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Nurturing Critical Thinking from Pre-School: Lessons for Early Years Educators

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ABSTRACT

Education across the globe is under increasing pressure to prepare learners who are ready to address numerous problems and challenges facing humanity in the 21st century and beyond. One of the notable factors that has been advanced is the lack of adequate and competent teachers able to nurture critical thinking and innovation skills. This paper explores the importance of critical thinking and strategies to develop them from early years. The study discusses the role of constructivism as a theory advocating active participation of learners and assuring that learning is significant. This presentation addresses many possible features and forms of critical thinking and the pedagogies that support learners in acquiring new competencies and skills to tackle 21st century challenges. The study concludes that if the world is determined to meet 2030 goals, early years educators should ensure adequate caregiving, and schools are expected to offer adequate methodologies for the development of skills of creative thinking as early as possible.

Keywords: Critical Thinking, Creativity, Constructivism, Early Years Learning.

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1. INTRODUCTION

The acquisition of thinking skills has become a major educational objective in recent years. Since the emergence of a global movement that calls for a new model of learning for the 21st century, the world is rapidly changing and filled with problems and possibilities that could not have been imagined few decades ago. Globalization process, people and societies around the world are connected through digital technologies, issues of climate change, information is so readily available that the need to learn and memorize facts diminishes, developmental acceleration in young generation, techno revolution, artificial intelligence and robots, to mention just a few. As emerging technologies enable easy and ready access to information, many tend to rely on them instead of taking pain to study and memorize facts. This has the tendency of creating a future generation that could pay little or no attention to learning as well exercising their mental ability. This development could influence the availability and supply of quality of human resources in the near future, especially if industries will be unwilling to substitute creative thinkers with machines or high-tech devices.

The need arises therefore for the integration of technology in educational activities while at the same time preserving the time tested virtues of personal creative thinking, acquisition and exhibition of knowledge from memory, and readiness for the world of work. It has been argued that formal education must be transformed to enable new forms of learning that are needed to tackle complex global challenges.

Today's preschoolers will be entering the workforce around the year 2040-45. It is not yet clear what the world will look like in five years, much less 15 years. What is known is that education in the 21st century will need to address a rapidly changing world. But then what should education in the 21st century look like? That is exactly what educators around the world are in the process of figuring out. The type of education we are experiencing today is no longer appropriate for preparing today's youth and children for a global market of tomorrow. Tony Wagner in his book, "The Global Achievement Gap", states ....

> "...mastery of the basic skills of reading, writing and math is no longer enough. Instead, work, learning and citizenship in the 21st century demand that we all know how to think" (Wagner, 2010, p. 17).

He goes on to say that children will need seven basic survival skills to succeed in the world that awaits them:

1. Collaboration across networks and leading by influence
2. Agility and adaptability
3. Initiative and entrepreneurialism
4. Effective oral and written communication
5. Accessing and analyzing information
6. Curiosity and imagination
7. Critical thinking and problem solving

One of the key goals of preschool education in 21st century is to ensure that the early years of schooling become less formal in nature, offering a more developmentally appropriate, child-led and skills-based approach to teaching and learning. The emphasis should be placed on the development of key skills, in particular thinking skills in order to develop children's skills and capabilities across the whole curriculum and provide frequent opportunities for pupils to think and do for themselves (Gelder, 2022). This move to encourage better thinking in early years' classrooms comes at a time when society, with its emphasis on the knowledge economy, demands individuals to be able to process effectively, organise and retrieve information. This shift means decreased emphasis on content knowledge and increased emphasis on transferable skills such as critical and creative thinking (Trickey & Topping, 2020).

Therefore, work, learning and citizenship in the 21st century demand that we all need to know how to think. Children are included in this context as they think too and they are the workforce and citizens of tomorrow.

What is critical thinking?

"To think" means to reason, to analyze, to weigh evidences and to solve the problem. Most importantly, education need to address not just thinking as it is but thinking which is creative and critical:

- It is the ability to make good decisions and to explain the foundations for those decisions.
- It is the process of examining and testing propositions to determine whether or not they correspondent to reality.

The use of critical thinking is one of the most valuable skills that can be passed on to children. Supporting and nurturing these skills is crucial to the development of self-esteem and strong academic and lifelong problem-solving skills which encompass all areas of a child's development: social, emotional, creative, cognitive and physical. So the sooner those skills are encouraged and built up in children, the better. However, the question of how best to teach these skills is largely overlooked (UNESCO-IBE, 2022). Re-thinking pedagogy for the twenty-first century is as crucial as identifying the new methodologies that may contribute to the development and mastery of 21st Century competencies and skills, and advance the quality of learning. Traditional approaches emphasizing memorization or the application of simple procedures will not advance learners' critical thinking skills or autonomy.

