

## Asking or Answering Questions: Musing over the Educational Strategy for the Future

Joseph Jordania <sup>a</sup>

<sup>a</sup>Melbourne University, Music Faculty, Conservatorium of Music, Australia

### ABSTRACT

Mainstream education systems are largely heavily based on checking students' knowledge by asking them questions and checking their answers. This is the complete reversal of the natural way of developing children's brains from early age—through asking questions themselves. This article discusses the evolutionary importance of the ability of asking questions for human intelligence and its potential for creating a new strategy of education, based on encouraging students' natural curiosity, and encouraging their natural ability to search for knowledge. The article proposes that the most natural way to develop young human brains is through asking questions to adults from a very young age, the strategy developed and honed during the evolution of Homo sapiens through natural selection. The article concludes with some concrete classroom strategies and play suggestions that can be used to encourage young learners to ask questions freely in both child-centered education (CCE) and more traditional teacher-centered education models.

### ARTICLE HISTORY

Received 17.03.2023

Accepted 07.05.2023



### KEYWORDS

Asking questions,  
answering questions,  
evolution of human  
cognition,  
educational cognitivism,  
Chinese educational  
model

## Introduction

Asking questions of students, and their answering the teacher's questions, is the central element of educational systems all over the world. Everything in current educational systems is based on answering questions. In textbooks “control questions” check the students' knowledge; “questions” are to be answered during most tests. This educational strategy inadvertently works in a very undesired direction: to keep children passive and obedient, rendering them only passive learners of existing knowledge instead of encouraging them to become thinking, creative human beings.

These problems have been long addressed in the new, progressive educational strategy, which gradually received the name “Child-Centered Education” (CCE), or “Learner-Centered Education” (LCE). Most of the world's prominent educators during the last few centuries took part in the movement towards the gradual creation of CCE, including Jean-

**Corresponding Author** Joseph Jordania  [jordania@unimelb.edu.au](mailto:jordania@unimelb.edu.au)  The University of Melbourne, Parkville Vic, 3052, Australia

**Cite As** Jordania, J. (2023). Asking or answering questions: Musing over the educational strategy for the future. *Culture, Education, and Future*, 1(1), 28-46.

2023 by Culture, Education, and Future

Jacques Rousseau, Johann Heinrich Pestolozzi, Friedrich Froebel, Maria Montessori, John Dewey, to name a few (Lee, 2018). Their educational ideas received validation from cognitive scholars as well. Developmental psychologist Piaget's stages of cognitive development theory influenced teachers' understanding of how children develop and learn in classroom settings (Piaget, 1936/1952), and Vygotsky's sociocultural cognitive development theory (Vygotsky, 1978) helped shift pedagogical practice in classrooms to facilitate children's learning and development (Matthews, 2003, p. 54; Stone, 1996, p. 11-12). Scholars claimed that children naturally have an inductive scientific thinking; they formulate and test hypotheses, learn from statistics and learn from interactions with the people around them the same way scientists do (Gopnik, 2012).

As a result of these findings, during recent decades proponents of CCE gradually changed the mainstream educational strategies, primarily in Western countries, concentrating on the needs and abilities of students. From the 1980s and particularly 1990s, CCE has been legitimized by government policies to be promoted in educational reforms in many developing countries as well (Brodie et al., 2002, O'Sullivan, 2003). Educators proposed new ways of classroom organization (Stacey, 2018; Jones, 2007), which led to inevitable changes, particularly teaching science in curricula and turning teachers into facilitators (Khalick et al., 2015). Primary attention was given to bringing more creativity in science classes (Cremin et al., 2015; Dejonckheere et al., 2016; Minner et al., 2009). Experiential and hands-on activities have been emphasized (MacDonald, 2016). Another study explored young children's literacy meaning-making experiences before and after tablets were introduced into classes (Harwood et al., 2015). The new strategy assumed that both teachers and students have different roles than those typical in a traditional classroom (Chichekian & Shore, 2016). CCE proponents concluded that experiential learning is primarily self-initiated learning as people have a natural inclination to learn (Rodgers, 2002). Governmental education bodies also stressed the importance of creating a class atmosphere that fosters creativity (National Research Council, 2000).

The response to CCE has not been unequivocally positive, though. It created controversies for several reasons. The major part (but not all) of the critique of CCE strategies came, understandably, from educators in the developing world, favoring traditional methods of teacher-based strategies. Many countries of the developing world were not ready to shift to CCE due to traditional values and cultural practices, and other objective reasons, like the size of classes, limited availability of resources and qualified teachers, etc. (Guthrie, 1990; O'Donoghue, 1994).

Several educators noted that CCE enhances a stereotypic masculine image among students, and early childhood education settings are 'feminized' as a result of the predominance of female teachers (Walkerdine, 1985, 1990; Skelton, 2002). Critics allege that many institutions or educators claim to be putting CCE into practice, but in reality are not (Lea et al. 2003:322). Others propose that CCE is a "White-Centered" discourse (Norquay, 1999); among other critical issues is the criticism of Rousseau for taking for granted that the child's self-development is driven by immediate interests, not by instruction (Oelkers, 2002). Others describe how teachers disturb children playing and solve conflicts between children rather than helping them work together and develop strong social relationships, and generally, there is insufficient pedagogical support, particularly for those children deemed at risk (Singer, 2005). These individual children appeared invisible in the teachers' understanding of CCE (Simon, 1981; Graue, 2005). Finally, there is an important claim

that contemporary Western countries use economic and political pressure to force developing countries to teach Western values in their classrooms (Shah, 2019; Tabulawa, 2003). In this article I will only indirectly discuss the arguments and counterarguments for and against CCE. Instead, I want to concentrate on a specific element of educational systems actively used in both CCE and traditional educational strategy—the questions children ask.

So, in this article for the first time in educational and developmental cognitivist literature I want to propose that *the most natural way to develop young humans' brains is through asking questions* from a very young age. This ingenious strategy was developed and honed during the evolution of *Homo sapiens* through natural selection. Asking questions in young age is indispensable for developing human intelligence and self-confidence. Currently children stop asking questions as soon as they go to school, as our current educational strategy purposefully trains them to answer question, discouraging them from continuing to ask questions. This gradually leads to low self-reliance and a non-justified dependance among the future citizens of democratic countries. In the last part of the article the author recommends a few class strategies and games to encourage young students to continue to ask questions. Implementation of these games and strategies is relatively easy both in CCE education as well as more traditional teacher-centered educational models.

I want initially to discuss briefly the importance of this ability to ask questions in children's (and generally human) development of cognition. As a hypothesis I propose that the ability to ask questions was the revolutionary cognitive development in human evolution, and, therefore, this element of human cognition deserves special attention from cognitivist and educationist perspectives. In the central part of the article, I discuss the proposed hypothesis after the literature review, and later I discuss the contrasting educational practices that encourage (or discourage) asking questions of teachers, both their pros and cons.

