The Way of No-Way To Pursue Knowledge in Many Ways

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Abstract

"The Tao that can be told is not the eternal Tao.
The name that can be named is not the eternal name.
The nameless is the beginning of heaven and earth.
The named is the mother of ten thousand things.
Ever desireless, one can see the mystery.
Ever desiring, one can see the manifestations.
These two spring from the same source but differ in name; this appears as darkness.
Darkness within darkness.
The gate to all mystery."–Lao Tsu (B.C. 2500)

The above is an English translation of the first verse of the book "Tao Te Ching" by Lao Tsu. A working meaning of the word "Tao" is "way". The technical jargon "multidisciplinary research" or "interdisciplinary research" are research in many named established areas (i.e. chemistry, physics, sociology, mathematics, statistics, theology, philosophy, political science etc.) by an individual or a group of individuals. This type of research has a mysterious common theme that cannot be isolated but is present in the manifestations in various research disciplines. One example of a common theme can be the goal of a new technological innovation. In this article, the problems and solutions of such endeavors are identified by practical analogies of living and nonliving natural phenomena to the above quoted verse by Lao Tsu.

Keywords: Multidisciplinary, Interdisciplinary, Research, Communication, Calculus

1. INTRODUCTION

The question of relevance of the verse [1] in the abstract must be burning in the mind of the reader. It will become clear in the rest of the article, that the purpose of imparting knowledge is to induce questions in the mind of the student. True knowledge cannot be expressed in words without distorting the knowledge by the combination of words, with limited scope. So, the questions will be asked and an effort will be made to enable to find a personal answer by the reader.

Some barriers to pursue knowledge involving skills in several different established areas of research or "Multi Disciplinary Research", during the interactive sessions of International Conference on Education, Training and Informatics (ICETI) 2014, were mentioned. They can be categorized broadly in four types. One, communication problems due to different interpretations associated with same terms in different areas of research. As an example, the word "cell" in biology has a different interpretation than "cell" in mobile-network. Two, ideological rigidity among the research community of any specific established research area. A hypothetical example will be the head of the department of political science not agreeing to hear a proposal of a faculty member to do research to model the change in the political behavior of a population using laws of physics, used for modeling diffusion of heat in liquids based on various environmental conditions, which will involve researchers from the department of physics. Three, phobia of losing relevance. An example will be an extension of the previous example. The experts of the established means of predicting population behavior for political ideology perceiving the new approach as a threat to their future progress in their profession. Four, weakness of human character. Factors like professional jealousy or greed for more power etc.

Serious researchers, innovators and inventors are feeling stifled by these factors in various institutes of academia and industry. The solution seems to have two major themes. One is communication and the other is attitude. In the most peripheral level, the communications meant for multidisciplinary audience have to be clear about the intended meaning of the terms used by the communicator. The communication also has to be balanced to avoid provoking the audience to react in a way which might result into barriers, such as ideological rejection or phobia of losing relevance. The communication also has to be motivating and inspiring to drive people away from their narrow vices of greed, jealousy, arrogance etc. The intangible attitude of the speaker is manifested through the communication to shape the intangible attitude of the audience. This will create a cycle of communication and attitude for effective interdisciplinary research.

In the next section, some simple choices for an effective communication for the purpose of facilitating multidisciplinary research are discussed. Some esoteric aspects of communication to describe vague concepts are discussed by drawing examples and analogies from calculus and physics. In the next section, natural substance like water, philosophical concepts like, acting without acting and the practice of body movement [2] are discussed to understand how to overcome the frustration when barriers are faced by sincere researchers in pursuit of knowledge in multidisci-

plinary research areas. There after, some elaborative examples are mentioned to make a holistic understanding of the verse quoted in the abstract. In the next section, some historical and philosophical aspects of religion is discussed to imply possible source of knowledge that can be applied to manage problems faced by researcher of multidisciplinary areas.

2. EXPLICIT COMMUNICATION

Prof. David J. Waters has emphasized the importance of writing research articles jargon free. It is an innate nature of any research area to coin terms for expressing specific concepts and ideas that appear very often in the discussion. Sometimes, even a term with vague meaning in original language is jargonized and very strict meaning is associated. One such example is the word "limit" in mathematics. A person not trained in the discipline of mathematics will not know that a limit may exist or it may not exist in the context of mathematics. This is wildly confusing to people, not trained in the discipline of rigorous mathematics. So, the option here is to pick words that are not hijacked and remoulded by any research discipline.

To eliminate any potential misunderstanding, it is better to use words that highlight the potential for growth and mutual benefit instead of highlighting the mistakes and errors in the solutions found in the confinements of disciplines. For example, words like 'I', 'me', 'my', 'you' should be avoided and replace those by 'we', 'our', 'us' to share both credit and blame. The simple and plain truth that no body is perfect is thus practiced to make it easy for people to forgive and embrace change.

