

Tactual Comic Books for Children with Vision Impairment

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Abstract

The aim of tactual comic books is for children who are blind to become independent and integrated within the community, by preventing the delayed development of visually impaired children. It is a learning process. Establishing the concept of reality through imaginary cues, rather than visual cues, that sighted children would develop their concepts and social skills from.

There has not been any development or research on this particular medium before.

While visually impaired children enjoy reading tactual comic books, it nourishes their cognition and perception, e.g. sense of distance; notion of perspective and angle; flexibility; significances; stimulating their touch receptors (tactual sensory), as they will be exposed to tactual graphics in daily routine, such as diagrams in maths, science, geography, and to read the manual for ATM machines; city maps to locate toilets or audible supported traffic signs; to locate emergency exits.

Comic books have been proven as an appealing powerful media, combining images and text, and have positive potential to impact on children's lives as well as adults, and can be very useful for classroom teaching or academic purpose, e.g. to introduce new things in life; to stimulate children's ability and passion to read; to conceive colours; shapes; animals; etc. They are considered as "children's literature".

Semiotic theory is an important element in producing tactile comic books, to conceive knowledge of designing tactual graphic representations, creating characters and objects in the story, writing the comic script all through to the production process, e.g. page layout, sequential tactual images and text. It is a linguistic study of sign, symbol and icon. Communication is the central concern of semiotics.

The conclusion, based on conducted user tests and the design/production process, is that tactual comic books are a learning process, a potential medium to educate children who

are blind and at the same time are a fun recreational/leisure time activity for them that ultimately will increase their independency and integration within the community.

Paper

Introduction

The aim of this research is to conceive and develop a set of requirements to produce perceptible tactual comic books for children with vision impairment in order to effectively communicate information.

The comic book is an art of storytelling and a proven powerful media that tremendously impacts children's life, helps children develop their perception, introduces new things in life, and also stimulates childrens' ability and passion to read, conceive colours, shapes, animals, and so on. Comic is an element of sequential visual communication, combining text and graphic images presented in a unique way.

The graphic image is the most important and strongest element in comic books. Even before children learn to read alphabet, letters are recognized as images, rather than as part of alphabetical order. The world now is such a world of image, the world of sign (icons, symbols, and index), not to mention cultural, lifestyle, psychological and other intangible signs. The world is built, connected and communicated with signs and images.

The reality just mentioned, consequently caused difficulties for children who are blind to adapt themselves to the world, which results in delayed development of vision impaired infants and children. Such delayed development can be anticipated and resolved since the early age by transforming the world of visual image into tactual images, presented as tactual comic books as part of the learning process.

Method

Literature Studies (Library and Internet Research)

- A. Semiotics Theory; Image and text, signification and codification, icon-symbol-index
- B. Comics; Significant elements, characteristics, impact, and sequential art of storytelling
- C. Blindness: tactual sensory, interpretation and perception
- D. Tactual Graphics

Interviews

- E. Tactual and alternatives-format materials producers
- F. Occupational therapists for Vision Impaired Children
- G. Educators for Vision Impaired Children

Case Study

- H. Study of applicable and inapplicable elements for tactual comics
- I. Study of tactual representation and semiotics theory

Designing and Testing Tactual Comic Books

- J. Determining user and usage
- K. Writing comic script
- L. Designing tactual representation for comic vocabularies, objects, and characters
- M. Designing physical Comic books (Introducing comics, Glossary, and the story)

User Test

- N. Problems arising and solution
- O. User test
- P. Good design and bad design
- Q. Evaluation

Semiotics: The Language of Sign

Semiotics can be defined as a study concerned with the creation of the symbolic and its signification processes. On one hand, semiotics is concerned with how the symbolic structured, and how it becomes pregnant with meaning. Communication is a central concern of semiotics. (Kim 1996)

There are two central concerns of semiotics:

Firstly, the relationship between the sign and its meaning. The processes of assigning meaning to and deriving meaning from a sign are called *signification*. Secondly, semiotics is concerned with the way by which signs are combined by following certain rules, or codes. This is the issue of *codification*.