### **Questions about questioning: Cognitive revolution?**

One of the central problems that cognitivists (and cognitive educationists) try to answer is how human intelligence starts to develop and when is it favorable to start formal education. The general approach to this question is divided: governmental bodies are mostly arguing for the need for the early start of formal education, and at least part of professional educators propose we should not rush to formal educational process (e.g., see McDougall, 2014; Smith, 2013).

I belong to those educationists who believe there is no need for an early and heavy-handed intervention from educators to develop a child's intelligence in the same way we do not need to teach a child her/his native language. Nature, more precisely natural selection, has provided every normal human baby with the best possible tool for their independent intellectual development, including the acquisition of native language systems. The name of this evolutionary tool is the ability to ask questions.

Charles Darwin famously used close observations of his own children in order to understand the young human's intellectual development, including questioning, as curiosity expressed in an information-seeking communication, and he also paid attention to the shrug as a universal expression of curiosity and lack of knowledge (Darwin, 1972). One of the earliest works of English psychologist and philosopher James Sully was dedicated to the

motifs behind the deep questions children sometimes ask (Sully, 2000/1896). Another early work in this sphere was the 4-page article published in 1924 by Lou H. Thompson from Fairwood Elementary School, “Children’s Questions.” In the article the author asks reasons for the neglect of such an interesting and important topic (Thompson, 1924). Among other works on the topic are the 1932 article by Edith Davis, “The Form and Function of Children’s Questions,” in which she cited the percentage of children’s questions in their communication (Davis, 1932).

In 1936 Piaget proposed that children’s questions come from their assumption that everything was created to suit humans’ needs (Piaget, 1936). In 1930, in a work dedicated to the intellectual growth of the children, Isaacs expressed the view (partly criticizing Piaget) that children asked questions when the reality was not anticipated by them (Isaacs, 1930). In the 1968 article “The Development of Grammatical structures by Formulating Wh Questions in Child Speech,” Roger Brown concluded that there is evidence that children in the preschool years do develop a grammatical structure underlying Wh questions that is much like the structure described in current transformational grammars (Brown, 1968). Barbara Tizard and Martin Hedges, in a book dedicated to children’s learning, found that in a question-and-answer dialogic form children are gathering information about the world around them, encouraging their cognitive development. As a result, children asked more questions of caregivers than of their friends at pre-schools (Tizard & Hedges, 1984). The need for dialogical communication in education was stressed in Paulo Freier’s *Pedagogy of the Oppressed* (1970). In his 2006 monograph *Who Asked the First Question?* Joseph Jordania proposed that the ability to ask questions was a cognitive revolution for human intelligence and language (Jordania, 2006). Another special monograph from around the same time (2007) by Michelle Chouinard, *Children’s Questions: A Mechanism for Cognitive Development*, concentrated on information-seeking questions. It examined the role children’s questions play in their cognitive development. The studies presented here indicate that children ask information-seeking questions that are related in topic and structure to their cognitive development. If parents do not provide the answers to these questions, children persist in asking for the information, which suggests that the goal of this behavior is to recruit needed information, including the pre-speech stage of development (Chouinard, 2007).

The last few years were particularly prolific for the research of children’s questions. Among them is study called “Question, Explanation, Follow-Up: A Mechanism for Learning from Others?” (Kurkul & Corriveau, 2017). A 2020 collection of articles on the subject, titled “The Questioning Child: Insights from Psychology and Education” is a multidimensional collection on this important topic (Butler et al, 2020). And finally, a very recent article by Paul Harris “Young Children Share Imagined Possibilities: Evidence for an Early-emerging Human Competence” comparatively discussed the children’s and apes’ cognitive abilities (Bronowski & Bellugi, 1980; Greenfield & Savage-Rumbaugh, 1990, 1993; Harris, 2022; McNeill, 1980; Premack & Premack, 1972, 1983; Terrace, 1980), a topic very close to the interests of this author.

The crucial topic for the current discussion on education here is that the ability to ask questions naturally appears in every child’s intellectual development, without any visible and conscious effort from their elders. For about a year after birth, every normal human baby begins to ask questions. This happens much earlier than the ability to acquire syntactic structures, and even earlier than the correct pronunciation of words (Crystal, 1987, p. 235,

243, 248; Ferguson, 1977; Moskowitz, 1991, p. 147). Young babies ask questions by simply using a rising intonation, and ask one-word questions like “dada?” (“Dad, are you there?”), or “kaka?” (“Can I have another piece of cake?”). The ability to ask questions is a part of human genetic makeup, or in other words, is hardwired in our genes.

An important question is how this ability comes alive after babies are born. Is this an instinctive ability, like swimming skills among ducklings, or does it need a “triggering” from the social surroundings? This question is difficult to answer at the current level of knowledge, but if we use the only (so far) currently available well-documented case when a human baby was put in complete isolation for years, we can get the preliminary answer. Let us look at the tragic story of a Californian girl, known to the scientific community as “Genie.” Genie was kept by her abusive father in a cellar for 13 years. She was finally rescued by her mother, herself a blind and sick woman. After her rescue, Genie received plenty of attention, care, and training from foster homes and scholars. Thanks to these caregivers, Genie, who appeared to have a normal intelligence, was able to develop some language skills, but unfortunately was unable to develop full language. Among the skills she failed to develop was the ability to ask questions (Wills, 1993, p. 288).

This fact strongly (although still preliminarily) suggests that, while questioning is obviously a genetic ability of every normal human mind, it needs a social environment to trigger its development (Jordania, 2006, p. 342-343). A most likely mechanism for triggering children’s genetic ability is parents’ asking questions by talking to children in a specific “musical” way, known in the scholarly literature as “motherese.” Other names for this phenomenon include “infant-directed speech,” “child-directed speech,” “caretaker speech,” and a few other informal terms. Most importantly, motherese consists predominantly of questions and cuddly play-words, pronounced with wide musical modulations of the voice. Infants love hearing this kind of speech and respond excitedly. As questions and phrases with rising question intonation constitute a large part of “motherese,” it is logical to conclude that it is critical for teaching young children the crucially important art of asking questions. Caregivers basically teach children this essential cognitive ability (how to ask questions) without even realizing what they are doing this through “infant-directed speech.”

In 2006 Jordania proposed that the ability to ask questions was a crucial step in our species’ cognitive evolutionary history (Jordania, 2006). As linguists suggest, human language has three functions: declarations, commands, and questions (e.g., De Laguna, 1963; Revesz, 1956). With the emergence of the last—the ability to ask questions—Jordania proposed that the communication of our ancestors became a dialogic, human language.

