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Thinking and Learning Demands in Contemporary Childhood

Cenk Akbiyik

Additional information is available at the end of the chapter

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Abstract

Is today's childhood is the same as the past's? Frankly speaking, we cannot answer this question as a clear yes. It is obvious that children today are more into tablet computers, social networks and online games than traditional child games. Besides, our communication styles have been changed significantly for the past years. We, no longer need to meet others face to face to ask for help or to chat. Artificial intelligence, machine learning and robots are another story of the contemporary world. Robots capable of perceiving their surroundings and making decisions have started to deprive many people of their jobs. But what kind of jobs will human beings perform? The increasing emphasis on innovation, cooperation, critical thinking, being creative, problem solving, communication skills and project management is an indicator of what kind of a business world will today's children meet in the future. This on-going trend also includes clues about how should children be educated. This study is focusing on thinking and learning demands expected contemporary children to meet. Throughout the chapter, the changing world was depicted briefly and then demands of the contemporary age on critical thinking, creative thinking, problem solving and learning were explored respectively.

Keywords: thinking skills, critical thinking, creative thinking, problem solving, learning

1. Introduction

It is a fact that the phrases starting with “the changing” are so popular in contemporary societies. Today's people want to change. They want to change the World, the technology, the economy, the educational system, the health system, etc. Many people are in search of innovations, new ideas and new trends. Our unending demand on change and innovation made our world a different place than it was 100 years ago. Technology, economy, lifestyles and many more have been through a drastic differentiation. We and our children are living

in a different society than yesterday's society. Everything changed but did thinking or learning demands on children remain the same? In this current chapter, I will try to question and present a brief picture of thinking and learning demands that contemporary children expected to meet.

1.1. The changing economy and business

The humankind has constructed many economical systems in search of food, wealth and power. Hunter-gatherer societies left their places to agricultural societies, then to industrial societies. Each system had its own demands and products. While some of the indicators of agricultural society were farmers, rural life, large families and food production, some indicators of industrial society were blue collar workers, urban life, nuclear family and goods production. Nowadays, we live in a society called as post-modern or post-industrial society. Apparent characteristics of this society are information production, services, white collar workers and advanced technology.

We know that the economy has deep impacts on everything. It affects how we earn, how we work, and what we eat. Interestingly, the economy also has impacts on our cognitive and affective skills. It affects what we learn, how we educate our children and even how we perceive the world around us. Nobody expects cognitive representations or schemas of a farmer and of an engineer to be the same or selective attention of a hunter and of an insurance broker, even though there may be significant similarities, to be the same.

1.2. The changing communication media

Within only a few decades, the communication media has evolved significantly from paper-based media to electronic media. Rapid developments in computer networks and software have resulted in various communication tools. Nowadays, a person without a mobile phone number or without a social network account is simply out of consideration. The communication rate and speed has escalated. Selfies, likes and location notifications are some of the many online ways we use to express ourselves. We are after transferring our thoughts and emotions using emoticons and animated gifs. Even one of the basic communication needs of human beings, face-to-face communication, has partially left its place to video calling.

Interestingly, the changing media has been affecting our way of communication. Nowadays, no one is willing to be waiting for sending or receiving messages. We demand immediate responses. Besides, there is an inclination of readers to read shorter texts written in everyday language. Blogs and short videos have already become dominant information sources for many people.

1.3. The changing technology

There is no doubt that the technology is progressing. Its rapid change rate can even sometimes be frightening for many people. Regarding technological changes, I have been neither

a pure optimist nor a pure pessimist. Because one particular technology may arise and solve some problems in humans' life while the very same technology may cause many other unpredicted problems. What attracts my attention more is how changing technology and society interact.

One interesting aspect of the use of technology is that its use shapes human relations, culture and economy sooner or later. Take information and communication technologies (ICT), for example. Recently, television has affected how we entertain ourselves and how we interact with our neighbours. Nowadays, the diffusing information technologies have been continuously affecting the way we communicate with others, the way we work, the way we express ourselves and even the way we learn. Ironically, today's wisest existence that everyone appeals to is an online search engine. Many thinking-related strategies such as research making, report writing and note taking have already changed and adapted with the current technology.

1.4. The changing culture and social structure

The term culture has various definitions. But, it is obvious that everything humans do impact culture in one or another way. The changing economy and technology have been affecting and changing culture and social structure. Popular culture has become even more popular with the widespread use of social networks. A song or a saying may spread among people in a very short time. You can see millions of people around the world displaying the same pattern of behaviour and then getting bored of it and then sticking to another pattern. Thanks to the communications media, the cycle of popularity has shortened dramatically. A particular type of behaviour can be labelled as "cool," "popular," "boring" and "lame," respectively within a few months.

