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Using the method of content analysis, this study examines a random selection of 115 children's picture books and 370 picture book catalog records in the Chapel Hill Public Library's children's collection and OPAC in order to record the depiction of information technology. Utilizing a limited definition of the phrase information technology, the titles, front and back covers, title pages, body text and body illustrations of each book are examined and coded for content, as are the summaries and subject headings contained in the catalog records. The resulting data is analyzed for patterns or anomalies (or the lack of either) in several areas including the following: changes across time, similarities and differences between textual content and the content of illustrations, and thematic approaches to the topic.

The study finds an increased presence of information technology in picture books, particularly in the illustrations, but few instances of information technology playing a key thematic role in picture books.

Headings:

Children's literature -- evaluation

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Picture books

THE DEPICTION OF INFORMATION TECHNOLOGY IN CHILDREN'S PICTURE
BOOKS

by
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INTRODUCTION

According to Marc Prensky, an educator and designer of computer learning games, students today (from the newborn to the college-aged) are fundamentally different from their predecessors. The difference is made clear by his designation of this generation as “Digital Natives” (Prensky, 2001). Born to an environment of pervasive technology, this generation has experienced and integrated the tools of the digital age naturally and without the wonder and forced adaptation that their elders, the “Digital Immigrants,” have undergone. Prensky argues that this atmosphere has created a generation which processes information differently and, therefore, learns differently.

Keeping this image of a “digital difference” in mind, a difference that affects learning behavior and perspective toward technology, this research project examines one of the earliest objects children experience on both an educational and an entertainment level: picture books.

The idea that today’s youth learn differently (Prensky, 2001; Walsh, 2003) and that this is due primarily to the prevalence of technology in their lives has led to new ideas about their education, socialization, and leisure activities. Walsh (2003) suggests that picture books, which are traditionally considered to weigh heavily in each of these areas, will take on an even larger role as the importance of visual literacy increases. Through the method of content analysis, this study addresses this related research question: How is information technology depicted in picture books?

Previous examinations of picture books have provided a foundation for extending our knowledge of how children integrate visual and verbal sign systems to make meaning and engage in interpreting their worlds (Sipe, 1998). Whether studying multiculturalism (Galda, 1998), gender representation (Gooden and Gooden, 2001), or popular culture (Brownlow and Durham, 1997) in children's literature and media, researchers have attempted to find links between content and childhood education and cultural assimilation. By examining the depiction of information technology in picture books, this study will further the knowledge of the content children are exposed to, specifically the representation of technology and its place in their lives.

Though technological change has taken place rapidly and broadly across society, it is unclear how our new world of computer digitization and ubiquitous gadgets is reflected in the picture books. The purpose of this study is to generate data that establishes both a history and the current status of how information technology (computers, cell phones, etc.—an operational definition is provided in the methods section) is presented in children's books. By examining a range of books over a range of publication dates, groundwork will be created to answer questions about the past and the present depiction of information technology created for the new "digital natives" and visual learners that comprise our youngest generation.

Literature Review

This study is supported by the literature review that follows, which is divided categorically by content. First, two theoretical papers are reviewed, each of which provides a framework for the research question. The first addresses the assertion that picture books are instrumental in the individual and the social development of children; the second asserts that children today are comfortable and experienced with information technology and develop visual literacy at an early age. The second set of articles is called “empirical research.” These two studies examine the relationship between the content of texts and illustrations in picture books and the effect they have on children. The third section, “model research,” highlights previous research similar to this study and provides examples of appropriate subject matter, methods, and the possibilities for future research based on this study.

Theoretical Literature

In the article “Children’s Response to Literature: Author, Text, Reader, Context,” Lawrence R. Sipe (1999), a researcher in the fields of education and children’s literature, discusses the widely accepted premise that children’s literature plays an important role in the individual and social development of children. In this paper he examines the research being done on children’s responses to literature, including the texts themselves, which is one of the areas this research involves. He also looks at children’s responses to author, reader, and context, but his ideas on text research are more relevant here.

Sipe notes that children respond to all parts of a book—the front and back covers, title page, end pages—in addition to both the text and the illustrations of the body itself. Using a traditional and a modernized version of the story of the gingerbread man as an example, he states that children are “acutely sensitive” (p. 122) to the different content of the illustrations. He introduces the idea that visual literacy is an important aspect of the study of children and picture books. Children hear or read the text while viewing pictures they link to the story or use to understand the story. Sipe also explains the concept of textual mirrors and windows. With multicultural literature (e.g., a story about an African American child) as an example, he describes how literature serves as a mirror to some children, reflecting the world they know, and a window to others, allowing a view of a world they may not know. He addresses the many influences on a child’s interpretation of literature, including characteristics of the child such as gender or cultural background, characteristics or relationship of the person reading to the child (teacher, sibling, etc.), and other influences such as popular culture.

All of these, Sipe states, are important areas for further research. This study, a content analysis, relates to his conclusive statements that children forge links between literature and their lives. Whether the links are “informative or transformative” (p. 127), children make meaning of their lives based on their interpretation of the books, and that is determined partially by the textual and illustrative content of the books.

A second theoretical paper that relates to the topic of this research is Mark Prensky’s “Digital Natives, Digital Immigrants” (2001). As mentioned above, Prensky, an educator and video learning-game designer, coined the phrases “digital

natives” and “digital immigrants” to describe the current generation (child to college student as of the year 2001) as compared to anyone of an older age. He explains that this newest generation has experienced digital technology (computers, video cams, cell phones, etc.) throughout their lives, while everyone else has adapted to it. He goes further with the idea and suggests that our educational system is not designed to teach this new generation because they, due to their technological experience, learn in new and different ways. He reports that biologists have actually suggested that a physical change has taken place in the brain, but states that whether or not this is true, there is definitely a difference in how the natives process information. Networking, multitasking, immediate access to information and rewards are all comfortable habits and expectations of digital natives. Prensky believes that there is a current divide between immigrant educators and native students that is not being addressed by the education system.

The argument he presents is convincing. While it is true that Prensky designs computer learning games that he markets, his theories preceded the games and he argues as an educator, not a salesman.

Prensky’s ideas are related to Sipe and to this research (as well as to the next review) by the idea of visual literacy. Prior to the ability to read, one key means whereby children experience the world is pictures. This study is interested in the content of the picture books they see, while Prensky would add television, video, etc. It is coincidental that the content that this study will analyze is information technology; the topic was chosen because it is current and relevant to the lives of

children. The larger interest is in how information (of any kind) is presented to children. Prensky's work relates to both of these interests.

