

[٧]

**Visual Learning and Science Teaching
for Kids**
(Vision in the development of thinking
skills for kindergarten children)

Prof. Dr.
Shereen Abbas Eraky
Professor of Child Curricula
Faculty of Education
Suez University

Dr.
Eman Abdullah Sharaf
Associate Professor of
Child Curricula
Faculty of Education
Suez University

Visual Learning and Science Teaching for Kids (Vision in the development of thinking kills for kindergarten children)

Prof. Dr. Shereen Abbas Eraky*, Dr. Eman Abdullah Sharaf**

Abstract:

This paper relates to the possibility of using the visual learning approach in science teaching to develop some thinking skills for kindergarten children.

When children see information related to scientific concepts in different visual forms, the visual images and stimuli convey a large amount of information that the child needs, which reduces the cognitive load, and makes the learning process easier, more interesting and exciting for the child, especially when the information is presented in a more dynamic, colorful and attractive way.

Visual learning is one of the educational approaches that can be provided at a small cost, as children easily apply visual learning skills to the world around them.

The research paper revolves around several points that can be summarized as follows:

- Developing thinking skills of kindergarten children.
- Teaching scientific concepts to children.
- Visual Learning and Science Teaching

The paper ends with a number of procedural recommendations that can help researchers, interested persons, and teachers in employing the visual approach in teaching science and benefiting from it in developing different thinking skills of kindergarten children.

Key words: Thinking skills- Scientific concepts- Visual learning- Kindergarten child

* Professor of Child Curricula- Faculty of Education- Suez University.

** Associate Professor of Child Curricula- Faculty of Education- Suez University.

Developing thinking skills of kindergarten children:

Nowadays, the world is facing many rapid changes in various areas of daily life, so educational institutions had to prepare learners to keep pace with those changes, by preparing a generation of learners who are able to succeed in various aspects of life, and to face various current problems and challenges with innovative solutions.

Therefore, interest in the development of thinking skills among learners was one of the most important educational goals in various educational systems, and recommended that school curricula should include concepts and activities that encourage children to think, question, analyze, compare, conclude, generate information, and apply them in new situations (Porntaweekul et.al. 2015)

Studies show the importance of the first six years of life for educational and personal success, and that the development of good thinkers is a process that must begin from the early years (Ritchhart & Perkins, 2008) In addition, brain research has shown that early experiences have a strong influence on the structure of the human brain, And on the extent of later adult abilities, so the development of good thinkers is a process that must start from the early years of life. (Birbili,2013)

Studies have also shown that children produce speech that shows high- level thinking that begins in the third and fourth years of life (Freeman,2015), and that children in preschool are able to develop their ability to think, discuss and analyze, as well they are capable of logical, analytical, imaginative and creative thinking. (Mahzabin, 2013).

Providing the opportunity to practice higher- order thinking (HOT) skills in teaching and learning processes makes students more aware of their own thinking and enhances their educational performance and cognitive development (Soleh, 2020). When students encounter problems, questions, or some unfamiliar obstacles, (HOT) skills are activated, which in turn lead to useful explanations, decisions, and results in the context of available knowledge and experience, and also promote the continuous growth of these intellectual skills, which requires

students to transfer scientific knowledge and apply it in new positions. (Saido et al. 2018).

Hence the interest in developing children's thinking skills, through meaningful educational content, that stimulates children's curiosity and motivates them to search and investigate, and by using appropriate educational methods that encourage children to observe, analyze, interpret and practice different thinking skills.

Teaching scientific concepts to children:

There is no doubt that scientific activities are one of the most important educational fields that encourage children to search, investigate, reflect, practice all thinking skills, especially higher- order thinking (HOT) skills, which facilitates understanding of the problems they face in their daily lives. Numerous studies have emphasized the necessity of teaching scientific concepts to the child, as it is a tool for organizing ideas, discovering and understanding the elements of the environment.

Teaching science to children in an interesting and attractive way based on observation, questioning, hypothesis work, classification, comparison, description, interpretation, and understanding of relationships are all necessary to develop children's scientific concepts and reorganize their knowledge structure in a meaningful way. (Ravanis, 2020), (López *et al* 2022).

Hence, it was necessary to focus on teaching scientific concepts to children through their active sensory experiences and their participation in a variety of activities that suit their abilities and potentials and generate motivation and desire to learn, and improve their positive attitudes and scientific thinking, (Areljung *et al* 2021),(Earle 2022).

Studies have indicated that teachers who emphasize the use of visual manipulations to explain and present scientific concepts acquire higher achievement for their students, not only in elementary school but in middle school, high school, and college. And stressed the importance of visual representation in achieving a deeper and meaningful understanding.(Boaler, et al 2016).

Definition of visual learning:

Visual learning is a method of processing information represented visually, numerous studies have shown that 75% of the information processed by the brain comes from visual stimuli, in addition the information represented visually is better organized in the form of maps in the minds of students (Williams, 2009).