1.5. The changing education system

It would be irrational to think that educational systems would not be affected from the changing world. Simply, the changing world has affected how educators teach. Among the educators, a shift from behaviourist to cognitive and from cognitive to constructive instructional methods can be clearly seen. Memorising, repeating and practising are just not enough to be a successful student anymore. Students are expected to search for information, to ask questions, to be creative, to solve problems and to think in many ways (deep, lateral, critical, creative, flexible, etc.). Educators have already been talking about a new instructional approach that is spreading. This new approach called connectivism is focusing on informal learning, making connections and learning hubs. It even proposes that learning can occur in non-human appliances such as computer networks or artificial intelligence devices.

On the other hand, the communication technology has also affected the way educational contents are delivered. Institutions no longer need to arrange face-to-face lessons. Distance learning environments brought convenience of delivering the content to large number of people

without limitations of physical distance. Blended learning environments supplied both flexibility of distance learning and social interactivity of face-to-face learning environments.

1.6. The changing childhood?

What does all this change mean? I tried to draw a very general picture of the change we experience in the contemporary era. But does it affect childhood? If so, how? In my opinion, living in a traditional society of the past was much more cognitively comfortable than living in a contemporary society. And I think this is valid also for children. Because children in a traditional society had to learn social rules and obey them. This was enough to survive socially. Those children did not have to ask questions, collect evidence, create new ideas or generate novel solutions. I think, nobody can deny the cognitive comfort of accepting the ongoing rules and procedures without questioning them. But the situation is quite different now. Today's children have to cope with changing technology, changing trends and changing role models. And generally, they are unable to find close social bonds preventing them to do the wrong (or what the society sees as wrong). In many countries, children are seen as responsible future citizens and they are expected to gain some degree of citizenship awareness, which means they must have knowledge to ask questions about political systems and applications. When large amount of knowledge a child has to learn about many aspects of complex contemporary life is considered, it becomes clearer that being a contemporary child is not easy. Contemporary children need to learn more and have certain cognitive skills to cope with demands of their societies.

2. Critical thinking in contemporary childhood

We can explain critical thinking as a kind of thinking focused on what to believe. But deciding whether or not to believe in something can occur in a number of ways. People may apply to heuristics, cultural standards or even mystical signals while making decisions. It is obvious that these decision methods cannot be called as critical thinking. Critical thinking is about logical and consistent thinking and also clarification and reasoning. So, we can roughly define critical thinking as thinking logically, consistently and clearly to decide what to accept. So, it can be claimed that critical thinking helps us to make right choices and decisions. As Epstein stated, critical thinking is a defence against a world with too much information and too many people trying to persuade us [1].

The content of critical thinking covers a number of skills and dispositions. Critical thinking skills generally involve analytical thinking. Reasoning, making inferences, questioning, clarifying meaning, identifying relations, interpreting numerical and graphical representations of information are among these skills. Some critical thinking skills such as dealing with fallacies involve language skills, whereas some others (i.e., assessing thinking criteria or evaluating conclusions) involve evaluative thinking. In addition, critical thinking is related with a set of affective variables, which are called critical thinking dispositions. Being open-minded, being aware of one's own emotions while making judgements and seeking alternative explanations are examples to critical thinking dispositions.

Critical thinking has borrowed many concepts and techniques from other disciplines such as being sceptical and asking questions from philosophy, reasoning and inferences from classical logic, deciding with numbers and interpreting descriptive statistics from statistics, cause and effect and correlational relations from scientific research, fallacies from rhetoric, diagrams and visual representations of information from mathematics and finally nature of human reasoning from psychology. In addition to these, critical thinking has strong ties with language and literature. In the subsequent sections, I will try to discuss the needs for and the uses of critical thinking from various standpoints.

2.1. Economy and business

As briefly explained before, the changing economy and business have yielded a demand in knowledge intensive job positions. These positions generally require more thinking skills than labour intensive jobs. White collar employees are expected to know, learn more, solve problems and make correct decisions. But unfortunately coming up with accurate and correct decisions is not always easy in today's business world. It requires a significant amount of knowledge, experience and thinking skills. It is true that most of us believe we have enough experience to say a few words about the situations we meet. We see nothing wrong about reaching a conclusion by comparing the current situation with the past ones. Only a few of us can realise that the information in hand may not be enough to reach a healthy conclusion. According to Kahneman, people overemphasise the seen, discard the unseen and reach conclusions rapidly [2]. That is why critical thinking skills are among those skills many employees should have and use. For example, thinking on such issues as adequacy of information, sources of information, validity of evidences, health of reasoning and validity of inference would help employees to make right choices and in this way to work more efficiently. Ironically, it is also true that there is a high risk of annoying your colleagues and bosses if you overthink critically and ask too many questions.

Through this perspective, I believe contemporary children should begin acquiring critical thinking skills before they become adults. They should start asking questions, seeking evidences and examining their own thinking as soon as they are mature enough to do.

