JPPIPA 9(12) (2023)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Development of Learning Models for Post-Earthquake Elementary School Students: Preliminary Studies

Ucu Rahayu[1], Leonard R. Hutasoit[1], Mestika Sekarwinahyu[1], Tri Wahyuningsih[1], Dyah Aniza Kismiati[1], Danang Budi Setyawan[1*], Dola Suciana[2]

[1] Biology Education Study Program, Universitas Terbuka, Tangerang Selatan, Indonesia
[2] Chemistry Education Study Program, Universitas Terbuka, Tangerang Selatan, Indonesia

Received: October 30, 2023
Revised: December 10, 2023
Accepted: December 25, 2023
Published: December 31, 2023

Corresponding Author:
Danang Budi Setyawan
danang.setyawan@ecampus.ut.ac.id

DOI: 10.29303/jppipa.v9i12.6325

Abstract: Disasters including earthquakes can traumatize people, especially children. One of the impacts is impaired concentration, making it difficult for children to learn or study. Hopefully, the right learning model can help students continue to participate in learning and heal the trauma. To find out this learning model, it is necessary to carry out a process of characterizing students in post-disaster areas. Based on the results of questionnaires and interviews with teachers and students in post-disaster areas, it is known that some students are still experiencing trauma, as indicated by 51.80% of students still having difficulty concentrating on studying. It is also known that the learning style of most students is auditory because 91.10% of students learn happier when they hear the teacher telling stories. Furthermore, student's learning styles are visual as shown by 83.90% of students enjoying reading, 80.4% of students enjoying seeing pictures, and 57.10% enjoying seeing animations. Judging from the tendency for collaboration, students prefer to study in groups. Based on these characteristics, students enjoy learning with active, interactive, and fun activities, so the AICEF learning model can be an alternative that can be used as a learning model for elementary school students in post-earthquake areas.

Keywords: Elementary School; Learning Model; Post-Earthquake; Preliminary Studies

Introduction

The earthquake that occurred in Cianjur Regency on November 21, 2022, has left the victims with deep sadness. Many people lost family members and relatives and experienced both material and non-material losses. Everyone, both adults and children, feels the same impact from these natural disasters. In addition, this earthquake phenomenon creates significant trauma, especially for children. One of the risks that victims of natural disasters can experience is psychological trauma due to mental stress from the ordeal they face (Nawangsih, 2014). This type of mental trauma can take the form of stress disorder, known as post-traumatic stress disorder (PTSD). PTSD is a psychological disorder that develops as a response to exposure to traumatic events, such as war, severe abuse, natural disasters, and non-natural disasters (Halligan et al., 2003). Such conditions have the potential to reduce the sufferer's quality of life in the long term (Elita & Sahiel, 2017).

Even though assistance has been provided to the victims, their mental health still requires attention, especially considering the trauma resulting from large-scale natural disasters. It is very important to be able to investigate the influence of trauma because very deep traumatic events cannot completely heal by themselves and will always be lodged and remembered by the human brain if they are not treated with the right help (Nur et al., 2020). After an unpleasant event such as a disaster, there will be an increase in stress hormones that accompany the event. Traumatic memories can be embedded more deeply in the neural pathways of the

How to Cite:
Rahayu, U., Hutasoit, L.R., Sekarwinahyu, M., Wahyuningsih, T., Kismiati, D.A., Setyawan, D.B., & Suciana, D. (2023). Development of Learning Models for Post-Earthquake Elementary School Students: Preliminary Studies. *Jurnal Penelitian Pendidikan IPA*, *9*(12), 11722–11727. https://doi.org/10.29303/jppipa.v9i12.6325

human brain compared to ordinary memories. This significantly increases the possibility that a traumatic event will continue to affect a person's life even after the event has passed (Roth & Friedman, 1998).