A sign consist of three constituent elements: a) a *signifier*, b) a *signified*, and c) a *sign itself*. “A sign itself” is an element constructed as a combination of a signifier and a signified. This tripartite model of signs offers the same frame regardless of the types of vehicles carrying signs, such as speech, gestures, icons, and so on. The following formula is convenient for an easier understanding of the structure of a sign:

$$\text{Sign} = \text{Signifier} + \text{Signified}$$

Signified is the idea, and signifier is vehicle of meaning, and Sign is the sign itself.

The fundamental formula in communication is, based on the system of sign introduced by Saussure:

The sender: $\text{Signified} + \text{Signifier} = \text{Sign} \sim \text{signification}$

The receiver: $\text{Sign} - \text{Signifier} = \text{Signified} \sim \text{interpretation}$

The Saussurean sign has three elements in total a) the signifier provided by the *external world*, b) the signified provided by the mind called the *internal world*, c) a sign embracing the previous two (i.e. signifier + signified) that enters into the *world of representations*. The following diagram shows the interrelationships of the three elements.

The symbolic world of representation

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Sign

||

The external word → Signifier + Signified ← *the internal world*

According to C.S. Peirce there are *three types* of “Sign”, they are *Icon, Symbol, Index*. Sign has different categories, such as Linguistic Signs, Iconic Signs, Sign for Social Decorum, Regulative Signs, Monetary Signs, Religious Signs, and Artistic Signs.

The process of signification has various *characteristics*, such as Monosemic~Polysemic; Denotation~Connotation; Metaphors~Metonymy~Synecdoche; Codes~Codification; Arbitrariness~Convention; Codification~Decodification

Comics: Sequential Art of Story Telling (Ancient to Present)

Comics is one of the most popular and pervasive media forms of our increasingly visual age (Varnum & Gibbons 2001). The format of the comic book presents a montage of both word and image, and the reader is thus required to exercise both visual and verbal interpretive skills. In its economical state, *comics employ a series of repetitive images and recognizable symbols. When these are used again and again to convey similar ideas, they become a language a literary form, and it is this disciplined application that creates the ‘grammar’ of sequential art* (Williams 1999). The combination of text and image is the most exquisite and exclusive form of artistic communication (Nielsen & Wichmann 2000).

The origins of sequential art begin with prehistoric man almost 20 thousand years ago. From Palaeolithic cave paintings to Egyptian hieroglyphs to the X-Men and even Spawn, this is the history and story of the creation of the comic art form. (History of Comics 1999) (Vallejo, Dominquez & Austri 1990). When life is bleak, a laugh can help. When life is dull, adventure spells relief. When life seems stupid, humor-become-satire makes its point. When life is lonely, romance provides connections. (Clough 1982)

Comic books have always been the domain of the young; children, adolescents, as well as the young adults. And are proven to be a powerful media in communicating ideas and effecting, forming the reader's belief, or values, even lifestyle, as it was considered as a menace to the society (Wright 2001). In an interview about comics by Media & Values Journal, a comic writer said " a comic writer has really got to understand life: how and why people behave the way they do (Koritnik 1982). Comics as a unique media form has marched out of the "funny papers" to an expanded social role: to educate and irritate, tickle and tease, inform and reform. The comic's universal appeal to the human psyche is strengthened by their universal distribution. (Clough 1982)

Comics should be able to influence society in a positive way, which is why writers need to have a lot of reference from real life story to produce a powerful comic as a media communication tools. Comics are part of a society's cultural supermarket. Their presence on the shelves makes their stories and vocabularies available for selection and incorporation into the mixture of values, beliefs and symbols that influence people's perceptions and behaviors. (LaRossa 1999; Sutjiadi 2003h)