Empirical Research

More recent research on the topic of visual literacy is presented by Maureen Walsh (2003) in her article "‘Reading’ Pictures: What Do They Reveal? Young Children’s Reading of Visual Text." Walsh states that it is a generally accepted idea that our globalized, technological world requires an increased ability to read images. Her study tests the abilities of two sets of children (one group from kindergarten, one from first grade) to interpret both the texts and the illustrations of two picture books. After the books were read once to the children, interviews were conducted in which the children were asked to retell the story and to comment on it. Walsh’s findings show clearly that both groups of children used the illustrations to personalize, to add to, and to understand the text. One of the books for example, which read only that a pig was seen on a farm, included pictures of a child chasing a pig and of a child washing a pig. Numerous comments were made by the children about how funny the pig was, about why the child needed to wash the pig, and about personal experiences on a farm. Walsh’s charted results show that every response by the children applied to the pictures, while a small minority of them applied to the text. She concludes that the children found meaning in the images presented to them regardless of their ability to read the text, and that the ability to process pictures is different from the ability to process the written word. She suggests that further research is needed on visual learning and its implication on the education of children.

Her research is important to this research question because Walsh has shown that the content of illustrations in picture books is interpreted by children outside of the text of the book. It appears that the illustrations speak as loudly as the words.

While Prensky and Walsh speak to the importance of the visual side of children's books, researchers have known for years that the text of a story also affects the thoughts and actions of children. In 1976, a study conducted by McArthur and Eisen and presented in the article "Achievements of Male and Female Storybook Characters as Determinants of Achievement Behavior by Boys and Girls," demonstrated a link between stereotypical portrayals of male and female behaviors and the actions of children who are exposed to them. Using three sets of children (each composed of males and females)—one who heard a 'stereotypical' story of male achievement, one who heard the same story but with a female protagonist, and one, the control group, who heard a story about animals with no sex differences—the researchers exposed the children to the stories and then assigned them a difficult task to do (a puzzle that required a great deal of time to finish), giving them the option to quit if they chose to, and offering no reward if they completed the task. Their results demonstrated a strong relationship between the sex of the "hero" of the stories and the persistence of a same sex child who heard that story in sticking to the difficult task. The children, the boys even more strongly than the girls, personalized the stories and performed better if they had heard a story of same sex achievement.

At the time of this study stereotyping was more common in children's literature, as was the prevalence of male protagonists. Despite a greater awareness of the dangers of stereotypes, they still exist (following reviews will illustrate this). This

research project does not focus on sex or gender stereotypes, but texts as well as illustrations will be examined, and McArthur and Eisen show in this paper that textual content is an important factor in the depicting of ideas to children.

Model Research

By examining 92 images in 62 picture books, researchers Sarah Sandefur and Leeann Moore (2004) produced a content analysis of the image of teachers in these books. Their paper, "The 'Nuts and Bolts' of Teacher Images in Children's Picture Storybooks: A Content Analysis," presents the hypothesis that negative images or stereotypes of teachers in children's books creates a corresponding negative impression in the minds of children. Their analysis records details of the teachers depicted (for example: race, gender, age, clothing, subjects taught by the teachers, words spoken by the teachers, students' responses to the teachers, and more), then classifies them as positive, negative, mixed review, or neutral based on their characteristics. Their findings include such data as the overwhelming portrayal of teachers as white non-Hispanic females, and, with names like Miss Malarkey, Ima Berpur, Mrs. Nutty, and Mr. Quackerbottom, they found more negative than positive images. Their findings were in line with their expectations, but did not address their original supposition that this negative stereotype affects children's ideas of teachers. From studies such as McArthur's and Eisen's mentioned previously, however, we do know that text does affect behavior. By examining the text and imagery used to represent teachers, this study does show that a negative stereotype is prevalent and the

researchers propose that a more positive image of teachers would better serve both students and educators.

This research is relevant to this study because it provides a working model for the examination of both text and illustrations in picture books. The researchers clearly listed the characteristics they measured or counted, and explained how they selected the books they used in the study. It is also relevant in that it examines the depictions of teachers as a whole, choosing not to focus on any one aspect (race, gender, etc.) but instead to simply report the overall findings and suggest areas in which they could be used for further research.

A second study, “Culture and Conflict: The Portrayal of Blacks in U.S. Children's Picture Books Through the Mid- and Late-Twentieth Century,” (Pescosolido, Grauerholz, & Milkie, 1997) looks at trends in visibility and the nature of the portrayal of African Americans in picture books over time. The researchers expected to find not a linear portrayal, but a varying picture that changed with the political climate of the country. This large study included three sets of books—Caldecott winners, random selections from the *Children's Catalog* which the researchers felt represented books that would be found in libraries, and books from the *Little Golden Books* series which represented popular fiction—which totaled over 2400 books that were examined. These books were coded for the presence or absence of Black characters, details about the characters (age, occupation, etc.), and the nature of any interracial relationships presented in the books. The findings were then compared to statistics gathered on the occurrence of racial conflicts in the United States. The results demonstrated a strong correlation between political upheaval and

the depiction of Blacks in children's books (the higher the level of conflict, the lower the number of Blacks found in the books).

This extensive study presents a broader picture of the application of content analysis. It demonstrates how books can be examined over time and how researchers compare data taken from different sources. It also addresses the concept of stereotyping and the effect it has on children.

Interested in how his native Chinese culture is presented in children's picture books, researcher Mingshui Cai (1994), in his paper "Images of Chinese and Chinese Americans Mirrored in Picture Books," examined 73 books that feature Chinese characters. He undertook the study with no preconceived ideas of what he would find, but with the understanding that books are often a child's first exposure to different cultures and will shape the attitudes that are formed about the culture.

He found that the books fell into three categories: folktales, stories about Chinese Americans or about Chinese people in America, and stories set in China, Taiwan, or Hong Kong. Cai does not code the books by individual characteristics as the two previous studies did, but discusses the books and how they present themes, such as love, family, history, and contemporary Chinese life. He found some evidence of negative stereotyping, but more positive than negative images. The greatest flaw, he stated, is the abundance of inaccurate historical or cultural information. He also noted the scarcity of material available on contemporary life and how such books would potentially further a positive understanding of one culture by another.

This paper displays a more qualitative examination of latent content, choosing to focus on books as a whole, and to judge them against the knowledge the researcher has of the subject matter himself. This format is appropriate to a study of national culture such as Cai's, but would be difficult to follow for the research question addressed here. It is useful, however, in that it is yet another example of the strong relationship between picture book content and meaning in the lives of children.