2.2. Culture and social structure

The lifestyle of the past, which according to me can be identified with rural life, patriarchal large families, emphasis on traditions and authoritarian government officers, can somehow be seen consistent within itself. In general, obeying the authorities was seen obligatory even when these authorities did not treat fairly. Seeking for justice was generally difficult. People tend to see themselves as servants or even properties rather than citizens. Applying traditions and religious practises was quite enough to find the true path and solve many social problems. Since, people were not expected to ask questions about the ongoing rules and applications, I see those days of humankind as the "cognitive comfort days." In fact, questioning the accepted rules and practises was seen as rebelliousness and generally was not permitted.

But the situation is quite different today. First of all, predetermined traditions have been weakening for many decades. Contemporary adults are expected to make their own decisions. And

making correct decisions is not always easy. It is a cognitive activity, which requires knowledge, thinking, planning, questioning, responsibility and more.

Moreover, most of the people today are living in cities where they know nothing or very little about the others. Each day, people meet tens of new faces whom they have to make decisions. We generally tend to make fast decisions about others based on shortcuts and our previous experiences. Unfortunately, few of us realise that first impression may be misleading and more knowledge is needed to make a right decision. For example, being competitive may not be enough to be a good director or a kind voice does not always mean a nice person.

And finally, we know that herd psychology is one dominant characteristic of human beings. Although we think that we are unique individuals, our decisions are generally shaped by external stimuli. Although it is one of the survival techniques of humankind, it can yield some undesired results. The social pressure can be very strong among adolescents, which may cause smoking, fighting, joining to gangs or even use of drugs. Not obeying the group norms is difficult as it requires independent thinking, courage and criticising.

Frankly speaking, all these factors can easily take cognitive comfort of people away. Even worse, they can result in indecisive society members who are unable to make their own decisions and who permit the others to think for them. Today's people need certain cognitive skills to fulfil contemporary society's expectations and make right choices. I see critical thinking among the most important skills society members of today should possess. That is why contemporary children and adolescents should acquire critical thinking skills, at least to a certain degree, to become liable future members of the society. They should think critically not only during making political or business decisions but also in various social contexts.

2.3. Media

The media may be one of the most influential factors in a children's or adolescent's life in few ways. Each person in contemporary society exposes to serious amount of media messages every day. Media contents such as commercials, movies, serials or music clips continuously keep giving messages. The media messages aim to persuade us to do particular behaviours like buying a product or a service. Interestingly, these messages often do not contain any explicit information about the related products or services. Instead, they try to convince viewers by affecting their emotions. Hence, emotions are strong factors that start and guide our behaviours; media messages aim to make us think that we will feel more confident, happier or healthier when we behave in accordance with them.

On the other hand, we know that role models are important sources for learning. According to social learning theory, behaviours are learned from the environment through the process of observational learning. Thus, a role model may start or encourage behaviours approved by the society, whereas another role model may start the unapproved ones. The effects of media contents can be serious when we think that movie and music stars and even cartoon characters may be seen as role models for many children and adolescents.

The hypodermic syringes model is one of the oldest communication models. It claims that media messages can be directly injected into people's minds. Today, the hypodermic syringes

model has lost its popularity. Because we know that there are many factors such as background knowledge and experiences, culture and attitudes that manage how a person receives and accepts messages. Critical thinking skills of children and adolescents can play a really critical role here. Because critical thinking skills are like cognitive protectors, they are among the skills that may protect viewers from bombardment of media messages.

But there is more. Media messages are not only commercial messages, which are trying to persuade us buy something. The history of humankind is a stage full of endless power plays. From emperors to sultans, from governments to companies, a considerable number of people want to hold power in their hands to dominate others. Media often acts a means of constructing and maintaining power. For example, propaganda is a known technique used to lead masses to desired paths. It is used to influence an audience often by presenting facts selectively or using loaded language. Interestingly, propaganda aims to produce emotional rather than rational responses. To an extent, propaganda cannot be identified easily by many people. Because, it uses many manipulative techniques. For example, by selecting specific words and phrases, events can be presented better or worse than they actually are. The very same group of people may be labelled as “terrorists” or “guerrillas” or “freedom fighters” by different media groups.

Without certain cognitive barriers, a child or an adolescent would be open to all media messages. You may think that legal regulations may be enough to keep children and adolescents safe. But in fact, children and adolescents need to have certain cognitive barriers to be able to protect themselves. These cognitive barriers may be constructed with the help of critical thinking skills.

Critical media literacy is one field dealing with the acquisition of these cognitive barriers. Children and adolescents need to practise certain exercises in order to gain this critical awareness. For instance, one of the easiest ways to apply for parents is co-viewing. Co-viewing is watching videos and TV together with their children and talking to them while watching. Asking questions such as “Why do you think did they do that? Everyone in this video looks so happy. Can it be the same in real life? What did you see in this commercial, can it be true? What may be their purpose?” and discussing the answers is an effective way to construct critical media literacy skills.