### ***Theory of mind and the ability to ask questions***

A very interesting logical puzzle regarding the ability to ask questions is the Theory of Mind (TOM), the ability of individuals to understand the mental state of others. A specific “Sally-Anne Test,” designed to check the presence of TOM in young children, establishes that young children are unable to realize that other children around them may not have the same knowledge they possess (Wimmer & Perner, 1983). During the test, children are introduced to two dolls, Sally and Anne. Sally takes a marble and hides it in her basket. Then she leaves the room, and the Anne doll shifts the marble from Sally’s to her own basket. When Sally returns, the child is asked: “Where will Sally look for the marble?” If a child is able to take Sally’s perspective, knowing that Sally was not present when the marble

was shifted, the child will answer correctly, but if the child cannot take the perspective, the child will be sure that Sally knows as much as the child knows. Based on this popular test, it is believed that children develop TOM at about 4.5 years (Astington & Gopnik, 1991; Roessler, 2013).

For a long time, it was believed that humans were the only species able to understand the mental states of others. This is hardly surprising. Attribution of any complex mental abilities to our species as “uniquely human” has a long history. Plenty of our mental abilities, from “designing features of a language,” displacement, the duality of patterning, traditional transmission, openness, arbitrariness, and productivity (e.g., Hockett, 1959; Hockett & Archer, 1964), to the TOM have been considered at different times “uniquely human.” All such “uniquely human” mental abilities were gradually found in the animal kingdom as well (and not only among the apes). Today, scholars agree (e.g., Savage-Rumbaugh & Lewin, 1994) that apes can learn successful communication with virtually all these features.

Even the lions have TOM: “After having killed, a lion either begins to eat immediately or else moves the carcass to another location. On several occasions, the prey was caught in high grass by a lion which then sat down and looked around casually for as long as 5 minutes, as if its hunt had been unsuccessful. It gave the impression of trying to conceal the presence of the carcass from the others that had taken part in the hunt, for as soon as these lay down or moved away it began to eat.” (Schaller, 1972, p. 268).

I suggest that we pay a special attention to the correlation of the presence of TOM and the ability to ask questions among humans. At first sight, it might seem obvious that asking a question *requires* TOM, as one needs to understand that others have different knowledge about which one might inquire. So, the idea that someone might have an ability to ask a question without having a TOM might seem absurd, but the facts are against this sensible proposition:

- 1) In normal children’s development, the ability to understand that others have a different knowledge from them, or TOM, appears at about age 4.5 years (Astington & Gopnik, 1991, p. 12; Roessler, 2013);
- 2) In the development of the same normal children, the ability to ask questions appears in the form of a correctly pronounced question intonation much earlier—before a child’s first birthday (Crystal, 1987, p. 143, 241).

If there is a close link between the ability to ask questions and TOM (which seems likely), the controversy over the earlier onset of questioning ability might have two explanations. First, the ability to ask questions might be the primary cognitive function in the evolution of our mental abilities, and TOM came later, possibly even partially based on the ability to ask questions. A second explanation might be that, in this case, children’s intellectual development does not represent the evolutionary sequence of forming human cognitive abilities.

- 1) The first explanation cannot be true, at least if we believe that we are evolutionarily closely related to apes. Apes, as discussed, have TOM but no ability to ask questions. Therefore, TOM was most likely present in the common chimpanzee-human ancestor, but the ability to ask questions was not. This fact strongly opposes the possibility that the ability to ask questions appeared among human ancestors earlier than TOM.



- 2) What about the second explanation? How to deal with the “ontogeny recapitulates phylogeny” argument, also known as the recapitulation theory? The “ontogeny recapitulates phylogeny” argument has become at least partially discredited and is now often referred as “biological mythology” (e.g., Kalinka & Tomancak, 2012). This brings us to the possible conclusion that the earlier onset of the ability to ask questions in children most likely does not represent an evolutionary chronology. So, it is possible that the ability to ask questions is phylogenetically late, but in ontogeny, it starts developing earlier because of its immense importance for the intellectual development of every member of the human species.

### ***Beginning of the formal education: Asking questions at school***

Let us now return to the existing educational strategy. Natural selection provided every human baby with the best possible way to develop intelligence and creativity. By asking myriad questions, young children *independently* (this is important!) develop their intellectual abilities. Basically, every young child's brain is a powerful *self-developing system*. All those who have had to answer thousands of questions from their children and grandchildren know the strength of this ability. This powerful process of self-education continues until children go to school. And as soon as formal education starts, children stop asking questions (e.g., Shah et al., 2018). This is a natural result of currently widespread teaching strategy, as at school children are gradually taught several all-important lessons:

- 1) When it comes to school, if they want to be considered good students, children need to learn how to *answer questions, not how to ask questions*,
- 2) At school, it is teachers who ask questions,
- 3) Good students are those who are the first to answer the questions,
- 4) So, in order to be loved and appreciated at school and by parents, children should forget about their insatiable urge to ask questions and concentrate on answering them.

Of course, at school, children are not banned from asking questions, but still, there are important limitations. As a rule, children are allowed to ask questions after a teacher gives permission with the words: “Does anyone have questions?” Teachers see such questions as a welcome expression of interest from students. By the way, this does not occur in every educational system, as will be discussed below. Governmental schools with relatively rigid curricula enforce the unitary schedule of what should go into the pupils' heads and when. So, instead of the joy of self-discovery (what our brains are best at, and what they are naturally designed to do), all the knowledge is presented to children in the form of ready-made facts. Students just need to remember these facts to be considered good students, doing well at the tests and exams of various levels.

Regarding the problem of early childhood education from another point of view, perhaps children are better off with human-designed systematic education than the chaotic process of acquiring information in the form of their own haphazard questions and the even more haphazard answers from adults (or as they are known in educational philosophy, MKO – “more knowledgeable other”)? Is not it better to gradually explain to children all the basic knowledge that humanity has managed to obtain over its history, instead of

answering thousands of their silly questions? Well, the proponents of CCE will agree that the passion for the search, the process of the search, and the joy of discovery are inherently more important for human intellectual development than the passive acquisition of existing knowledge. The most important function of our brain is the ability to search, receive and organize (or construct) knowledge in a unique and creative way, and our brains are already designed to do this. It is crucial for educators to remember that children naturally have the skills to think and to learn.

According to Piaget: “The goal of education is not to increase the amount of knowledge but to create the possibilities for a child to invent and discover, to create men who are capable of doing new things” (Piaget, Quotes). And Einstein said, “The important thing is to not stop questioning” (Einstein, Quotes). Many things have changed during the past centuries and decades (not everywhere, sadly). Child Centered Education has made a big step forward. For example, most contemporary schools have stopped physical punishment, but the fight against the natural curiosity of students still rages on, from primary to tertiary education. Should we be surprised then that there are complaints about adults’ lack of interest when compared with young children’s inquisitive minds? “What a distressing contrast there is between the radiant intelligence of the child and the feeble mentality of the average adult” (Freud, Quotes). “Men are born ignorant, not stupid; they are made stupid by education” (Russel, Quotes).