Fisher (1998), a leading expert in developing children's thinking skills, said that thinking is not a natural function like sleeping, walking and talking. Thinking, he stressed, is a skill that needs to be acquired and developed. He further stressed that thinking is a higher cognitive function of the brain, which must be nourished and nurtured during sensitive periods of development. Great potential exists in applying early brain development research findings to optimization of developmental processes in early years (Britto, 2017).

These include the following:

1. **Experiences impact the architecture of the brain.** At birth the human brain is in an amazingly unfinished state. The hardware is present but the connections are yet to be made. The child's experiences in the larger world result in connections that are reinforced as the experiences are repeated (Shonkoff & Phillips, 2000).
2. **A predictable process assists the brain in channeling stimuli into long-term learning.** The more senses involved during learning, the more likely the brain will receive and process information. By using multiple senses to learn, children find it easier to match new information to their existing knowledge.

To help children focus on a lesson, ECCE educators are advised to ask a relevant question or to show intriguing photos, encourage children to think about how they will use the new information and to ask themselves: "How is this information relevant to my life?" When presenting the actual content of the lesson, an educator should show to the children how the new information is similar to other information familiar to them. The following methods can be used to stimulate long term learning:

Use of real materials.

Familiar and tangible objects demonstrating concepts can help make ideas concrete. For example, rather than talking about birds or animals in a Zoo still sitting in the classroom of 3- and 4-year-olds, go outside to observe those animals, or watch a cartoon, then make a pictorial presentation of all the different birds/animals the children have seen and heard.

Provision of natural environments

Use places where an activity would ordinarily occur—home, school, outdoors, market, hospital, or any place where learning is more meaningful than sitting at a desk. For example, when studying nature, an educator may use outdoor activities for a nature hunt rather than showing children just pictures of trees, flowers or insects; or to take them to the hospital, chemist, or supermarket to threat relevant topics.

Designing of relevant and real-world learning activities

Learning activities that are designed to connect children experiences to real-world problems will transform their focus. Experiences in school differ markedly from their lives outside school. Gradually schools become irrelevant to interests and issues that affect them is therefore of real concern. (Irrelevant and outdated content of several textbooks for example).

Environmental influences can contribute to increased alertness and memory

Keeping such influences as safety, emotions, novelty, humour, music, choices, physical movement, and hands-on activities in mind, sets the stage for success.

Safety and well-being come before anything else

The brain attends to these needs first. A child who comes to school hungry, ill, or frightened by something that happened on the way will find it difficult, if not impossible, to focus on what is going on in the classroom. Children will struggle with learning if they feel afraid because a classroom setting is too restrictive, a home environment is very demanding, or a classmate's behaviour is aggressive. Emotions affect memory and brain function. When a person feels content, the brain releases endorphins that enhance memory skills (Jensen, 2021).

Start the day with humour

Tell a funny story or share a silly picture. Laughing makes children feel secure and content.

Sing a few songs together

Incorporate dance and movement with singing whenever possible. Children can draw, paint, or do other creative projects while listening to various types of music.

According to many experts, to develop basic critical thinking skills from pre-school age, there is a need to re-define the role of the teacher and the child. Teachers need to move from primarily being the information keeper and information dispenser to being an orchestrator of learning where knowledge is co-constructed with the child. Teachers have to become facilitators, mentors, sources and resources to scaffold children's learning, because the 21st century will require knowledge generation, not just information delivery, and schools will need to create a "culture of inquiry" that is shared equally by teachers and children. Although teachers' roles in contemporary preschool education are still evolving, teachers remain central, no matter how education is conceptualized (UNESCO - IBE, 2022). However, the role of teachers in the 21st Century must move away from imparting knowledge, towards guiding, discussing.

Teachers must also evolve into creative workers, jointly constructing knowledge with learners in the classroom. If today's teachers are to meet the needs of twenty-first century learners, they must not only develop what they know, but also how they know. Meaningful professional development obviously needed which requires teachers to shift their paradigm – to break with and replace their past ways of thinking and knowing with a totally new understanding of their role.