A topic that has received extensive examination by researchers of the content of picture books is the representation of gender. An example of this is Diane M. Turner-Bowker's "Gender Stereotyped Descriptors in Children's Picture Books: Does 'Curious Jane' Exist in the Literature?" Noting the historical prevalence of males in titles, as main characters, and in stereotypical occupations and activities, Turner-Bowker explains that the situation changed in the 1970's when publishers developed guidelines to even the presentation of female characters and to lessen the use of stereotypical roles for both genders. While a change did occur, studies still show some evidence of different representations.

In this study thirty books were examined (Caldecott winners and "Honors" books from the stated time range) for the sex of the characters in titles, pictures, and central roles. Also examined were the adjectives used to describe male and female characters. The results showed that males were more likely to appear in titles, pictures, and in central roles, but that female were described by more positive adjectives. The three most common adjectives used to describe females were beautiful, frightened, and worthy; for males, the three were fat, big, and hungry. The larger numbers of male characters demonstrates that picture books have not been

equalized, and the use of different words to describe the genders, even though the female descriptors were considered more positive, also demonstrates a bias.

This study demonstrates a descriptive as well as a relational look at the question of content. Adjective assignment and adjective meaning are defined and compared, leading to a clearer picture of how the characters are presented to the reader. Turner-Bowker's work shows the role of language in the perpetuation of stereotypes.

The research of Gooden and Gooden (2001) also looks at gender representation in children's picture books, building on several previous studies that have analyzed the stereotyping of gender roles in illustrations and titles. By closely examining each page and charting the presence of male and female characters and the roles they play (the sex of prominent characters and their activities, for example), the research showed that gender stereotyping had decreased slightly over time, but still occurred in picture books. Males were still the more prominent characters though females constituted a larger percentage of the actual reading population. The article discusses the importance of children's literature as a model for both individual values and an interpretation of society, focusing on how women's roles are represented.

This study offers an example of content analysis by examination of illustrations and how stated criteria are tabulated and compared. It builds on previous studies, allowing not only conclusions to be drawn about the books in the current research, but how the stereotyping has changed over time. This is relevant to this study as an example of sampling and tabulating results, and demonstrates the usefulness of content analysis as a tool for future researchers to make historic

comparisons. Information technology is a relatively new subject of analysis, but as its place in children's lives continues to grow, the depiction that is presented becomes more important.

One last model study for my own research is Brownlow and Durham's (1997) study "Sex differences in the Use of Science and Technology in Children's Cartoons." The researchers tabulated the instances of male and female characters, their positive or negative roles (heroes vs. villains), and their use of technology in a selected set of cartoons. They found a definite prevalence of male heroes and male users of science, though acknowledged that the cartoons they examined were aimed at a male audience. They also discussed the role of popular culture as a conveyer of values and mores in the lives of children.

This study is relevant to this paper's research question in that it illustrates the importance of how technology is presented to children. The researchers do not provide a clear definition of "science and technology" and their experiment would be hard to duplicate for that reason, but the intent is similar: a desire to understand and record the depiction of technology that children experience in literature or other media.

Methods

The method of research used in this study is content analysis. Defined by Babbie as “the study of recorded human communications,” this method is “particularly well suited” to the study of books (Babbie, p. 314). Because the question addressed asks how information technology is depicted in picture books, a systematic examination of the books themselves will most directly provide data that answers this question. In addition, the summaries and subject headings contained in picture book OPAC records are examined.

This study consists of two parts and the units of analysis include the picture book and picture book catalog records. The variable to be coded and analyzed is the absence or presence of information technology. This requires the choice of a sampling technique, the establishment of an operational definition for the phrase “information technology,” and the creation of codebooks and coding forms for the recording and classification of the data.

The first step, the choice of a sampling technique, must take into consideration the sample that is available to the researcher. There are approximately five thousand children’s picture books published each year. Not only would it be impossible to sample from the total number ever published, it would also be nearly impossible to sample from the books published in any one recent year. The sampling frame, or list of such a collection, may or may not exist. Most of the books are quickly out of publication and are never reproduced, which means that even if a list did exist, locating all of the books would be highly unlikely.

For these reasons, and others (time, cost, etc.), one alternative that some researchers choose when studying picture books is to use the list of the Caldecott Medal winners or similar “honors” type lists. These finite lists cover a broad range of time (1938 to present for the Caldecott, for example) and the books are generally readily available to researchers. For the purposes of this study, however, it is less important to cover a broad range of time (information technology is a contemporary topic) as it is to cover a broad range of books, which rules out using only “special” award-winning books. The random sampling of a substantial but limited collection (so that a sampling frame exists) is desired though, so this study uses the picture book collection at the Chapel Hill Public Library, a local, easily accessible collection. The limitations or disadvantages of this choice will be discussed at the end of this section.

This means that the study will involve both probability and non-probability sampling: there does exist a list of the books in the collection, but the sampling will rely on what is available, both in terms of what books the collection contains as compared to all the possible books published, and which books are on the shelf at the time of the study (books that are checked out or missing will not have a chance to be included). Another limit to this study is in the capabilities of the library’s OPAC. It is not capable of creating a list of books greater than 10,000, so the books and the records randomly selected for analysis are from a list cut off at the ten thousandth book of an estimated picture book collection of 12,000. The catalog was first searched by call number (PIC at CHPL) netting a result set limited to 10,000, then limited to English language, and sorted by author. The final list consisted of 9678 numbered books.

Using a sample size calculator (<http://www.raosoft.com/samplesize.html>), it was determined that with a collection of 9678 picture books, it is necessary to examine 370 in order to achieve a 95% confidence level with a 5% margin of error. Because time prohibited the analysis of this number of books, but valid results were desired, this number (370) was used instead to determine the number of picture books catalog records to be examined. Most of the records include summaries of the books and a list of subject headings assigned to the books. To assure a random selection, a random sequence generator (<http://www.random.org/sequences/>) was used to create a list of 370 numbers between 0 and 9678. These numbers were matched to the picture book record numbers and each record's title, summary, and subject headings were analyzed.

An analysis of the books themselves, however, provides the most accurate and informative content data. Lists limited by publication date were created for each decade beginning with 1950 and one for all books predating 1950. Coding was performed on 10 randomly selected books from the pre1950's collections (of 69), 10 from the 1950's (of 43), 10 from the 1960's (of 95), 10 from the 1970's (of 210), 25 from the 1980's (of 1244), 25 from the 1990's (of 3220), and 25 from the 2000's (of 4797), for a total of 115 books (from the total collection of 9678). The selection of the books was determined by the random sequence generator as in the analysis of the catalog records above. If the random selection was not available, the next book in the numbered search results was analyzed.