2.4. Political systems

Uneducated, unthinking and uninformed societies may be ideal for authoritarian governments and dictatorships. But it seems that democracy has been becoming the leading political ideology all over the world. The democracy, in modern usage, is a system of government in which the citizens exercise power directly or elect representatives from among themselves to form a governing body. In addition of using their votes during elections, the key role of citizens in a democratic system is to participate in public life and become informed about public issues. Citizens of a democratic country are expected to watch carefully how their political leaders and representatives use their powers.

It is accepted that people should collect information, reason, make inferences, criticise and ask questions in a democratic political system. These skills are obviously within the content of critical

thinking. You need to think critically to be able to ask the right questions. You also need critical thinking to make valid inferences and to reach correct conclusions. In fact, critical thinking is seen as a necessary skill for the people living in a democratic society. That is one of the main reasons underlying the efforts to teach critical thinking skills or include them in school curricula.

Expecting children and adolescents to keep responsible citizens may be found too much. I would not disagree with this idea. But in order to become responsible citizens of the future, they should begin acquiring critical thinking skills during their childhood. Hence, acquiring, adapting and using these skills require a certain amount of time, practising and a considerable effort.

2.5. What does critical thinking mean for contemporary children?

Throughout the sections above, I gave brief explanations from standpoints of economy and business, culture and social structure, media and political systems. I wanted to depict a brief picture of how critical thinking is essential in contemporary life. But what does critical thinking mean for contemporary children? We know that critical thinking requires a significant amount of cognitive processes. It also requires a certain level of both cognitive and affective maturation. It would be unrealistic to expect a child think really critical before he or she reaches the formal operational stage. But as will be explained in later sections, critical thinking skills cannot be acquired in a few months of time. Acquisition of critical thinking skills is a process and it needs practice and application of these skills in various real-life situations. Children should be thought and guided to practice critical thinking skills, of course using proper techniques and situations in accordance with their cognitive and affective development, even in their early developmental stages.

Moreover, critical thinking is not only a set of cognitive skills. As explained earlier, it also involves affective responses such as developing courage to ask questions. We know that affective responses demand longer time periods to foster and internalise. This is another reason of why contemporary children should begin practising critical thinking before they become adults.

At this point, I have to state that children of the Western world are more advantageous in terms of critical thinking. Critical thinking is a legacy of the Greek adopted by the West. Also, critical thinking is culturally valued in many Western countries. But the situation is reverse in many Eastern countries. As stated earlier, critical thinking is not desired and valued in some cultures. That is why contemporary children living in Western countries are able to acquire these skills easier and use them more freely.

3. Creative thinking in contemporary childhood

Most executives, many scientists and almost all business school graduates believe that if you analyse data, this will give people new ideas. Unfortunately, this belief is totally wrong. The mind can only see what it is prepared to see. Analysing data will enable the analyst to select from his or her repertoire of old ideas and find which one may fit. Analysing data will not produce new ideas [3]. That is why if we want children and adolescent to produce new ideas, we have to ensure they are able to think creatively.

Creative thinking is referred with “thinking the original,” “thinking the unthought” or “seeing the unseen.” Statements such as creative thinking, creativity, innovation, difference, authenticity and originality are so popular in contemporary life. It seems as people are likely in a continuous search of the new. But personally, I find this emphasis on the “new” so artificial and exaggerated. Because, I see that individuals are not capable of thinking of ideas completely new and totally different from the existing ones. Big innovations do not come suddenly and in one piece. Our creative imaginations must have something to work on. As Adair stated [4]: we do not form new ideas out of nothing.

3.1. What is creative thinking about?

Although it is clear that creative thinking is about new ideas, it also involves making judgments about them. The creative process includes elaborating on the initial ideas, testing and refining them and even rejecting them [5].

Paul Torrance, commonly known as the “father of creativity,” identified four creative thinking skills: fluency, flexibility, originality and elaboration. His research also provided evidence that these four skills can be taught and assessed [5].

A simple search reveals the creative thinking literature, which is full of stories of inventors making sudden and unexpected inventions. But these kinds of sudden enlightenments do not come to any people. Instead, they come to the ones who are focused and who spent considerable cognitive effort on one specific subject. Thus, creativity is a process and it is subject to effort, time and preparation. The nearest approach to identifying an underlying process is the one made by Graham Wallas. He proposed that the generation of original ideas passes through four phases: preparation, incubation, illumination and verification. Although creative thinkers may not follow the same sequence, it is nonetheless a useful framework [4].

3.2. What is practical value of critical thinking?

As stated earlier, the business world has been putting great emphasis on new ideas. Without very strong reasons, no one expects them to spend their financial and human resources on innovation, creativity and creative thinking. There is a creativity game going on and while the good players can boost their businesses, the others draw back or remain the same.

According to Bono, the need for creative thinking is related with a number of factors [3]. Reducing costs of quality programmes is the first one of these factors. Because doing the old things with more quality may not be the right answer. There may need to be a change in what is being done. Maintenance management is the second reason. Maintenance management is strongly oriented towards problem solving. And there is a need for creativity to solve problems arising time to time. And finally, competition is the third reason. There is a need for some product and marketing initiatives differentiation to keep up with competitors in terms of price, quality, distribution and promotion.

