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Research Article

Need Analysis Of EGRA Training With Neuroscience Approach For Teachers As A Foundation For Improving Basic Literacy Of Early Grade Students

Risna[1*], Laksmi Dewi[2], Edy Suparjoto[3]

[1*]Indonesia University of Education, risna@upi.edu
[2]Indonesia University of Education, laksmi@upi.edu
[3]Bandung Department of Education, edyzhoto@gmail.com

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ABSTRACT

The reading ability of Indonesian children is considered less than satisfactory, even though according to the 2022 PISA ranking, Indonesia has been increasing 5 position compared to previously. This is due to their acute addiction to gadgets. In early grade students this affects their reading skills significantly, besides the literacy-based education model that suits children's needs is also not well developed. On the basis of that problem, it is necessary to develop basic literacy teaching, one of them is with neuroscience-based literacy teaching. The application of neuroscience-based literacy teaching is done with the teaching of games, where students are asked to recognize different forms of letters through different colours. To understand this, teachers need to be introduced to neuroscience-based literacy learning methods. This study measures the ability of teachers to apply neuroscience-based basic literacy in early grade students. Through descriptive interviews as well as a series of quantitative data collection methods, the positive impact of neuroscience-based teaching was found when teachers were able to understand Early Grade Reading Assessment training with a neuro-science approach.

Index Terms—EGRA, neuroscience approach, basic literacy

I. INTRODUCTION

The literacy level in Indonesia is poorly calculated. To date, Indonesian literacy is ranked 60th out of 61st countries. UNESCO states that the reading skill ratio of Indonesian people is one to a thousand. It's mean, there's only one person who can read from a thousand Indonesians (Kementerian Komunikasi Dan Informatika, n.d.; Nilai Budaya Literasi Indonesia Naik Pada 2022, Ini Trennya Empat Tahun Terakhir, n.d.). Based on National Education Report in 2023) the literacy competences of elementary school students has increased by 8.11%, to 61.53%, which is still quite low when compared to the target of minimum literacy competences of the Indonesia Emas program 2045.

Moreover, many Indonesians prefer to speak out on social media and throw comments without reading the issues being discussed. As a result, Indonesian society has become a reactive society. They don't learn to comment accordingly sitting on problems and thinking reactive emotions that ultimately have a bad impact. Looking at this problem, we need a proper treatment plan and efforts to ensure that the psychological and cultural problems of Indonesians are sustainable. But the problem is, reading education cannot be taught simply. There needs to be stages of reading lessons and literacy improvement, and reading activities can't be directly taught. There needs to be a steady phase in reading lessons and literacy improvement. The reading ability of early grade students will determine the level of mastery of other competences in advanced classes. This is because early school students who have difficulty reading are at risk of lagging behind students who are already skilled in reading. They will have difficulty understanding information, instructions, even material in writing. Without intervention, these gaps would be wider and could affect the overall learning motivation of students with reading difficulties.

Stanovich (1986), explains comprehensively that early school students who have good reading abilities will be able to absorb information well anyway, have more vocabulary and can develop vocabulary and construct information that they get better than early class students who are not skilled in reading. This is what Stanovich calls the Matthew effect, where in the graph presented there is a clear correlation between the low reading competence of early school students and the level of other competence gaps within a given time frame.

It should be understood that the ability to read is like instilling a habit. Such habits cannot be built by arrivals, it requires a process of identification ranging from letters, words to simple readings before then to more difficult and complex readings. Based on the study of habits by Charles Duhigg (Duhigg, 2020), a customary approach is needed. The children are first allowed to get used to reading, then slowly they are introduced to the benefits of reading. Reading later will stimulate the child's mind and also add the science they need.

But what happened to literacy education wasn't done well. Generally, an interest in gadgets or social media is normal because gadgets and social media make it easier for children to see colored visual appearances and emotional sounds. Your own children are more interested in clear images and sounds. Without them knowing, their habit will lead them to addiction. (Gunawan et al., 2021).

But in this case, children are only consumers of the visual product. When children are consumers and receive information only in one direction, then their ability to think creatively becomes weak. This is what ultimately negatively affects their ability to think critically and analytically. (Suzana et al., 2020).