The next requirement of this study is the creation of an operational definition of the phrase "information technology." In other words, what exactly will be

measured? Generally, the term is conceptualized rather broadly: according to TechEncyclopedia (<http://www.techweb.com/encyclopedia/>) it is “an umbrella term for the entire computer industry... [that] may embrace or exclude the telecommunications and networking industry.” Entrepreneur.com (<http://www.entrepreneur.com/encyclopedia/>) provides a definition more useful to this study: “a term that encompasses all forms of technology used to create, store, exchange and utilize information in its various forms including business data, conversations, still images, motion pictures, and multimedia presentations.” Because the second definition includes a list of the types of information that this phrase covers, it is useful in the creation of an operational definition as it applies to the lives of children. The designated definition must include a clear and concise list of the items that fit the subject matter, that can be codified, and that allow for easy replication by other researchers. Therefore, the operational definition of information technology that will be used in this study is as follows: Items of technology whose primary purpose is the creation, storage, or transfer of information, limited to computers and their accessories (printer, mouse, monitor, gaming equipment); telephones of all types; still, digital, and video cameras; and individual, handheld music players (mp3’s, iPods, etc.). This list excludes some business machines (copiers and fax machines, for example) and scientific or specialized digital technology because it is meant to reflect the technology that is present in the lives of children, the technology that they would recognize and be able to name.

With the sample chosen and the phrase information technology defined, the next step was determining what parts of each catalog record and of each book were to

be analyzed and how the data would be coded. In the first part of the study, the randomly selected catalog records were searched for information technology terms. The codebook and coding form (see Appendix, Tables A and B) used for this part of the study require that the book number be recorded (the number from the sequence generator that corresponds to the books position on the OPAC generated list), the date of publication, the absence or presence of an IT term in the title of the book and what that term is, the absence or presence of a book summary and whether or not the summary contains an IT term, and the absence or presence of subject headings and whether or not IT terms are used. This part of the study is designed to demonstrate how prevalent IT terminology is in the catalog records of picture books, and what terms are used.

Because Sipe's research (1999) shows that children respond to all parts of a book, including the front and back covers and the title page, as well as the text and illustrations, this study also examines 115 randomly selected books (for complete list see Appendix, Table C) in their entirety, measuring the manifest content of each part of the book and making one qualitative measure, the overall theme of the book. A codebook and a coding form were created for this also.

The codebook (Appendix, Table D) provides a complete explanation of each variable to be measured. The books were identified by number only on the coding sheet (Appendix, Table E), and the bibliographic information was recorded separately. The publication date of each book was also recorded so that the results could be analyzed by year, by decade, or by any temporal set desired.

The first variable examined is the title of the book chosen from one of three coding options: contains information technology (IT) terms, refers to information technology without specifically utilizing a term, or does not include IT words or references. For example, a book titled *Jane's New Computer* contains one IT word so this title would be coded "Yes, computer." A different title for the same book, *Jane's Birthday Surprise*, does not contain the word computer but refers to one. This title would be coded "Refers to, computer." A title with no IT words present or referred to is coded "No."

The next part of the study involves an examination of the illustrations of the books. These are divided into sections that include the front cover, the back cover, the title page, and a combined look at the illustrations that make up the body of the book. For each of these sections, the number of instances when information technology is depicted, and what item is depicted, is recorded. The code sheet offers the following options: computer (room-size, personal computer, laptop, and accessory), telephone (wired and wireless), camera (still, digital, and video), individual music player, or none. The coding consists of a count of each item for each section.

A similar examination of the books' texts was also done. Starting with whatever follows the title page, be it a table of contents, an introduction, or the story itself, a count of the instances of information technology words is noted. The options include computer, laptop, printer, mouse, other computer related words that will be recorded, telephone, cell phone, other telephone related words that will be recorded, camera, video camera, other camera related words that will be recorded, music player

or related words, or none. This includes brand names and text that is a part of the illustrations rather than the body of the work.

Finally, based on the overall content of the text and the illustrations, it was recorded whether or not the overall theme of the book involves or is related to information technology. Unlike the rest of the data created for this study, this variable is subjective and therefore less reliable.

Since this study involves recorded information rather than human beings, there are no inducements or ethical issues to discuss. One question that must be addressed, however, is the prevalence of fantasy and science fiction in children's books, the issue being whether or not to code "unreal" technology as depictions of the types of information technology that will be measured. The decision is to include any book that is randomly selected. An attempt to eliminate fantasy from a study of children's literature would be a gross misrepresentation of the subject. Animals talk, children ride dinosaurs, anything is possible, and that is an important part of picture books. It makes no difference to this research whether a cell phone is being used by an aardvark on the moon or a child in her room; the important detail is the presence of a cell phone. A child experiences exposure regardless of any fantastic characteristics of the books, and because the information technology that this study will measure has been clearly defined, science fiction-type gadgets will not be counted unless they fit the operational definition.

There are disadvantages and limitations to the method of content analysis, and to this particular study. Rarely is it possible to examine or to have access to all instances of any large group or population. This study is limited to the books in one

library and can therefore only be said to be representative of that collection. It would not be accurate to expand the validity of the results to a larger or to a different collection of books; therefore the limited sample limits the generalizability of this research. Studies of this type must attempt to code at least the minimal number that is determined to represent the whole based on statistical estimates. This study is able to do that for the catalog records only and therefore achieves an acceptable rating for validity and reliability for one part of the study, but not for the study as a whole. In addition, the study does not include a second coder with whom the coding can be compared and the assessments verified. The positive side to this drawback, however, consists of the fact that other than judging the theme of the books, all of the data is based on manifest content and subject to replication. Additional advantages include the low cost, the absence of human subjects, and the unobtrusive nature of the method.

Results

Part One—Catalog Records

Chosen randomly by computer, the 370 records were distributed thusly:

Table 1

	Publication date						
	Pre50's	50's	60's	70's	80's	90's	2000's
No. of books	5	0	2	9	56	115	183

Of the 370 records, there were 21 that did not include summaries and 4 that offered no subject headings. None of the records included an IT term in its title, and only one title made reference to an IT term—Amy Reichert’s *While Mama Had a Quick Little Chat*, a 2005 publication summarized as follows: “While Rose’s mother has a ‘quick little chat’ on the telephone, Rose is supposed to get ready for bed but finds she is hosting a party instead” (<http://catalog.chapelhillpubliclibrary.org/search>). There were no records with IT terms used as subject headings, and Reichert’s book was one of only three that included IT terms in their summaries. The other two are *Pinky Promise: A Book about Telling the Truth* by Vanita Braver, MD (2004) and *Orson Blasts Off!* by Raúl Colón (2004). The summary of Braver’s book states that a child “drops her mother’s expensive camera” then learns a lesson about lying and telling the truth. Colón’s book is described this way in the OPAC: “When his computer breaks down, a little boy discovers that imagination is way more fun than a computer game.” The three terms noted then, and the only three found in the 370 records, are one instance each of telephone, camera, and computer.