The visual learning style is about how learners gather and process information from illustrations, graphs, symbols, photographs, icons and other visual stimulus. (Murphy, 2013)

The researchers define visual learning as a method of teaching and learning through which children acquire knowledge and understanding directly through visual tools that include (printed words, paintings, drawings, sculpture, photography, mapping, graphics and representations, video, television, pictures, slides, figures, films, and newspapers), and these tools help in presenting the educational content more effectively and enhance the learning process, as well as contribute to the development of the different thinking skills of children.

Visual learning and young children:

Young children are already visual learners long before they begin to understand language and learn to read, where visual models go beyond their language abilities, regardless of their language backgrounds, learning styles, and cultural experiences, children easily engage with visual models. Research tells us that the majority of students in a regular classroom need to see information in order to learn it. (Quiroz & Lema 2016).

The visual learner greatly benefits from seeing and watching demonstrations and really likes visual stimuli; such as pictures, slides, and graphs. Also for them, it is often far easier for recall to work with images as oppose to working with words, as you will picture the image in their head while recalling it is much more difficult when trying to recall the word itself. (Indrapuri et al 2022).

There are many reasons why it is important to actually show the children what we are teaching:

- 1- The visual material explains the details being taught.
- 2- A person learns in daily life through the senses: 3% through taste, 3% through smell, 6% through touch, 13% through hearing, 75% through vision.
- 3- Visuals make learning more permanent and less likely to be forgotten.
- 4- Visuals lead to understanding. (Murphy 2013), (Vanichvasin 2013).

Visual Learning Skills:

This kind of learning style develops on learners different skills as: observation, recognition, interpretation, perception, self- expression (Murphy, 2013).

- **Observation:** is about seeing – not just looking, but really examining something focus our attention and concentrate on detail,.
- **Recognition:** helps us to recall something based on our observations. “I’ve seen that happen before.” “I know what it is.” “I remember that”
- **Interpretation:** relies on comprehension and enhances our understanding of something based on what we see.
- **Perception:** uses visual analysis to help us make predictions and expand our thinking beyond what we see.
- **Self- expression:** is about drawing and image making that allows us to communicate our feelings, share our knowledge, and demonstrate our creativity.(Murphy 2012)

Children easily apply visual learning skills to the world around them, and to the different visual sources they find in the classroom environment. Visual models can provide information about subjects, items, or objects in a child's environment. Through their drawings, children can express their thoughts and feelings and share them with their classmates. So they learn how to share their ideas and communicate with others, and this ability is often referred to as visual literacy. Children must be visual learners, and must learn how to read, interpret and reproduce visual information.

So as educators, we need to prepare our children to interact with the visual effects and visual education that they will live and work with, through the use of educational technologies that fit that perception.

Visual Learning and Science Teaching

Numerous studies have emphasized the necessity of teaching scientific concepts to the child, as it is a tool for organizing ideas, discovering and understanding the elements of the environment, and being a basis for learning concepts, knowledge and skills in all educational fields, whether in the kindergarten stage or in the later educational stages.

Educators believe that the use of the visual approach in classroom education is important, because the visual approach is an effective strategy in understanding the scientific contents, as the presentation of models, shapes and graphics extensively within the curricula facilitates understanding of the learners, and thus develops their performance and achievements in those courses. (Ebeid & Afana 2003).

Hence, it was necessary to focus on teaching scientific concepts to children through their active sensory experiences and their participation in a variety of activities that suit their abilities and capabilities and generate motivation and desire to learn. Their ability to think, research and discover, which facilitates the understanding and study of various natural phenomena, which in turn is reflected in understanding the problems they face in daily life. Children learn most effectively when they integrate information into meaningful contexts that relate to their daily lives.

The researchers believe that teaching science based on visual learning is one of the most important ways that lead to the child's enjoyment of science as a subject and method, and it also allows him to practice various activities through an active learning environment rich in visual stimuli, which makes the child more responsive and more responsible for his learning.

Simplifying and teaching scientific concepts to children using visual learning depends on observing, recognizing, distinguishing and describing things, realizing the relationships

between them, linking the information the child discovers with those in his cognitive structure to discover new relationships, providing insights, conclusions and interpretations based on those observations, and making predictions that go beyond the limits of the information provided. And share that information with their peers, whether through drawing and making pictures that allow them to share and communicate with others and show their creativity.

Benefits of the Visual Learning:

Visual learning helps students organize and analyze information using diagrams and plots to display large amounts of information in ways that are easy to understand and help reveal relationships and patterns. It helps students integrate and construct new knowledge in an active process that involves interactions between prior knowledge, simultaneous experiences, and external information resources. (Tippett 2016)

According to research, students learn better, remember information, and achieve academic success when it is represented and learned visually. (Aisami 2015)

Visual learning helps students think critically linking verbal and visual information helps students make connections, understand relationships and recall related details. Visual thinking and learning utilize graphical ways of working with ideas and presenting information. Research in both educational theory and cognitive psychology tells us that visual learning is among the very best methods for teaching students of all ages how to think and how to learn. (Quiroz & Lema 2016)

Recommendations:

Based on the previous presentation, the researchers recommend the following:

- 1- Preparing training programs for student teachers in kindergarten colleges, and post- service teachers to help them employ the visual approach in science education and the various educational fields for kindergarten children.