After a natural disaster such as an earthquake occurs, in general the main topic of discussion is efforts to increase post-disaster economic growth. However, not much has been discussed regarding how to restore enthusiasm for learning with fun methods for students affected by disasters. Major events such as earthquakes can of course make learning and teaching activities not run well. The condition of students who are still experiencing trauma makes the teaching and learning process not conducive because PTSD affect student academic motivation and performance (Mirsaleh et al., 2015; Ness et al., 2015). Students must face situations that are still beyond their understanding. Therefore, a teacher plays an important role in developing enjoyable learning and can support students to follow the learning process well (Pietro, 2018). Teacher also can become media for trauma healing through learning (Brunzell et al., 2015). The trauma experienced by children who are disaster victims of course has a negative impact on the learning process at school. They find it difficult to concentrate, experience anxiety and difficulty concentrating.

In order to restore learning activities after a disaster, of course an appropriate learning method is needed. Even though a teacher is not a therapist, in terms of the continuity of learning activities, of course they are at the forefront of getting their students back to learning well. Trauma-based learning activities generally focus on two things, namely: improving regulatory abilities and overcoming irregular stress responses experienced by students. In this case, teachers can create a learning environment that can train students to control themselves and their anxiety with fun learning activities; improving students' ability to form strong relationships between themselves (Brunzell et al., 2015). These relationships refer to ongoing relationships with other people (e.g., parents, teachers, and friends). This relationship with those closest to them can of course increase calm, comfort, pleasure, or security for themselves (Ludy-Dobson & Perry, 2010).

Research conducted by Steele (2002). states that based on neuroimaging studies and measurements of chemicals in the brain, it shows that students' comfort levels can influence the transmission and storage of information in the brain. When students are engaged, motivated, and feeling minimal stress, information flows freely through the brain's affective filter. Heller (2015) proposes that students will remember what they learn better when learning is associated with strong positive emotions. Therefore, it is very important to develop fun learning activities, especially for children who are disaster victims.

Proper characteristic of PTSD victim can help for better treatment choice (Zoellner et al., 2003). Based on the problems described, the researcher intends to characterize students in post-earthquake locations, which includes learning styles, preferred learning media, and so on. Apart from that, to find out the forms of learning activities usually carried out by teachers in the classroom. This will be the basis for researchers to develop appropriate and relevant learning models to reduce the impact of trauma and also improve learning activities to make them more enjoyable for students.

Method

The series of research that will be classified as a type of development research or known as R&D (Research and Development) research. This type of R&D research is a series of research processes carried out to develop and validate educational products (Borg & Gall, 2007). In this research, a learning model will be developed that suits students' learning characteristics. Various learning tools will be developed, starting from student books, teacher books, student worksheet, RPP, and pretest and posttest questions. The development research model used in this research is the ADDIE development model. According to (Dick & Carey, 1996), the stages in ADDIE include Analysis, Design, Development, Implementation, and Evaluation.

At this time the research carried out has completed the analysis stage. The main activity at the analysis stage is analyzing the need for developing new learning models/methods and evaluating the feasibility and requirements for developing these learning models/methods. The development of the learning model begins with analyzing the needs of teachers and students obtained from interviews. At this analysis stage, the method used is a descriptive method, to describe existing phenomena systematically, factually, accurately, and as is. Researchers can directly relate to respondents and other objects related to the problem being studied.

The respondents involved at this stage were 56 students, 21 male, and 35 females, as well as 20 teachers at elementary schools affected by the earthquake, including SDN Sukamaju 1 and SDN Cimande 02 Cianjur, West Java. The instruments used in data collection were student response questionnaires and interview sheets for teachers.

Result and Discussion

Based on research data that has been obtained both through filling out student questionnaires and teacher

interviews, it is known that the earthquake that rocked Cianjur Regency and its surroundings left an impact on everyone who experienced it, both adults and children. Children at SDN Sukamaju 1 and SDN Cimande 02 Cianjur experienced various forms of trauma, including those shown in Table 1.

