

TOK Essay

Word count: 1597 words

Title 4: The role of analogy is to provide understanding rather than justification. To what extent do you agree with this statement.

There is a famous proverb in my Gujarati language, “Murkho no samjhe saadhmarya vagar, saadhmarya vagar samjave eea murkh”, which translates to “A fool cannot be made to understand a concept without an analogy, a person who attempts to explain to a fool without an analogy is a fool himself.” In my culture, analogy is an integral component of simplification; to create an effective explanation, analogies are used in forms of proverbs or idioms related to the daily stereotypical Gujarati life. Therefore, learning in my language comes from obvious inference from synonymous situations.

Justification is given post understanding; therefore, justification may vary from person to person based on interpretation and insight. Conversely, to administer understanding, one must consider the sender and the receiver, where the sender, an object or person, has an objective to educate the receiver, another person. The extent of success in achieving this objective can be measured through tools such as testing.

Role of analogy in understanding is to reduce the load on one’s cognition and ease the recollection of concepts. Role of analogy in justification is to arrive to a conclusion, while considering solid facts in the front. Analogy is the lens through which new knowledge can be viewed with clarity. Analogy is not a WOK, rather, it is a state of thought that facilitates other WOKs to garner and share knowledge. Although analogy is not a means of gaining new knowledge, it is a catalyst for acquiring new knowledge by other WOKs. The basis of analogy is by drawing familiar parallels to explain unfamiliar situations. Analogies erase the abstract by invoking the known. Nevertheless, the applications of analogy differ in AOKs of Natural Sciences, Mathematics, and Religious Knowledge Systems.

Reason, intuition, and sense perception are fundamental WOKs to the AOK of natural sciences. In natural sciences, justification is only possible after empirical observation that stimulates the sense perception. An integral part of Natural sciences is sharing knowledge through the means of teaching. Analogy is a tool used by many natural sciences educators to enhance their teaching. In my two years of IB Physics HL, I encountered many situations where analogies were used to elaborate on complex concepts by building on to simpler known ones. For example, when we were first introduced to the concept of thermal physics, my

professor explained the interaction (electrostatic forces of attraction) between molecules as if they had small springs installed between each molecule. Therefore, I was successfully able to answer a question regarding energy transfer between molecules, because I could reason my way to the answer due to my knowledge of spring mechanics, although, the springs didn't really exist. The use of the analogy enhanced the pedagogy. Because the subject matter was made more comprehensible, my intuition could kick in and elaborate on further phenomena regarding the topic.

On the other hand, analogies' part in scientific exploration differs. Here, analogies are components of reasoning to validate or disprove empirical findings and theoretical inferences. A notable case occurred in the early 1900s, when Albert Einstein resolved the photoelectric effect by postulating the duality of light as a particle and wave. The scientific community was in a frenzy due to the inability of physicists to reason the link between light's behavior as a particle and as a wave. In 1924, Louis de Broglie proposed the de Broglie hypothesis, which argued that the wavelength of light- a wave property- was analogous to the momentum of photons of light- a particle property("De Broglie Wave."). This revolutionised the approach that physicists took towards quantum mechanics and soon all the properties of light were deemed analogous to some property of particles. Max Born, in 1926, established the synonymous relationship between amplitude of wave and probability of the position of a particle(Carroll). The wave-like light phenomena were explained through the perspective of particles and much of the ambiguity in the photoelectric was resolved. de Broglie and Born justified the resolution to the photoelectric effect by posing analogies between the bipolar nature of light. Although the physicists were unable to reason an exact theorem to marry waves and particles, by connecting critical characteristics of the wave to the vital traits of the particle, a valid justification to the dilemma was established. Hence, it can be inferred that to deem situations analogous, what really matters is what element of the situation was analogous, rather, than the quantity of similarity between situations.

