

## Social Studies Comic Application of Neuropedagogy Approach to Social Studies Textbook of Junior High School

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**Abstract.** Research on brain based learning began intensive since the 1990s and mostly revolves around the teaching and learning process. The abundance of research on neuorsains has a profound effect on the speed of brain-based learning research. Meanwhile, research on history textbooks mostly takes the theme of historiography and minimal research on its use in learning. This is where the importance of research is brain based learning and social studies textbooks. Textbook research related to brain-based learning has been initiated by the team since 2013. This year's research, researchers will conduct further research on brain-based learning as the basis for making IPS comic textbooks. Based on the study of previous research findings, the application of Neuropedagogy in IPS textbooks in the form of comics includes: time line, a glimpse of info, historical lessons, behind characters, mind maps, historical caricatures, historical humor, historical mysteries, contemporary issues, if history, and memorizing strategies . The main limitation of this research problem is how is the application of brain-based learning in social studies text books VII class? This research uses a research and development approach model with the steps in this process referring to the form of a cycle.

**Keywords:** brain based learning, textbook, social studies, mind map, memorizing, comic application

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### A. INTRODUCTION

Textbooks are an important part of the social studies learning process and this can be understood because text books are considered to be the most important teaching material so that their existence is an inseparable part of the learning process (Prastowo, 2011: 169, Supriatna, 2007). Social studies textbooks are learning tools commonly used in schools that function to support the learning process.

The IPS textbook that will be compiled is a comic book. This is based on the assumption that picture language is far more communicative than written language, and Martin (1968) said "one picture is better than a thousand words". Oral and written language has limitations besides its advantages. Comics are image media that are unique enough to communicate a story. In this media stories are usually presented in pictures that tell something.

The use of comic media in learning is expected to improve student learning in teaching which, in turn, is expected to improve student learning outcomes, both

thinking skills and strengthening emotional, social, and reflective aspects. Comics are media that can be used to convey material or problems in learning that were abstracted into more concrete images. The comics that will be presented are not only comics that contain social studies material but also try to apply brain-based learning concepts, especially the strengthening of emotional aspects in learning.

Research on brain based learning began to be carried out intensively since the 1990s conducted by educators (teachers and lecturers) and psychologists. Researchers such as Armstrong (2009); Crowell (1999), Caine et al. (2009); Goleman (1994); Jensen (1995/2000, 2005); and Sousa (2006) is a pioneer in the brain based learning movement (Connell, 2009). Research on brain based learning acts as a stimulus to investigate the intricacies of how the brain learns optimally (Caine & Caine, 1991). The majority of research on Brain based learning is directed at optimizing learning and learning processes, such as Máčajová (2013) research on 21st century learning,

Ghazal, Mat Zin, and Muda (2015) about learning behavior, Jana Trníková (2013) concerning the connectedness of Brain based learning and inclusive education, and Zaydeh and Hamed (2014) who examined the use of brain based learning with computer applications on multiple intelligence of children Gaza Palestine which is in a state of conflict. Patty O'Grady (2011), her research on neuroscience education aimed at designing and delivering systematically effective programs in the world of education. Erkan Akyürek and Özlem Afacan (2013) who examined the effect of the use of brain based learning on children's motivation in learning science. Ping Li, Lauren E. Chaby, Jennifer Legault & Victoria A. Braithwaite. (2015) who developed virtual learning tools that are adapted to brain principles combined with innovative educational techniques for teaching science.

Research about Brain-based learning with social studies textbooks has not been done intensively. Textbook research related to brain based learning has been initiated by the team since 2013. In 2013, the focus of research was on the aspects of the use of history textbooks through brain based learning to improve historical thinking and historical understanding. The research was continued in 2014, the research was based on quantitative research, which is a correlational study that discusses "The Effect of Using Text Books in History Learning through Brain Based Learning on Historical Thinking and Historical Understanding". From these two studies, there are indications that there are a number of reasons for the lack of results obtained from these studies, the main factor being the textbook. In 2013 and 2014 research, brain based learning was used as a learning model, while the textbooks used were textbooks that were already in school.