Let us now ask: if many prominent humans are critical of the existing strict system of education, why it is still so popular? The most probable answer to the question of why schools are so rigid and restrictive is probably found in the so-called “domestication theory” (e.g., Simler & Hanson, 2018, p. 238-240). The center of the theory is that schools, with their strict rules of obedience, prepare children for their future life as adults who will have to spend most of their lives working day jobs from 9 to 5. And there is a more direct financial reason as well. Stephen R. Donaldson, a contemporary American author, pointed out probably the most attractive side of the existing system of education, together with the ugly side of it: “Whatever the explanation, it’s perfectly obvious that our educational system has nothing to do with education: it’s a babysitting service designed to replicate the worst qualities of the parents” (Donaldson, Quotes). Our rigid schooling system is just too convenient for many families (and employers) to discard. But even if we need to take children to school for several hours five days a week, schools do not have to be rigid and conservative to the point they close off children’s curiosity.

### ***A case of Chinese Education***

The achievements of Chinese students have understandably created a loud buzz in the world of education, and for good reason. In the educational ranking system of countries according to mathematics, science and reading tests, China and other East Asian countries boast the greatest achievements in school test scores. They dominate the Program of International Student Assessment (PISA) reports (Pisa Reports by Country). Shanghai (China), Singapore, and Hong Kong are usually the top three on the list. Other East Asian entries follow, only debating the top places among themselves. From other countries, the first appearance of the Western World is Finland, coming in at the fifth place in science and sixth in reading tests (see. Finland remains...). The United States ranks number 36, 28, and 24 on the three tests, Germany at 16-12-19, the United Kingdom at 26-20-23, and France



at 25-26-21. The home country of arguably the largest number of Nobel Laureates, Israel, can be found at a low and unexpected rank of 41-41-34. The success of Chinese students is quite well known to the circles of educators. A number of international educators (e.g., Jensen, et al., 2012) suggest that East Asian students have much better literacy and mathematical skills than European and American students because their system of education is simply better.

One of the great aspects of the Chinese educational system is that teachers are more respected in China than in any other country. For a Chinese student, her or his teacher is almost a god-like figure. According to cultural expectations, a Chinese teacher should have a ready answer to every question from students. A student who tries to challenge or question the teacher would be perceived as arrogant and a social outcast, a threat to the class, educational system, and society at large. Total respect for teachers and past generations invariably leads to an atmosphere where experience and the existing order become an overriding force in life, education, and science. This is the direct road toward overall mental and intellectual stasis. Sustaining the status quo becomes the most important driving force in many fields of life, and new ideas are viewed as a threat to the social health and well-being of the already balanced community. As a result, coming up with new ideas is very alien to students in the Chinese educational system. This is not surprising, given that the legendary Confucius himself made a similar claim. According to Confucius's own words, he was seeking knowledge in the past, without trying to create any new knowledge himself: "I am not one who was born in the possession of knowledge; I am one who is fond of antiquity, and earnest in seeking it there" ... "I transmit [knowledge] but I do not create" (Chan, 1963, p. 18-48).

Deep respect and reverence for teachers create another feature of the Chinese educational system that is hard to understand from the Western point of view. This points to students asking questions to teachers, which is the article's main topic. While it was emphasized at the beginning of this article that Western schools forcefully discourage children's natural urge to ask questions, this prohibition is never too strict or absolute. Students can ask questions (mostly at designated times, with the teacher's permission), and most important, students who do ask questions are usually seen as the *most enthusiastic learners*.

It is very different in Chinese and other Confucian cultures. It is fair to say students are never explicitly banned from asking questions, but doing so is considered a negative phenomenon. According to an article on the Chinese educational system (Starr, 2012), a question asked by a student at Chinese schools might mean one of the following two things: (1) the student is silly and did not understand what the teacher already explained (and what everybody else understood), or (2) the student is too ambitious and wants to show a teacher in a bad light — that the teacher cannot answer a new question. Both of these possible reasons are viewed as *extremely undesirable behavior*. Besides, virtually every Chinese student believes that questions asked by students waste valuable lesson time. Therefore, we can conclude, at least for our discussion, that Chinese students are discouraged from asking questions (e.g., Starr, 2012).

At the same time, the Chinese educational system achieves excellent results in raising generations of hard-working and law-abiding citizens, who have a deep respect for their teachers and are very knowledgeable in the existing set of educational requirements. Their domination of the world ranking education systems is well deserved, and Chinese and other East Asian students also excel in the USA and many European countries with very different

systems of education. They are sometimes referred to as the “model minority” (e.g., Chen, 2012; Chen 1995; Kao, 1995; Kao & Thomson, 2003). Amy Chua, Chinese-American lawyer and author of the bestselling 2011 book *Battle Hymn of the Tiger Mother*, formulated eloquently the above-mentioned principles that are held high in the Chinese traditional attitude towards education. They are so different from Western principles that the editor of the *Financial Times* Isabel Berwick called the “tiger mother” approach to parenting “the exact opposite of everything that the Western liberal holds dear” (Berwick, 2011).

I am suggesting that the striving towards the brilliance of the Confucian educational system in exams and tests might have negative implications as well, severely limiting students’ creativity and ambition from an early age. Deep reverence for the past, teachers, and existing rules is a great method for maintaining a stable and easy-to-govern society, but it is probably not the best strategy for the development of a free, open society. The big, exciting question for future educators is whether it is possible to have the best of both educational systems—hardworking and law-abiding citizens on one side and creative scholars and freely thinking citizens on the other. And on a more practical note, what type of education should we prefer for our children?

There is no easy answer to this question. Probably the best option is to *give children and their parents a choice*, so the presence of various school systems in a society and a wider knowledge of these systems in the general population would be helpful. I can only suggest a very rough guide to assist parents and teachers. Possibly it would be beneficial for some children, good and successful students, who try to get high marks in every subject and are highly motivated to be at the top of the class, to be taken into a school with a stricter approach, where their higher learning abilities are tested against stricter curricula requirements and against other high-achieving fellow students. As for the other, more self-motivated, and passionate learners, who clearly distinguish among school subjects their favorite and least favorite classes, the creative atmosphere and freedom of alternative schools with a free educational system (CCE) would be more beneficial. In many countries, such an option with schools with various educational systems already exists.