A lot of research has been done on comic books and its impact on society, and mostly its impact on children and their emotion. It seems likely that children's books, which are a primary feature in children's worlds, would impact this aspect of children's development." (Tepper 1999)

Comics and Education

Comics are "hybrids" consisting of images and text and considered as "children's literature" (Groensteen 2000). The comic strip is a story, consisting of pictures, drawn by one or more artist, the picture being static, multiple, and juxtaposed. A much simpler definition of the comic strip is a sequence of pictures that should be funny and thrilling, complete in itself or part of a longer story. There should be a continuing character and there should be a speech drawn with the customary balloon lines (Swartz 1878).

Based on content analysis and value analysis, on an early 1907 *Buster Brown* comic by Richard F. Outcault, over a certain period of times, John Alan Swartz finds that comics can teach values like behaviour, emotional security, knowledge, humour, beauty, appearance, value of recognition, practicality, economic value, generosity, opposite sex, independency, obedience, family love, religion, truthfulness, conformity, self regard, creativity, value of excitement, unity, work, manners, aggression, ownership, outdoor activity, sex love, carefulness, new experience, achievements, pleasant personality, morality, self expression, dominance, advice, affection. Although many cartoons and comics reflect the worst possible literature, however, others have discovered value and have benefited from using this medium in instruction, motivational factors in academic curriculum, in the classroom, and for academic purposes. (Thomas 1983)

Howard G. Ball, a Professor from Alabama A&M University, wrote that, originally, the comic strip was designed to carry visual messages to many non-reading migrants who had recently entered America. It was an effective medium for perpetuating the values and mores that were considered important for the growth of the nation. (Ball 1976)

In addition to the entertainment objective, comics are being used by; 1) business and industries to convey corporate activities and programs 2) local, state, and federal agencies to promote a variety of public service issues affecting the physical, social, emotional, and psychological well-being of their citizens; 3) commercial publications to provide information on vocational and career opportunities; and 4) manufacturers of equipment to demonstrate steps and procedures for operating and maintaining equipment. These are but a few of the responsible communicative tasks now being charged to the comics medium.

The proper presentation of successful comic strips requires thoughtful planning; and understanding of the content to be presented; and a planned and organized way for collecting, arranging and presenting information.

Gary Wright, a Professor of Education, University of Texas at Tyler, in “The comic book-A Forgotten Medium in the Classroom” says the comic book has provided satisfying leisure reading for millions of children throughout the world, and knowledge about this source of classroom reading materials may help the teacher in using it wisely (Wright 1979). Classroom teachers should not forget comic books as children’s interest in them has not dissipated during the last half century; if anything, it has increased. It is in the reading teacher’s best interest to learn more about this medium and to use it in motivating students and helping them to read.

Comics are especially good for developing conceptual and logical abilities, such as sequencing, abstract thinking, and class inclusion. For the dyslexic child, they offer practice in left-to-right eye movement, discrimination of important details, and the general process of reading itself. Guided work with comics may help children to distinguish between fantasy and reality, as well as to express themselves verbally in a clearer manner. Best of all, the time spent in developing an understanding and appreciation for comics can benefit learning in disabled children’s comprehension of social situations, develop their sense of humour, and provide them with an enjoyable leisure time activity (Ellman 1979). Comics are informative. From this the student can learn new vocabulary, the difference between antonyms and synonyms, configuration, sequence, sentence structure, different dialects, and punctuation

The Elements of Comics

Comics are essentially a visual medium composed of images, while words are a vital component, the major dependence for description and narration is on universally understood images, crafted with the intention of imitating or exaggerating reality. Comics is a literary/art form, and as it matures, it aspires to recognition as a “legitimate” medium (Eisner 1996). The comics characteristic aspect is juxtaposed pictorial and other images in deliberate sequence (McCloud 1993)

I apply the theory of semiotics and comics in every stage of the production process, i.e. story writing, creating and describing the characters and objects, panels sequencing, designing icon for comics vocabularies, designing tactual representation, and lay out setting.