Preschoolers learn to think when adults take them seriously, engage them in meaningful conversations, inspire their imaginations, and ask them questions that get them to think. This is exactly the approach that is needed to be incorporated into the early years' classrooms. Early childhood educators have a very important role to play when it comes to helping children reach their potential. Their guidance and support helps children learn and develop critical thinking skills. For that, the educators need to understand first how a child perceives and thinks about the world around him. Therefore, it is important to understand the patterns/milestones of intellectual/cognitive development and age appropriate strategies of its development. All those are well explained through the Bloom's Taxonomy.

According to Bloom (as cited in Krathwohl, 2012) human thinking skills can be broken down into six categories. The first three are knowledge, comprehension, and application which are more concrete thinking skills. Then, analysis, synthesis, and evaluation require more abstraction and are known as critical thinking skills.

Knowledge

Knowledge involves remembering or recalling appropriate, previously learned information to draw out factual (usually right or wrong) answers. Using words and phrases such as: how many, when, where, list, mention, etc., will draw out factual answers and test the child's recall and recognition skills. (How many days are in a week? When did Nigeria become independent?)

Comprehension

It involves grasping or understanding the meaning of informational materials. The use of words such as: describe, explain, differentiate, etc., will encourage the child to translate, interpret, or conclude. (Explain how an egg becomes a chicken. Describe a watermelon/mango/to your best friend).

Application

This skill involves applying previously learned information (or knowledge) to new and unfamiliar situations. For example, "Remember last week, when we talked about the days of the week and we found them on a calendar? Today we are going to talk about the months of the year, which are also found on a calendar." Using such words such as: demonstrate, show, solve, examine, experiment, etc., will encourage the child to apply knowledge to situations that are new and unfamiliar. (What do an egg and the shape of a mango have in common? Can an egg grow into a cow?).

Analysis

Analysis involves breaking down information into parts, or examining of information. Using words and phrases such as: what are the differences, explain, compare, separate, arrange, etc., would encourage children to break information down into parts. (What is the difference between a red apple and a red pepper? Compare yam and cassava).

Synthesis

Synthesis means applying prior knowledge and skills to combine elements into a pattern. Learning to read is an example of synthesis, when a child needs to form syllables (knowing sounds of letters), then words and eventually sentences. Using the words and phrases such as: combine, rearrange, substitute, what if…?, etc., will encourage the child to combine elements into a pattern that is new. (What would happen if you used 10 straws instead of just one to take some juice? To ask a child to complete a story read to him).

Evaluation

Evaluation involves judging or deciding according to some set of criteria, without real right or wrong answers. Use of words such as: why, assess, decide, measure, select, explain, conclude, compare, summarize, etc., would encourage the child to make judgments according to a set of criteria. (What do all plants have in common? What might have happened if…Why do you think the sky is blue?). To be able develop critical thinking in preschoolers, educators should always remember about those 6 thinking skills and methods of training those skills. They should also understand that the most important thing is to have fun with these skills. When children enjoy the interactions they will love to learn.

The duty of a teacher is to help learn how to learn. Such an approach in education is known as constructivist teaching and learning which is based on Theory of Constructivism. The Theory has been in existence as teaching methodology for centuries. Translated from the Latin “construere”, Constructivism means “to build”. The root of Constructivism is the Developmental Theory of Jean Piaget (1896 – 1980) and Socio-Cultural Theory of Lev Vygotsky (1896 – 1934). Other psychologists and educationists who advocated Constructivism were Maria Montessori (1870 – 1952), John Dewey (1859 – 1952), Ernst Von Glasersfeld (1912 – 2001) among many.

According to Constructivism, knowledge is not a thing that can be simply given by the teacher in front of the learners. Rather, knowledge is constructed by learners through an active process of development. Constructive learning emphasizes the process and not the product (Awopetu, 2015). This means that it is more important to know how one arrives at a particular answer and not the answer itself (in mathematics for example).

How does this theory of knowledge translate into practice? How do definitions of what it means to "construct knowledge" inform educator’s actions in the process of nurturing critical thinking? Fundamentally, constructivism says that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences.

Theory of Constructivism is a learning theory and its main beliefs are:

1. Learning is an active process.
2. Knowledge is constructed from (and shaped by) experience.
3. Learning is a personal interpretation of the world.
4. Constructivism emphasizes problem solving and understanding.
5. Teaching/learning process uses authentic tasks, experiences, settings, assessments.
6. Content presented holistically –not in separate smaller parts.