Part Two—Picture Books

The coding results of the 115 randomly selected picture books are here in Table 2:

Date of Publication	No. of Books with IT results	No. of Titles with IT terms	Front Covers with IT illustrations	Back Covers with IT illustrations	Title Pages with IT illustrations	IT Illustrations in body of book	IT Terms in body of text
Pre1950's	2/10 = 20%	0	0	0	0	3 – telephones	1 – “telephone” 2 – telephone references
1950's	1/10 = 10%	0	0	0	0	4 – cameras	0
1960's	0/10 = 0%	0	0	0	0	0	0
1970's	1/10 = 10%	0	1 – camera	0	0	2 – telephones	0
1980/s	8/25 = 32%	0	0	0	0	3 – computer accessories 6 – telephones 2 – cameras 1 – video camera	8 – computer references 3 – “telephone” 4 – telephone references 1 – camera reference
1990's	8/25 = 32%	0	1 – pc 1 – mp3 player	0	0	1 – pc 1 – computer accessory 6 – telephones 3 – cameras 3 – video cameras 1 – mp3 player	1 – “computer” 1 – computer reference 1 – “telephone” 5 – telephone references 6 – camera reference
2000's	10/25 = 40%	0	0	0	0	3 – telephones 5 – cell phones 8 – cameras 7 – video cameras 4 – mp3 earphones	1 – “telephone” 3 – telephone references 1 – “camera” 1 – camera reference

The totals for the above chart:

Table 3

Pub. Date	Books w/ IT results	Titles w/ IT Terms or Ref.	Front Covers w/ IT Ills.	Back Covers w/ IT Ills.	Title Pages w/ IT Ills.	IT Ills. in Body	IT Text in Body	Totals
Pre50's	2/10	0	0	0	0	3	3	3 Ill., 3 Txt
50's	1/10	0	0	0	0	4	0	4 Ill., 0 Txt
60's	0/10	0	0	0	0	0	0	0 Ill., 0 Txt
70's	1/10	0	1	0	0	2	0	3 Ill., 0 Txt
80's	8/25	0	0	0	0	22	16	22 Ill., 16 Txt
90's	8/25	0	2	0	0	15	14	17 Ill., 14 Txt
00's	10/25	0	0	0	0	27	5	27 Ill., 6 Txt
Totals	30/115	0	3	0	0	73	38	76 Ill., 39 Txt

By comparison, the three books mentioned in the random catalog selection had totals as follows:

Table 4_[BS1]

Title	Books w/IT results	Titles w/IT Terms or Ref.	Front Covers w/IT Ills.	Back Covers w/IT Ills.	Title Pages w/IT Ills.	IT Ills. in Body	IT Text in Body	Totals
<i>Quick Chat</i>		1 ref. to talking on phone	1 phone	1 phone	1 phone	11 all phones	1 "phone" 18 refs. to talking on phone	14 Ill., 20 Txt
<i>Pinky</i>		0	1 camera	0	0	4 cameras 1 laptop	1 "computer" 8 "camera" 6 refs to using camera	6 Ill., 15 Txt
<i>Orson</i>		0	0	0	0	2 pc's	1 "computer" 1 ref to computer games	2 Ill., 2 Txt
Totals	3/3	1	2	1	1	18	36	22 Ill., 37 Txt

Based on the coding of the 115 randomly selected books (Table 2), the totals by IT type are as follows:

Table 5

	Telephones				Individual Music Player	
	Illustrations		Text		Illustrations	
	Wired	Wireless	“Telephone”	Telephone reference		
Pre50’s	3		1	1 – “called” 1 – “dialed”		
1970’s	2					
1980’s	6		3	2 – “called” 1 – “dialed” 1 – “phoned”		
1990’s	6		1	1 – “called” 2 – “call” 1 – “telephone call” 1 – “telephone wire”	2	
2000’s	3	5	1	1 – “dialed” 1 – “calls” 1 – “press zero”	4 – earphones	
Totals	20	5	6	14	6	
Total Telephone Illustrations and Text Uses				45	Total Mp3 Illustrations	6

Table 6

	Computers					
	Illustrations				Text	
	Room size	Personal computer	Laptop	Computer accessory	“computer”	Computer reference
1980’s				3 – computer games		7 – “video game” 1 – “video arcade”
1990’s		2		1 – computer game	1	1 – “video game”
Totals	0	2	0	4	1	9
Total Computer Illustrations and Text Uses						16

Table 7

	Cameras				
	Illustrations		Text		
	Still	Video	“Camera”	Video Camera	Camera reference
1950’s	4				
1970’s	1				
1980’s`	12	1			1 – “flashbulbs flickered”
1990’s	3	3			1 – “picture taken” 1 – “photo booth” 1 – “film” 2 – “photos” 1 – “TV camera”
2000’s	8	7	1		1 – “taking pictures”
Totals	28	11	1	0	8
Total Camera Illustrations and Text Uses					48

Discussion

The statistic that stands out most clearly for the catalog record study is the absence of information technology subject headings among all 370 items. If this number does in fact provide a reliable result that may be generalized to the collection as a whole that would mean that there are no picture books with information technology terms as subject headings, with an error range of 5%. A subsequent subject search performed to test this idea found that the only terms that yielded results (among all those listed in the operational definition of information technology) were “computer” with 4 results, “telephone” with 5 results, and “video game” with 1 result. This subject search was not limited by the OPAC to 10,000 items; it included all books in the picture book collection. Ten books from a collection of 12,000 represent less than 0.1% of the total—an explanation for zero hits that fits within the range of error. This statistic leads to the conclusion that information technology is rarely the primary subject matter or theme of children’s picture books.

The three records that used IT terms in their summaries also represent a small percentage of the total at 0.8%, and if this is generalized to the whole picture book collection, 96 books (+/- 5%) assign information technology a key role in their plots or themes. These are small numbers, but when one considers that a subject search using the term “dinosaur,” popular characters and topics of children’s books, results in a list of 103 books, the small numbers appear to be more significant.

Also notable is the fact that all three of the books with relevant summaries have copyright dates in the 2000’s. Telephones and cameras are not new technology, but the results of this section of the study, and even more so the results of the

examination of the books as a whole, reveal that the presence of all forms of technology has increased over time. That statement seems logical—much of the technology this study looks at has existed for only two or three decades. But as the introduction to this paper stated, the role of technology in our everyday lives has increased dramatically.

