3.1: What are the educational milestones of the 17th and 18th centuries?

by Kim Rodriguez

Education in the 17th and 18th centuries was influenced primarily by theologians, philosophers, and government which included the pedagogies of Sir Francis Bacon of England, Wolfgang Ratke of Germany, René Descartes of France, Jean-Jacques Rousseau of Switzerland, John Comenius (a.k.a. Komensky) of Moravia, and John Locke of England. There were other groups of teachers that impacted education reform during this period such as the Jesuits, the Oratorians, and the Puritan reformers; however, discussion for this text will focus on the individuals who have made an impact on education during this Age of Enlightenment. Ideologies and methodologies were set forth and established as a result of these influences, many of which are in practice today. For example, Comenius's ideas for separating students into three levels of schooling based on age is popularly structured in today's school systems. We have elementary, middle, and high school, as well as higher learning in colleges. The milestones that were made have changed the way education is perceived and the way in which teaching is conducted with great thought aimed towards what is best for the student to become a contributing member of society.

Sir Francis Bacon (1561–1626)

Note

Knowledge is power.—Nam et ipsa scientia potestas est - Sir Francis Bacon

Bacon observed that the educators of his time were close-minded and ineffective because they presented themselves as orators of empty rhetoric rather than teachers of factual scientific information based on proven theory. His approach to teaching included a method he called empiricism, "the doctrine that knowledge derives from experience" (Merriam-Webster). Bacon argued that pupils need to be prepared for life through proper schooling so that they would be better able to function within, and contribute to, their society. He believed that the science of life and the use of inductive
reasoning would best prepare a person for nearly all aspects of living. One form of inductive reasoning and the empirical method that we use today is the Scientific Method, based largely on Bacon's philosophies of observing, studying, and analyzing factual data rather than relying on the ideas and guesswork of our own or others. The Scientific Method was originally named for him and is sometimes referred to as the Baconian Method (Encyclopædia Britannica).

**Rene Descartes (1596-1650)**

Note

I think- therefore, I am (cogito ergo sum) - Rene Descartes

Descartes had a different approach in mind for teaching and learning than Sir Francis Bacon's empiricist ideas. Unlike the analytically structured approach, he believed that the basis for learning originates from human reasoning which must be the foundation for all critical thinking and analytical practices. Arguably, one of his greatest achievements is his work, *La géométrie*. Descartes *La géométrie* explains how to apply algebraic computations to geometry, also known as Cartesian geometry today (O'Connor, Robertson). His work focuses on these major points:

1. First step towards a theory of invariants
2. Algebra makes it possible to recognize problems in geometry
3. Algebra imports into geometry the principles of division and hierarchy method
4. Geometrical solvability is not possible without algebra

(O'Connor, Robertson)

René Descartes also invented the way we plot points on a graph. This method is called the Cartesian Coordinate System, which is used the same way all over the world for purposes of mapping and graphing by plotting points (plot points horizontally first, vertically second). Although Descartes might be best known as a great philosopher, his most notable achievements are in the field of mathematics and much of his math theory (as shown in the table above) is in use today.

Note

Descartes awakened late at 11:00 each morning for most of his life due to an undetermined illness; however, during his stay with Queen Christina of Sweden he was requested to draw tangents each morning at 5:00. After a few months in this environment, cold and early morning awakenings, he died of pneumonia (O'Connor, Robertson).

**John Comenius (Jan Komensky) (1592-1670)**

Note

...the whole of the human race may become educated, men of all ages, all conditions, both sexes and all nations. - Comenius

The above quote comes from Comenius's work *Pampaedia*, in which he emphasized the belief that everyone should be educated to fulfill their lives, an ideal he called *Pansophism* meaning universal wisdom. Comenius, once a bishop of the Moravian Church, developed this philosophy shortly after escaping "religious persecution by taking refuge in Poland,
Hungary, Sweden, and The Netherlands” (Gutek). Comenius was a leading philosopher of education during this period. He proposed the segregation of schools according to age and grade levels. At seven to 12, pupils would enter a "vernacular school" (Gutek) where there would be six different classes, one for each age. During this time the pupil would learn "religion, ethics, diction, reading, writing, math, music, economy, civics, history, geography, and handicraft" (Encyclopædia Britannica). In these lower levels, the pupil would hone his/her imaginative and memorization skills. At 13-18, pupils would learn Latin, i.e. grammar. Courses involving language arts and the sciences would be further studied. At 19-24, the pupil would continue on to higher education at a university which Comenius believed each province should establish. In 1657, Comenius's methods were incorporated into The Great Didactic which emphasizes two schools of thought: the Arts and the Sciences. Additional publications by Comenius were The Gate of Tongues Unlocked (1631), which was used to teach pupils Latin from their native language; also Orbis Sensualium Pictus (1658), which was a picture book for young readers. Comenius believed that children learned best through sensory perceptions and pictures that identified with labeled objects. Today, classes that are grouped by age, two primary schools of thought (arts and sciences), and the use of illustrated children's books to promote literacy is a nearly universal ideal.

