Feb. 8, 2024

Critical Thinking and Pseudoscience

www.kidsacademy.mobi

Most parents would want their child to hone their literacy and math skills, as this is known to be the foundation of learning. However, school curriculums are now focusing on developing critical thinking skills among children – it is believed that children need to learn to think critically to be successful. As a teacher and therapist, I would always ask children any stories they would like to share and will throw questions at them. For example, some kids will tell what happened during their weekend, and I will ask them who was with them, what they ate, how fun it was, or even a complex question like how different this weekend was from their other weekends. Such questions will give them the opportunity to use critical thinking skills when they explain things while recalling memories. Children are little scientists, they love asking and observing, and it is our task to educate them the best we can.

In this article, we will discuss critical thinking, pseudoscience and ways to strengthen children's critical thinking skills. If you want to learn more on critical thinking skills, you may read the first article here in the Kids Academy website.

What Is Critical Thinking for Children?

John Dewey, an American psychologist and philosopher, defined critical thinking as active, persistent, and careful consideration of a belief or a supposed form of knowledge, and he called it "reflective thinking."

Critical thinking is a set of skills wherein children compare and contrast things, explain why things happen, understand other people's views or perspectives, predict what will happen, produce different ideas, and give opinions. To put it simply, it is going beyond what your children already know.

Why Is Critical Thinking Important?

Ellen Galinsky, in her book Mind in the Making: The seven essential life skills every child needs, explains the importance of teaching children critical thinking skills. She mentions that when children play they use the same processes as scientists. Toddlers already have an early understanding of cause and effect – they like to explore possibilities during playtime.

Critical thinking skills are fundamental for a child's cognitive development as they sharpen the readiness to understand how things work in the real world, and how to use

logical skills to solve problems. This skill also helps children understand their and other people's emotions; children who don't know how to use this skill will more likely act on their emotions instantly without regarding the consequences. Moreover, if children do not use critical thinking, it will be easier for them to believe anything that adults tell them even if it is not real. Critical thinking helps children learn to evaluate the information given to them. When dealing with problems, using critical thinking is necessary to understand the problem and to produce possible solutions.

Critical thinking is important not only for children, but for adults as well – when faced with complex situations we tend to rely on simplistic solutions which are often inaccurate and outdated. Parents should also have a strong critical thinking capacity because children are naturally curious and would always ask questions, and it is a parent's job to give answers and explain the world to their child.

Pseudoscience

When I was a child, my grandmother would always tell us to wear a sock with mint inside whenever we felt sick with a cold, cough, headache, etc. All of us believed that it was a magic cure, so we did this every time, and it became a family tradition. I continued to

believe this idea as I got older because it was coming from my grandmother and I did not see her as someone who would tell lies. So I held onto this tradition of mine until I did some research and found out that wearing a sock with mint does not cure my cold and cough! The weird thing is I really thought it worked since I would always get better when I wore it. But then I learned about the placebo effect and realized that a cold would go away in any case – with the sock or without it. I never got skeptical about what adults told me since I knew they only wished me well and was sure they knew better. A mint sock is a harmless superstition in case you try to cure a simple cold with it, however, if we used it for a more dangerous sickness instead of real treatment the effects might have been very serious.

Pseudoscience is a false science. It is something that sounds logical and convincing, but in fact is neither of those things – same as placebos. However, unlike placebos, pseudoscience can bring a lot of damage. Pseudoscience is a practice that purports to be scientific, and even seems to be backed up by some research but in reality fails to comply with scientific methods.

We classify pseudoscience by a combination of these characteristics:

- Asserting theories without verification from an experiment or support from an experiment;
- Asserting claims that cannot be proven or are falsifiable;
- Asserting claims that contradict true science;
- Failing to provide an experimental possibility of reproducible results;
- Claiming a theory or belief predicts something that it does not.

One popular pseudoscience is astrology. A lot of people believe in it even though they know it is not real, because it entertains us and gives us the comfort of certainty. Pseudoscience is definitely everywhere, we come across it in different social media and mass media platforms. Pseudoscience has been in existence for hundreds of years and it will always exist.

It is easy for children to believe anything an adult authority figure says. Though some pseudoscientific beliefs are innocent, others can cause serious harm. One primary example is when the COVID-19 hit and many people refused to believe the virus exists and follow the safety regulations, which helped to spread the virus. Such convictions can also be easily passed from parents to their children.

Pseudoscience and Critical Thinking

“It ain’t so much the things we don’t know that gets us in trouble. It’s the things we know that ain’t so.”

Mark Twain

Now let us examine how critical thinking can protect us against pseudoscience and fraud. Children will doubtlessly believe whatever an adult tells them unless they know how to ask questions and dig deeper into the subject. Busting pseudoscience is a terrific way to teach critical thinking skills.