A closer look at the three books found in the catalog study offers an interesting view of how technology is being presented to children. In two cases technology is given a negative connotation, and in the third it is presented as an adult concept. The young girl in Reichert's *While Mama had a Quick Little Chat* is repeatedly put off and ignored by her mother who is talking on the telephone. The author could have easily chosen another distraction for the mother—a book, a bath, etc.—but chose to use a telephone. The message to the reader is that the telephone is more important to the mother than her child, which is certainly a negative way to view the telephone. In Braver's *Pinky Promise*, a young girl drops her mother's expensive camera and thinks that she has broken it. The theme of the book involves telling the truth, so the camera could have been any expensive item that belonged to the parent that the child wanted to use. A camera is an easily recognizable item that most children probably have in their homes, however, and is a good choice. There is a subtle message though, that cameras are for adults and not for children. This does not reflect an easy relationship between children and technology that Prensky claims exists.

Colón's *Orson Blasts Off!* clearly attributes negative connotations to computers, and more specifically, computer games. When Orson's computer breaks

he is angry and bored, but learns that there are interesting things to do besides play computer games. There is no question that technology plays the villain's role in this book.

The second part of this study looked closely at 115 books and it presents a somewhat different picture of the depiction of information technology. Despite the catalog records displaying the presence of almost no IT terms, 30 of the 115 books examined were found to contain either illustrations or textual references to information technology. In no cases were the themes of the books determined to be IT related, but the *presence* of information technology was fairly common, especially since the 1980's.

The number of illustrations increased at least twofold when comparing the last 3 decades to all earlier decades, and in the past decade has begun to include all types of information technology. The cover of Laurence Anholt's *Billy and the Big New School*, for example, published in 1999, shows several scenes depicting school life for an elementary school student, and one of them is a student sitting at a desk with a computer. In Jim Harris' *The Three Little Dinosaurs*, published in 1999 also, three young dinosaurs are shown walking along, one of whom is wearing headphones and has an mp3 player clipped to his shirt. This story is a retelling of the classic Three Little Pigs story, and it is interesting to note that the first dinosaur, the "laziest," builds a quick, flimsy house because he "had better things to do." He is shown sitting in his dried grass house in a chair, holding a video game controller, eating popcorn and drinking coke. Again, computer technology is presented in a negative way.

Anholt's book could be considered a balance to this, however, because he shows computers as educational tools, not time-wasters.

As Tables 5, 6 and 7 show, cameras are by far the IT item most often depicted in the illustrations of these books, followed by telephones (with cell phones beginning to appear in the 2000's), computers, and individual music players. Cameras were less likely, however, than telephones or computers to be a part of the text of the book. They are more often a "prop" in the background: hanging around a tourist's neck, flashing in a crowded audience, and then in the 90's and 2000's, video cameras appear too, playing the same role.

Telephone references were more often included in the text of the books, not as key components of the theme, but as small parts of the plot. From Bemalmans' 1947 *Madeline* where an ambulance is called for an emergency case of appendicitis, to Katherine Tillotson's 2003 *Penguin and Little Blue* where room service is often called, the phone is a normal, mundane part of life. More recently cell phones are appearing in illustrations, especially in crowd scenes. In Robert Neubecker's *Wow! City!* (2004), the city streets are teeming with busy people, four of whom are on cell phones, three who are wearing earphones, and one who is operating a video camera. The "new" is presented here as ordinary and mundane also, a normal part of life and of a child's world.

Computers were only present in three of the 115 books, and two of these three instances were as video games. Other than Anholt and Harris, Berenstain's 1983 *The Berenstain Bears' Trouble with Money* involved the young bears' wish to spend their

money on video games and their parents' thought that they were wasting their money (another negative representation of video games).

It should be noted that none of the 115 books studied were among the list of books located using the subject heading search. Yet, these 115 books contain over 100 instances of either illustrations or textual references to information technology. This means that the depiction of IT is not as a major role-player in children's books, but as a growing, accepted, often background and already taken-for-granted, part of childhood—a neutral topic. When it was found to play an important role in a book, however, the authors did sometimes portray information technology in both positive and negative ways. One cannot conclude that the depiction is entirely impartial.

Importance of Study

As previously stated, the current generation of children, the digital natives, are savvy and comfortable users of technology. Their elders, the immigrants, have adapted to technology. Though Prensky is probably correct in his assertion that the natives learn differently, the youngest children, those who cannot spell or read, still learn by looking and listening. Picture books provide images and stories that shape these children's understanding of the world. The content of the images and stories determines what that understanding will be.

The theory that visual learning will become more important to today's youth places picture books in an even more important role in their lives. The content of the books they read or have read to them is important because of this role, regardless of what that content is. Information technology is one small, but growing aspect of children's lives. This study is not meant to judge the rightness or wrongness, or the goodness or the badness of the depictions measured. It does not make a judgment about what should or should not be presented to children, but instead provides a look at exactly what is and has been presented. By analyzing changes that have occurred over time in content and frequency, a clearer picture appears of what adults have felt it necessary or important to include or to add to picture books in the form of information technology.

This data is also important when paired with other types of data that affect a child's view of the world. This research opens the door to new research on topics such as the representation of information technology and gender, or technology and race, or any pairing that might demonstrate an uneven picture of what ought to be a

neutral topic. Teachers, parents, and librarians who value unbiased and evenhanded representations of the world in children's books, will benefit from studies such as this that highlight a growing aspect of children's lives and examine its depiction in their literature.

Summary and Conclusions

This content analysis looks at 115 randomly selected picture books and 370 randomly selected picture book catalog records. Each of these is coded for information technology illustrations, terms, references to terms, and theme. The results are presented by decade, with terms and illustrations described, and by IT type (cameras vs. computers, etc.). Several individual books are discussed, as is the absence of IT terms as subject headings, and the small number of IT terms used in the catalog record summaries of the books.

The results demonstrate a gradually increasing presence of information technology in the coded books over time, especially in the illustrations. Also noted, however, is the rarity of information technology as a theme in the books. Especially interesting is the fact that the three books which do include an IT item as a central plot or thematic device, present the item negatively—two of them in an outright manner, one more subtly. This is a small sample on which to base generalized conclusions, but there is no question that the presence of IT terms and illustrations is increasing, both in the role of background material and subject material.

Further Research

[BS2]The study of children's picture books is a broad and well-established field. The idea that children's literature plays an important role in a child's development of a world view as well as an individual identity is broadly accepted and the basis for studies of interest to a broad range of people: teachers, parents, librarians, children, researchers in the fields of sociology, psychology, education, and information and library science. All of these are concerned with the questions of how children learn, and the role of books in the learning process. This study suggests that the depiction of information technology may not be a "neutral" topic in these books. Further research that examines picture books specifically selected for IT content instead of randomly selected, would be useful in determining the extent of the negative or the positive images being presented.

