AL IBTIDA: JURNAL PENDIDIKAN GURU MI (2021) Vol 8 (1) : 65-79
DOI: http://dx.doi.org/ 10.24235/al.ibtida.snj.v8i1.7795

Al Ibtida: Jurnal Pendidikan Guru MI
ISSN: 2442-5133, e-ISSN: 2527-7227
Journal homepage: http://syekhnurjati.ac.id/jurnal/index.php/ibtida
Journal email: alibtida@syekhnurjati.ac.id

Writing Skills Development: A Balancing Perspective of Brain Function in Elementary Schools

Ririen Wardiani*
*Department of Indonesian Language Education and Literature, STKIP PGRI Ponorogo, Indonesia
Email: wardianiririen@gmail.com

Indrya Mulyaningsih**
**Department of Indonesian Language Education, Faculty of Tarbiyah dan Teacher Training, Institut Agama Islam Negeri Syekh Nurjati Cirebon, Indonesia
Email: indrya.m@gmail.com

Siriporn Maneechukate***
***Department of Thai and Eastern Languages Section, Faculty of Liberal Arts, Maejo University, Thailand
Email: siripornm259@yahoo.com

Received: February 14th, 2021. Accepted: June 12th, 2021. Published: June 27th, 2021.

Abstract

Writing is a skill that involves creativity. It can be triggered by using a stimulating activity of both hemispheres of the brain. This study aims to describe the improvement of narrative writing skills by using a learning model based on the balancing of the functions of the right and left hemispheres of the brain. The research method used is classroom action research through three implementation cycles from January – December 2019 in three elementary schools in Ponorogo, Indonesia. The sample of this study was 72 students of grade 4. The data collected through using tests, observations, and interviews were then analyzed both qualitatively and quantitatively. The results showed that to produce good writing, students need to be guided and given a lighter. After balancing the functions of the cerebral hemispheres, 86% or 62 students met the minimum completeness score. The students' ability in writing narratives has increased significantly, especially in the aspects of content, content organization, vocabulary, grammar, and spelling.

Keywords: *narrative writing; the balancing of the functions of the cerebral hemispheres; the brain learning model.*

Abstrak

Menulis merupakan keterampilan yang melibatkan kreativitas. Ini dapat dipicu dengan menggunakan aktivitas stimulasi kedua belahan otak. Penelitian ini bertujuan untuk mendeskripsikan peningkatan keterampilan menulis narasi dengan menggunakan model pembelajaran berbasis keseimbangan fungsi belahan otak kanan dan kiri. Metode penelitian yang digunakan adalah penelitian tindakan kelas melalui tiga siklus pelaksanaan dari Januari – Desember 2019 di tiga sekolah dasar di Ponorogo, Indonesia. Sampel penelitian ini adalah 72 siswa kelas 4. Data yang dikumpulkan melalui tes, observasi, dan wawancara kemudian dianalisis secara kualitatif dan kuantitatif. Hasil penelitian menunjukkan bahwa untuk menghasilkan tulisan yang baik, siswa perlu dibimbing dan diberi pemantik. Setelah dilakukan penyeimbangan fungsi belahan otak, 86% atau 62 siswa memenuhi nilai ketuntasan minimal. Kemampuan siswa dalam menulis narasi meningkat secara signifikan, terutama dalam aspek isi, organisasi isi, kosa kata, tata bahasa, dan ejaan.

Kata kunci: *menulis narasi; menyeimbangkan fungsi belahan otak; model pembelajaran otak.*

INTRODUCTION

Writing or composing is one of the skills that students do not like the most (Suparno & Yunus, 2008; Trismanto, 2017). The dislike of writing is influenced by the family environment and society and the experience of learning to write in school, which is less motivating (Graham, 2019). Often teachers also experience difficulties in learning to write (Wardiani, Suwandi, Budiyono, & Andayani, 2016). Learning should be fun to stimulate imagination and creativity in writing (Mulyaningsih, Suwandi, Setiawan, & Rohmadi, 2018). This is due to the limited use of multi-sensory stimulating media (Taljaard, 2016) and learning models that allow students to be active (Mulyaningsih, Suwardi, Setiawan, & Rohmadi, 2016). It is known that writing skills require literacy skills because they use social, historical, and cultural situations in creating and interpreting meaning through texts (Kern, 2000). Therefore, effective writing techniques and strategies are needed (Urquhart & Monette, 2005).