Table 1. Student Condition Post-Earthquake

Student Condition	Percentage (%)
Can't concentrate	51.8
Afraid to come to school	60.7
Afraid to study in the class	48.2

From the table above, even though the big earthquake had passed, almost a year had passed. A total of 29 people still find it difficult to focus on learning activities, 34 people are afraid to go to school and 22 people are afraid to study in class. This of course can interfere with students' success in the learning process. The trauma experienced by students can hurt students' academic abilities, this is due to loss of attention and concentration caused by the anxiety and pressure they experience. Therefore, it is very important to be able to develop learning activities that can make students happier and reduce the feelings of trauma they experience.

The learning activities that will be developed must be adapted to the student's learning styles. Each student usually has their approach to understanding the same information or learning material. This phenomenon is known as learning style or learning modality. One of the most popular and recognized learning styles to date is known by the abbreviation VAK, which refers to the Visual, Auditory, and Kinesthetic learning styles (Suyono, 2018). Based on the answers to the interview results submitted by 25 teachers, results were obtained regarding student learning styles as shown in Figure 1.

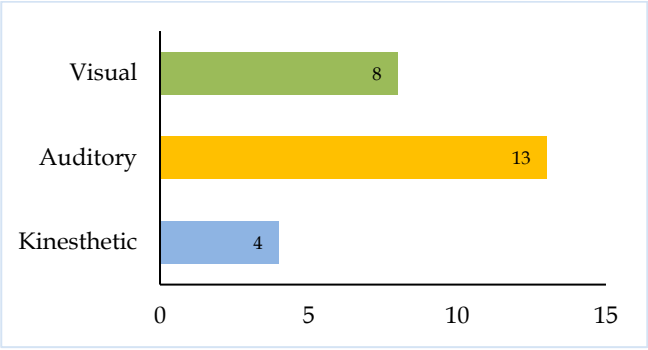

Figure 1. Type of Student Learning Style

From the picture above, it is known that 12 teachers stated that students in their class tended to learn more with an auditory learning style, 8 teachers stated that their students preferred learning with a visual style, and 4 people kinesthetic. Learning style is a method in which a person feels most comfortable, easy, and safe in the learning process they undertake, both in terms of time and use of the senses (Subini, 2017).

When it comes to healing trauma, learning style should be one of the most important components. To achieve the ultimate learning goal, teachers need to use a combination of teaching methods (Nur et al., 2020). This is done to create a classroom environment that can stimulate students to learn and make the class as interactive as possible. Students learn in a variety of ways, some students are visual learners, while others are auditory or kinesthetic learners. Visual learners learn visually through charts, graphs, and images. Auditory learning by listening to lectures and reading. Kinesthetic learners learn by using physical movement, touching, or feeling. Students can choose one, two, or three learning styles (Chania et al., 2016).

The teacher's opinion was confirmed through questions contained in the questionnaire; students were asked to determine the learning activities they liked. From the answers they gave, as shown in Table 2.

Table 2. Student Learning Activity Preferences

Learning Activity Preferences	Percentage (%)
Reading a book	83.9
Seeing animations	57.1
Seeing picture	80.4
A study by story tell	91.1
Study with music	23.2
Study with play	42.9

Based on the table above, it is known that students choose various learning activities that they like, and the most popular is that they like learning by listening to their teacher telling stories, then in second place is reading story books and the third is that they like learning material presented through picture media. This is in line with the opinion of teachers who state that students prefer auditory rather than visual learning styles.

Given these differences in learning styles and preferred learning activities, teachers need to include developing learning activities that can accommodate each learning style so that all students can be successful in their classes. Even though students use all their senses to receive information, each of them certainly has their preferences for how to learn. If teachers only apply one type of learning pattern, this will have an impact on student performance in learning (Wahyuni, 2017). Based on research conducted by (Öznacar et al., 2018). The mismatch between the patterns used by teachers in the learning process and students' learning styles can create emotional problems, low learning motivation, and other problems that interfere with learning success. The right

learning process can help increase motivation of student (Dini et al., 2023; Putra et al., 2022; Rizki et al., 2023; Sari & Paidi, 2023).