Other areas of interest include a more stringent examination of technology as a function of time. That is, an examination that looks at the appearance of IT in the books as compared to the dates of the inventions of the items. It would also be interesting to focus on one item, telephones for example, and follow its role in picture books over time.

Just as information technology is increasing its role in the lives of children, this study demonstrates that it is increasing in picture books also. Understanding the role it will serve in picture books is an important topic of future research.

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Appendix

Table A

Codebook: Picture Book Record Analysis

Unit of Data Collection: Each picture book record is one unit of analysis.

Book ID: Fill in book ID number (1-9678) and add bibliographic information to separate book list.

Publication Date: Fill in the book's year of publication.

Title: Indicate whether the title of the book contains an information technology (IT) word and record the word, refers to an IT item without using an IT word and record the item, or does neither.

1. Contains a word: If a title specifically contains the words computer, printer, mouse, monitor, telephone or forms of the word telephone, camera, or music player, or the brand names of any of these items, it will be coded as a title that contains a word and the word will be recorded. (e.g., *Janie Gets a Computer* = yes, computer)
2. Refers to: If the title refers to an IT item without specifically using an IT word, it will be coded "refers to" and the item recorded (e.g., *Filming My Science Project* = refers to camera, video)
3. Neither: If the title neither contains an IT word nor refers to an IT item, it will be coded neither.

Summary: Examine record for presence of book summary.

1. Indicate no summary provided in record by marking "no summary."
2. Indicate an IT term used in the summary by marking appropriate term or recording related term or mark none if no IT terms are listed.
 - a. Computer
 - b. Laptop
 - c. Printer
 - d. Mouse
 - e. Other computer related word (record word)
 - f. Telephone

- g. Cell phone
- h. Other telephone related word (record word)
- i. Camera
- j. Video camera or recorder
- k. Other camera related word (record word)
- l. Individual music player or related word (record word)
- m. None

Subject Headings: Examine record for subject heading list.

1. No: If no subjects are included in record, indicate by marking no.
2. Yes: If IT terms are listed in the subject headings, mark yes and record term(s). If no IT terms are listed, mark no.

Table C

List of Analyzed Picture Books

Pre1950's

1939	Bemelmans, Ludwig	Madeline
1940	Duvoisin, Roger	Donkey-Donkey
1933	Flack, Marjorie	The Story About Ping
1907	Gramatky, Hardie	Little Toot
1940	McCloskey, Robert	Lentil
1941	McCloskey, Robert	Make Way for Ducklings
1910	Potter, Beatrix	Tale of Mrs. Tittlemouse
1903	Potter, Beatrix	The Tale of Squirrel Nutkin
1937	Suess, Dr.	And to Think That I Saw It on Mulberry Street
1949	Suess, Dr.	Bartholomew and the Oobleck

1950's

1954	Averill, Esther Holden	Jenny's Birthday Book
1959	Bemelmans, Ludwig	Madeline and the Gypsies
1953	Booth, Philip	Crossing
1952	Eichenberg, Fritz	Ape in a Cape: An Alphabet of Odd Animals
1958	Joslin, Sesyle	What Do You Say, Dear?
1951	Krauss, Ruth	I Can Fly
1953	Krauss, Ruth	A Very Special House
1957	Lamorisse, Albert	The Red Balloon
1952	McCloskey, Robert	One Morning in Maine
1957	Rey, H. A.	Curious George Gets a Medal

1960's

1964	Caudill, Rebecca	A Pocketful of Cricket
1964	Freeman, Don	Dandelion
1964	Kuskin, Karla	Under My Hood I Have a Hat
1967	Lionni, Leo	Frederick
1966	Lindgren, Astrid	The Tomten and The Fox
1963	Lobel, Arnold	Prince Bertram The Bad
1969	Mayer, Mercer	Frog, Where Are You?
1964	Scheer, Julian	Rain Makes Applesauce
1962	Sendak, Maurice	One Was Johnny: A Counting Book
1961	Showers, Paul	The Listening Walk

1970's

1979	Cole, Brock	The King at the Door
1976	Conover, Chris	Six Little Ducks
1976	Crowe, Robert L.	Clyde Monster

1977	De Paola, Tomie	The Quicksand Book
1974	Keats, Ezra Jack	Dreams
1971	Kraus, Robert	Leo the Late Bloomer
1979	Lobel, Arnold	A Treeful of Pigs
1976	Marshall, James	George and Martha Rise and Shine
1977	Peet, Bill	Big Bad Bruce
1979	Peet, Bill	Cowardly Clyde

1980's

1982	Ahlberg, Janet	The Baby's Catalogue
1987	Anderson, Peggy Perry	Time For Bed, the Babysitter Said
1985	Asch, Frank	Moonbear's Shadow
1983	Berenstain, Stan	The Berenstain Bears' Trouble With Money
1984	Bond, Felicia	Poinsettia and the Firefighters
1988	Brimner, Larry Dane	Country Bear's Good Neighbor
1982	Carlson, Nancy L.	Harriet and the Roller Coaster
1988	Goode, Diane	I Hear a Noise
1980	Griffith, Helen V.	Mine Will, Said John
1987	Hazen, Barbara Shook	Fang
1989	Heine, Helme	Prince Bear
1986	Hines, Anna Grossnickle	Daddy Makes the Best Spaghetti
1989	Houghton, Eric	Walter's Magic Wand
1989	Johnson, Angela	Tell Me a Story, Mama
1987	Kellogg, Steven	Aster Aardvark's Alphabet Adventures
1987	Leaf, Margaret	Eyes of the Dragon
1988	Mathers, Petra	Theodor and Mr. Balbini
1985	Miller, Moira	Oscar Mouse Finds a Home
1987	Narahashi, Keiko	I Have a Friend
1987	Rice, Eve	City Night
1984	Schwartz, Amy	Her Majesty, Aunt Essie
1988	Smith, Barry	Tom and Annie Go Shopping
1987	Stanley, Diane	Captain Whiz-Bang
1987	Stehr, Frederic	Quack-Quack
1985	Stevenson, James	Are We Almost There?