Constructivism is a theoretical foundation for early childhood and is all about children learning how to learn. Children construct knowledge through physical activity, social interactions with others and their own active thinking. Children practice the tools of learning: how to plan, monitor, revise, reflect, investigate and solve problems; and to see and exchange points of view with others. Children are viewed as capable and competent co-constructors of knowledge who are being groomed for the demands of an ever changing world. Constructivism also capitalizes on children's natural curiosity and it advocates for play as an important means to early development of thinking skills. It places a strong emphasis on having knowledgeable, responsive and reflective educators who participate in play to guide children's planning, decision-making and communication and extend their explorations. The teacher's role therefore is to observe and listen to children's ideas and scaffold learning.

Characteristics of critical thinking

1. Flexible – learners are able to change methods, patterns of reaching the goal.
2. Independent –learners are able to identify and solve the problem autonomously.
3. Systematic –learners are able to control and assess the process and the results.
4. Developing sense of responsibility – learners are bold/confident in plan of action and decisions.

Unfortunately, today's reality is that the conformity of schools has drilled children into a submission that prevents analytical and creative thinking. Too often, children are trained to look for the one "right answer" and follow standards, and therefore are actively discouraged from thinking "outside the box." Early years educators must constantly keep in mind that children in early childhood classroom are developmentally different from pupils who are in primary school (Britz & Richard, 1992). They cannot be expected to remain seated for a long period of time. It is not developmentally appropriate to provide lots of "homework" or "classwork" in early years. as well.

Some lessons for ECCE educators

To make the development of critical thinking skills successful, the following can be used by educators in ECCE classroom:

Always consider individual differences (temperament, learning styles, learning tempos, etc). Personalization has implications for what, how and where we teach. Educators no longer have to adhere to the 'one-size-fits-all' approach of traditional education systems. With personalized learning, individuals approach problems in their own way, grasp ideas at their own pace, and respond differently to multiple forms of feedback (Hampson, Patton & Shanks, 2021). Effective twenty-first century teachers cultivate learners' individual sense of wonder and inspire them.

Encourage child's zeal to create something new

It has been observed by researchers that few schools teach children to create knowledge; instead learners are taught that knowledge is static and complete, and they become experts at consuming knowledge rather than producing it (Awopetu, 2015; Britz & Richard, 1992; Fisher, 1998). The ultimate goal of learning is to stimulate learners' capacities to create and generate ideas, concepts and knowledge. To this end, there is a need for meaningful learning experiences that tap into and expand learners' creativity.

Appreciate every child for his/her personal achievement.

Appreciation and encouragement help children develop creative capacities in themselves and feel recognized.

Stimulate in the child desire to find solutions independently

Traditional approaches emphasizing memorization or the application of simple procedures will not advance learners' critical thinking skills or autonomy. To develop the higher-order skills they now need, individuals must engage in meaningful enquiry-based learning (home work should reflect relevant and age appropriate knowledge).

Introduce collaborative learning

Gone are the days when people learned and worked in isolation. Today, people regularly take part in online communities where they share opinions, critique ideas, swap insights and comment on each other's plans and aspirations. Collaboration is a 21st century trend that shifts learning from teacher or lecture-centered settings to collaborative ones. Collaborative learning – the intentional grouping and pairing of learners for the purpose of achieving a learning goal. Ultimately, participatory learning is not simply a matter of interaction, but of interaction that results in the co-creation of learning. What makes this approach particularly appealing is that all members of the group are responsible for teaching their peers and managing questions and clarifications. In other words, learners are responsible for each other's learning as well as their own.

Parental involvement

Even though children nowadays spend more time within school that at home, the role of parents must be acknowledged and they should be encouraged to participate or contribute to their children's learning process.

Promote learning without borders

People can learn anytime and anywhere. Today's learners must recognize that learning and relearning can occur outside classrooms and schools throughout their lives. It is likely that these learners will require an introduction to learning options available to them now and in the near future. Fostering this commitment to lifelong learning will ensure that learners remain open to new developments and opportunities as they arise.

Encourage persistence

When a child says he or she can't do something that you know he or she can do, educators should try not to get caught up in the attempts to avoid doing the task. Instead, they should try and motivate the child by making the task fun and interesting, set a challenge to help make learning fun, for example: "I wonder how many spelling words you can get through in one minute?" Reminding children of positive goals can also help them to keep trying, for instance: "Keep practicing a few more times. Just think how proud you will feel when you perform really well at your exam in a couple of weeks."

