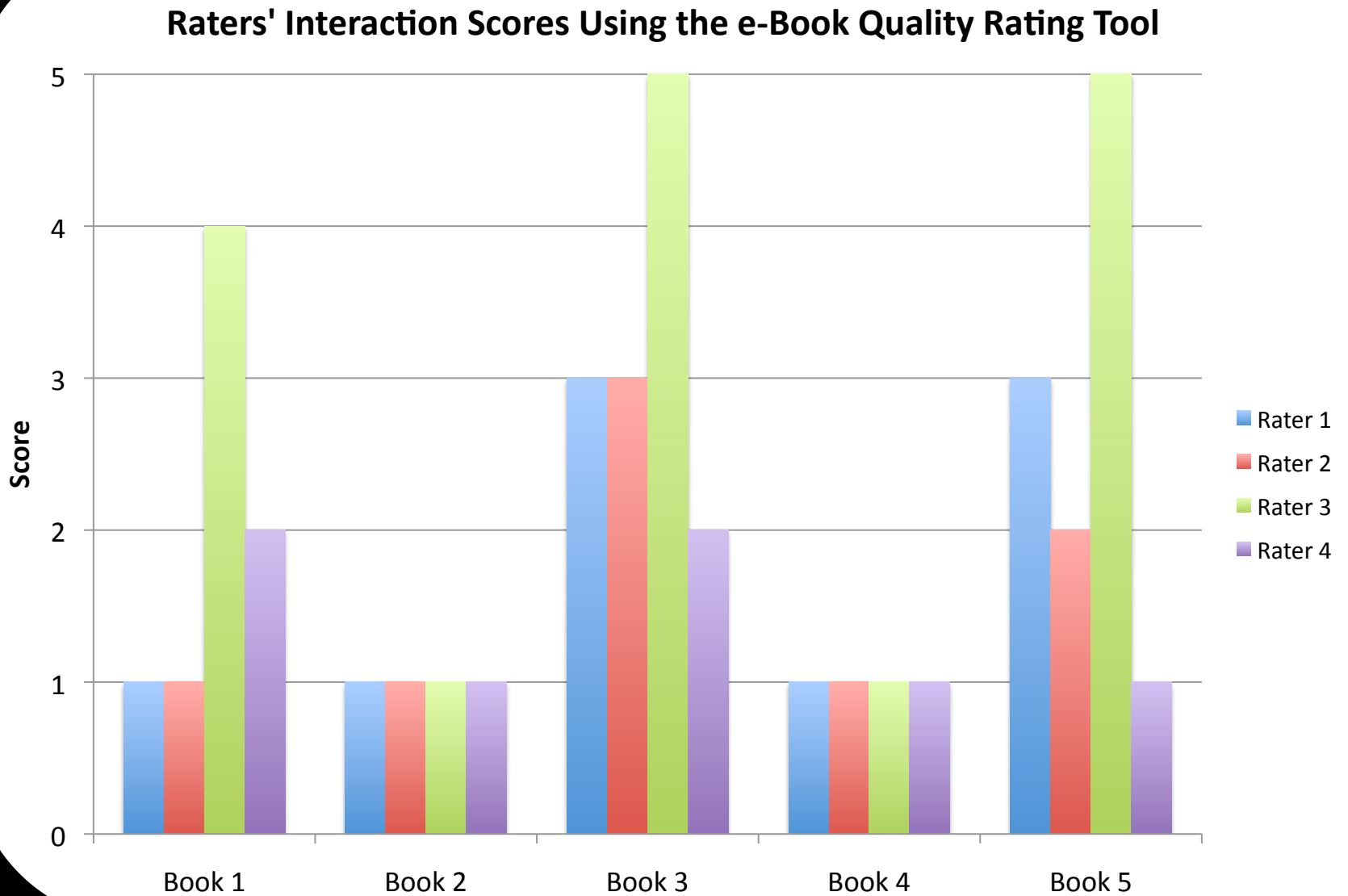**Raters' Multimedia Scores Using the e-Book Quality Rating Tool**

Legend:
- Rater 1
- Rater 2
- Rater 3
- Rater 4

Chart 2 shows equally strong inter-rater reliability (87%)* for Multimedia ratings using the e-Book Quality Rating Tool 2.

Is Tool 2 Any Better?

Raters' Interaction Scores Using the e-Book Quality Rating Tool

Score

- Rater 1
- Rater 2
- Rater 3
- Rater 4

Book 1   Book 2   Book 3   Book 4   Book 5

Chart 3 shows that Interaction ratings using the e-Book Quality Rating Tool 2 are not as robust (73%) as the previous 2 scales.

Thank You!

Akron Ready Steps – http://akronreadysteps.ning.com/
Southwest Institute for Families – http://www.swifamilies.org/