One of the strategies that can be used is a brain-based learning model. It is because the writing process requires the work of the brain. The brain has differences in storing and processing information (Sousa, 2016). The left brain controls intelligence quotient, whereas the right brain plays an important role in developing the emotional quotient (Checa & Fernández-Berrocal, 2015). The brain is essential in processing information, memory, behaviour, emotions, and motivation (DePorter & Hernacki, 2009). Music is needed to balance the left brain (Hallam, 2010). It is also necessary to include aesthetics in learning and provide positive feedback for oneself (Jung et al., 2010). This narrative writing learning model refers to the way the brain makes a balance between language skills, creativity, and imagination (Hernowo, 2015; Wardiani et al., 2016).

This balancing of the left and right hemispheres functions is stimulated through a fun learning model (Duman, 2010; Gülpinar, 2005). This model better prepares students for starting learning (DePorter & Hernacki, 2009; Hernowo, 2015). This makes learning more memorable (Suryandari, 2012). This model uses multi-sensory stimulation, which impacts on recalling experiences stored in the brain and combines the writing steps and balance steps for each student (Joyce & Calhoun, 2011). The learning model of narrative writing integrates activities based on the left and right hemispheres of the brain (Cheng, Baker, & Dursun, 2019). Concrete activity procedures appear in verbal activities balanced with visual and spatial activities. Discussions are not only logical but also intuitive and imaginative and use effective media or tools.

The stages of learning to write based on balancing the functions of the left and right hemispheres consist of igniting emotions, clustering, expression, editing, display, and reflection (Wardiani et al., 2016). The first stage is igniting emotions. In this step, the teacher awakens the students' imagination by using concrete objects, pictures, films, and music. The teacher stimulates the students with question words from the developer. The use of concrete objects, images, films, and music is a right-brain activity. This activity is always accompanied by verbal exposure, a left-brain activity (Alqahtani, 2015). The second stage is clustering. The working principle of clustering can be structured, hierarchical, and in a relationship. This operating principle is centred on the left-brain activity. This activity is balanced using colours, shapes, and signs, which are the right-brain activity (Mutha, Haaland, & Sainburg, 2013). The third stage is expression. It focuses on expressing an idea or thought in memory through language. The use of this language is a left-brain activity. Activities to compensate are combined with imagination, intuition, and creativity, which are right-brain activities (Corballis, 2014). The fourth stage is editing. Editing activities are more dominant with left-brain activity because the left brain function processes input sequentially or sequentially and analyzes. This is balanced with a right-brain activity by giving signs, colours, and thinking holistically (Hector, 2011). The fifth stage is display. Display activity is a visual activity, that is a right-brain activity, balanced with verbal exposure evaluating (Roser, Fiser, Aslin, & Gazzaniga, 2011). The sixth stage is reflection. Activities at this stage focus on the left-brain activity (Kanai, Feilden, Firth, & Rees, 2011). This is balanced with the design of the next activity, which is a right-brain activity.

Various studies related to writing skills have been carried out. Sapkota (2012) proved that essay writing skills could be improved through peer and teacher correction. Research by Saenz, Bermeo, Fernando, & Chaves (2013) confirms that the writing skills of elementary

school students in Colombia can be improved through collaborative work. Ramadhani & Lestiono (2015) research shows that the descriptive writing skills written by grade VIII junior high school students can be improved by writing a diary. Likewise, Habibi, Eviyuliwati, & Kartowisastro (2018) research proves that there is an effect of journal writing on the narrative text writing skills of high school students. Tuan (2010) conducted experiments to improve writing skills by fostering motivation and building close bonds between teachers and students. Anh (2019) research shows that the use of technology can improve students' writing skills. The study by Rozak, Mulyati, Damaianti, & Sumiyadi (2018) developed a profile of learning to read and write by utilizing literary literacy. Kellogg (2008) research proves that writing skills are carried out through a cognitive apprenticeship training program that emphasizes intentional practice. Based on the various studies above, there has been no research to improve writing skills using a learning model based on balancing the brain functions. Research related to the learning model of narrative writing based on balancing the functions of left and right hemispheres has not been widely carried out. Some studies focusing on balancing the roles of right hemispheres processes have not been linked to learning, particularly in writing narrative. Therefore, this research needs to be done to improve the students' skills in writing narrative.

METHODS

Using classroom action research, four stages of activities were done in one cycle including: planning, action and observation, and reflection (Kemmis & McTaggart, 1988). The research was conducted in January - December 2019 in three elementary schools in Ponorogo, East Java, Indonesia. A total of 72 fourth grade students were involved in this study. They were selected randomly. Data were collected through observation, interviews, and performance tests. Open interviews were conducted with three teachers and 30 students. Teachers that taught the fourth grade level were also selected as the participants of this study. Ten students take each class. So, the total is 30 students. Questions were conducted openly regarding strategies and learning methods as well as students' skills in writing narrative. Observations were made on activities during learning. The instruments used were interview guidelines and teacher and student observation guidelines, and performance tests in narrative writing skills tests.