”Did you know that there is an octopus that lives in a tree? It is named “The Pacific Northwest Tree Octopus,” (Octopus paxarbolis) this octopus is now endangered and it is in our hands to save it. The tree octopus can be found in the temperate rain forests of Olympic Peninsula on the west coast of North America. This type of cephalopods can

reach an average size of 30-33 meters! Also, the tree octopuses are amphibious, they spend their early life and the period of their mating season in their ancestral aquatic environment. They are now on the verge of extinction because of the fashion industry, and their parts are being used to create decoration for hats."

Image source: https://zapatopi.net/

If you go to the website for the tree octopuses, you'll find the information about it and several fundraising options.

This is a research done by Dr. Donald Leu who created a fake web-campaign to help save a fictitious octopus from extinction. His goal was to see how many people would buy this misinformation just because it's found on the internet. Most participants of the study actually believed the tree octopus was real and were greatly surprised when told by the researchers that the creature did not exist. This experiment tested the critical thinking abilities of the respondents.

Debunking known pseudoscientific claims is a great way to train critical thinking in children. Parents or teacher can turn to the above example: the Pacific Northwest tree octopus. Share this with your children and have them do their own research about the existence of this creature. Then you can explain how important it is to be skeptical and not to accept blindly whatever we're told or shown, even by someone who is believed to be in authority.

Strengthening Critical Thinking Skills

Now, with critical thinking skills, we do not want children to question or disprove whatever an adult might say. What we want from them is to develop the ability to

understand better, to do research by asking questions, turning to reference materials and the Internet, and to come up with practical solutions when given problems.

The Foundation for Critical Thinking – a nonprofit organization that cultivates core intellectual virtues that lead to fair-minded thinking – has identified three ways K-6 children typically think:

1. Naïve Nancy – does not believe she needs to think because her parents are always there to do it for her. She often believes what she hears on TV and does not ask questions. She is most likely to go along with whatever her friends decide.
2. Selfish Sam – thinks a lot because it gets him what he wants. He would believe everything that is necessary to achieve his goals regardless of whether it hurts other people.
3. Fair-minded Fran – loves to be curious because it helps her learn. She knows when to believe and when to be skeptic. Fran is also a good friend, and she understands other people's situations.

The Foundation for Critical Thinking developed five "Intellectual Standards" to help children learn to think better.

- Clarity – prompt children to give explanations and examples to make their statements clear and easily understandable.
- Accuracy – ask them for evidence or facts. Help your child do research and find arguments that support or disprove their point.
- Relevancy – help kids stay on track by linking meaningful information when discussing a certain topic. Teach them to pay attention if the new statements and questions relate to the problem.
- Logic – help your child see how things come together. Ask questions about how they came to the conclusion and whether what they say is based on evidence.
- Fairness – teach your child to notice when they try to manipulate evidence just because they really want to prove their point. Show them how to be emphatic in their thinking process and to always be open to other people's opinion when making conclusions.

Always be a role model and have patience when teaching. Let kids have fun and be curious without feeling pressured. Remember, children are little scientists; they will ask more questions and explore new things as they grow older, and guardians should be there to support and instruct them.

About the author

Jorezza Antonio - Behavioral Therapist.

Metro Manila, National Capital Region, Philippines.

Resources:

1. Schmaltz, R. M., Jansen, E., & Wenckowski, N. (2017). Redefining Critical Thinking: Teaching Students to Think like Scientists. Frontiers in psychology, 8, 459. https://doi.org/10.3389/fpsyg.2017.00459
2. https://www.canr.msu.edu/news/the_importance_of_critical_thinking_for_young_children
3. Adam, A., & Mason, T. (2014) Using a Pseudoscience Activity to Teach Critical Thinking Skills, Teaching of Psychology 2014, Vol. 41(2) 130-134 DOI: 10.1177/0098628314530343
4. https://www.skeptic.ca/Skeptics_Tool_Kit.pdf
5. https://www.nbcconnecticut.com/news/local/an-octopus-in-a-tree-seems-real/1871501/
6. https://www.webmd.com/pain-management/what-is-the-placebo-effect
7. https://www.earlychildhoodwebinars.com/presenters/ellen-galinsky/
8. https://www.rootsofaction.com/critical-thinking-ways-to-improve-your-childs-mind-this-summer/
9. http://academickids.com/encyclopedia/index.php/Pseudoscience
10. https://sciencebasedmedicine.org/tcm-traditional-chinese-medicine-new-developments/
11. https://www.theguardian.com/higher-education-network/2016/jan/26/why-people-fall-for-pseudoscience-and-how-academics-can-fight-back