In the past Covid-19 era, the negative effects of gadgets and social media are becoming more pronounced. Children's interactions on gadgets and social media are becoming intense. They're experiencing academic delays and even a collapse of social skills. Gadgets and social media are really just a provider for children and the effects are equivalent to addiction. Of course this concerns parents because they expect their children to be intelligent and have good social abilities. However, research proves that the intensity of parental surveillance alone is not enough (Cahyani & Atmaja, 2021).

The problem of literacy and good use cannot be replaced. When children read, children are not consumers, they engage in using their imaginative abilities and recognizing emotions that cannot be found by simply looking at social media posts. (Cordova Jr et al., 2024; Septiani & Syaodih, 2021). Therefore, the urgency is needed to design training Early Grade Reading Asssessment efficient and effectively, adapted to the needs of today's children. However, packaging is essential for children to be attracted to literacy in its entirety.

The concept of neuroscience in childhood education has opened the door to a deeper understanding of how the child's brain develops and learns. Understanding the neuroscience is the key to understanding the intellectual development of the child, because the brain is the main control that affects learning, thinking, and behaviour. With an understanding of the neuro-science, educators can design learning strategies that are more effective and adapted to the developmental stages of their brain. It helps create a conducive and stimulating learning environment, which in turn can enhance the child's intellectual potential optimally. (Susanti, 2021; Susanto & Munfarohah, 2020).

But of course, to get the maximum outcome, educators must understand what neuroscience-based education is. This research was conducted with the aim of studying how to develop the capacity of educators to develop EGRA teaching with neuroscience approach lessons well. The interview and several data collection techniques was done to see how these educators could understand the concepts of teaching reading with neuroscience approach, especially with the educational model that through games, visualization through games and also the introduction of students to different characters and colours.

Neuroscience Approach

Neuroscience is the field of science that studies the human brain and related nervous systems. In educational language, understanding the basics of neuroscience plays an important role in helping educators, parents, and the general public understand how children's brains work and how it affects their intellectual development (Nursalim et al., 2022; Setiawan & Ilmiyah, 2020).

To be known, the human brain is a complex organ composed of different parts with unique functions. The main parts of the brain include the cerebral cortex, the frontal lobe, the parietal lobus, the temporal lobus and the occipital lobus. Each part has an important role in regulating body functions, emotions, and cognition. The brain is responsible for vital functions such as sensory information processing, decision-making, learning, and emotional regulation. Understanding brain function helps in designing effective learning strategies as well as supporting the development of children's cognitive skills.

Children's brains develop rapidly as they age. This process involves the formation and perfection of neural connections, which are essential for cognitive development and overall intellectual development. (Batubara & Supena, n.d.) A supportive environment, rich sensory stimulation, and positive social interaction can affect the development of children's brains. A healthy and challenging cognitive environment can stimulate optimal brain development.

Generally speaking, the approach of neuroscience studies the relationship between cognition and emotion. Understanding how the brain regulates emotions and how emotions affect cognitive processes can help in developing learning approaches that focus on the emotional well-being and mental development of children. (Nugroho, n.d.) The application of neuroscience concepts in education can help educators design more effective teaching methods. Understanding the way the brain works allows educators to use learning strategies that match the level of cognitive development of children (Amelia et al., 2020).

In the context of literacy education, children at an early age should be sensory stimulated and also challenged to attract them so that they can develop their sensory abilities and see the reading experience as an engaging process. In various studies, gaming is considered to be more attractive to children because in gaming there is a level of challenges that can be solved and also the process to respond to challenge after challenge that makes children want to keep playing the game and continuously respond to the challenges that exist. This is an experience that is sometimes not found in reading books (Tao et al., 2021; Zeng et al. 2020).

The way reading is taught is often confined only to the traditional reading process, the addition of vocabulary, the introduction of complex sentence structures and the process of boring spelling. Because that's the basis of thinking, this study is designed to present a reading experience like a game experience. This is the basic understanding that teachers need to understand so that they can develop games that fit their children's needs.

II. METHOD

The research method utilized mixed method research design. In order to better comprehend a study issue, a mixed method research design, combines quantitative and qualitative methodologies in a single or series of studies (Creswell, 2012). To support the experimental design, the researcher used an exploratory sequential design that allowed for the collection of both quantitative and qualitative data. It was carried out on a group of teachers who had classes where their children were learning about reading skills. In the first cycle, 32 teachers from 4 different schools were interviewed about their early reading and writing teaching methods and strategies, the early assessments they conducted, and the extent of their understanding and knowledge of the Early Grade Reading Assessment.

