

Is the production of
knowledge and team
or individual based
task?



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“ The production of knowledge is always a collaborative task and never solely a product of the individual.” Discuss this statement with reference to two areas of knowledge.

Throughout history, the credit for crucial discoveries has typically been given to single individuals; Alexander Fleming, Marie Curie and Stephen Hawking are heralded as scientific geniuses for their respective findings. This leads us to believe that the production of knowledge, the act of using available resources to create an understanding of something through experience, can be carried out by an individual. However, none of these scientists made their discoveries single-handedly; they each had partners with whom they actively worked together (Satell, 2016), which can be defined as collaboration. While I do believe that knowledge can be the product of an individual, we tend to accept knowledge as shared knowledge only when we consider it to be reliable. To aid me in my exploration of how knowledge is produced, I want to investigate how reliability is established. According to methodology such as the scientific method within the Natural Sciences, reliability stems from collaboration (Kognity, 2015). Using this example, I will examine to what extent an individual can produce reliable knowledge. I am also looking to explore the role of collaboration within the production of knowledge by examining the creative process within the Arts.

To determine the significance of reliability within the production of knowledge, a knowledge question I have identified is: “ To what extent can an individual produce reliable knowledge?”. One could argue that an individual can produce reliable knowledge by applying the scientific method using sense perception and reasoning. Reliable means that the knowledge

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can be trusted as it is consistent; anyone applying the same method should obtain the same knowledge from it. In order to produce knowledge utilizing the scientific method, one does not need to collaborate; the conclusion of an experiment, or the knowledge gained from it, is derived before the investigation is shared and repeated (Kognity, 2015). To arrive at a reliable conclusion, scientists use inductive reasoning or deductive reasoning. Inductive logic means reasoning from the specific to the general and was most famously carried out by Isaac Newton. By noticing that an apple fell from a tree at a constant acceleration, he derived a law of gravity that applies to all objects, everywhere. Deductive logic means reasoning from the general to the specific. This method includes two premises and a logically inferred conclusion (Kent State University, 2004). For example, we know that noble gases are stable, and that neon is a noble gas. Therefore, we know that neon is stable. Thus, this form of reasoning allows an individual to obtain reliable knowledge, as long as both premises are true. Empiricists will argue that all knowledge is derived from sense experience, hence scientists should use sense perception, which relies exclusively on an individual, to obtain reliable results. Knowledge is considered to be reliable when it is supported by empirical evidence, which is gathered through sense perception and must consist of several elements to be considered as such (Bradford, 2017). For example, it must be free from bias, manipulation and circular logical fallacies (Kognity, 2015). None of these criteria require collaboration, hence any individual scientist can consistently produce the same knowledge as anyone else by correctly applying the scientific method.

However, another element that increases the validity of evidence is that it has been positively peer-reviewed, which implies that collaboration is required in the production of reliable knowledge. This peer-review process is a crucial part of justifying the knowledge claims made by scientists because it allows these claims to be assessed, approved or challenged, hence checking if they are reliable. I believe it can be said that we are more likely to accept knowledge as shared knowledge if we regard it as reliable.

Reliability stems from consistency; scientific knowledge can only be proven to be consistent if the experiment is shared and repeated by others who arrive at the same conclusion (Tong, 2003). The scientific method is cyclical in nature; personal knowledge obtained from sense perception becomes shared knowledge once it is peer-reviewed. Succeeding scientists then use this shared knowledge to derive new personal knowledge. To illustrate the first step of this cycle, let us consider Alexander Fleming, who is renowned for discovering penicillin in 1929 (Satell, 2016). Fleming and countless other innovators are believed to have acted as lone geniuses in the production of their scientific knowledge. However, the reason why this knowledge has been continuously proven to be reliable is because it was produced collaboratively. Penicillin only came into widespread use 14 years after its discovery, which is because the help of chemists Howard Florey and Ernst Chain was required to study the bacteria-killing substance and synthesize it into a viable compound (Satell, 2016). Therefore, we can conclude that knowledge that is produced collaboratively is increasingly reliable as working with one's peers allows claims to be disputed, developed and tested.