On the other hand, it will not be fair to limit the value of creative thinking with just businesses and technology. Political systems, social sciences, art, literature, philosophy and media are all products of human creativity. Without new ideas, none of them would be possible.

3.3. Creative thinking and artificial intelligence

Artificial intelligence is the study of intelligence exhibited by machines. With the help of artificial intelligence, many tasks in our lives became easier. From voice recognition software to self-driving cars, artificial intelligence is progressing rapidly. We know that computers are already far better than human cognition in a number of tasks. For example, they outperform humans in making calculations and performing repetitive tasks. But computers fall very behind of human mind when we talk about thinking skills. But it seems that with the advancing artificial intelligence technologies, machines are approaching human mind step by step.

Today's artificial intelligence devices are designed to perform a narrow task. But, the long-term aim of the researchers is to design a general artificial intelligence. When this happens, we can see devices that are learning, making decisions, asking questions and even criticising. No need to mention that such sophisticated devices will have deep impacts on every single system that humans created. From robotic workers to policemen, artificial intelligence would be everywhere taking many jobs from humans.

According to me, the last thinking skill a machine could perform will be creative thinking. And I think, in the future the distinctive thinking skill among artificial intelligence and human mind will be creative thinking. That is why, creative thinking of children could be more important for their own future. In tomorrow's world, only those who possess distinctive skills, especially creative skills, would be able to find better jobs.

3.4. What does creative thinking mean for contemporary children?

Children, especially at their early years, are naturally creative. Probably each one of us has witnessed how unusual connections children can make and how unexpected answers they can produce. This characteristic of children depends on their creative innocence. Neural pathways in children's brain form with time and experience. When an individual reaches to adulthood, he or she acquires, to a large extent, the thinking ways of the society in which he or she lives. Cultural viewpoints, heuristics, prejudices, past experiences and generalisations force individuals think in one direction limiting their capacity of creative thinking. In this case, special trainings and methods are used to catch the lost creativity once again.

But as known, creativity is not valued in every society. Living in a society where creativity is not valued can be difficult for children. In such societies, children are raised hearing precautions that mean "you are not supposed to do anything different and new, just obey the traditions." But it is true that all societies require new and original ideas. All societies need inventors, innovators and pioneers.

I believe it is largely parents' and teachers' duty to show effort to protect this natural tendency of children. And this can be achieved partially by creating creative learning environments (as will be explained later) and partially by displaying very simple behaviour patterns. Patterns such as avoiding laughing at children's ideas, listening to them seriously, showing interest in their opinions, asking questions about their ideas, answering their questions patiently and encouraging them to think and create more will ensure natural curiosity and creative of children. Otherwise, I am sure it must be discouraging and even offending for every child not to be listened or getting ridiculed.

4. Problem solving in contemporary childhood

Human life is full of various problems to be solved. In very broad terms, a problem can be defined as a difficulty that has to be solved. It can be surprising how even ordinary problems we meet each day in our daily lives can require strategies to be solved. For example, such as preparing tea, a simple task we solve without even thinking, has many steps and it requires some knowledge. Problems we encounter may be in various forms such as logical, algorithmic, case based or design based.

Problem solving is not a single skill, but rather an overlapping of a number of thinking skills. Likely to be involved in it are logical thinking, lateral thinking, synthesis, analysis, evaluation, sequencing, decision making, research and prediction [6]. While some of these problems by applying certain rules and procedures, like logical and algorithmic problems, some problems require intensive thinking and critical thinking skills. On the other hand, solution of design problems and case-based problems demand creative thinking to generate new and original ideas.

As we see, problem solving skills involve selecting tools and procedures that serve to overcome the difficulty. Problem solving is a complex process requiring a set of skills in which some are cognitive and some are affective. Cognitive aspect of problem solving is about reasoning, critical thinking, creative thinking and decision making. Problem solving is also related with affective variables such as self-confidence, communicative skills, motivation and self-efficacy. Problem solving has also a behavioural aspect, which is going into action and ability to implement generated solutions.

The known steps of problem solving have been proposed by Polya. Although he proposed these steps for mathematics instruction, they reflect a general approach to problem solving and they can be used in various problems: Understanding the problem, planning, implementation and evaluation. Other models proposed on problem solving more or less reflect the steps of Polya.

People face many different and new problems as their lives move away from the traditional. Solving problems in traditional manner can be seen as referring to ongoing applications and rules, using heuristics and cultural shortcuts. But generally, solving most problems requires some sort of strategy, a method. When people are solving problems, they may use all more than one method. This is quite logical, as the heuristic method can lead to a very rapid solution while the systematic search is slowest [7].