The observed aspects include preliminary activities in the form of perceptions, core activities in exploration, elaboration and confirmation, and closing activities. These three aspects emphasize the teachers' and students' active involvement in learning (Hong & Salika, 2011). The interview questions tried to garner the data regarding models, strategies,

techniques, media used during learning, obstacles faced during education to write, and the learning model needed. The assessment aspects used to determine writing skills included content, content organization, vocabulary, grammar, and spelling.

Triangulation of sources and theory was done to ensure the validity of the data. The data obtained could thus answer the problem formulation. The data obtained were related to the theory of narrative writing skills. Data from observations and interviews were analyzed using descriptive analysis, while the data from the test were analyzed using the SPSS application with the Wilcoxon Signed Range Test (Harris & Hardin, 2013). Learning success indicators were based on learning completeness, both individual and classical. Personal wholeness was if each student got a minimum score of 75. Classical completeness was if 80% of all students had completed personally. The hypothesis put forward is that there is an increase in narrative writing skills if the Asymp results. Sig. (2-tailed) is smaller than <0.05 (Imam, Mohammed, & Moses Abanyam, 2014).

The research procedures were as follows. The first procedure was planning. The teacher prepared the lesson using a narrative writing learning model based on balancing the left and right hemispheres' functions. Writing a narrative requires careful preparation and planning (Ma & Zainal, 2018). The second procedure was action and observation. The teacher implemented the narrative writing learning model based on balancing the functions of left and right hemispheres. The teacher also made observations to know the changes in student behaviour. The third procedure was reflection. The results of the observations were reflected in the planning of the next stage of action. The obstacles and the success of implementing the first cycle's actions were observed, evaluated, and reflected on the design of activities in the second and subsequent cycles. The cycle was stopped after learning completeness was achieved.

RESULTS AND DISCUSSION

This research was conducted in three cycles. Each learning narrative stage consists of six activities: emotional ignite, clustering, expression, editing, reflection, and display. The following are the results of implementing the narrative writing learning model based on balancing the functions of the left and right hemispheres in each cycle.

Results of Cycle I

In the first cycle of the learning model based on the balance of functions of the left and right hemispheres, the image media were used in delivering emotional ignite. Images of footwear or sandals were used as a balancing activity for the left and right-brain functions.

The function of giving emotional ignite was to bring students into the object's image. Question words assisted clustering in the form of what, who, when, where, how, and why. The next step was to express the writing from the clustering results that the students had made. Students carried out editing activities by reading their work. The teacher then read the analysis results classically relating to the content of the ideas, the organization of the content, the style or choice of structure and vocabulary, and grammar. The reflection activity started with the analysis of the results of writing the edited narrative. The analysis results would be used as reinforcement so that students always remembered what had been done. The last stage was the display of the students' work on the classroom wall magazine according to each class's conditions.

The results of the interviews showed the students' responses to the image media used. Initially, picture media were able to stimulate the students' curiosity. The emotional involvement of feelings that appeared in the pictures did not lead the students to outline clustering. The picture was associated with the question words what, who, when, where, how, and why. Students still had difficulty in associating pictures with question words such as how and why. The problem of students in learning to write narrative using a learning model based on balancing the functions of the right and left hemispheres of the brain was that they still looked confused in developing words into sentences.

Based on the results of the learning, it was found that the emotional involvement was not yet visible. Images of footwear or sandals as a lighter for emotions were not optimal. The emotional involvement about feelings or impressions that arised through the pictures did not enable students to outline the form of a computer. Based on the observations, the image of being fun in writing stories was not yet visible. Students still seemed confused in developing words into sentences. It was the first time they performed such activities, forming words into sentences. Students did not tell in detail the pictures that were used as emotional ignite media. In expressing writing, students were more likely to describe the functions and uses of sandals than to narrate them. The content of ideas in narrative writing written by students was less creative. For example, most students wrote about getting a gift bag when asked to write a fun story. If the story was sad, students wrote about the damaged bag. The content of ideas was obtained from children's experiences that involved emotion, understanding, and vocabulary mastery. Students did not tell in detail the pictures that were used as emotional ignite media. In the first cycle results, students who reached the minimum criteria were 30 out of 72 students. The percentage of completeness in the first cycle was 42%. Meanwhile, the limit for learning completeness was 75.