**John Locke (1632-1704)**

Note

Let us then suppose the Mind to be, as we say, white Paper, void of all Characters, without any Ideas; How comes it to be furnished...? To this I answer, in one word, From Experience: In that, all our Knowledge is founded; and from that it ultimately derives it self. - John Locke

The above quote comes from Locke's *An Essay of Understanding*. His main idea was that humans are born with minds that are "blank slates - tabula rasa, and empty of ideas" (Gutek). Locke believed that the human mind should entertain initial thoughts that should progress and yield to complicated thoughts and ideas. Locke believed that a person must experience what he/she learns from life situations. His writings were very important during the Age of Enlightenment because his thoughts focused not only on education during that era, but also government. State education was a major concern for philosophers during that period and Locke's influence in politics may have helped pave the way for his philosophies to take root in government planning for education.

**Jean-Jacques Rousseau (1712-1778)**

Note

I hate books; they only teach us to talk about things we know nothing about. - Jean-Jacques Rousseau

Rousseau helped bring about an educational revolution in France with his work "Emile". In this book Rousseau talks about how children should be allowed to be outside in the sunlight playing; this is where they learn the best. He also states that children have stages of development as they grow and education should coincide with them. Before age 12 a child is limited in the complex thought so they should be taught simply. Between ages 12 and 16 reason starts to develop and by age 16 children become young adults; young adults should be taught a trade such as masonry or carpentry. A child that grows up in this fashion will have the best possibility to develop to his full potential. Rousseau also says that education begins at home and parents should not preach but lead by example. For the most part Rousseau believes that children should make their own decisions and their educators should be there for support.
Educating the Masses during the Age of Enlightenment

During this era, philosophers and educators believed that deductive and inductive reasoning was paramount in the teacher and learning process. Though most of the 17th and 18th century pedagogies originate in Europe, these ideas made a great impact on influential Americans such as Benjamin Franklin and Thomas Jefferson, who both saw the importance of scientific, critical, and exploratory thought, as well as "a civic education" (Gutek). So given all of these ideologies, many of which are closely aligned to one another in some way, how did some leaders of nations comply? Below are some examples of attempts that were made at that time.

In Prussia: Mandatory schooling for all children ages 5–14 was implemented under the regime of Frederick the Great of Prussia. His minister was Freiherr von Zedlitz who "supported the founding of new schools and the centralization of school administration under an Oberschulkollegium, or national board of education (1787)" (Encyclopædia Britannica).

In Russia: Catherine II of Russia attempted to nationalize education. She issued an education act in 1786 which called for two years of study in district schools followed by five years of study in provincial schools. Religious instruction was absent from these schools. Unfortunately, only half of the towns had the schools (approximately 250 towns). Alexander I implemented a system of education that was free and controlled by the state, which led all the way through the university level. However, years later these reforms came under re-consideration by conservatives.

In America: Benjamin Franklin and Thomas Jefferson, well-known Francophiles and ambassadors to France, embraced and incorporated the new ideas which were implemented in the European countries as much as possible and helped influence a strong foundation for education in America. Compulsory education became paramount in early America. Although most school instruction was initially deeply based on religious modules from Puritania influences, the later political separation of church and state (First Amendment of the Constitution of the United States - Article [1] - [1]) removed religious instruction from state supported schools.

We take for granted that compulsory schooling in our world today is the norm; however, evidence indicates that nearly 50% of all children in the world (ages 6-18) do not attend school (Gutek). The United Nations Educational, Scientific and Cultural Organization (UNESCO) strives to help all children in the world to attend school and eradicate illiteracy. While much success has been achieved by such organizations, there is still much to be done.

Note

Thomas Jefferson declared that John Locke, Francis Bacon and Isaac Newton were the "three greatest men the world had ever produced" (Peterson, 1236).

Exercise

1. Which quote originated from René Descartes?

   a. Knowledge is power

   b. I think - therefore, I am

   c. Love Truth, but pardon error
d. We hold these truths to be self-evident, that all men are created equal

2. Which philosopher believed that the human mind starts as a blank slate - *tabula rasa*?
   a. John Comenious
   b. Wolfgang Ratke
   c. Rene Descartes
   d. John Locke

3. Francis Bacon's analytical approach to learning and understanding is called which of the following?
   a. Scientific method
   b. Pansophism
   c. Tabula Rasa
   d. Rationalism

4. The division of teaching based on age levels is part of whose philosophy?
   a. John Comenious
   b. Thomas Jefferson
   c. Benjamin Franklin
   d. Alexander I

5. René Descartes most famous work explains which of the following ideas?
   a. The belief that everyone should be educated in order to fulfill their lives
   b. explains how to apply algebraic computations to geometry
   c. The Baconian, or Scientific, Method
   d. The belief that reality is the origin of knowledge

**Answer**

1. b
2. d
3. a
Sources

Bartlett, J. Familiar Quotations, 10th ed. (1919) [2]


United States Congress. [8]


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