However, this also establishes that, even though it is less reliable and

therefore often disregarded by society, knowledge can be the product of a sole individual, which contradicts what the prescribed title claims.

A knowledge question I have identified that will help me explore how knowledge is produced is “ What role does collaboration play in the production of knowledge?”. Within the Arts, spectator response theory can be used to argue that collaboration is indeed necessary for the production of knowledge, which, in this case, is knowledge of a piece of art. Painter Marcel Duchamp, who established this theory, argued that “ the creative act is not performed by the artist alone; the spectator brings the work in contact with the external world by deciphering and interpreting its inner qualifications and thus adds his contribution to the creative act” (MoMA Learning, 2017). Therefore, a piece of art requires the collaboration of spectators for it to be complete. A number of artists agree; they believe that art is a shared process, meaning that once a piece of art is created, it no longer belongs to them and it is up to the audience to interpret it (Musto, 2016). Both theories imply that collaboration is fundamental within the creative process, which is the methodology used to produce knowledge within the Arts. This corresponds to one of the many disputed methods of what constitutes as high-quality art. Philosopher John Dewey believed that high-quality art is that which “ facilitates an interaction [with the spectator] and thus provides access to the emotional realm of experience” (Kognity, 2015). In other words, the artist must collaborate with the viewer through his piece of art for knowledge to be produced. Additionally, using language to communicate their thoughts allows critics and audiences to precisely analyze and evaluate pieces of art, thus collaboratively completing the production of knowledge.

Using technical terms when discussing a work of art with other spectators allows us to express the knowledge we derive from our sense perception. The effective collaboration of spectators will therefore establish a rich understanding of a piece of art, which becomes shared knowledge. Such communication is imperative especially when interpreting non-representational art, which is not immediately recognizable as “[something from] the natural world” (Gersch-Nesic, 2019).

However, one might claim that collaboration is not necessary for the production of knowledge by recognizing how reason can be applied as a Way of Knowing within the creative process. Let us consider the example of Ludwig van Beethoven; despite going deaf, he continued to single-handedly produce symphonies (Classic FM, 2018). He reasoned that, based on previous, shared knowledge established within the field of music, certain melodic structures will evoke particular emotions within his audience. For instance, Beethoven incorporated a disharmonic combination of notes, known as dissonance, in sequences of his famous “ Moonlight Sonata” to induce a feeling of discomfort within the listener. Similarly, in the same composition, he uses consonance at times, a harmonic sequence of notes, to induce a pleasant atmosphere for the audience (Music and math: The genius of Beethoven, 2014). Both Beethoven and Bach are known for synthesizing harmonies that adhere to a particular set of rules and sequenced steps, hence applying a rational process to individually produce intricate symphonies. Applying reason within the creative process is not only typical for music; in the visual arts, artists select factors such as proportion, technique and genre-identifying features to achieve a desired outcome. For

example, using a motif, a pattern resulting from the repeated use of an idea or theme, creates an effect of “ unification, balance, form and coherency” (Kognity, 2015). Contrary to spectator response theory, this implies that the knowledge produced by a piece of art is determined solely by the artist. The idea of the artistic process being rational or, formulaic even, is supported by the assessment criteria within the IB Literature course; each student is graded depending on how thoroughly they can analyze the plot, character development and the effect of stylistic devices used by the author. Hence, an individual can single-handedly produce knowledge by applying reason within the creative process.

Contrary to the claim within the prescribed title, I can conclude that collaboration is not required for the production of knowledge. However, it may lead to more accurate, profound and complete knowledge as highlighted by the collaboration of spectators. Additionally, by considering methodology within the Natural Sciences, we determined that collaboration typically increases the reliability of produced knowledge. This explains why the majority of knowledge that we accept as shared knowledge, such as the usability of penicillin, was produced collaboratively. We tend to discard knowledge that was produced individually because we do not consider it to be very reliable, precise or thorough, which makes it less likely to become shared knowledge.

Although my exploration confirms my initial hypothesis, I believe that my insights are very dependent on the definition of collaboration. Arguing that an individual accessing prior knowledge in order to produce new knowledge

is a form of collaboration would have presumably led me to conclude that knowledge is never truly the product of an individual.

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