From these problems, the researchers conducted further research in 2017 on brain based learning as the basis for making textbooks not as a learning model. The research findings can be summarized, namely: The pattern of neuropedagogy from the results of the first year of research developed in the form of historical quotes,

Time Line, Info at a glance, Wisdom, Behind the Figure, Mind, Caricature, Humor (Stories that contain aspects of humor), controversy issues, contemporary issues, If History, Music (the technique of remembering using songs), Memorizing Strategies, and deconstructivistic questions. In 2019, the author tries to apply aspects of brain-based learning in social studies textbooks by presenting them in comic form.

## **B. LITERATURE REVIEW**

### **1. Comic**

Comics are images that convey information or produce an aesthetic response for people who see it. Norton, (1986: 15) mentions the definition of comics as sequential art, "the arrangement of pictures or images and words to narrate a story or dramatize an idea." Comics can be categorized as learning media and the use of comic media in learning is expected to improve the learning process students in teaching Comics are media or tools for telling stories in the form of pictures', while according to McCloud (2008: 15) "comics are nouns, pictures and other symbols that are strapped in a particular sequence, to convey information and achieve aesthetic responses. from its readers ". While Norton, (1986: 15) mentions the notion of comics as sequential art," the arrangement of pictures or images and words to narrate a story or dramatize an idea ".

Comics have advantages over video, animation or film learning media. Comics as a still image media have an element of "permanent". Williams in Yang (2003) mentions 'permanent comics, visual components'. Comics are communication media that are included in graphic communication media, the contents are in the form of a combination of images, words, symbols arranged in such a way that the reader gets an aesthetic response in the form of ideas or stories. Likewise, the comic media that will be used in this study are comics based on the notions explained above. Comics are drawing media that have more communicative features compared to

other drawing media such as paintings, photographs, sketches or posters.

## 2. Brain Based Learning

Eric Jansen (2008: 6-8) defines brain-based learning (brain based teaching) as a way of thinking about the learning process, namely the involvement of strategies based on principles derived from an understanding of the brain. Barbara K. Given in her book *Brain Based Teaching* (2007: 57) develops five primary learning systems, namely emotional, social, cognitive, physical, and reflective. The learning system functions so that the learning process runs more effectively and both students and teachers feel greater joy in teaching and learning. Emotional learning system according to Given (2007: 59) is a learning system that tries to create a classroom that is conducive to residual emotional security and personal relationships for students. The emotional system is personal, self-centered, and internal. (Given, 2007: 62).

According to Given (2007: 60-62), social learning systems are the desire to be part of a group, to be respected, and to enjoy the attention of others. Social systems focus on interactions with others or interpersonal experiences (Given, 2007: 62). Cognitive learning system according to Given (2007: 62-63) is the system that receives the most attention because this system deals with reading, writing, arithmetic, and all other aspects in developing academic skills. Social systems focus on interactions with others or interpersonal experiences (Given, 2007: 62, Jansen, 2008: 284). Physical learning system according to Given (2007: 63) is learning that is oriented to the active participation of students and kinesthetic (movement or action).

Neuropedagogy is generally seen as a new interdisciplinary field that focuses on learning and teaching mechanisms while considering brain function. Apart from this general definition, scientific literature introduces many other ways to understand the subject of neuropedagogy (Máčajová, 2013). One of the basic goals of

neuropedagogy is to improve the educational process by using the science of neurology. Neurological knowledge is seen as a science that integrates knowledge from various fields and is expected to produce various approaches and new lines of learning (Máčajová, 2013).

According to Barth, brain-based learning is a learning process that gives students the opportunity to increase their learning potential (Calhoun. 2012). Brain-based learning engages students in their own learning and creates a learning environment where students are actively involved. Brain based learning is actually brain based learning, and trying to understand the relationship between the brain and the learning process that leads us to the role of emotions, patterns, meaning, rhythm environment, movement, gender, and enrichment. (Jansen, 2008: vii).