The use of learning media is something that can make learning more enjoyable. In fact, at SDN Sukamaju 1 and SDN Cimande 02 Cianjur, based on the results of interviews conducted with teachers, as shown in Figure 2, it is known that only 48% of teachers often use learning media, 44% rarely use learning media and 8 % never used learning media.

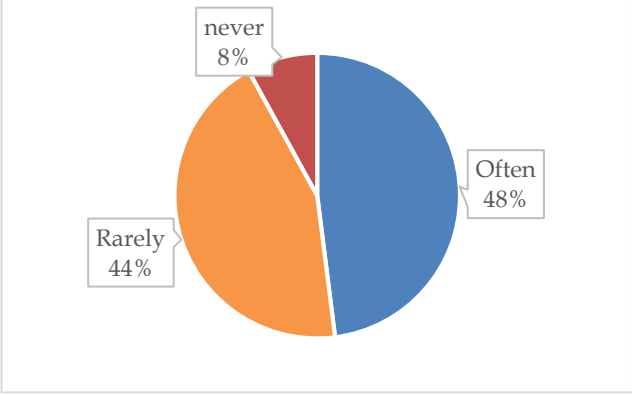

Figure 2. Teacher Utilization of Learning Media

Learning media acts as a means of delivering material in the learning process. Learning media can increase student learning motivation (Nuramalina et al., 2022; Putri & Alyani, 2023; Sanjaya, 2014; Susilawati et al., 2022). This is because the existence of learning media makes learning activities more interesting. Along with current advances in technology and information, the types of learning media that can be used by educators are increasingly developing, for example, video, animation, AR/VR-based media, and so on. Of course, the use of learning media must also be adjusted to the needs and material being taught (Nasution, 2013). Proper learning media also can boost motivation for students (Puspitarini & Hanif, 2019).

Apart from that, it is important to know which learning students like to do in groups or independently. From the answers submitted by students through questionnaires, researchers also looked at students' tendencies to collaborate during learning activities, as shown in Table 3.

Table 3. Student Tendency to Collaborate

Student Condition	Percentage (%)
Study in group	85.7
A study by own self	67.9

Based on the table above, more students like studying in groups. As stated by (Brunzell et al., 2015) one way to heal trauma is by improving students' ability to form strong relationships with each other. In line with the Murphy et al. (2002) findings that if group treatment can help improve PTSD symptoms like trauma healing. This is because forming good relationships with those closest to them can of course increase calm, comfort, pleasure, or security for themselves (Ludy-Dobson & Perry, 2010). One way that can be done to form good relationships with fellow students at school is to guide them so they can learn and work together in a group. Studying in groups can also improve students' collaboration skills. This ability is one of the 21st-century skills that is important for student learning success (Da Fonte & Barton-Arwood, 2017). Based on research conducted by Puspitasari (2018) collaboration has a positive impact on student learning, this is because collaborative learning involves training in effective division of labor, increasing students' responsible character, and combining information from various sources of knowledge, perspectives, and experience. Nursakinah & Suyanta (2023) report that student whom study in group with discovery learning methods can increase critical thinking. The right combination of learning model can help students to improve their academic performance (Yanti et al., 2023).

Based on the explanation above, the learning model that will be developed is expected to be able to answer all students' needs to create active, interactive, and fun learning activities as well as a form of trauma healing. One effort that can be made to make learning activities more enjoyable is to use the AICEF learning model which stands for active, innovative, creative, effective, and fun learning (Remiswal & Amelia, 2013). The AICEF learning model is a strategy used to increase the effectiveness of the learning process. The AICEF strategy always places teachers as individuals who create a conducive learning environment or as facilitators in learning, while students are considered as learning participants who must play an active, innovative, creative, effective role and enjoy the learning process (Hamzah & Mohamad, 2015).

AICEF learning is a learning model that combines various methods and uses various teaching media (Liansari & Azizah, 2022). Classroom arrangements and student seating arrangements are carried out carefully to create an active, innovative, creative, effective, and enjoyable learning atmosphere. This aims to ensure that students can feel interested and easily absorb the knowledge and skills taught. The AICEF learning model will combine various methods and use various teaching media to create an active, innovative, creative, effective, and enjoyable learning atmosphere (Wulan et al., 2017).