In Mitchell's book titled "Picture Theory", he mentions an interesting fact, that the Egyptian's method of representation in pictorial form was based on what they knew rather than what they saw (Mitchell 1994). My theory is that communicating information tactually to vision impaired children is building mental images through what they conceive by utilizing the tactual and sensory skills. Attempting to understand as well as believing what they touch, they feel, the tactual sensation, instead of seeing it. And that tactual sensation becomes their point of referent and their experience, and that referent will be used naturally, either while reading various tactual comic books, or in the more generic and broader terms, in their daily routine as reference, in a limitation that only if it is applicable and compatible.

My theory is parallel to the expression "*seeing is believing*", or should I say that I challenge the expression, it is "*feeling is believing*" (Toupin 2002). And this theory is actually the basis for building the convention of reading tactual comic books. Once the reader understand the convention, they wouldn't have difficulties reading the next tactual comic books (Kim 1996; McCloud 1993; Sabin 1996; Wright 1979). Tactual Comic Books for Children with Vision Impairment is more than just an entertaining medium, it's all about learning process towards excellence for their future, in a fun and entertaining way.

Applicable Elements for Tactual Comic Books

Some comic's elements are applicable/relevant in producing tactual comic books. Those elements are divided into 2 stages; the comic *writing* process and the *design* process.

The applicable elements in story writing: 1) Putting writers personal experience into account; 2) Subliminal message within the story; 3) Creating the right ambience and

atmosphere; 4) Creating moral conflicts; 5) Ability to utilize current state of emotion; 6) Reflecting the finished story (Sutjiadi 2003h).

In the design process, the important comic's elements are: 1) Closure; 2) Word Balloons; 3) Cliff hanger; 4) Thought bubbles; 5) Illusions of motion; 6) Mood; 7) Narration box (Commission 1996)

Inapplicable Elements for Tactual Comic Books

An irony occurs in producing tactual comic books, the element of "3-D visual thinking" ability is inapplicable/irrelevant, whereas, according to Joe Edkin, it is the most important element in producing comic books for sighted reader throughout the writing process to the design process (Edkin 2002; Sutjiadi 2003h).

However, I believe that the "3-D visual thinking" could become relevant or applicable in the future of tactual comic books. After the development of tactual comic books and the establishment of the convention of reading tactual comic books along with the development of the concepts, cognition, and perception of the vision impaired readers, it is not impossible to convey or to stimulate 3-D visual thinking, of course, in its own particular manner, e.g. "3-D *space* thinking" rather than 3-D "*visual*" thinking

The second important element that I consider inapplicable is the juxtaposed panels on each pages (McCloud 1993) due to the space limitation and format concern. Alternative printed media technology for vision impaired people tend to be in large format hence the reader have sufficient space to feel the tactual graphics or Braille text, concerning the touch receptors on the tips of the fingers, and that Braille text take space.

It is not relevant for this first production of tactual comic book, and I preferred not too experimental by putting more than one panel on each page, in correspond to my primary intention establishing the convention tactual comic books since this is the first tactual comic book ever made. Nevertheless, it's a learning process and development, for the next production of tactual comic books I will take juxtaposed panel element into account.

In “The Primacy of Perception”, Merleau-Ponty says that at the early age, children are sensitive to facial expressions, e.g. smile (Merleau-Ponty 1989). It’s one of the challenges and a big question whether having a smiling iconic face would mean anything for vision impaired reader, or would it be very confusing or misleading.

Designing Tactual Comic Books for Children with Vision Impairment

User and Usage of Tactual Comic Books

I determined the age group of user for tactual comic books is from 9 or 10 years old and above. And the extended age group is between 5-9 years old, and the purpose is to introduce them to the notion of tactual comic books, the combination of tactual images and Braille text, thus they will get familiar since their age.