Jensen defines brain-based learning as "learning according to the way the brain is naturally designed for learning". The brain as a learning organ needs to be continuously studied to design an effective learning environment. Brain-based learning is an instruction, which considers how the brain obtains, processes, and interprets information, and connects, stores, and recalls its messages (Zaydeh and Al Astal, 2014). The main idea of brain-based learning is to maximize learning time to produce extraordinary results for those who are taught metaphors (Phillips, 2014).

Brain based learning is a neuroscience application in education. Barbara K. Given (2007: 40) considers that the application of Brain based learning in the world of education is very important because education is identical with developing the desire to learn, understand how to learn, and apply teaching practices based on how the brain actually functions. The neurological approach to learning offers a basic theoretical framework both for human learning theory and for educational practice. Neurological learning studies focus on the structure and process of brain operations that include higher and lower cognitive functions and processes (Máčajová, 2013).

Brain based learning is a way to activate all parts of the brain during the learning process. Schools that have implemented brain-based teaching and learning have shown improvements in student achievement over a period of time. Effective teachers use brain-based techniques to prevent students from being actively involved in the learning process. When students are actively involved in the learning process, both hemispheres of their brain can be activated to enhance learning. While most students choose one learning style, modality, or hemisphere of the brain from another, activating the activity of the left brain and right brain can improve student learning achievement (Calhoun, 2012).

### 3. Textbooks

Textbooks are one of the educational media which are strategically positioned, and also influence the quality of education, because they function as learning resources and media which are very important to support the achievement of competencies that are learning objectives (Banowati, 2007: 147). The function of the textbook includes: (a) as reference material and references by students, (b) as an evaluation material, (c) as a teaching aid in implementing the curriculum, (d) as one of

the determinants of teaching methods or techniques to be used educator. Helius Syamsuddin in an article (2000) wrote about the criteria and problems of writing a textbook. In his opinion there are six criteria that must be met in writing a textbook, namely: factual substance that must be accounted for, interpretation and / or explanation, presentation and rhetoric that must be in accordance with the theory of developmental psychology, introduction of historical concepts (Indonesian and General) need to use criteria , textbooks of history-technically conceptual history following the GBPP (curriculum), complete illustrations, pictures, photos, historical maps in informative and narrative settings and layouts.

### C. RESULTS AND DISCUSSION

The results of the study include aspects of the design of comic script, comic part A, comic part B, and discussion. The first step when we are going to compose a comic is to make a story script. In compiling stories in general or in particular stories in comics, there are four things that must be considered, namely, theme, settings, characters, and duration plus the curriculum currently in force. The following comic themes will be compiled into story scripts:

Table 1. Comic themes developed in the study

NO	NASKAH	PENJELASAN KONSEP
1	Sejarah Pembuatan PETA Dunia	Tokoh Pembuat Peta
2	Perkembangan PETA di Indonesia dan Pembaruan PETA NKRI	Tokoh Pembuat Peta di Indonesia
3	Perkembangan Perusahaan dalam negeri pengelola SDA (Contohnya Pertamina, Krakatau Steel dll)	Peta Persebaran SDA di Indonesia
4	SDA laut di Indonesia	Profil Susi Pudji Astuti
5	Penjelasan Iklim	Tokoh Peneliti Iklim terbaru
6	Fauna di Indonesia	Fauna langka di Indonesia
7	Bencana-bencana Gempa besar di Indonesia	Mengapa terjadi Gempa
8	Bencana letusan gunung Api di Indonesia	Mengapa terjadi letusan gunung berapi
9	Bom waktu Patahan Lembang	Apa itu Patahan
10	<i>Fenomena Warga Desa ke Kota Besar</i>	<i>Urbanisasi</i>
11	Daerah Kumuh (Slum Area)	Kepadatan Penduduk
12	Bonus Demografi 2045	Piramida Penduduk
13	Kebakaran Hutan	Pentingnya menjaga SDA
14	Gili Trawangan NTB	Potensi Kemaritiman Indonesia
15	Masjid Agung Demak	Akulturasi
16	Rivalitas Suporter Klub Sepakbola (Bobotoh vs Jak Mania)	Interaksi Sosial Disosiatif