As a solution, the teacher and the researcher planned to replace the emotional ignite media using other media. Since the emotional ignite could be done in a multi-sensory manner, teachers and researchers agreed to use concrete objects. Clustering was made with the help of a guide question word connected to the composition framework, the beginning of the story, story development, and the ending of the story.

Results of Cycle II

In the cycle II, the researchers used a learning model based on balancing the left and right hemispheres with emotional ignite using concrete objects. The making of clustering was assisted by a question word guide connected to the composition framework, in the form of: the beginning of the story, the development of the story, and the ending of the story. The use of media in the form of concrete objects must adapt to the child. This means that the media used were objects familiar to children. The objects used could stimulate the children's imagination to do the writing. The next step was to express the writing from the clustering results that the students had already made. Students carried out editing activities by reading their work. The teacher then read the analysis results classically related to the content of the ideas put forward, the organization of the content, the style or choice of structure and vocabulary, and grammar. The teacher initiated the reflection activity by analyzing the results of writing the narrative that the students had edited. The analysis results would be used as reinforcement so that students could always remember what has been done. The last stage was the display of students' work on the classroom wall magazine, which was adjusted to each class's conditions.

In cycle II, there was a change. Some students were able to outline the form of clustering. In this cycle, there was an increase in the writing skills possessed by students. The results of the interviews showed that students had difficulty in developing the content of ideas. The content of ideas expressed by students was less creative. For example, a happy story often conveyed was getting a bag as a gift, a sad story about a broken suitcase. Students had difficulties in bringing up story conflicts. In the cycle II, it was shown that 49 of 72 students reached the minimum criteria. The percentage of completeness in the second cycle was 68%. The factor supporting the improvement of narrative writing skills was the clustering of the guides' question words connected with an essay framework to strengthen the story's content. In the cycle II, it was shown that 49 of 72 students reached the minimum criteria. The percentage of completeness in the second cycle was 68%. The factor supporting the improvement of narrative writing skills is the clustering of the guides' question words connected with an essay framework to strengthen the story's content.

For the learning process to run optimally, the teacher and the researcher planed to try out the film as a medium for emotional ignite. The reason was that the students were more interested in audiovisual displays. Students were expected to be more easily stimulated by their emotions to produce a maximum frame of the essay. Besides, clustering was made by connecting the question words of the guide with the essay frame.

Results of Cycle III

In the cycle III, the researchers used a learning model based on balancing the left and right hemispheres with emotional ignite using film media. The results of the interviews showed that the students were enthusiastic when the film screening took place. The use of film as an emotional trigger had resulted in significant changes. Students were more active in learning. Students' emotions were more easily triggered so that creative ideas emerged in their learning of narrative writing. Students were enthusiastic in participating in the class. The impression of fun in learning could be seen. Almost all students could express their story ideas. The ability of students to make clustering improved. The ability of students to express writing was quite good.

The clustering method was based on events that occured at the beginning of the story, story development, and at the end of the story. The next step was to express the writing from the clustering results that the students had made. Students carried out editing activities by reading their work. The teacher then read the analysis results classically related to the content of the ideas put forward, the organization of the content, the style or choice of structure and vocabulary and grammar. The reflection activity started with the analysis of the results of writing the edited narrative. The analysis results would be used as reinforcement so that students could always remember what had been done. The last stage was the display of students' work on the classroom wall magazine according to each class's conditions.

The use of film media as an emotional centre provided significant changes. Students were more enthusiastic in learning. Students' emotions came up with creative ideas as a capital for narrative writing. Students were passionate about participating in emotional ignite. The impression of fun in learning was visible. Almost all students could come up with their story ideas. The ability of students to make clustering has improved. The ability of students to express writing has developed. Students only needed to be regularly trained in writing stories. Students' abilities were good at raising conflicts or problems. The students' vocabulary mastery has improved. In the cycle III, it was shown that 62 of 72 students reached the minimum criteria. The percentage of completeness in cycle II was 86%.

As for the students' narrative writing skills, the scores obtained were analyzed using the Wilcoxon Signed Range Test. The value of cycle I was compared with the value of cycle II and the value of cycle II was compared with the value of cycle III. Details can be seen in Tables 1 and 2.

Table 1. The results of calculating the value of students' writing ability in the first cycle and the second cycle using Wilcoxon Signed Range Test Ranks

		N	Mean Rank	Sum of Ranks
Cycle Value 2- Cycle Value 1	Negative Ranks	6[a]	23.17	139.00
	Positive Ranks	58[b]	33.47	1941.00
	Ties	8[c]		
	Total	72		

Statistics Test[a]

	Cycle Value 2- Cycle Value 1
Z	-6.031[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

The results showed the statistical differences in the cycle I and cycle II. The statistical test results above are known as Asymp. Sig. (2-tailed) worth 0,000. It is because the value of 0.000 is less than <0.05, it can be concluded that there has been an increase in the results of writing narrative written by students in cycle II.