For the usage of the tactual comic book, readers are supposed to be able to read it by themselves, and not depending on other people, it is part of the process to become independent. Therefore the tactual comic books consist of three sections. The *first* section is *introduction for the notion of comic books and its vocabulary*, the *second* is *introduction for the characters and objects* involved in the comic book, and *third* is *the comic book* itself. It is recommended for the first time readers to be accompanied, e.g. family members, teachers, it would be easier for them to understand the convention of tactual comic books.

Writing Tactual Comic Books

To effectively communicate with the readers in such age bracket, I wrote the script in a very informal manner, thus the readers feel comfortable reading and enjoying their journey with the new medium, tactual comic books, without having any feeling of being pushed or forced (Richie 1979). I tried to create the whole process as a dialogue of a friend with the readers.

I wrote a very simple short story, with subliminal messages e.g. friendship, admitting your mistake, being accountable. And also I tried to distinct one character from the others, while attempting to cover as many elements of comics as possible, e.g. narration box, background, mood, and motion. Some of them are very experimental.

Semiotics theory has been applied in selecting name for each character, the description the character's uniqueness, in order to be distinctively tactually represented, e.g. wearing baseball cap, glasses, long hair, fluffy hair, whiskers of kitten.

Designing Tactual Representation

The tactual representation has to be deliberately designed, for example when designing the dog, questions occurred such as whether it should be represented from front elevation or side elevation like Charles Schulz's Snoopy figure. Snoopy figure might be a good icon to representing dog for sighted people, but it would be confusing for vision impaired children, because it has 1 eye and 1 ear. Another example was the cat, whether I should use the metonymy approach for the cat by just using the head of the cat to represent the whole cat (Kim 1996). According to Polly K. Edman's book "Tactile Graphics", vision impaired people want to experience something likely to the reality, e.g. a cat comes with whiskers, tail, eras, eyes, mouth, nose, and four legs (Edman 1992).

Some questions arose during the storyboarding process are as follows:

- R. Whether the speech bubbles pointing diagonally or vertically to the characters below
- S. Whether the speech bubbles need to be given code inside it, in order to explaining the expression of the word, e.g. “T” for standard *Talk*, “S” for *Sound* like “woof”, “Y” for *Yelling/shouting* and high tone, “E” for *Expression* like “whoopee”
- T. Whether it is confusing to have long shot, medium shot and wide angle shot
- U. Is it necessary to mention the atmosphere of the setting, e.g. the sound of the birds, the sound of the lake, the smell of the fresh air?
- V. Is it possible to have different elevation of the character, whether it is slightly 3 dimensional or side elevation
- W. Would it be too confusing if the character’s knees are bended?
- X. Would it be confusing if the characters sitting in different position or facing to different direction?
- Y. Whether Scott’s speech bubble is confusing?
- Z. If the answer is yes, the next question is whether the dog’s thought bubble is confusing or clarifying that it is Scott’s speech bubble?
- AA. Is it confusing to have close up shots?
- BB. If the character facing and moving to different direction, specially if it’s moving from right to left, rather than left to right, would it be too confusing? Would it be detrimental for their concept and their convention of reading from left to right?
- CC. Whether the “motion arrow” indicates anything to the readers?
- DD. By putting characters in different order to indicate who’s talking first, would it be confusing? Would it encounter the notion of consistency of making tactual representation?
- EE. Is it possible to add expression on the characters face? Would it mean anything to have facial expression? (Tan 2001)
- FF. Would it be confusing if I rotated the cat’s position diagonally?
- GG. Emphasizing the dog’s facial expression by enlarging the head of the dog, would mean anything? Or would it be confusing?

Problem and Solution

Writing Problem: Insufficient Description (Signification Error)

When the tactual comic was tested I learned errors in the writing process and insufficient description. One of them is the “motion arrow”, it is not well described and the description is too visual. It should have described how the arrow works e.g. the arrow indicates the object or character is moving towards the direction as indicated by the *dot* as a point of departure, and the other end of the arrow as the direction towards to. This insufficiency indicates how the verbal description has caused error interpretation process resulting signification failure.