17	Trend Belajar Berbasis Online (Ruang Guru)	Bentuk - Bentuk Lembaga non – formal
18	Keberagaman Tempat Ibadah di Surabaya	Bentuk Toleransi
19	Trend Korean Style	Faktor Terjadinya Interaksi Sosial (Imitasi)
20	Berbelanja Online	Konsep kebutuhan dan keinginan
21	Kenakalan Remaja	Dampak negatif IT pada bid. Budaya
22	Digitalisasi pada bid. Ekonomi	Profil Nadiem Makarim (CEO Gojek)
23	Berita Hoax	Dampak perkembangan ilmu dan teknologi di bid. Sosial
24	Peringatan Muharam dengan pawai obor	Peninggalan Sejarah bercorak Islam
25	Keberadaan Goa Pawon	Kehidupan masa pra aksara

Source: Research data (2019)

The next process after the story is structured, the story that is structured into the storyboard. Storyboard is the first prototype model of a project, in this case a comic. In other words the storyboard is the layout of the placement as well as the composition of the image panels and word balloons to be arranged.

The next step is the process of filming the storyboard. Storyboards are panel lines provided with images such as character drawings, and background images. The dialogue balloons are then written in the required storyline. Sketch drawings usually use a pencil or removable stationery, the comics creator sketches the image as an outline on the image. This is useful for the next stage of ink delivery. The next sketch is in ink. This stage of ink is usually used in a variety of pens according to the needs of the person drawing. This process is very confusing in the making of comics, because the inked image is the image that the comic reader will see. The last step is to add a final touch to the comic to make the result more interesting to the reader. Finishing can be special effects, gray only, or decorative patterns such as floral patterns, polishes, squares and more. Finishing can be done in two ways, first by finishing the manual using hand and rugos / screentone, or finishing using the computer digitally.

Here are some examples of comics you have created:



Figure 1: Modern and Traditional Market Theme Comics

Comics with the theme of modern and traditional markets are formulated with more interesting and fulfilling comic-based textbook elements. Live story lines, interesting picture illustrations, meaningful story messages, and contextual examples that are displayed are very relevant and interesting. Can be used as an advanced model for simple comics with a manual manufacturing process.

The comics created in digital form are as

follows:

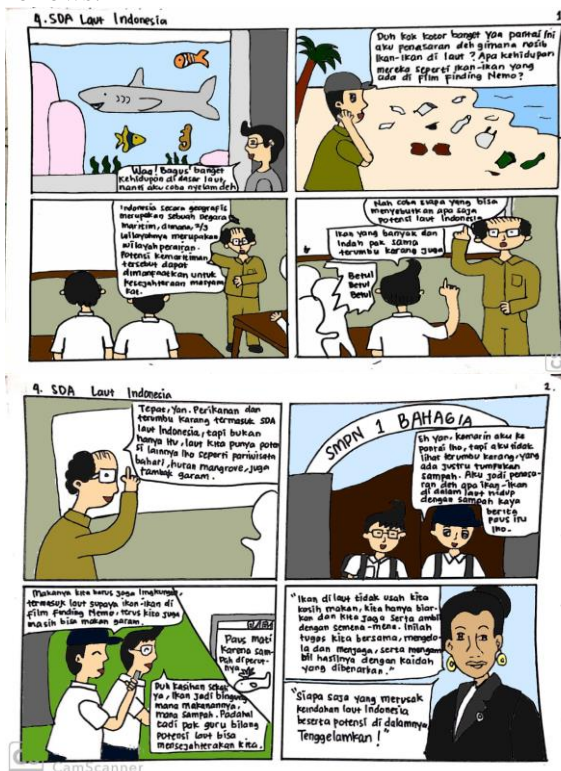


Figure 2. Indonesian Ocean Nature Resources Theme Comic

The first panel of comics is already good by raising contextual issues related to comic themes, namely regarding the distribution of natural resource utilization in Indonesia. The storyline that is raised is already relevant to the issues raised and fosters curiosity for comic readers. However, there is no compatibility between the initial panel and the final panel, the problems surrounding natural resources contained in the initial panel are less than perfect raised in the final panel. The final panel shows more about the types of natural resources in Indonesia, while the natural resources issue is only raised briefly. This description causes confusion about the themes raised in the comics whether it is about the distribution of natural resources in Indonesia or about the distribution of types of natural resources. It is necessary to present representative images of natural resources and their distribution in Indonesia, concluding with a final panel that supports the message to be conveyed that the distribution of natural resources in Indonesia has not been evenly distributed

and raises the contextual issues discussed in the initial panel. The ideas raised in the comics are good, just refine and focus on the themes that will be raised.