Table 2. The results of calculating the value of students' writing ability in the second cycle and the third cycle using Wilcoxon Signed Range Test Ranks

		N	Mean Rank	Sum of Ranks
Cycle Value 3 - Cycle Value 2	Negative Ranks	11[a]	29.95	329.50
	Positive Ranks	56[b]	34.79	1948.50
	Ties	5[c]		
	Total	72		

Statistics Test[a]

	Cycle Value 3 - Cycle Value 2
Z	-5.064[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Research Results Based on the Aspect of Narrative Writing Ability

The quality of students' writing obtained from the cycle II and the cycle III through Wilcoxon Signed Ranks' calculation is presented in Table 2. The results showed that there were statistical differences in cycle II and cycle III. The statistical test above shows that Asymp. Sig. (2-tailed) is worth of 0.000. It is because the value of 0.000 is less than <0.05, it can be concluded that there is an increase in student writing results in cycle III.

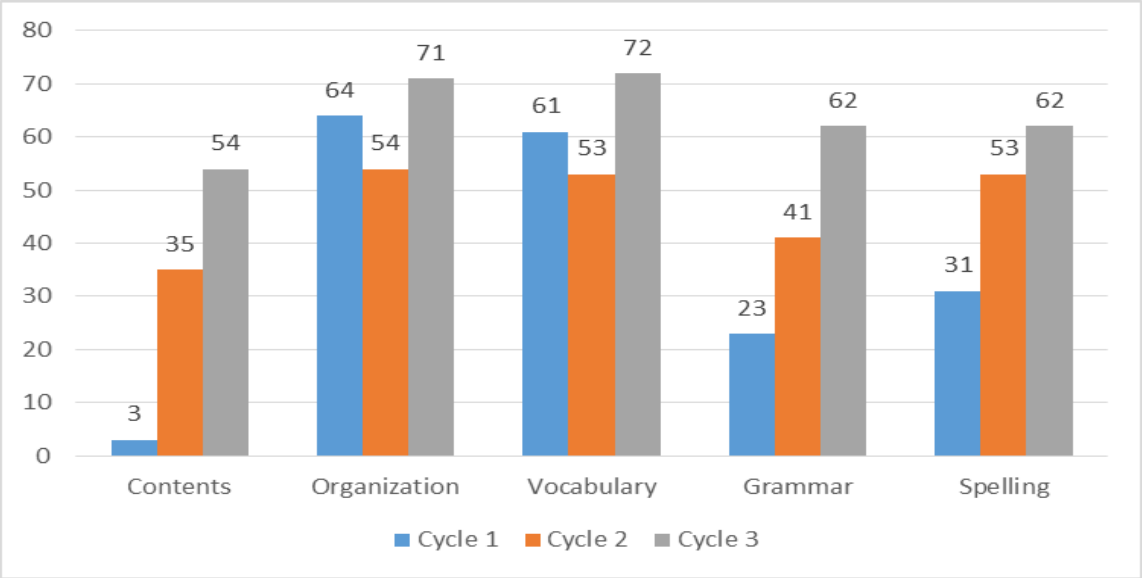

Figure 1. Ability to Write in Perspective of a Balancing Model of the Left and Right Hemispheres of Function

Students who achieved the minimum criteria in the cycle I were 30 out of 72 students. The completeness percentage was 42%. The completeness of cycle II was 49 out of 72 students or 68%. It was shown that completeness reached 86%; 62 out of 72 students got the minimum criteria in the cycle III.

Based on the aspects assessed in cycle I, there were only three students that had good content. 64 students were good at organizing content whereas 61 students were exemplary in vocabulary. There were 23 students who were good at grammar whereas 31 students were good at spelling. The aspect with the lowest level of achievement was the content of the ideas expressed. This is illustrated in Figure 1.

In the results obtained in cycle II, 35 out of 72 students met the excellent criteria in the content aspect. Students completed the ideal measures in content organization (54 students), vocabulary (53 students), grammar (41 students), and spelling (53 students). As shown in the results of the interviews, the students felt that concrete objects and groupings related to the storyline helped them in their learning. The complete results are illustrated in Figure 1.