- 2- Preparing training courses and workshops for kindergarten teachers to learn about visual learning and how to use it in teaching scientific and mathematical concepts to kindergarten children.
- 3- Training the kindergarten teacher on the use of visual learning in stimulating children's different thinking skills.
- 4- integrating different forms of visual stimuli in teaching all sciences to children, especially in the field of science and mathematics.
- 5- encourage researchers to do more research to know the effectiveness of visual learning in the development of different thinking skills in children.
- 6- Employing all the visual elements surrounding the child to arouse his curiosity and encourage him to think, analyze, describe and relate new information to those in his cognitive structure.
- 7- Train children in visual learning skills by asking questions about surrounding items in the child's environment, for example, observation, recognition, Explanation. Perception and self- expression.

References:

- 1- Aisami, R. S. (2015). Learning styles and visual literacy for learning and performance. *Procedia- Social and Behavioral Sciences*, 176, 538- 545.
- 2- Areljung, S., Due, K., Ottander, C., Skoog, M., & Sundberg, B. (2021). Why and how teachers make use of drawing activities in early childhood science education. *International Journal of Science Education*, 43(13), 2127- 2147.
- 3- Birbili, M. (2013). Developing young children's thinking skills in Greek early childhood classrooms: curriculum and practice. *Early Child Development and Care*, 183(8), 1101- 1114.
- 4- Boaler, J., Chen, L., Williams, C., & Cordero, M. (2016). Seeing as understanding: The importance of visual mathematics for our brain and learning. *Journal of Applied and Computational Mathematics*, 5.
- 5- Debes, J. (s.f.). *What Is Visual Learning Style?* Retrived on 17th March, 2016; of *What Is Visual Learning Style?:* http://www.corwin.com/sites/default/files/upm-binaries/27832_Ch_1.pdf
- 6- Earle, S. (2022). Early Science research summary: use of play and role of the adult. *Journal of Emergent Science*, 22, 5- 12.
- 7- Ebeid, William and Afana, Ezzo (2003). *Thinking and the school curriculum*. 1st edition. Kuwait: Al- Falah Library.
- 8- Freeman, C. (2015). *The effect of parental input on the development of higher order thinking in young children* (Doctoral dissertation, The University of Chicago).
- 9- Indrapuri, R. S. A., & Perdana, M. F. (2022). A Study of Predominantly Learning Styles of the Second Year Students of SMK Jakarta Pusat 1. *Journal on Teacher Education*, 4(2), 1537- 1543.

- 10- López- Banet, L., Miguélez Rosique, J. A., Martínez-Carmona, M., & Ayuso Fernández, G. E. (2022). Development of Food Competence in Early Childhood Education. *Education Sciences*, 12(2), 64.
- 11- Mahzabin, Z. (2013). Piaget's pre operational stage and the role of social and cultural development of a child psychology in Bangladeshi context (Doctoral dissertation, BRAC University).
- 12- Murphy, S. (2013). The power of visual learning and storytelling in early childhood education. *Nashville, TN: Pearson*.
- 13- Murphy, S. J. (2012). Modeling Positive Behaviors for Young Children through Visual Learning Strategies and Within Recognizable Contexts. *Research into Practice*.
- 14- Porntaweekul, S., Raksasataya, S., & Nethanomsak, T. (2015). Development of the reflective thinking instructional model for student teachers. *International Forum of Teaching and Studies*, 11(1- 2), 24–32.
- 15- Quiroz Perez, M. J., & Lema Sananay, G. M. (2016). *The description of Visual Learning Style in the English Teaching- Learning process in students of Séptimo Año de Educación General Básica "D" at the Unidad Educativa Militar N° 6 "Combatientes de Tapi", City of Riobamba, Chimborazo Province, in the academic term February-July 2016* (Bachelor's thesis, Riobamba, UNACH 2016).
- 16- Ravanis, K. (2020). Precursor models of the Physical Sciences in Early Childhood Education students' thinking. *Science Education Research and Praxis*, (76), 24–31.
- 17- Ritchhart, R., & Perkins, D. (2008). Making thinking visible. *Educational leadership*, 65(5), 57- 6.
- 18- Saido, G. M., Siraj, S., Nordin, A. B. B., & Al_Amedy, O. S. (2018). Higher order thinking skills among secondary school students in science learning. *MOJES: Malaysian Online Journal of Educational Sciences*, 3(3), 13- 20.
- 19- Soleh, D. A. (2020). The Effectiveness of Computer-Based Problem Solving to Improve Higher Order

Thinking Skills on Prospective Teachers. *International Journal of Instruction*, 13(2), 393- 406. <https://doi.org/10.29333/iji.2020.13227a>

- 20- Tippett, C. D. (2016). What recent research on diagrams suggests about learning with rather than learning from visual representations in science. *International Journal of Science Education*, 38(5), 725- 746.
- 21- Vanichvasin, P. (2013, November). Enhancing the quality of learning through the use of infographics as visual communication tool and learning tool. In *Proceedings ICQA 2013 international conference on QA culture: Cooperation or competition* (p. 135).
- 22- Williams, R, (2009). Visual Learning Theory. http://www.aweoregon.org/research_theory.html.