Conclusion

Based on the preliminary study that has been carried out, it is known that students are still

experiencing trauma after the earthquake that happened to them, so it is necessary to develop learning activities that can increase their enthusiasm for learning. The learning activities developed need to be adapted to their learning style, and the type of learning activity they prefer as explained in the research results above. Therefore, this research can be followed up by developing a learning model that is fun and liked by students. To create fun learning activities for students after the earthquake disaster.

Acknowledgments
We would like to express our appreciation to Ministry of Education, Culture, Research, and Technology with whom we were able to carry out this research through BIMA funding. We also express our gratitude to LPPM-UT for facilitating our research.

Author Contributions
Ucu Rahayu, Mestika, Leonard, and Tri conceptualized research ideas, methodological designs, data analysis, management, and coordination responsibilities. Dyah, Danang, and Dola conducted research and process investigations, literature. Ucu Rahayu and Mestika provided critical feedback on the manuscript. All authors read and approved the final version of the manuscript.

Funding
This research was funded by the Ministry of Education, Culture, Research, and Technology by BIMA funding 2023.

Conflicts of Interest
There is no conflict of interest in this study. All team members were dedicated to the research objectives and conducted with a high degree of independence.

References

Borg, & Gall. (2007). *Educational research: An introduction* (N. Y. Longman (ed.)).

Brunzell, T., Waters, L., & Stokes, H. (2015). Teaching with strengths in trauma-affected students: A new approach to healing and growth in the classroom. *American Journal of Orthopsychiatry*, *85*(1), 3. https://doi.org/10.1037/ort0000048

Chania, Y., Haviz, M., & Sasmita, D. (2016). Hubungan Gaya Belajar dengan Hasil Belajar Siswa Pada Mata Pelajaran Biologi Kelas X SMAN 2 Sungai Tarab Kabupaten Tanah Datar. *Journal of Sainstek*, *8*(1), 77–84. Retrieved from https://shorturl.asia/aUWp1

Da Fonte, M. A., & Barton-Arwood, S. M. (2017). Collaboration of general and special education teachers: Perspectives and strategies. *Intervention in School and Clinic*, *53*(2), 99–106. https://doi.org/10.1177/1053451217693370

Dick, W., & Carey, L. (1996). *The systematic design of instruction (4th ed.)*. New York, NY: Harper Collin.

Dini, A., Rahmatan, H., Muhibbudin, N., C., & Safrida. (2023). Application of the E-module combined with the Guided Inquiry Learning Model to Increase Student Motivation and Learning Outcomes on the Structure and Function of Plant Tissues. *Jurnal Penelitian Pendidikan IPA*, *9*(6), 4768–4776. https://doi.org/10.29303/jppipa.v9i6.3857

Elita, S., & Sahiel. (2017). Acceptance and Commitment Therapy (ACT) Bagi Penderita Gangguan Stress Pasca Bencana. *Jurnal Konseling Dan Pendidikan*, *5*(2). https://doi.org/10.29210/117800

Halligan, S. L., M., T., Clark, D. M., & Ehlers, A. (2003). Posttraumatic stress disorder following assault: The role of cognitive processing, trauma memory, and appraisals. *Journal of Consulting and Clinical Psychology*, *71*(3), 419–431. https://doi.org/10.1037/0022-006X.71.3.419

Hamzah, B. U., & Mohamad, N. (2015). *Belajar dengan pendekatan PAIKEM*. Bumi Aksara.

Heller, M. A. (2015). *Becoming incredible: Healing trauma through performance*. The University of Utah.

Liansari, V., & Azizah, N. L. (2022). The Relationship between the Use of Active, Innovative, Creative, and Fun Learning Techniques and Online English Learning by Multidisciplinary Students. *ICIGR Conference Proceedings, KnE Social Sciences*, 18–23. https://doi.org/10.18502/kss.v7i10.11205

Ludy-Dobson, C. R., & Perry, B. P. (2010). *The role of healthy relational interactions in buffering the impact of childhood trauma* (E. Gil (ed.)). The Gilford Press.