The third cycle results showed that 62 of the 72 students met the minimum criteria (86% completeness). Based on the aspects assessed, 45 out of 72 students completed the extraordinary measures on the content element. Students met the excellent criteria on content organization (71 students), vocabulary (72 students), grammar (62 students), and spelling (62 students). The results of interviews with students support this. Students felt that film media as a trigger for emotions and groupings related to the storyline was constructive. This can be seen in Figure 1.

Figure 1 shows the development of each aspect of narrative story writing in each cycle. Good skills in the initial conditions include aspects of content organization, vocabulary, and spelling. Three aspects have increased in cycle III including the vocabulary (100% or 72 students), the organizational content aspect (86% or 62 students), and the spelling aspect (86% or 62 students).

Based on the data in Figure 1, it can be seen that the initial ability to write narrative is inadequate, namely the aspects of content and grammar. However, in its development, this situation has increased in cycle III. The ideas expressed by students were less creative. This is because the students' reading skills are still not optimal (Atayeva, Putro, Kassymova, & Kosbay, 2019). The development of sentences in the narrative is also not optimal. It can be seen that during the study, students had difficulty developing sentences.

In cycle, I, the ideas expressed by students were less creative. For example, a happy story that most of the students tell was about getting a gift bag. Suppose it is a sad story about a broken bag. The content of ideas obtained from children's experiences includes emotions, and an understanding and mastery of vocabulary. Brain-based learning has five systems: 1) emotional learning system; 2) social learning system; 3) cognitive learning system; 4) physical learning system; 5) reflective learning system (Jung et al., 2010). Emotional involvement is important because the emotional learning system determines personal desires, dreams, and desires. This system projects a person's spirit, attitude, creativity, creates a sense of self that provides energy (Iskandarwassid & Ristiani, 2010; Shah, 2011). Teachers must be able to arouse students' emotions to get ideas in writing (Given, 2002).

In the second cycle, there was an improvement in the student narrative writing. The factor supporting this improvement is in the making of clusters of guide words linked to an essay framework to strengthen the content of the story (Javed et al., 2013). Writing with clustering has a beneficial impact. Clustering connected with an essay framework provides advantages; it enables the writer to see and make connections between ideas, helps the writer develop the ideas that have been put forward, helps the author trace the path the brain takes to

arrive at a specific concept (DePorter, & Hernacki, 2009). The making of the clustering enhances the students' abilities in narrative writing. This can be seen in the results obtained. The content of ideas has increased. The writing development has completed. The content organization has a fluid expression. Concepts are clearly expressed, concise, and well ordered. The use of vocabulary has improved; students could choose and use words more precisely. There is sometimes an error in spelling but it does not interfere the meaning of words.

In cycle III, clustering is based on the events at the beginning of the story, story development, and the end of the story by dividing the storyline into several possibilities. This is because the narrative text is formed from several text structures. The first is orientation. It is the part where the writer paints the world for the story. This section introduces the place and time of the event as well as the characters. The second is complication. It is a part of the story where the main character faces obstacles in achieving goals. It is a section where the conflict begins. The third is the resolution. It is the part of the story where the main character resolves the problem or conflict (Knapp & Watkins, 2005). Therefore, a structure in the narrative text can make it easier for students to express stories. This can improve the student writing skills. In cycle III, there is an increase in writing skills. The story is written entirely.

The students have developed the content organization with a fluent expression. Ideas are clearly expressed, compact, well ordered, logical sequence, and cohesive. There is an increase in the use of sophisticated words, choice of words, appropriate expressions, and mastery of word-formation. The use of language has complex constructs, but it is effective. In this case, there is a minimal misuse of the linguistic form. The spelling is sometimes misspelt, but it does not obscure the meaning.

CONCLUSION

The learning model based on balancing the functions of the left and right hemispheres of the brain can help students explore the students' ideas. Activities that use right and left brain stimulation will stimulate cooperation. Pesibo kaki-based learning model provides fun activities for students in the writing process. Pesibo kaki-based learning by utilizing the information and communication technology in the form of film screenings can be used effectively by teachers to overcome the students' reluctance to in writing. Pesibo kaki-based learning model is implemented by preparing students to start learning with emotional panic activities. This makes the students happier because the learning activities combine the left brain and suitable brain activities. Activities that balance the work functions of the left brain and right brain give more impression so that the experiences are easy to remember. This

model uses a multisensory stimulation that impacts on the experience recall. The multisensory media can be used in music and movies. It creates an atmosphere that stimulates the left and suitable brain activity.