4.1. What does problem solving mean for contemporary children?

Contemporary children face various kinds of problems. Of course, a part of these problems are no different from the problems of children of the past. On the other hand, contemporary children have to cope with many contemporary problems. I see problems regarding educational system as the first group of problems contemporary children face. The compulsory education policy has eroded the elitist structure of educational institutions. Despite many ongoing efforts, today schools may force students to confront with many problems such as bullying, substance addiction, mobbing, peer violence or gangs. It is clear that contemporary children should have necessary affective and social skills in order to be able to cope with all these problems.

According to me, technological problems are the second group among contemporary children's problems. Today's children use many technologies such as computers, tablets, mobile phones, social media sites and blogs. While these technologies make our lives easier, they also produce many problems. Keeping personal information safe, plagiarism, online bullying, ineffective time management, exposure to harmful images and even internet addiction are among these. Children today also have to learn how to use these technologies effectively and properly.

Changing social and family structure may form third group of problems contemporary children have to struggle. Large families of the past have disappeared. Today's families are formed by generally three or four people, which means children may not have enough social interaction within the family. Moreover, divorce rates are rising gradually resulting many broken families. Getting used to living with either of the parents, step parents and step sisters or brothers is another big problem of today's children. That is why it is curial to equip contemporary children with necessary coping skills and problem solving strategies regarding contemporary family structure.

5. Learning demands in contemporary childhood

In a changing world, educational systems remaining the same are unlikely. The changing economy, social structure, media and political systems have affected learning demands from children one way or another. Children have been expected to learn a variety of disciplines for a long time. Although priority among them might have changed over time, mathematics, literature, foreign language, art, science, social sciences and physical activities have been among these disciplines. But our contemporary age has put some more learning demands and also more responsibilities on children. The most important demand is seen as learner centeredness, which gives responsibility of the learning to students. Moreover, flexible learning environments, non-formal learning demands, new types of literacies and emphasis on thinking skills altogether create a different educational environment than the past.

5.1. From behaviourism to constructivism to connectivism

Instructional approaches are general understanding of theories and practices regarding instruction. Behaviourist, cognitive and constructive approaches are the three commonly accepted approaches in the educational literature. An observable shift in instructional approaches has been taking place for many decades.

Behaviourist approach is the oldest and it leans on behaviourism, a school of psychology that focuses on observable behaviours. This approach explains learning as change in behaviours. The most important principle is the role of external stimuli on learning.

The behaviourist approach had deep impacts on educational systems. Practices such as step by step explanation, use of rewards, emphasis on drill and practice, teacher centeredness and students seen as passive receivers are all outcomes of this approach.

Although the behaviourist approach explained many aspects of human learning, scientist realised human learning is far more complicated and cannot be shaped through only external stimuli. Besides, behaviourist practices fell short to find adequate solutions to some problems in learning environments. That is why, a second approach known as the cognitive approach began to foster.

The cognitive approach is also behaviourist in nature. But cognitivists stopped seeing human cognition as a black box. Instead, they grew an interest for discovering its nature. This approach also had deep impacts on schools and educators. Concepts such as mnemonics, learning strategies, learning styles and perception entered educational literature and found themselves many application areas.

Unlike the former two, the constructive approach derived from philosophy, not from psychology. The constructive approach brought a totally different perspective to learning. It defended a subjective position and explained learning as construction of information by the individual himself. Constructivism also suggested that responsibility of learning belongs to learner himself or herself. This approach gave priority to discovery learning, real-life problems, thinking skills, cooperation and context of learning. Although there were a few pioneering educators (like Dewey and Montessori) supporting constructivism long before it became widespread, the constructivist approach has started to spread after 1990s.

In the contemporary era, with the influence of information and communication technologies a new trend is fostering. For a while, educators have been talking about a concept called connectivism. It can be stated that connectivism is making an emphasis on informal and non-formal learning, the two concepts largely neglected by the other instructional approaches. The main focus of connectivism is about humans learning by making connections. Connections can be established by many ways. Going to a library, searching an online database, asking to an expert and joining an online community are examples to learning connections. Perhaps the most interesting and extraordinary aspect of connectivism is its explanation on learning. Connectivism states that learning does not take place only in living organism, but also in non-human appliances. This idea makes sense when we think about search engines, artificial intelligence applications and information databases.

The impact of connectivism on educational systems is still not clear. I believe the trend will be towards blended and flexible learning systems where each learner will be able to have a flexible and partially personal schedule and curricula. Also students will be able to participate in lessons and learn partially independent of physical restrictions.

5.2. Flexible learning environments and non-formal education

If I have to choose just one word to describe the future of education, this would be “flexibility.” Considering needs and comfort of humans, many manufacturing and services sectors have been offering flexible and personal products. I think educational systems will not be able to stay out of this trend. Higher educational institutions have already begun offering flexible programmes for their students. Student exchange programmes, double degree programmes and chance of selecting the major after admission are related examples. On the other hand, universities try to make their programmes more flexible via creating blended learning

environments. Blended learning is a hybrid methodology. It means face-to-face learning environments and distance learning environments are used together. Blended learning is getting more attention as such environments provide both human-human interaction and communication and flexibility at the same time.