The problem starts when we try to “classify” children according to their natural tendencies. Although a small number of children are relatively easy to “classify” into these two rigid groups, who decides which child should attend which type of school? In China, students take their education extremely seriously, and their reverence for their teacher’s words has no limits. But these two ostensibly wonderful things for a good education might become enemies for the development of creative thinking. In total contrast to Confucian teaching philosophy, Leonardo Da Vinci once said: “Poor is a pupil who does not surpass his master” (Da Vinci, Quotes). It is not a matter of which is better. It depends on the educational aim. For responsible, hardworking citizens who do their best in following existing rules, a stricter education is more effective. The downside of the strict educational strategy is reduced creativity. On the other hand, a more open and egalitarian teaching strategy, based on CCE, in which teachers are not considered untouchable and their knowledge and authority can be questioned by students, boosts creativity and self-reliance, but on the negative side, citizens who undergo such a democratic educational strategy are not as obedient in following existing rules and regulations. It is up to us, educators, scholars, governmental bodies, parents, and citizens, to make a choice.

## Conclusion

Developing a more creative educational method that would not be child indoctrination has been a dream for many thinkers who gradually built a new strategy of CCE. At the same time, stopping students from asking questions might be an educational “crime against human nature” that we are still committing. If we do not deal with this problem, if we prohibit our children to continue their natural cognitive development by asking questions, forcing them instead to concentrate on answering our questions, our efforts of raising them as free, creative individuals might be mostly wasted.

Plutarch said, “The mind is not a vessel to be filled, but a fire to be kindled” some 25 centuries ago (Serrant, 2020). Malcolm S. Forbes, the publisher of *Forbes* magazine, agreed: “Education’s purpose is to replace an empty mind with an open one” (Forbes, Quotes). This idea would find plenty of supporters among educators and parents, but it is the opposite of what we are often doing at our schools, particularly our schools for gifted children. We mostly use their minds exactly as vessels of various capacity, and we are filling them as fast as we can. Unlike computers with a huge memory, the most valuable part of every child is their creative thinking, the ability to see and organize things in their own unique way. Above all, we should treasure a student’s emotional life.

We should not forget that gifted students can be very different from one other. I suggest dividing students with extraordinary intellectual capacities roughly into two categories: (1) students who need external stimulation and challenge in order to stay alert and interested, and (2) students who are happy to be left alone, as they are constantly motivated to follow their own interests. We can call the first category of students “prodigious learners” and the second category “autonomous learners.” Both are gifted and can be extremely successful at school, but they are quite different.

The first category might be eager to go to the most prestigious schools and institutions where their gifts will allow them to learn an exceptional amount of information and shine among peers. These students might be moved by their ambition more than their love for the subject of study; they often try to get the highest marks in every subject. If this is the case, despite my critical view of the policy of exploiting children’s memory, I would suggest giving such students a chance to go to a special school with overloaded programs. Ambition can be a driving force as purposeful and passionate as any other life-long human passion or desire. This category of gifted students might become bored without sufficient challenge to keep their extraordinary intellectual capacities up and running. There is an internal cognitive conflict in this category of students: their ability to learn is higher than their motivation to learn. Schools with extremely busy curricula will most likely be beneficial for such students. If such students are left at ordinary schools, they might abandon learning (as “too easy” and “not challenging”) and get into unwanted activities, from using various substances to save them from boredom to criminal activities to get some excitement.

The second category of gifted students, “autonomous learners,” as a rule consists of avid readers, who can keep busy and interested without any external pressure. They are happy to use their free time for various activities, are highly motivated, and do not seem to be bored with extra free time. They actually do not seem to have any free time! They often have their favorite subjects at school and might neglect other subjects. Such children should be allowed some independence in their development. They should not be taken to

special schools but provided with more books, libraries, bookshops, and various scholarly exhibitions. They also benefit from seeing different countries and meeting people from various cultures. For such a self-developing or an “autonomous learner” student, going to a special school with overloaded programs might become a major source of discomfort and anxiety.

Pressure for students in special schools is understandably very high, and it comes at a price. For example, the rate of student suicide at Harvard is about double than at any other university (Hatoff, 2012). There are other negative results as well. Harvard is very highly rated because some of the best scholars and teachers are invited to work there and because a large number of brilliant students completed their doctoral degrees there. Most such scholars, however, were educated as undergraduates at different, more “ordinary” universities. Of course, Harvard graduates are brilliantly represented in the world of politics, but the undergraduate students did not make the great impact in science as expected (Bero, 2021). For example, arguably the most difficult math teaching program, the year-long “Math 55” course from Harvard, is so difficult that only about half of the most talented and dedicated of the initial group complete it (Yefremova, 2023). And how are those who successfully managed to complete this legendary course represented among the world’s best scholars, inventors, Nobel Prize winners? Apart from very few distinguished professors, no other major scholars came out of this Harvard course, and no Nobel Prize winners. Tellingly, the two most famous students from this course are Bill Gates and Richard Stallman, two computer geniuses who both dropped out of Harvard.

In summary:

- 1) A child’s brain is a powerful self-developing system, and early and heavy-handed intervention in the natural intellectual development of a young child is highly undesirable;
- 2) By stopping children from asking questions, our existing system of education goes against the most natural way of the development of human intelligence;
- 3) The most prestigious schools use the greater learning ability of their students’ primarily as hard drives of extraordinary capacity to store a vast amount of information;
- 4) To raise independent and creative thinkers from gifted children, particularly from the “autonomous learners,” we should give them more independence, and allow them to have a hand in their own education;
- 5) We can briefly summarize that there does not exist a universal pedagogy which works with equal effectiveness irrespective of the context (Holliday, 1994).

These conclusions bring us to a perennial question about the need for a new and better educational strategy with a variety of possibilities of implications.

## Implications

Probably the best thing about the suggested model of educational strategy that it is extremely flexible. We can easily adapt this strategy from the rare “questioning classes” and “questioning games” in existing educational systems, both governmental and private, both

CCE based, or traditional strategies, to the completely new educational system, based on encouraging students to ask questions. In a paper dedicated to the subject delivered at an educational congress in Delhi in January of 2011, Jordania proposed a list of various techniques and strategies to encourage students to ask questions at different educational levels (Jordania, 2011). The central idea is that we need to design different ways to encourage students to ask questions, and therefore, to be more critical, independent, and creative. Following are a few practical suggestions of how to organize special lessons, games, and tests.

Since asking questions is a natural state of children's early intellectual development, we do not really need to "teach" children how to ask questions in primary school. We just need not to stop them from asking questions. Importantly, we need to take into account that there always will be a few children who are naturally good and confident in asking questions, but also students who are shy to ask questions, as they are afraid of speaking in front of the class, or that their question will be considered silly. To overcome this, I suggest to organize a special class (or classes): for example, a special "lesson of silly questions" devoted to asking any questions, particularly "silly," funny questions. For example, teachers could provide situational pictures and ask students to ask any questions, including the silliest possible questions, about the picture, what the subjects in the picture might ask or say to each other, explaining that a question might be normal in itself, but can become silly when it is out of place. For example, "which school do you go to" is not a silly question by itself, but if this question is asked, for example, by a cloud to a train, it becomes silly. Or, in another example, a teacher would bring a box to the class, and say something is in the box, inviting students one by one to ask questions about the qualities of the hidden object to find out what is in the box, with the teacher answering only "yes" or "no". As the game progresses, children get closer and closer to the answer. Alternatively, a teacher (or students) could bring several pictures with a question and an answer connected to each picture, but written separately from the pictures. Students must choose (1) which question and answer goes with which picture most logically, or (2) which combinations of pictures and answers are the funniest.