REFERENCES

Alqahtani, M. (2015). The Importance of Vocabulary in Language Learning and How to be Taught. *International Journal of Teaching and Education*, *III*(3), 21–34. https://doi.org/10.20472/te.2015.3.3.002

Anh, D. T. N. (2019). EFL Student's Writing Skills : Challenges and Remedies. *IOSR Journal of Research & Method in Education*, *9*(6), 74–84. https://doi.org/10.9790/7388-0906017484

Atayeva, M., Putro, N. H. P. S., Kassymova, G., & Kosbay, S. (2019). Impact of Reading on Students' Writing Ability (pp. 5–13). https://doi.org/10.31643/2019.001

Checa, P., & Fernández-Berrocal, P. (2015). The Role of Intelligence Quotient and Emotional Intelligence in Cognitive Control Processes. *Frontiers in Psychology*, *6*(DEC), 1–8. https://doi.org/10.3389/fpsyg.2015.01853

Cheng, C., Baker, G. B., & Dursun, S. M. (2019). Use of Multisensory Stimulation Interventions in the Treatment of Major Neurocognitive Disorders. *Psychiatry and Clinical Psychopharmacology*, *29*(4), 916–921. https://doi.org/10.1080/24750573.2019.1699738

Corballis, M. C. (2014). Left Brain, Right Brain: Facts and Fantasies. *PLoS Biology*, *12*(1). https://doi.org/10.1371/journal.pbio.1001767

DePorter, B., & Hernacki, M. (2009). *Quantum Learning*. Bandung: Kaifa.

Duman, B. (2010). The Effects of Brain-Based Learning on the Academic Achievement of Students with Different Learning Styles. *Educational Sciences: Theory & Practice*, *10*(4), 2077–2103.

Given, B. K. (2002). *Brain-Based Teaching: Merancang Kengiatan Belajar-Mengajar yang Melibatkan Otak Emosional, Sosial, Kognitif, Kinestetis, dan Reflektif*. Bandung: Kaifa.

Graham, S. (2019). Changing How Writing Is Taught. *Review of Research in Education*, *43*(1), 277–303. https://doi.org/10.3102/0091732X18821125

Gülpinar, M. A. (2005). The Principles of Brain-Based Learning and Constructivist Models in Education. *Educational Sciences: Theory & Practice*, *5*(2), 299–307.

Habibi, F., Eviyuliwati, I., & Kartowisastro, S. (2018). The Effect of Reflective Journal Writing on Students ' Writing Ability o f Narrative Text. *Advances in Social Science, Education and Humanities Research*, *115*(Icems 2017), 16–20.

Hallam, S. (2010). The power of music: Its impact on the intellectual, social and personal development of children and young people. *International Journal of Music Education*, *28*(3), 269–289. https://doi.org/10.1177/0255761410370658

Harris, T., & Hardin, J. W. (2013). Exact Wilcoxon Signed-Rank and Wilcoxon Mann-Whitney Ranksum Tests. *Stata Journal*, *13*(2), 337–343. https://doi.org/10.1177/1536867x1301300208

Hector, C. S. (2011). Visual Mapping to Enhance Learning and Critical Thinking Skills.

Optometric Education, *36*(3), 125–139.

Hernowo. (2015). *Quantum Writing: Cara Cepat nan Bermanfaat untuk Merangsang Munculnya Potensi Menulis*. Bandung: Kaifa.

Hong, C., & Salika, E. (2011). Action Research in Teacher Education: Classroom Inquiry, Reflection, and Data-Driven Decision Making. *Journal of Inquiry and Action in Education*, *4*(2), 1–17.

Imam, A., Mohammed, U., & Moses Abanyam, C. (2014). On Consistency and Limitation of paired t-test, Sign and Wilcoxon Sign Rank Test. *IOSR Journal of Mathematics*, *10*(1), 01–06. https://doi.org/10.9790/5728-10140106

Iskandarwassid, & Ristiani, I. (2010). Peningkatan Kemampuan Menulis Narasi Melalui Model Pembelajaran Teknik Visual-Auditif-Taktil. *Pendidikan Jurnal Penelitian*, *11*(1), 75–99.

Javed, M., Juan, W. X., Nazli, S., Princpal, V., Oxford, M., High, C., & Vehari, S. (2013). A Study of Students' Assessment in Writing Skills of the English Language. *International Journal of Instruction*, *6*(2), 129–144.

Joyce, B., M, W., & Calhoun, E. (2011). *Models of Teaching. Model-model Pengajaran*. Yogyakarta: Pustaka Pelajar.