I think other formal education institutes (primary schools, secondary schools and high school) fell behind universities in providing flexibility. This situation can be explained if developmental stages of the students of these institutions are taken into account. But I believe, the entire schooling system will be forced to change to create flexible learning environments and programmes in the close future. Personally, I am dreaming about a schooling system that I and my child together will be able to create a personalised programme by selecting lessons, lesson hours and instructional tasks out of a pool and then complete the requirements through different environments such as at a school, at a course or through online lessons.

On the other hand, we know that we acquire a great portion of our knowledge not at schools but outside the formal education system. Self-directed readings, personal interests, courses and interest groups occupy great place in our knowledge base. For example, I personally sometimes feel surprised when I see how much my son has learnt from watching online educational videos falling onto his areas of interest.

Non-formal education is a term describing organised learning outside of the formal education system. Examples of non-formal learning include sports lessons, arts lessons, educational courses, conferences and continuing professional development programmes. The objectives of a non-formal learner may be to increase skills and knowledge, as well as to experience the emotional rewards associated with interest in a subject matter. Non-formal education provides flexibility in organisation and methods. It encourages children and adolescents, as well as adults, to choose their own programme and projects. By this way, learners can find flexibility and freedom to explore their emerging interests. While non-formal education is popular among the adults, I believe it should be more common among children and adolescents since reaching information and educational sources are much easier today.

5.3. Thinking skills

Thinking skills are generally investigated under three main titles, which are critical thinking skills, creative thinking skills and problem solving skills. All of these skills are co-related and affects the other in some ways. Interestingly, these relations may be both in negative and positive directions. For example, critical thinking focuses on clarification and consistency. But these concerns may be factors inhibiting creative thinking, which focuses on making remote connections. Besides, formal structure of critical thinking may also put individuals think through only one way. But on the contrary, critical thinking is a necessary skill to evaluate newly created options. Vice versa, critical thinking and creative thinking are very necessary components in a problem solving process because problem solving requires many subskills requiring the both. On the other hand, an effective problem solving process may not always require using critical thinking or creative thinking. Sometimes using cultural shortcuts as heuristics may produce a lot faster and more economic solutions. That is why, if we want contemporary children and adolescents to possess thinking skills, they should be exposed to various thinking skill activities at various contexts.

5.3.1. *Instruction of critical thinking*

Critical thinking consists of a set of skills and dispositions. The critical thinking skills can be grouped as formal and informal skills. Formal skills are content independent. That means they can be thought independent of a subject matter while informal skills should be thought in a context. Here, two opposing views arise. Some educators claim that critical thinking can be thought free from a context. Teaching formal rules would be enough to acquire critical thinking skills. The other view claims that there is not such a thing as pure critical thinking and critical thinking occurs in a context. So, these skills must be thought within a subject matter.

I see critical thinking having both aspects. That is why both approaches should be used to reach an effective instruction. Many skills of critical thinking can be thought independent from a specific subject matter. So, various examples and situations from various subject matters can be used during their instruction. For example “if statements, cause and effect relations or fallacies can be studied independent of a specific topic.”

On the other hand, every discipline may have its own critical thinking rules. On these special occasions, the content has to be known in order to be able to ask right questions or to evaluate evidences. Otherwise, critical thinking may remain too superficial and yield ineffective decisions.

Critical thinking can be fostered through various disciplines. According to me, language lessons hold a special place among these disciplines. Because exercises on four language skills provide very convenient means for critical thinking. Students can start learning initial questioning techniques (i.e., h-w questions) during these exercises. Besides, writing activities are especially vital for fostering critical thinking skills. A clear and consistent essay shows a thinking mind. Social science lessons also provide valuable situations for critical thinking. Case studies and discussions may enable students to think from different viewpoints. And philosophy (or a similar lesson with a different name) is the source of methodological scepticism and it requires intensive critical thinking. I find instruction of “systematic philosophy” in philosophy lessons very important for gaining critical thinking skills and dispositions.

On the other hand, the scientific method, which is closely related with critical thinking, is generally thought at science lessons. Formulating hypotheses, making experiments, observing, collecting data and evaluating the hypotheses are all activities to foster critical thinking of students. Mathematics helps critical thinking of students in other ways. Interpreting numerical data and reading charts and using sets are common to mathematics and critical thinking. Besides, ill-structured mathematical problems may help students to assess known information and decide what else has to be learned, which is one of the main critical thinking skills.