Teachers could also ask students to think of silly questions as homework. Children could bring their own pictures, or photos with their own silly questions. It is important that everyone participate in this exercise and that everyone be encouraged to engender confidence in shy students that might stay with them during their entire educational process. Another situation might be to ask children to think which questions they would ask different people, including real people or characters from books and movies, such as Santa Claus. Special "questioning lessons" might be also a good way to introduce the whole class to the natural cultural or environmental diversity of the children in their class. Still another possibility is to choose a child and encourage other children to ask questions about their family, ethnic origin, interests, favorite food, games, etc. If children are enthusiastic, every child might become the centre of such questions. Primary school teachers can design plenty of interesting and engaging games to involve children in fun, interesting question-asking games. It is crucial that students are encouraged for their inventiveness and creativity as early as possible.

I believe the traditional method (students answering questions) should still remain the centre of educational system, but I am recommending quality time during the educational process—classes, games, tests, and strategies—to encourage students to continue to ask questions as well. Such activities will make the educational process more creative, more

open to suggestions, more interesting, more productive, and more fun. For secondary school, teachers could use different games and strategies, including well-known games totally based on asking questions. For example, somebody thinks of a person, and others ask this person indirect “yes/no” questions in order to find out who the person is. Different classes can use this game according to subject (for example, science students need to identify a scholar, media or arts students, a media or arts personality, etc.). For me the key factor should be the *student perspective in the educational process*. I am not alone in my preferences. “Education does not start in teachers’ words. It starts in students’ heads,” remarked Ignacio Estrada, director for grants administration at the Gordon and Betty Moore Foundation (Estrada, Quotes). This perspective is crucial for the CCE strategy.

Rousseau famously gave the foundations of a new system of education that was later labelled as “free education.” His ideas were used as a basis for several contemporary educational systems, including the Montessori, Reggio Emilia, and Steiner (Waldorf) systems, probably the three most popular alternative systems in the Western world today. Instead of restraining children from asking questions, we should encourage them to do so, in different ways and by different strategies. And I suggest using this educational tool throughout most of the primary, secondary, and tertiary educational institutions to foster open creativity and to help form a society of open-minded and free-thinking citizens.

### Acknowledgements

The author wants to express gratitude to the scholars from various fields of expertise, particularly Richard Byrne, Tecumseh Fitch, Klaus Zuberbuhler, Irene Pepperberg, Bruce Watson, Jenny Wade, and three anonymous reviewers of the first version of this article.

### Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author received no financial support for the research, authorship, and/or publication of this article.

### About the author(s)

**Joseph Jordania** is an ethnomusicologist and evolutionary musicologist. He received his tertiary education (B.A., M.A.) at Tbilisi State Conservatory of music, and worked as a teacher of secondary and tertiary schools. In 1979-82 he served as a Senior Consultant of Public education (traditional music) of the Ministry of Culture of Georgia. Created a program for public schools. Received his Ph.D. from Tbilisi Theatrical Institution in 1982, and D.Mus. from Kiev State Conservatory (in 1991). Since 1995 lives in Australia, Melbourne. His research interests include the teaching methodologies, the cognitive development of early humans, the origins of music, language, speech, and speech pathologies. He published numerous articles in the field of evolutionary musicology, authored seven books



(in Georgian, Russian, English, Chinese, and Japanese languages). In 2009 he received the Fumio Koizumi Prize in ethnomusicology. E-mail: [jordania@unimelb.edu.au](mailto:jordania@unimelb.edu.au)

## Orcid

Joseph Jordania  <https://orcid.org/0000-0003-3205-492X>

## References

- Astington, J. W., & Gopnik, A. (1991). Theoretical explanations of children's understanding of the mind. *British Journal of Developmental Psychology*, 9(1), 7-31.
- Bero, T. (2023). Turns out, Harvard students aren't that smart after all. *The Guardian*. Retrieved March 9, 2023, from <https://www.theguardian.com/commentisfree/2021/nov/17/harvard-university-students-smart-iq>
- Berwick, I. (2011). Review: Battle hymn of the tiger mother. Retrieved March 13, 2023, <https://www.theguardian.com/books/2011/jan/29/tiger-mother-amy-chua-review>
- Brodie, K., Lelliott, A., & Davis, H. (2002). Forms and substance in learner-centred teaching: Teachers' take-up from an in-service programme in South Africa. *Teaching and Teacher Education*, 18(5), 541-559.
- Bronowski, J., & Bellugi, U. (1980). Language, name and concept. In T. A. Sebeok & J. Umiker-Sebeok (Eds.), *Speaking of apes: A critical anthology of two-way communication with man* (pp. 103-113). Plenum Press.
- Brown, R. (1968). The development of wh questions in child speech. *Journal of Verbal Learning and Verbal Behavior*, 7(2), 279-290.
- Butler, L. P., Ronfard S., & Corriveau, K. H. (Eds.) (2020). *The questioning child: Insights from psychology and education*. Cambridge University Press.
- Chan, Wing-Tsit. (1963). *A source book in Chinese philosophy* (Trans. Wing-Tsit Chan). Princeton University Press.
- Chen, C. (2012). Asians: Too smart for their own good? *The New York Times*. Retrieved March 1, 2023, <https://www.nytimes.com/2012/12/20/opinion/asians-too-smart-for-their-own-good.html>
- Chen, J. L. (1995). *The internalization of the model minority stereotype as a predictor of depression among Chinese-Americans* (Unpublished doctoral dissertation). California School of Professional Psychology, Los Angeles.
- Chichekian, T., & Shore, B. M. (2016). Preservice and practicing teachers' self-efficacy for inquiry-based instruction. *Cogent Education*, 3(1), 1236872.
- Chouinard, M. M., Harris, P. L., & Maratsos, M. P. (2007). Children's questions: A mechanism for cognitive development. III. Diary study of children's questions. *Monographs of the Society for Research in Child Development*, 72(1), 45-57.
- Cremin, T., Glauert, E., Craft, A., Compton, A., & Stylianidou, F. (2015). Creative little scientists: Exploring pedagogical synergies between inquiry-based and creative approaches in early years science. *Education 3-13*, 43(4), 404-419.
- Crystal, D. (1987). *The Cambridge encyclopaedia of language*. Cambridge University Press.
- Da Vinci, L. (Quotes). Retrieved March 7, 2023, [https://www.brainyquote.com/quotes/leonardo-da\\_vinci\\_542476](https://www.brainyquote.com/quotes/leonardo-da_vinci_542476)

