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Evolution of Human Knowledge

A K Ziauddin Ahmed

Humans are thinking animals; we can think and we can imagine. The unique human capability to recombine words into numerous varieties of new meanings contributes to our ability to think. Researchers have found that monkeys can count up to four only and it is thought that the human ability to count higher numbers came only after we developed language. Language is the primary means of communication. The ability to communicate is the foundation of human civilization.

We learn through observation, communication, and interactions. Children learn from parents and society through communication and interaction. Marc Hauser, a professor of psychology at Harvard University, found in his research that other animals have interesting thoughts but they can only convey those by gestures or grunts, shrieks, etc. Hauser remarks, "When humans evolved speech, they liberated the kinds of thoughts nonhumans have. Feedback between language and thinking then boosted human self-awareness and other cognitive functions."

Thoughts and imagination lead to discovery, invention, conviction, and knowledge. Thinking is triggered by information that reaches us through communication. Thus, communication is important in the development of human knowledge.

Interactions and the exchange of thoughts add to the stock of knowledge. New ideas lead to newer ideas. As George Bernard Shaw put it, "If you have an apple and I have an apple and we exchange these apples then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas."

As Jurgen Renn, a German historian of science, remarks in his book, 'The Evolution of Knowledge', knowledge "can be stored, shared, and passed on from individual to individual and across generations with the help of 'external representations,' such as writing or symbol systems, which are part of the material culture of a society."

In ancient times, people communicated through paintings and carvings like cave paintings and hieroglyphics in pyramids. Those communications could not be passed from individual to individual. Papyrus and clay tablets facilitated the transmission of knowledge from person to person. However, as those materials were handmade, they had limitations in terms of volume of production. Also, it took years to travel to faraway lands. Thus, the circulation of knowledge was extremely slow.

According to the article 'A Salute to the Wheel' by Megan Gambino published in the Smithsonian magazine in June 2009, the wheel was first created around 3500 BC in Mesopotamia (modern-day Iraq). The wheel brought out the concept of circular motion, which was behind the invention of the windmill, carousel, mechanical clock, motor, etc. With the invention of the wheel, civilization started rolling. However, the initial wheels were not very impressive and useful. They were solid disks of wood. We can imagine what it would be like to ride on those wheels. They would be slow and bumpy. It was not until 2000 BC, which is 1500 years later, that people began to hollow out the discs to make a lighter wheel.

On the other hand, consider the invention of the telephone. In 1844, Samuel Morse of the USA developed the telegraph. He sent words in the form of dots and dashes through a wire connection. After only 32 years in 1876, a Scottish-born American inventor, Alexander Graham Bell, invented the telephone, the means of sending voice through the wire.

New ideas lead to newer ideas. Knowledge acts as a platform on which thoughts and imaginations of different people develop more knowledge. Italian Engineer Guglielmo Marconi's invention of wireless communication in 1895 led to the subsequent inventions of the radio, radar, TV transmission, mobile phone, microwave, etc.

Consider the invention of zero. In our everyday life, we can feel the value of zero. How would we write even ten, let alone the big numbers, without using zero? We can't think of developments in mathematics and physics and for that matter the evolution of modern civilization without the concept of zero. According to an article by Curt Suplee published in the Washington Post in January 2000 and another one by John Matson published in Scientific American in August 2009, the concept of zero first appeared in Babylon (ancient Iraq) between 400 and 300 BC. It was then developed in India as a number in the 5th century AD. Then the Islamic conquest brought the knowledge back to Baghdad and it was used and popularized by the Arab mathematician Al-Khwarizmi in the 9th century AD. Then from Algeria, the concept of zero was taken to Europe by an Italian merchant and part-time mathematician Fibonacci in 1202.

The invention of the printing press and speedy transportation helped the circulation of knowledge wider and faster. When it took 1500 years just to hollow out the solid wheel to make it lighter and faster, within a range of only 75 years (from 1901 to 1975) during the twentieth century we invented the radio, the airplane, rocket, television, the computer, nuclear power, microchips, and the internet.

Because of technological advancements, transportation and telecommunication have become faster and cheaper than ever before. But people's freedom of movement on earth has become more constrained than the ancient times. If people are allowed to freely interact, exchange thoughts and ideas, and work together across national borders, there will be more invention, innovation, and discovery.

The writer is a former Corporate Professional and Academic