Mirsaleh, Y. R., Manesh, A. B., & Tavallaei, S. V. (2015). Role of Secondary Post-Traumatic Stress Disorder and Resilience on Academic Motivation and Performance of Veterans' Student Children. *Iranian Journal of War and Public Health*, *8*(4), 225 – 233. Retrieved from https://ijwph.ir/article-1-588-en.html

Murphy, R. T., Rosen, C. S., Cameron, R. P., & Thompson, K. E. (2002). Development of a group treatment for enhancing motivation to change PTSD symptoms. *Cognitive and Behavioral Practice*, *9*(4), 308 – 316. https://doi.org/10.1016/S1077-7229(02)80025-6

Nasution. (2013). *Berbagai Pendekata Dalam Prose Belajar Mengajar*. Bumi Aksara.

Nawangsih, E. (2014). lay therapy untuk anak-anak korban bencana alam yang mengalami trauma (post traumatic stress disorder/ptsd. *Psympathic: Jurnal Ilmiah Psikologi*, *1*(2). Retrieved from https://core.ac.uk/reader/234030580

Ness, B. M., Middleton, M. J., & Hildebrandt, M. J. (2015). Examining the Effects of Self-reported Posttraumatic Stress Disorder Symptoms and Positive Relations With Others on Self-regulated Learning for Student Service Members/Veterans.

Journal of American College Health, *63*(7), 448–458,. https://doi.org/10.1080/07448481.2014.975719

Nur, D., Yusra, K., & Amrullah, A. (2020). *Using Fun English Learning for Trauma Healing of the Earthquake Victim Students* (Vol. 465, Issue Access 2019, pp. 55–57). https://doi.org/10.2991/assehr.k.200827.015

Nuramalina, A. R., Rahmatan, H., Safitri, R., Pada, A. U. T., Nurmaliah, C., & Evendi, E. (2022). Using Project-Based Learning Model with Mind Mapping Method to Increase Students' Learning Motivation. *Jurnal Penelitian Pendidikan IPA*, *8*(6), 2712–2716. https://doi.org/10.29303/jppipa.v8i6.2152

Nursakinah, S., & Suyanta, S. (2023). Influence of Models Discovery Learning to Critical Thinking Ability and Scientific Attitude of Students. *Jurnal Penelitian Pendidikan IPA*, *9*(10), 8879–8889. https://doi.org/10.29303/jppipa.v9i10.4792

Öznacar, B., Şensoy, Ş., & Satılmış, A. (2018). Learning styles and emotional intelligence levels of university teacher candidate. *Eurasia Journal of Mathematics, Science and Technology Education*, *14*(5). Retrieved from https://www.ejmste.com/article/learning-styles-and-emotional-intelligence-levels-of-university-teacher-candidates-5390

Pietro, G. (2018). The academic impact of natural disasters: evidence from L'Aquila earthquake. *Education Economics*, *26*(1), 62–77. https://doi.org/10.1080/09645292.2017.1394984

Puspitarini, Y. D., & Hanif, M. (2019). Using Learning Media to Increase Learning Motivation in Elementary School. *Anatolian Journal of Education*, *4*(2), 53–60. Retrieved from https://eric.ed.gov/?id=ej1244451

Puspitasari, N. (2018). Peningkatan Collaboration Skill Siswa sebagai Kecakapan Abad 21 Melalui Pembelajaran Model Cooperative Learning Tipe Team Accelerated Instruction (Tai) Mata Pelajaran Ipa Di Sd Negeri Kotagede 1. *Jurnal Pendidikan Guru Sekolah Dasar*, *38*(7), 2767–3780. Retrieved from https://journal.student.uny.ac.id/index.php/pgsd/article/view/14023