Watch for signs of frustration

If a teacher noticed a child becoming frustrated by a task, he/she could try and step in before he or she gives up. It can be a good idea to encourage the child to take short break, or to try something else for a while. Taking a break and coming back refreshed can often make tasks seem easier.

Appreciate the potentials of play with the mediating role of adults/caregivers

Basics of critical thinking the best can be developed through play coordinated and mediated by adults.

1. Play can increase problem solving abilities:

• In an academic environment play helps children adjust to the school setting, enhances children's learning readiness, learning behaviours, and problem-solving skills.

• Play and recess may increase children's capacity to store new information, as their cognitive capacity is enhanced when they are offered multiple changes in activities during the school hours.

2. Play can increase creativity:

• Play helps children become more creative as it encourages recombining ideas, making associations, and transforming objects.

Unfortunately, in contemporary early years' classrooms there is no much time dedicated to play activities. Pressure and priorities of academic skills force out the play from childhood (Hampson, Patton & Shanks, 2021).

Many developmental and behavioral problems of children in 21st century can be traced to the limited time spent in free play. Level of involvement in play activities among preschoolers drastically reducing which leads to underdevelopment of play skills in children and by extension to underdevelopment of thinking skills (Awopetu & Ossom, 2018).

How can caregivers encourage critical thinking?

Expect it: Require children to defend their ideas and answers to questions. Show them it is not enough to have an opinion or the "right" answer. They need to defend their opinions and understand how they arrived at the answer and why it is "right."

Model it: The teacher can show children how to think critically and creatively about instructional material. Even in "teaching for the pass on a test," show children how to think about alternative answers, not just memorize the right answer. Show why some answers are right and some wrong.

Reward it. When good thinking occurs, teachers should call attention to it and to the students that generated it. Learning activities and assignments should have clear expectations for students to generate critical and creative thought. Special incentives should be provided. Rigorous analysis will only occur if it is expected and rewarded.

Employ and encourage strategic questioning.

Questioning is an effective technique to engage learners. Asking probing questions can foster curiosity and teaches learners to ask questions, it expands thinking and processing of information, stimulates deeper learning. Questions encourage learners to explore and redefine their understanding of key concepts. It therefore should be noted that children who can ask insightful questions are more likely to be successful in school. Critical thinkers are active learners. They are people who constantly question what they see or hear, and who want to know what details lay beneath the surface.

CONCLUSION: NEXT STEPS AND FUTURE ISSUES

Just as teachers cannot overhaul the education system alone, nations cannot counteract worldwide deficiencies in education systems in isolation. The world will face consequences if today's learners are not adequately prepared to think critically to be able to collaborate and resolve the world's economic, environmental, health, social and political challenges. The roles of schools in the future remain uncertain. Nations must acknowledge the many reasons why twenty-first century learning must be different. They must critically evaluate traditional education to determine whether schools are living up to current expectations. Every nation has its own vision of what a twenty-first century education should look like.

Every nation can contribute to a global pool of expertise on how best to implement a twenty-first century education system. Each nation must examine new ideas and increase the collective impact by tackling these challenges through regional partnerships and coalitions that accommodate local needs and contexts. One thing that must be emphasized is the adoption of relevant positive aspects of culture within specific contexts to make education valuable and the strongest possible channel for positive societal change. Education should prepare learners to tackle collaborative problem-solving scenarios that are persistent and lack clear solutions. Real-world challenges are highly complex, often ill-defined and interdisciplinary in nature.

These challenges may vary from nation to nation, but the message is fundamentally the same: education is failing to prepare learners for the uncertain future ahead. Learners are missing out on experiences that will prepare them for more satisfying lives and productive work. Nations are also losing opportunities to prepare youth for citizenship, and economies are suffering from a lack of innovation. The twenty-first century has immense potential to reaffirm the role of education with a view to equipping young learners to address complex societal, economic and environmental issues. The transformation from teacher-led learning to self-directed learning and critical thinking will provide learners with a range of competencies and skills needed to succeed in modern global societies.

The most popular topic in recent educational discourse is 2030 Global Agenda and Achieving of Sustainable Development Goals. Therefore, if the world is really determined to meet 2030 goals, ECCE educators should ensure adequate caregiving, and schools should be encouraged to offer adequate methodologies for the development of skills of creative thinking as early as possible which will help in actualisation of the vision we all hope to achieve over the next 12-15 years.

"If your brain won't learn and adapt in a fast changing world, you won't prosper and neither will society." (October, 2015, Jim Yong Kim, World Bank Group President)

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