- Darwin, C. R. (1872). *The expression of the emotions in man and animals*. John Murray.
- Davis, E. A. (1932). The form and function of children's questions. *Child Development*, 3(1), 57–74.
- De Laguna, G. A. (1963). *Speech, its function and development*. Indiana University Press.
- Dejonckheere, P. J. N., De Wit, N. L., Van de Keere, K. V., & Vervaeet, S. (2016). Exploring the classroom: Teaching science in early childhood. *European Journal of Educational Research*, 5(3), 149–164.
- Donaldson, S. R. (Quotes). Retrieved February 21, 2023, <https://www.azquotes.com/quote/566447>
- Einstein, A. (Quotes). Retrieved February 19, 2023, <https://www.goodreads.com/quotes/20604-the-important-thing-is-not-to-stop-questioning-curiosity-has>
- Ferguson, C. A. (1977). Baby talk as a simplified register. In C. E. Snow & C. A. Ferguson (Eds.), *Talking to children* (pp. 219-235). Cambridge University Press.
- Finland remains among top nations in PISA education survey. Retrieved February 27, 2023, <https://finland.fi/life-society/finland-remains-among-top-nations-in-pisa-education-survey/>
- Forbes, M. (Quotes). Retrieved February 14, 2023, <https://www.goodreads.com/quotes/3338-the-purpose-of-education-is-to-replace-an-empty-mind>
- Freier, P. (1970). *Pedagogy of the oppressed*. Seabury Press.
- Freud, S. (Quotes). Retrieved February 14, 2023, [https://www.brainyquote.com/quotes/sigmund-freud\\_106066](https://www.brainyquote.com/quotes/sigmund-freud_106066)
- Gardner, B. T., & Gardner, R. A. (1975). Evidence for sentence constituents in the early utterances of child and chimpanzee. *Journal of Experimental Psychology: General*, 104(3), 244-267.
- Gardner, R. A., & Gardner, B. T. (1969). Teaching sign language to a chimpanzee: A standardized system of gestures provides a means of two-way communication with a chimpanzee. *Science*, 165(3894), 664-672.
- Gopnik, A. (2012). Scientific thinking in young children: Theoretical advances, empirical research, and policy implications. *Science*, 337(6102), 1623–1627.
- Graue E. (2005). (De)centering the kindergarten prototype in the child-centred classroom. In Ryan S. & Grieshaber S. (Eds.), *Practical transformations and transformational practices: Globalization, postmodernism, and early childhood education* (pp. 39-58). Elsevier.
- Greenfield, P. M., & Savage-Rumbaugh, E. S. (1993). Comparing communicative competence in child and chimp: The pragmatics of repetition. *Journal of Child Language*, 20(1), 1-26.
- Greenfield, P.M., & Savage-Rumbaugh S. (1990). Grammatical combination in Pan paniscus: processes of learning and invention in the evolution and development of language. In S. T. Parker & K. R. Gibson (Eds.), *Language and intelligence in monkeys and apes: Comparative developmental perspectives* (pp. 540–578). Cambridge University Press.
- Guthrie, G. (1990). In the defense of formalistic teaching. In Rust, V. D. & Dalin, P. (Eds.), *Teachers and teaching in the developing world* (pp. 219-232). Garland Publishers.
- Harris, P. L. (2020). The point, the Shrug, and the question of clarification. In Butler, L. P., Ronfard S., & Corriveau, K. H. (Eds.), *The questioning child: Insights from psychology and education* (pp. 29-50). Cambridge University Press.
- Harris, P. L. (2022). Young children share imagined possibilities: evidence for an early-emerging human competence. *Philosophical Transactions of the Royal Society B*, 377(1866), 20220022.
- Harwood, D., Bajovic, M., Woloshyn, V., Di Cesare, D. M., Lane, L., & Scott, K. (2015). Intersecting spaces in early childhood education: Inquiry-based pedagogy and tablets. *The International Journal of Holistic Early Learning and Development*, 1, 53-67.

- Hatoff, Q. (2012). Donning a mask: Suicide at Harvard. *The Harvard Crimson*. Retrieved February 26, 2023, <https://www.thecrimson.com/article/2012/12/10/suicide-harvard-mental-health/>
- Hockett, C. F. (1959). Animal 'Languages' and human language. In J. N. Spuhler (Ed.), *The evolution of man's capacity for culture* (pp. 32-39). Wayne State University Press.
- Hockett, C. F., & Archer, R. (1964). The human revolution. *Current Anthropology*, 5, 135-168.
- Holliday, A. (1994). *Appropriate methodology and social context*. Cambridge University Press.
- Isaacs, S. S. (1930). *The intellectual growth of young children*. Routledge and Kegan Paul.
- Jensen, B., Hunter, A., Sonnemann, J., & Burns, T. (2012). Catching up: Learning from the best school systems in East Asia. Grattan Institute. Retrieved February 8, 2023, <https://core.ac.uk/download/pdf/30679884.pdf>
- Jones, L. (2007). *The student-centered classroom*. Cambridge University Press.
- Jordania, J. (2006). *Who asked the first question? Origins of human choral singing, intelligence, language and speech*. Tbilisi State University Press.
- Jordania, J. (2011). Should we teach students how to answer questions or how to ask questions? Towards a new educational strategy. *Sutra the thread, A Quarterly Journal for Research on Education, Psychology, Traditional Sciences and Systems, Health and Consciousness*. Vol. 8: 29-42. Materials of the International congress "Revisiting Education Culture Learning and Training Formats for Human Empowerment," held in New Delhi, 14-18 January, 2010.
- Kalinka, A. T., & Tomancak, P. (2012). The evolution of early animal embryos: conservation or divergence?. *Trends in ecology & evolution*, 27(7), 385-393.
- Kao, G. (1995). Asian Americans as model minorities? A look at their academic performance. *American Journal of Education*, 103(2), 121-159.
- Kao, G., & Thompson, J. S. (2003). Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology*, 29(1), 417-442.
- Khalick, A-E, F., Lederman, N., & Schwartz, R. (2015). Inquiry, as a curriculum strand. *Encyclopedia of science education* (pp. 510-514). Springer.
- Kurkul, K. E., & Corriveau, K. H. (2018). Question, explanation, follow-up: A mechanism for learning from others?. *Child Development*, 89(1), 280-294.
- Lea, S. J., Stephenson, D., & Troy, J. (2003). Higher education students' attitudes to student-centred learning: beyond educational bulimia??. *Studies in Higher Education*, 28(3), 321-334.
- Lee, I-F. (2018). Child-centered learning. In Shackelford, T., & Weekes-Shackelford, V. (Eds.), *Encyclopedia of evolutionary psychological science*. Springer, Cham. Retrieved March 1, 2023, [https://doi.org/10.1007/978-3-319-16999-6\\_2439-1](https://doi.org/10.1007/978-3-319-16999-6_2439-1)
- MacDonald, K. (2016). *Back to the garten: Inquiry-based learning in an outdoor kindergarten classroom* (Unpublished masters' thesis). Faculty of Social Sciences, Brock University, St. Catherines, Ontario.
- Matthews, W. J. (2003). Constructivism in the classroom: Epistemology, history, and empirical evidence. *Teacher Education Quarterly*, 30(3), 51-64.
- McDougall, B. (2014). Principals call for a national standard school starting age of five-and-a-half. August 29, 2014. News. Daily Telegraph, Sydney.
- McNeill, D. (1980). Sentence structure in chimpanzee communication. In T. A. Sebeok & J. Umiker-Sebeok (Eds.), *Speaking of apes: A critical anthology of two-way communication with man* (pp. 150-156). Plenum Press.
- Minner, D., Levy, A., & Century, J. (2009). Inquiry-based science instruction. What is it and does it matter? Results from a research synthesis year 1984 to 2002. *Journal of Research in Science Teaching*, 47(4), 474-496.