1990's

1999	Anholt, Laurence	Billy and the Big New School
1994	Bender, Robert	The Preposterous Rhinoceros or Alvin's Beastly Birthday
1999	Cahoon, Heather	Word Play ABC
1995	Dale, Penny	Daisy Rabbit's Tree House
1995	Ehlert, Lois	Snowballs
1991	Emberley, Michael	The Present
1995	Ford, Miela	Sunflower
1991	Guy, Rosa	Billy the Great

1999	Harris, Jim	The Three Little Dinosaurs
1999	Jessup, Harley	Grandma Summer
1992	Hill, Eric	Spot Goes to a Party
1994	Kennedy, William	Charlie Malarkey and the Singing Moose
1999	Keselman, Gabriela	The Gift
1994	Kiser, Kevin	Sherman the Sheep
1992	Komaiko, Leah	Aunt Elaine Does the Dance From Spain
1998	Lachtman, Ofelia Dumas	Big Enough = Bastante Grande
1993	Levine, Arthur A.	Sheep Dreams
1998	Pfister, Marcus	How Leo Learned to Be King
1992	Pirotta, Saviour	Little Bird
1996	Rosenberg, Liz	Grandmother and the Runaway Shadow
1995	Rossi, Joyce	The Gullywasher
1993	Samton, Sheila White	Tilly and the Rhinoceros
1996	Sanfield, Steve	The Great Turtle Drive
1994	Sardegna, Jill	The Roly-Poly Spider
1990	Silverman, Erica	On Grandma's Roof
2000's		
2001	Asher, Sandy	Stella's Dancing Days
2003	Ashman, Linda	Rub-A-Dub Sub
2003	Best, Cari	When Catherine the Great and I Were Eight!
2005	Brett, Jan	Honey, Honey, Lion!: A Story From Africa
2000	Brown, Ruth	Holly: The True Story of a Cat
2006	Child, Lauren	But, Excuse Me, That is My Book
2003	Donaldson, Julia	The Spiffiest Giant in Town
2006	Dotlich, Rebecca Kai	What is Science?
2000	Ernst, Lisa Campbell	Goldilocks Returns
2006	Fox, Mem	A Particular Cow
2003	Graves, Keith	Down in the Dumps with the 3 Nasty Gnarlies: Featuring Snotty Judy Butterfly
2007	Gregory, Nan	Pink
2005	Hennessy, B. G.	Because of You
2007	Krensky, Stephen	Big Bad Wolves at School
2006	Lewis, Kim	Hooray for Harry
2002	Mak, Kam	My Chinatown: One Year in Poems
2003	McDonald, Megan	Penguin and Little Blue
2005	Michelson, Richard	Happy Feet: The Savoy Ballroom Lindy Hoppers and Me
2007	Montenegro, Laura Nyman	A Poet's Bird Garden
2006	Napoli, Donna Jo	Bobby the Bold
2004	Neubecker, Robert	Wow! City!

2003	O'Hair, Margaret	Twin to Twin
2003	Parr, Todd	The Family Book
2007	Robberecht, Thierry	Sarah's Little Ghosts
2000	Shields, Carol Diggory	Music

Table D

Codebook: Picture Book Analysis

Unit of Data Collection: Each individual picture book is one unit of analysis.

Book ID: Fill in book ID number and add bibliographic information to separate book list.

Publication Date: Fill in the book's year of publication.

Title: Indicate whether the title of the book contains an information technology (IT) word and record the word, refers to an IT item without using an IT word and record the item, or does neither.

4. Contains a word: If a title specifically contains the words computer, printer, mouse, monitor, telephone or forms of the word telephone, camera, or music player, or the brand names of any of these items, it will be coded as a title that contains a word and the word will be recorded. (e.g., *Janie Gets a Computer* = yes, computer)
5. Refers to: If the title refers to an IT item without specifically using an IT word, it will be coded "refers to" and the item recorded (e.g., *Filming My Science Project* = refers to camera, video)
6. Neither: If the title neither contains an IT word nor refers to an IT item, it will be coded neither.

Front Cover: Indicate whether the cover art on the front cover depicts an IT item or items and indicate what is depicted, or indicate none.

1. Contains an IT item: If an item or items is depicted, indicate yes, and the number of each item(s) depicted
 - a. computer
 - i. room-size
 - ii. personal computer
 - iii. laptop
 - iv. accessory without computer
 - b. telephone
 - i. wired

- ii. wireless
- c. camera
 - i. still
 - ii. digital
 - iii. video
- d. music player^[BS3]

2. None: No IT item is depicted on the front cover.

Back Cover: Indicate whether the cover art on the back cover depicts an IT item or items and indicate what is depicted, or indicate none.

1. Contains an IT item: If an item or items is depicted, indicate yes, and the number of each item(s) depicted

- a. computer and/or accessory
 - i. room-size
 - ii. personal computer
 - iii. laptop
 - iv. accessory without computer
- b. telephone
 - i. wired
 - ii. wireless
- c. camera
 - i. still
 - ii. digital
 - iii. video
- d. music player

2. None: No IT item is depicted on the back cover.

Title Page: Indicate whether the title page illustration depicts an IT item or items and indicate what is depicted, or indicate none.

1. Contains an IT item: If an item or items is depicted, indicate yes, and the number of each item(s) depicted

- a. computer and/or accessory
 - i. room size

- ii. personal computer
- iii. laptop
- iv. accessory without computer
- b. telephone
 - i. wired
 - ii. wireless
- c. camera
 - i. still
 - ii. digital
 - iii. video
- d. music player

2. None: No IT item is depicted in the illustrations on the title page.

Illustrations: Indicate by number how many times each listed IT item appears in the illustrations of the body of the book.

1. Computer and/or accessory
 - a. room-size
 - b. personal computer
 - c. laptop
 - d. accessory without computer
2. Telephone
 - a. wired
 - b. wireless
3. Camera
 - a. still
 - b. digital
 - c. video
4. Music player

Text: Indicate how many times each IT term is used in the body of the story, including any printed words in the illustrations, or indicate none.

1. Computer
2. Laptop

3. Printer
4. Mouse
5. Other computer related word (record word)
6. Telephone
7. Cell phone
8. Other telephone related word (record word)
9. Camera
10. Video camera or recorder
11. Other camera related word (record word)
12. Music player or related word (record word)
13. None

Overall Theme of Book: After examining text and illustrations, indicate whether or not the overall theme of the book involves an IT item or items.

1. Yes: If the plot or general theme involves IT items, indicate by marking yes and listing the items. (e.g., a story about a student group raising money to buy computers for their library would involve a “computer” theme)
2. No: If IT items are not a part of the plot or general theme, indicate by marking no.

Table E

Coding Form: Picture Book Analysis

Book ID _____ Publication Date _____													
	Yes				Refers to				No				
Title													
	Computer				Telephone		Camera			M P	No		
	RS	PC	LT	Acc	W	WL	St	Dig	Vid				
Front Cover													
Back Cover													
Title Page													
Illustrations													
	Computer	Laptop	Printer	Mouse	Other Computer	Telephone	CellPhone	Other Phone	Camera	VideoCa	Other Camera	MP	None
Text													
										Yes		No	
Theme													