Tactual Representation: Good Design Vs. Bad Design

Bad Design refers to the condition where tactual representation results in communication failure, meaning the semiotics theory is not well applied, error signification, whereas *Good Design* is the opposite condition.

Having the same body shape for the cat and the dog is misleading, the readers tend to conceive both representations are one same kind of animal, either both dogs, or both cats. From the user test I learned that most of the time readers thought that both were the cats. The cat is not distinctive enough from the dog or vice versa.

Using the same thickness of stroke is a bad design as well, the thickness of the representation of the grass and the lake are very confusing, it could have been less confusing if the stroke line was thinner, and that would have indicated that the particular representation is less important than the objects with thicker stroke. I learned that the thickness of outline or of the representation could distinguish the importance of a certain representation from the others.

The cat whiskers are a good design as they tell that the object is a representation of a cat, however the whiskers are not well emphasised. The representation of the dog is a good

design, meaning the readers' signification works well, it refers to the *dog* signified. The theory of semiotics works.

User Test: Visually Impaired Young Reader

Based on the test, I learned that the whole notion of tactual comic books is a fabulous idea, and it works very well, I would even say that it works much more than I expected. The premise about introducing the convention of reading tactual comic books works very well.

When the tactual comic was tested on the same student twice in 2 different days in 1 week apart, during the second week I noticed that the student could read the comic quicker than the first test, more relaxed, and she could even understand the busiest page on page 18. The whole sequence from page 16, 17 to 18 works very well, both verbally and graphically. Added to that, the 11-year-old girl was not a fast Braille reader. It took her approximately 45 minutes to read the first half of the tactual comic book during the first test, and it was exhausting for her. And to finish reading the whole book on the following week, it took her 20 minutes, and she was having fun and more relaxed. The whole notion of the learning process towards tactual experience is absolutely true.

Evaluation

I should say that the whole design process, integrated with the theory of comic books and semiotics works effectively. I learned that one single line has the potential resulting signification failure, as much as it could result a successful signification. For example, one line on Scott character's head signified Scott's baseball cap, and also Mitchell character's glasses.

The reader successfully could learn onomatopoeia and the notion of sound effect by the icon and verbal text. I noticed on the video presentation, the reader does not verbally read the text “*-sneez-*”, instead, she verbally reads the sound of the text “*hatchoo*”.

This indicates that the reader understands the convention of verbal text and onomatopoeia in the tactual comics.

Having the same representation at the top right corner of each page as background of the setting is an effective idea. The reader notices that the same representation appears on every page. It allows the reader to conceive the ambience, the mood and the atmosphere of the setting or the story.

The naming works well. When the girl was asked about which characters she liked the most, she said that she liked “Fluffy” the dog, because the dog is *fluffy*, and it feels *fluffy* i.e. the dog is tactually represented *fluffy*. The semiotics theory works for both verbal language (words) and tactual pictorial language (Saraceni 2001).

The reader also learns about the notion of gesture on Page 9, she says the characters are lying down on the grass, although it is not completely correct, however it indicates that she understands that they are the same characters in different gesture.

When she was asked about the different sizes of characters and how some pages only have faces, she understood that it was the close up shots, meaning that she has learnt the notion of distance and the notion of space throughout the reading process.

Conclusion

The whole notion of producing and utilizing Tactual Comic Books for Children with Vision Impairment as learning process for them to develop their concepts, cognition, and perception in order to access tactual information, preventing delayed development and ultimately to become integrated within the community and not having the barrier of being blind or visually impaired, works very well.

Tactual comic books obviously have the potential to change the whole notion of blindness and the education of the children who are visually impaired, and yet there is

still a lot more to be discovered and be explored. This is just the beginning of a new era in visually impaired children's literacy.

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