- Moskowitz, B. A. (1978). The acquisition of language. *Scientific American*, 239(5), 92-109.
- National Research Council. (2000). *Inquiry and the National Science Education Standards: A guide for Teaching and Learning*. National Academy Press. Retrieved March 2, 2023, <https://www.nap.edu/read/9596/chapter/1#xi>.
- Norquay, N. (1999). Social difference and the problem of the 'unique individual': An uneasy legacy of child-centred pedagogy. *Canadian Journal of Education*, 24(2)183-196.
- O'Donoghue, T. A. (1994). The need for educational reform and the role of teacher training: An alternative perspective. *International Journal of Educational Development*, 14(2), 207-210.
- Oelkers, J. (2002). Rousseau and the image of modern education. *Journal of Curriculum Studies*, 34(6), 679-698.
- O'Sullivan, E. (2003). Bringing a perspective of transformative learning to globalized consumption. *International Journal of Consumer Studies*, 27(4), 326-330.
- Piaget, J. (1936). *The origin of intelligence in the child*. Routledge & Kegan Paul.
- Pisa Records by Country. (2023). Retrieved March 4, 2023, <https://worldpopulationreview.com/country-rankings/pisa-scores-by-country>
- Premack, A. J., & Premack, D. (1972). Teaching language to an ape. *Scientific American*, 227(4), 92-99.
- Premack, D., & Premack, A. J. (1983). *The mind of an ape*. W.W. Norton & Company.
- Revesz, G. (1956). *The origin and prehistory of language*. Longmans, Green and Co.
- Rivas, E. (2005). Recent use of signs by chimpanzees (Pan Troglodytes) in interactions with humans. *Journal of Comparative Psychology*, 119(4), 404.
- Rodgers, C. R. (2002). Seeing student learning: Teacher change and the role of reflection. *Harvard Educational Review*, 72(2), 230.
- Roessler, J. (2013). Knowledge, causal explanation, and teleology. In T. S. Gendler & J. Hawthorne (Eds.), *Oxford studies in epistemology volume 4*, (pp. 321-332). Retrieved February 18, 2023, <https://academic.oup.com/book/274/chapter-abstract/134840263?redirectedFrom=fulltext>
- Russel, B. B. (Quotes). Retrieved March 10, 2023, <https://www.brainyquote.com/authors/bertrand-russell-quotes>
- Savage-Rumbaugh, E. S., & Lewin, R. (1994). *Kanzi: The ape at the brink of the human mind*. John Wiley & Sons, Inc.
- Schaller, G. B. (1972). *The serengeti lion: A study of predator-prey relations*. University of Chicago Press.
- Serrant, L. (2020). *How well do you listen? Plutarch and his letter on listening*. Retrieved March 3, 2023, <https://classicalwisdom.com/people/historians/how-well-do-you-listen-plutarch-and-his-letter-on-listening/>
- Shah, P. E., Weeks, H. M., Richards, B., & Kaciroti, N. (2018). Early childhood curiosity and kindergarten reading and math academic achievement. *Pediatric Research*, 84(3), 380-386.
- Shah, R. K. (2019). Child-centered education: Criticisms. *Shanlax International Journal of Education*, 8(1), 22-37.
- Simler, K., & Hanson, R. (2018). *The elephant in the brain: Hidden motives in everyday life*. Oxford University Press.
- Simon, B. (1981). The primary school revolution: Myth or reality? In B. Simon & J. Willcocks (Eds.), *Research and practice in the primary classroom*. Routledge & Kegan Paul.
- Singer, E. (2005). The liberation of the child: A recurrent theme in the history of education in western societies. *Early Child Development and Care*, 175(6), 611-620.

- Skelton, C. (2002). The feminisation of schooling or re-masculinising primary education?. *International Studies in Sociology of Education*, 12(1), 77-96.
- Smith, S. (2013). 'Too much, too soon': Children should not start school until age six or seven, say education experts. Retrieved February 14, 2023, <http://www.dailymail.co.uk/news/article-2418281/Children-start-school-age-seven-say-education-experts.html#ixzz3MfEqS1Th>
- Stacey, S. (2018). *Inquiry-based early learning environments: Creating, supporting, and collaborating*. Redleaf Press.
- Starr, D. (2012). China and the Confucian education model. *Universitas*, 21(1), 1-27.
- Stone, J. E. (1996). Developmentalism: An obscure but pervasive restriction on educational improvement. *Education Policy Analysis Archives*, 4(8), 1-32.
- Sully, J. (1896/2000). *Studies of childhood*. D. Appleton.
- Tabulawa, R. (2003). International aid agencies, learner-centred pedagogy and political democratisation: A critique. *Comparative education*, 39(1), 7-26.
- Terrace, H. S. (1980). *Nim*. Eyre Methuen.
- Thompson, L. H. (1924). Children's questions. *Educational Research Bulletin*, 3(16), 347-352.
- Tizard, B., & Hughes M. (1984). *Young children learning*. Harvard University Press.
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Walkerdine, V. (1985). On the regulation of speaking and silence: Subjectivity, class, and gender in contemporary schooling. In C. Steedman, C. Urwin, & V. Walkerdine (Eds.), *Language, gender, and childhood* (pp. 203-241). Routledge & Kegan Paul.
- Walkerdine, V. (1990). *Schoolgirl fictions*. Verso Books.
- Wills, C. (1993). *The runaway brain: The evolution of human uniqueness*. Basic Books.
- Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition*, 13(1), 103-128.
- Wise, S. M. (2002). *Drawing the line*. Perseus Books.
- Yefremova, A. (2023). *Demystifying math 55*. Retrieved February 20, 2023, <https://www.math.harvard.edu/demystifying-math-55/>