In general, part A comics are arranged quite well through short lines in the form of short comics. The illustrations are made in such a way that the message to be conveyed can be achieved. However, further development is still needed, especially guidelines for developing comics that are relevant to the theme. A brain based learning approach is needed to increase the creativity and imagination of students to be able to illustrate the information obtained, processed through the process of creative thinking, so that it can produce interesting and relevant textbook comics. Based on the analysis of the comics that have been made, found some strengths that can continue to be developed and some weaknesses that must be corrected so that the comics can meet the desired criteria as textbook innovations in social studies learning.

Part B comics about the pre-literacy period are made in a fairly long panel and complete story. The comic model has become one of the ideal and representative comic models representing the information expected as a comic book text innovation. The storyline is interesting to be listened to with the reflection of time machines from the present to the future. Shows the existence of creative imagination that if humans have the opportunity to return to the past it will find interesting experiences and facts, in historical terms known as if history. In addition, the selection of illustration illustrations is representative of the pre-literate situation so that it can transfer messages and information well. The dialogue chosen is not too long, the sentence chosen is communicative and attracts the reader so that the comic is fluid and interesting. Finally, the content of the material to be conveyed is also well represented by the illustrations illustrated.

As one of the visual media, comic media certainly has its own advantages if it is used in teaching and learning activities. Some comic functions include adding to the vocabulary of the reader, making it easier for students to capture abstract things or



formulations, can develop children's reading interest and one of the other fields of study, the whole storyline in comics leads to positive actions. Meanwhile the weaknesses of the comic media include the ease of people reading comics, making them lazy to read, causing rejection of non-picture books. Comics are a strong communication media. Functions that can be utilized by comics include comics for information on education, advertising, and as a means of entertainment. Each type of comic has certain criteria that must be met so that the message to be conveyed can be understood clearly. Comics for educational information, both stories and designs, are specifically designed to convey educational messages. The message must be clearly received. Comics can also be used as advertising media mascot of a product can be used as a main character with traits in accordance with the desired image of the product or brand. The educational value of comic media in the teaching and learning process can create students' interest, make teaching and learning effective, can increase learning interest and arouse their appreciation. Comic media in learning that are designed have been used that contain messages of knowledge. The pictures show examples of moral nuanced behavior, love and affection for each creature and creator.

The use of comic media is an effort to train students to not be pegged to memorize a script. This of course involves imagination and accuracy. Active imagination serves to foster active, initiative, creative and innovative, hone the imagination of imagination, fair and logical dialogue, and the ability to solve unexpected problems. Comics as a media has a role as a tool that has the function of conveying learning messages. In this context learning refers to a communication process between educators and the learning media used. In the learning process later it will also run optimally if the learning message is delivered clearly, coherently and interestingly. Comics as a social studies learning media certainly have a role as a tool that has the function of delivering learning messages.

IPS comics are designed to resemble textbooks in general so students when reading comics will feel like reading textbooks but there are pictures in them so students are more interested in reading them. Comics as a media has a role as a tool that has the function of conveying learning messages. In this context learning refers to a communication process between educators and the learning media used. In the learning process later it will also run optimally if the learning message is delivered clearly, coherently and interestingly. The comics compiled are examples of message design specifications that are translated and produced in book form and through print technology.

#### **D. CONCLUSION**

Comics have advantages over video, animation or film learning media because the impact of Comics conveys information and produces aesthetic responses for people who see it. Comics have more communicative features than other drawing media such as paintings, photographs, sketches, or posters. The use of comic media in learning is expected to improve student learning in teaching which, in turn, is expected to improve student learning outcomes. The comics that will be presented are not only comics that contain social studies material but also try to apply brain-based learning concepts, especially the strengthening of emotional aspects in learning.

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