Jung, R. E., Segall, J. M., Bockholt, H. J., Flores, R. A., Smith, S. M., Chavez, R. S., & Haier, R. J. (2010). Neuroanatomy of Creativity. *Human Brain Mapping*, *31*(3), 398–409. https://doi.org/10.1002/hbm.20874

Kanai, R., Feilden, T., Firth, C., & Rees, G. (2011). Political Orientations Are Correlated with Brain Structure in Young Adults. *Current Biology*, *21*(8), 677–680. https://doi.org/10.1016/j.cub.2011.03.017

Kellogg, R. T. (2008). Training Writing Skills: A Cognitive Developmental Perspective. *Journal of Writing Research*, *1*(1), 1–26. https://doi.org/10.17239/jowr-2008.01.01.1

Kern, R. (2000). *Literacy and Language Teaching*. Oxford: Oxford University Press.

Knapp, P., & Watkins, M. (2005). *Genre, Text, Grammar. Technologies for Teaching and Assessing Writing*. Australia: University of New South Wales Press.

Ma, F. F., & Zainal, A. Z. (2018). The Effects of Planning Conditions on Primary School ESL Pupils Narrative Writting. *Indonesian Journal of Applied Linguistics*, *7*(3), 559–574.

Mulyaningsih, I., Suwandi, S., Setiawan, B., & Rohmadi, M. (2018). PARMI (Production, Attention, Retention, Motivation, and Innovation): an Alternative to Improving Scientific Writing Skills. *Lingua Cultura*, *12*(4), 317–321. https://doi.org/10.21512/lc.v12i4.4159

Mulyaningsih, I., Suwardi, S., Setiawan, B., & Rohmadi, M. (2016). Model Pembelajaran Menulis Ilmiah Berbasis PARMI (Produksi, Atensi, Retensi, Motivasi, dan Inovasi). *Journal of Chemical Information and Modeling*, *53*(9), 1689–1699.

Mutha, P. K., Haaland, K. Y., & Sainburg, R. L. (2013). The Effects of Brain Lateralization on Motor. *Journal of Cognitive Neuroscience*, *44*(6), 455–469. https://doi.org/10.1080/00222895.2012.747482.THE

Ramadhani, E. F., & Lestiono, R. (2015). The Use Of Diary Writing to Improve Eight Grade. *Erudio (Journal of Educational Innovation)*, *3*(1), 24–31.

Roser, M. E., Fiser, J., Aslin, R. N., & Gazzaniga, M. S. (2011). Right Hemisphere Dominance in Visual Statistical lLarning. *Journal of Cognitive Neuroscience*, *23*(5), 1088–1099.

https://doi.org/10.1162/jocn.2010.21508

Rozak, R. W. A., Mulyati, Y., Damaianti, V. S., & Sumiyadi, S. (2018). Developing Reading Skills and Beginning Writing through Literary Literacy. *Advances in Social Science, Education and Humanities Research*, *263*(ICLLE 2018), 135–141.

Saenz, L. F., Bermeo, J. A., Fernando, A., & Chaves, C. (2013). The Role of Collaborative Work in the Development of Elementary Students ' Writing Skills. *Profille*, *15*(1), 11–25.

Sapkota, A. (2012). Developing Students' Writing Skill through Peer and Teacher Correction : An Action Research. *NELTA: Nepal English Language Teachers' Association*, *17*(1), 70–82.

Shah, C. et. al. (2011). *Neural Correlates of Creative Writing An fMRI Study. Human Brain Mapping*. Germany: Wiley Periodicals, Inc.

Sousa, D. A. (2016). *How the brain learns*. Corwin Press.

Suparno, & Yunus, M. (2008). *Keterampilan Dasar Menulis*. Jakarta: Universitas Terbuka.

Suryandari, S. (2012). Optimalisasi Membentuk Krakter Menggunakan Stimulus Otak Kanan dan Otak Kiri Pada Pembelajaran Matematika dalam Pencapaian Target Prestasi Puncak (pp. 978–979). Yogyakarta: Universitas Negeri Yogyakarta.

Trismanto. (2017). Keterampilan Menulis dan Permasalahannya. *Bangun Rekaprima*, *03*(9), 62–67.

Tuan, L. T. (2010). Enhancing EFL Learners ' Writing Skill via Journal Writing. *English Language Teaching*, *3*(3), 81–88.

Urquhart, V. & Monette, M. (2005). *Teaching Writing in the Content Areas*. United States of America: McREL.

Wardiani, R., Suwandi, S., Budiyono, & Andayani. (2016). Analisis Kebutuhan Pengembangan Model Pembelajaran Menulis Narasi Berbasis Penyeimbangan Fungsi Otak Pada Siswa SD di Kabupaten Ponorogo. Ponorogo: STKIP Ponorogo.