Substantiating the existence of god has been a crucial element of Religious knowledge systems. In religious knowledge system, reasoning strengthens faith. Analogous reasoning is a strong means of substantiating the unexplained faith in deities. A well renowned teleological ideology is the watchmaker-analogy by William Paley. The argument explains that the accidental discovery of a complicated object in nature, such as a watch, suggests that there is a deliberate watchmaker in existence. Since the universe is a complicated discovery, synonymous with the watch, Paley concluded that there must exist a universe creator, synonymous with the watch-creator. His argument entails that the intricacies in the design of the universe contradict the possibility of a random sequence of events in its creation, so the only conclusion that can be arrived at is the existence of a designer of the universe (“William Paley, ‘The Teleological Argument’ Philosophy of Religion.”). The parallels drawn in this analogy encapsulate similar traits between the objects compared and sequence a logical deduction from the statement. It can then be concluded that analogies aid in sequential justifications and deductive reasoning.

Analogies have often been witnessed in the religious literature, where the use of metaphorical characters to teach behavioral lessons is prominent. Religious texts act as authoritative sources to validate the emotional experiences of the mass in ancient times. Such a case is presented in the Indian recited poem, Ramayana. The Ramayana employs an anthropomorphic animals (human-like emotions, bodies, and minds endowed to animals) plot device to address the value system of ancient Indians. The most prominent among this symbolism is the monkey army recruited by Lord Rama. The monkey represents agitation, lawlessness, as well as agility (“The Ramayana by Vālmīki). Lord Rama appoints the monkeys to show them the path of discipline and self-control, traits that he depicted in his character (“Vedantic Significance in Ramayana”). Similarly, Jambhavana, a bear, has been shown to possess brute strength, patience, and wisdom, traits that bears showcase in the wild (Sairam). The choice of an animal to play the role in Ramayana is in conjunction with the emotions that the animal presented in the wild. The Ramayana serves the propaganda of educating the Ancient Indians about the causes and consequences of certain emotions on their quality of life. The deliberate animal characterization strengthened the need of emotional inference from the hybrid characters for the ancient Indians. Ramayana recognizes the tendency of humans to resort to raw emotional, irrational

behavior and administers awareness about this fallacy through the analogies in the narrative. Understanding developed through self-inference from analogies is more concrete, than understanding developed through pure dictation.

To understand new knowledge in Mathematics, fundamental knowledge leading up to the new knowledge must be known. In Mathematics, analogy in the long term, with increased complexity, becomes obscure in understanding. While studying in the pre-primary grades, I was taught to count numbers by imagining them as pebbles. The number one virtually represented one pebble for me. So when I was introduced to the concept of real numbers, which also include negative numbers, in the third grade, I was perplexed. How could there be a negative pebble? Are negative pebbles (numbers) beyond my imagination? Could I witness the existence of a negative pebble? It was only after the explanation of the number line by my tutor, that I understood the nature of negative numbers. In this case, the analogy of numbers as pebbles in my imagination hindered my acceptance of richer subject matter in the number theory. Later, in the IB Mathematics HL curriculum, I came across complex numbers. Again, imagining the number line was futile in explaining the concept of complex numbers. Therefore, my analogy of the number theory matured to the Argand diagram that showcased the existence of complex numbers by illustrating an additional number line, perpendicular to the horizontal one. It can be inferred from these anecdotes that analogies have to both evolve and retain simplicity over time in order to sustain explaining more challenging concepts.

All things considered, the bifunctionality of analogies, in aiding understanding and providing justification, is evident across Natural Science, Religious Knowledge systems, and Mathematics. In the natural sciences, to plant a seed of new idea in the field of mind, one must add the fertilizer of analogy so that the intuition assists in the nurturing of the idea. To maintain their function in sharing knowledge, analogies need to advance over time to better explain discoveries in concepts that keep increasing in sophistication. Analogies can reaffirm beliefs if strong enough parallels are drawn between the abstract and the concrete. Analogies are used by authoritative sources in RKS to mold emotions in the devotees, so that they are synchronized with the value system of the RKS. The effective use of analogy is more prevalent in providing

understanding rather than justification, because the latter leaves room for controversy and embraces counters that create ambiguity. Analogies in Natural Science and Mathematics are formed around objects from the physical world that can be sensed through sense perception. In contrast, analogies in RKS are generally drawn between intangible feelings and emotions. Analogy provides an expression of the understanding of the concept by the speaker. Therefore, rather than a role, analogy is the understanding itself. Whereas, analogy is a tool in providing justification, because situations that are absolutely identical may not exist.

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