This was done as part of the qualitative data collection. In quantitative data collection, the data collection instrument was developed based on the results of the qualitative data analysis. The first cycle teachers were tested to see to what extent they understood how to teach reading in early grade students. In this cycle, the researcher experimented with a pre and post-test to measure basic knowledge about EGRA. The results of the 32 primary school teachers who were sampled for the study had an average score of 58. The pre and post-test instruments were based on the EGRA teaching guide.

Quantitative data was also taken based on the results of the 2023 Teacher Competency Test on the Pedagodic Competency indicator. where out of 612 primary school teachers tested, the average score was only 68. In the second cycle, early reading assessments were conducted from 1st to 3rd grade as initial needs analysis data. Out of 128 children, the assessment results showed that only 9% of the children could read narrative or informational texts of appropriate complexity. 12% of the total experiment sample understood common words presented randomly. 31% could translate sounds into writing and spell them correctly. 18% of the total sample could read silently, and the remaining percentage showed a low level of literacy. And based on the collected data, some of the concepts asked to understand were basic knowledge of the teacher, its application to the child and how the methods of games and other approaches are performed on the child so that they get the best benefit from the implementation of EGRA with neuroscience approach.

First Cycle

In the first cycle, teachers are invited to discuss to understand the meaning of neuroscience. When these educational and interviewing processes were carried out, in fact, the understanding test was also carried on because it was undeniable that many teachers had difficulty understanding these neuroscience processes.

One of the tests that teachers perform is their ability to understand how to position children on their imagination with their learning abilities. Although often not discussed in depth, teachers need to use the child's imagination as a vehicle to deliver reading lessons. In terms of imagination, imagination is defined as

the ability to imagine something that does not exist or has not yet happened. In the context of problem solving, imagination plays a crucial role because it can help us see a way out of a seemingly dead-end situation. (Dini, 2022).

When we face problems, we are often trapped in a mindset that is confined to conventional thinking or ways that have been commonly used before. However, by using imagination, we can transcend these boundaries. Imagination allows us to reverse the way we view problems, from end to beginning, from the desired outcome to the stages necessary to it. (Khalid et al., 2020; Puccio et al., 2020; Treffinger et al., 2023).

Starting from imagination or dreams, we can imagine a variety of possible solutions without being constrained by real constraints or logic. It opens the door to the creativity and innovation needed to find solutions that may not have been thought of before.

Based on this theoretical understanding, a teaching model was developed. The teaching was done by asking the teacher to design games that could stimulate their imagination. From the initial interview, there were teachers who were able to link the concept of imagination to teaching, but instead there were difficult teachers. For example, in this case, there's a teacher who created an ass bridge system. For example, to help a child remember the letter A he compared this letter A with a special shape, for example, letter A is similar to a tower. Then the child's imagination is asked to match A with the tower, while there are other models of imagination games that children are asked to see imaginative animation when the chicken (Ayam; in Bahasa) arrives turns into a letter A. Comedy like this leaves an impression and experience on the child so that they are interested and easy to remember various shapes of letters.

In this teaching model the child feels the utility of the lesson given through reading. It makes them feel that reading is not a superficial activity. On the contrary, reading can stimulate dopamine or the pleasure of getting new science that makes children more self-esteem and at the same time they also experience increased serotonin. This increase is due to human instincts that people are happy if they understand a problem better and know how problems can be solved with their abilities. This learning process is continuously repeated until regular brain activity, including in the learning process, forms and strengthens these synapses, which in turn enhances the child's ability to think, learn, and remember new information (Irawan, 2020; Putra, 2020; Sanyoto et al., n.d.; Wahid, 2022).

Second Cycle

Teachers who were interviewed were then assessed on the basis of their ability to understand the abstract concepts of neuroscience and asked to practice how they applied the neuroscience with the games they had designed. In cases where teachers do not really understand the process of neuroscience and design games only with the limitations of their knowledge, it was found that the results obtained were not too pleasant.