Putra, R., Khairil, K., Huda, I., Rahmatan, H., & Artika, W. (2022). Application of Flipped Classroom on Students. In *Learning Motivation on Human Excretion System Material. Jurnal Penelitian Pendidikan IPA* (pp. 8 3 ,1294–1300). https://doi.org/10.29303/jppipa.v8i3.1652

Putri, S. E., & Alyani, F. (2023). The Effect of Using Multimedia-Based Learning on Motivation and Learning Outcomes. *Jurnal Penelitian Pendidikan IPA*, *9*(11), 9921–9927. https://doi.org/10.29303/jppipa.v9i11.4396

Rizki, M. W., Evendi, E., Syukri, M., Saminan, S., & Mursal, M. (2023). The Impact of Changes in the Learning System on Students' Learning Motivation. *Jurnal Penelitian Pendidikan IPA*, *9*(3), 1059–1063. https://doi.org/10.29303/jppipa.v9i3.2941

Roth, S., & Friedman, M. J. (1998). Childhood trauma remembered: A report on the current scientific knowledge base and its applications. *J. Child Sex. Abus.* https://doi.org/10.1300/J070v07n01_07

Sanjaya, W. (2014). *Media Komunikasi Pembelajaran*. Kencana Pr.

Sari, M. J., & Paidi. (2023). Analysis of Students' Learning Motivation Using Guided Inquiry Learning Model. *Jurnal Penelitian Pendidikan IPA*, *9*(8), 6265–6271. https://doi.org/10.29303/jppipa.v9i8.4366

Steele, W. (2002). Trauma's Impact on learning and behavior: A case for interventions in schools. *Trauma Loss Res. Inter*, *2*(2), 34–47. Retrieved from https://kumquat-haddock-67lr.squarespace.com/s/Trauma-Impact-Learning-Behaviour.pdf

Subini, N. (2017). *Rahasia Gaya Belajar Orang Besar*. Javalitera.

Susilawati, A., Yusrizal, Y., Halim, A., Syukri, M., Khaldun, I., & Susanna, S. (2022). The Effect of Using Physics Education Technology (PhET) Simulation Media to Enhance Students' Motivation and Problem-Solving Skills in Learning Physics. *Jurnal Penelitian Pendidikan IPA*, *8*(3), 1157–1167. https://doi.org/10.29303/jppipa.v8i3.1571

Suyono, A. (2018). Pengaruh Gaya Belajar Terhadap Hasil Belajar Pada Mata Pelajaran Akuntansi Kelas XI IPS SMA N 3 Tapung Tahun Ajaran 2017/2018. *Al Pendidikan Ekonomi Akuntansi FKIP UIR*, *6*(1), 1–10. Retrieved from https://journal.uir.ac.id/index.php/peka/article/view/1858

Wahyuni, Y. (2017). Identifikasi Gaya Belajar (Visual, Auditorial, Kinestetik) Mahasiswa Pendidikan Matematika Universitas Bung Hatta. *Jurnal Penelitian Dan Pembelajaran Matematika*, *10*(2). https://doi.org/10.30870/jppm.v10i2.2037

Wulan, R., Saputra, E., & Ali, N. (2017). Implementasi Sistem Aplikasi dan Metode Pembelajaran Paikem Gembrot Berjas (Berbasis Jaringan Sosial. *STRING (Satuan Tulisan Dan Riset Inovasi Teknologi*, *2*(1), 1 – 9. https://doi.org/10.30998/string.v2i1.1718

Yanti, N. L. I. M., Redhana, W., & Suastra, W. (2023). Multiple Scaffolding STEAM Project-Based Learning Model In Science Learning. *Jurnal Penelitian Pendidikan IPA*, *9*(8), 6493–6502. https://doi.org/10.29303/jppipa.v9i8.4470.

Zoellner, L. A., Feeny, N. C., Cochran, B., & Pruitt, L. (2003). Treatment choice for PTSD. *Behaviour Research and Therapy*, *41*(8), 879 – 886. https://doi.org/10.1016/S0005-7967(02)00100-6