Unfortunately, all these efforts may remain fruitless if children learn critical thinking skills but do not use them in their lives. Usage of critical thinking skills can be maintained with critical thinking dispositions, which is the other aspect of critical thinking instruction, the affective domain aspect. Arranging arguments, encouraging children to ask questions and dealing with contradictory situations are some examples, which can be used to foster critical thinking dispositions. Teacher and parent attitudes are extremely important for gaining critical thinking dispositions. Children and adolescents may acquire these dispositions through observation. Especially, developing courage to ask questions is a very valuable disposition and can be learned effectively by observation. That is why children should see their parents and teachers as role models of critical thinking.

5.3.2. *Instruction of creative thinking*

There is a general tendency to think that creative thinking is natural. It is a gift given to some people. Perhaps natural creativity of children arising from their creative innocence (as explained earlier) makes us think that way. But Bono ([3], p. 31) rejects the claim that creativity is natural and cannot be taught. And he proposes creative thinking skills can be learned and states that there is a lot of experience showing that training in creative thinking can make a significant difference.

Because creative thinking is involved in making remote connections, students should be exposed to activities that demand creative questioning, real-life problem solving, brain storming, webbing, dreaming, visualising, symbolising, transforming, divergent and convergent thinking. Through this perspective, many instructional methods can be suggested. For example, creative drama and poetry requires the use of imaginative creative skills. Therefore, they provide an enjoyable way of developing those faculties.

The atmosphere of the learning environment is also very important for fostering creative thinking. Because creativity is infectious; if you want to become more creative, you should surround yourself with creative people and seek out creative environments ([5], p. 14). Learning environments designed to foster creative thinking should also focus on curiosity.

On the other hand, asking questions is important for creativity and it requires being ready for surprising answers. Developing your capacity for creative thinking will bring rewards, but they may not be the expected ones. A creative thinker needs to be adventurous and open-minded like a resourceful explorer ([4], p. 28).

5.3.3. *Instruction of problem solving skills*

Although children learn a great deal from our lives, effective problem solving skills may not always be acquired in the flow of daily life. But according to general tendency, these skills can be learned through instruction. That is why teaching of problem solving skills is among general aims of education systems.

I find tendencies and attitudes towards problem solving as important traits in problem solving process. Because everyone would appreciate critical roles of affective characteristics such as courage to solve problems, willingness to cooperate, ability to stay calm or being able to differentiate emotional passions and real needs. So, it can be said that an affective problem solving instruction should focus on acquisition of affective variables.

Problem-based learning is a constructive learning method where real-life problems are brought to learning environments. This can be done by using scenarios, cases, biographies, videos or through observation. Through problem solving process, learners are expected to investigate, propose novel solutions and evaluate their solutions in terms of feasibility, applicability, budget, weaknesses and strengths. Problem-based learning process may be complex, hard, confusing and even sometimes discouraging for students. But, well-managed problem solving activities would be very helpful in gaining problem solving skills.

Unfortunately, problem-based learning may require time, money and relatively more effort. In classical schooling system where teachers have many constraints on time and budget, it seems difficult to present an effective problem solving instruction. Because they may provide more flexible and free learning environments, non-formal education would satisfy this need on problem solving instruction. Courses, certificate programmes, interest groups and personal development trainings would help children and adolescents in gaining the desired problem solving skills through various contexts.

6. What should parents and educators do to help contemporary children?

Parents and educators have huge responsibilities in preparing children for life. Regarding instruction of thinking skills, schools have already been taking various steps or at least they claim they do. As these skills have been investigated by educators and scientist for more than 30 years, they are in the focus of many school curricula. But, it is also observable that despite all these efforts, thinking skills may not be acquired by children adequately enough through the formal education system. Besides, although schools spend considerable efforts on technology integration, they fell behind many sectors in maintaining flexibility. That is why I put a substantial emphasis on non-formal and informal education.

First of all, parents should be aware of their vital roles as being first and the most effective role models of their children. Conscious parents will help their children to overcome many thinking problems through the flow of life. Parents also have responsibility to exert principles on media selection. Proper video channels, TV programmes and social network connections would contribute to children's thinking and learning without even getting noticed. Second, social surroundings of children have very important roles on their learning and motivation. Interest groups and learning communities can be benefitted in presenting both desired learning environments and social atmosphere for the instruction of thinking skills. And finally, as they can provide more flexibility and manage different kinds of learning tasks better than formal educational institutions, non-formal educational institutions such as courses, camps, training centres, online programmes and certificate programmes provide much more convenient learning situations for children to gain thinking skills. Parents and children should see these kinds of learning situations as opportunities and they should try to get as much benefit as they could from them.

7. Concluding remarks

Throughout the chapter, I gave a brief depiction of thinking and learning demands in contemporary childhood. Within this scope, critical thinking, creative thinking and problem solving skills were explained and also learning demands in the contemporary age were touched. If the main idea of the chapter had to be stated with only one sentence, it would be: contemporary children have to learn and think more than their peers in the past as they have to face different challenges.

Author details

Cenk Akbiyik

Address all correspondence to: cenkakbiyik@gmail.com

Independent Scientist, Kayseri, Turkey

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