Third Cycle

Teachers who have difficulty understanding this neuroscience are then gathered in Focus Group Discussion to express their difficulties. One of the problems these teachers have is the difficulty of critical thinking because they are dealing with senior teachers. This seniority makes teachers not dare to take a different step. When taking different steps, they were concerned about being treated as a member of an unfaithful group that made relationships in the workplace unhealthy. In this matter, teachers cannot be blamed entirely because in this matter leadership is needed for teachers to dare to think critically and open themselves. However, toxic relationships can happen anywhere, but leadership determination can inhibit or mitigate the negative impact. (Bhandarker & Rai, 2019).

Next, some teachers who have trouble understanding neurosciences are also detected to have limited empathy (Nisa, 2022). In various studies, empathy is often seen as the key to bringing teachers closer to students. Students who have an emotional investment in their teachers tend to work harder in learning. When students learn harder, of course their performance will increase so that they can the desired achievement. But besides that, empathy is an important bridge for teachers in applying the neuroscience educational model. The right neuroscience model should be implemented using a child's golden moment to maximum results. However, if the teacher himself fails to read the moment, then the chances of their loss are wide open. This is a problem that needs to be addressed immediately.

However, it is not impossible to cultivate empathy with teachers. Teachers can begin to be introduced to the concept of emotional variation, which leads them to learn how to behave and the expected results in the future. Empathetic teachers are also often due to family and genetic conditions that prevent them from learning to read emotions and various other needs.

III. RESULT AND DISCUSSION

Children's reading hours are increasing

According to the parents of the students, children's reading hours are increasing. If once children had to be forced to read, now children disciplined to choose and read their own books. According to the parents there was curiosity to add and find information that was interesting to them.

This growing curiosity is a positive sign as children learn to appreciate science more and discover the

interesting side of science that makes them have an emotional bond. This growth of curiosity is a good sign because curiosity (Kusumaningrum & Sukartono, 2022; Lestari & Wulandari, 2021; Solehudin et al., 2020) is the basis of all science. When children are asked only to learn, their ability to absorb science becomes very limited. Children don't want to learn not purely because of their own mistakes.
The problem is, for kids their age, they don't find a reason to learn. Through neuroscience-based teaching, they were invited to see the function of learning for them. But they don't have to be forced to study on their own because they see learning as a necessity which results in their own enjoyment.

Communication Wealth

Parents also realize that now their children are easier to express themselves. There are some keywords that children use to describe their feelings. For instance, the word "sad" has now found other variations in the child such as "harassed", "sloppy", and "unhappy". The child's ability to detect this sad substitute is a good development and shows that the child benefits from reading lessons well.
The ability to communicate richly also stimulates the child's thinking ability in the future. They have the potential to continue to evolve so that they can the achievement expected from the base of their intellectual abilities. Reading turned out to make children richer in communication.

Communicative Comprehension Skills

The children also thought to be more empathic. Empathy is an important thing to have a child. Empathy is closely related to leadership. This can happen because with empathy the child can understand others and influence them. The interesting thing about the experiment is that when children are exposed to good reading, their empathy also grows well because they now have better language skills. Through the expression given by older people or even friends of the same age, children understand how they should behave.
In the long run, empathy development in children has the potential to lead to the development of a variety of skills and abilities. Through empathy, children not only learn to understand and respond to the feelings of others, but also develop the key skills needed to be effective leaders in the future. The ability to empathize allows them to interact better with others, build stronger relationships, and lead better. It opens the door to a variety of competitive advantages, because leaders who can understand and appreciate other people's feelings and perspectives are often more effective in leading teams, resolving conflicts, and achieving common goals. Thus, empathy is not just interpersonal skills, but also the foundation for strong leadership skills and long-term success (Jian, 2022).
The results of this study reveal that EGRA's neuroscience-based training gives indications of promising initial outcomes. It was found that students' interest in reading activity increased drastically as a result of this approach. Besides, they also showed an improvement in understanding new vocabulary as well as creative ability to solve problems. Interestingly, this study found that students involved in EGRA-based neuroscience training also showed deeper levels of empathy. It shows that this approach not only helps in improving reading skills, but also contributes to the development of socio-emotional aspects, including leadership skills. However, it must be acknowledged that the greatest challenge is how to manage teachers. Teachers are still stuck in the traditional teaching model that makes their relationship at school unproblematic. Besides, some teachers also lack the empathy needed to implement the neuroscience education system so the application of this system becomes limited. Meanwhile, for teachers who are already familiar with empathy and the abstract concepts of neuroscience, they show a much more exciting and reliable performance to help students develop forward especially in the basic ability to read that is EGRA.

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