3. COMMUNICATION OF VAGUE

Prof. David J. Waters also highlighted that the truth is vague and words are definitive and crisp in meaning. Expressing the vague truth by words with crisp meaning is inherently faulty. This motivates towards ways to express the vague better without restricting the expanse of vague truth by not meshing the vague truth into collection of words that are crisp in meaning when manifested in the medium of language.

An example in calculus is analyzed to gain some knowledge about the art of expressing vague truth with words without restricting the actual expanse of vague truths. The term 'limit' in calculus can be explained by looking at a series of numbers such as $\{1, \frac{1}{2}, \frac{1}{3}, ...\}$. If the acceptable numbers are only positive real numbers, then a large number produces a very small number (i.e. $1 \div$a positive real number) in the series. Notice that the positive real numbers don't include zero as a member of the collection. Also, notice that the difference between 1 and $\frac{1}{2}$ (i.e., $1/2$) is greater than the difference between $\frac{1}{2}$ and $\frac{1}{3}$ (i.e., $1/6$) and so on. This implies that the numbers, in the series, get close to each other as they get smaller. The number, which has infinitely many series members as its nearest neighbor or is the center of the infinite concentration of members, is called the 'limit' of the series. The formal definition of 'limit' is stated as "a number L is a limit in a set of numbers if for any positive number, δ, there exists a number a in the set, such that $|L-a|$ is less than δ." In the definition, the smallness of δ is most important but not explicitly mentioned. For a very small δ the probability of an exception (i.e., absence of any points or existence of a measurable empty space between two points that are δ distance apart) increases. The formal definition includes all possibility but not crisply quantifying the value of δ. It embodies infinitely many points near the 'limit' point by expressing the definition using the vagueness of δ. Thus, words with vagueness in meaning is used to express a vague concept. If the set of numbers of the series does not include zero as a member then the definition of 'limit' is alluding to an esoteric or vague truth that doesn't exist in the collection of the points of the series.

It is the vagueness of truth that causes the existence of irrational numbers like $\sqrt{2}, \sqrt{3}, \sqrt{5}$ etc. The number system were developed initially with numbers, such as 1, 2, 3, ... etc. Then operations such as '$+$' and reverse operation '$-$' were developed. There is no problem if a '$-$' operation is always subtracting an equal or smaller number. The '$+$' operation is a way to move towards the increasing direction of the number line. The reverse operation '$-$' is for moving towards decreasing direction. The effort to validate the universality of the '$-$' operation revealed the need for negative numbers when operations like $1-3$ were attempted, for example. Similarly, the operations '$\times$' and '$\div$' eventually revealed the need for fractional numbers. The operation '$\times$' facilitated faster move in the increasing direction and '$\div$' as its reverse. When '$\div$' was applied in cases, such as $3 \div 5$ then rational numbers were revealed. The exponential operations like '^{2}' and its reverse operation '$\sqrt[2]{}$' revealed the existence of irrational numbers and imaginary numbers. So, the numbers, conceptualized as discrete and tangible, eventually led towards vague, such as infinitely many numbers and intangible numbers (e.g., irrational numbers and imaginary numbers). So, the theoretical definitions of various types of numbers in the number line are also ways to communicate vagueness without compromising the extent of the vague truth.

In physics, soon after Albert Einstein's theory of relativity was published and the results of Michaelson and Morley's famous experiment to detect ether was inconclusive, majority of physicists decided to settle with the concept that space is empty. Recent experimental discoveries in particle physics and high energy physics are driving theoretical physicists to propose concepts of nature of space as container of events of particles appearing and disappearing or particles are being created and destroyed [3]. Notice the vagueness of "appearing and disappearing" without any measurable time of existence. This implies that some times space may appear not empty if an experimental probe particle is influenced by any of the "appearing and disappearing" particles. Also, the space may appear empty if the experimental probe particle is not influenced by the

"appearing and disappearing" particles.

In physical chemistry, the state of dynamic equilibrium is another concept that embodies vagueness. In dynamic equilibrium, some materials change into a different kind but an equal amount of the other kind is changed in the reverse way. It is is assumed that no change is be detected over a long period between observations. Hence, it is considered to be equilibrium. The truth is that there is always a little imbalance causing changes back and forth.

4. INTEGRATION OF ATTITUDE

Phrases such as "acting without acting", "unblemished witness" and "be like water" [2] have profound guidance about how to solve the problems of multidisciplinary research. Words that lack abstract meaning but have a physical association such as "water" or "air" are free from being moulded into a different meaning by any discipline. Combinations of words contradicting each other, such as "acting without acting", do not allow to arrive into any crisp meaning. I will make an attempt to induce a state of mind to enable independent analysis of the reader. The most vague concept so far is the first verse of Lao Tsu quoted in the abstract.

First, a researcher must be inquisitive and ask what does water have to do with "acting without acting" or "unblemished witness"? The name water has many nameless implications, e.g., Water is transparent, it has no color of its own. If water is pure without any particles interfering with lights then it is an "unblemished witness" of its existence. Water flows effortlessly if the surrounding imbalance of gravity makes it to do so. It does so until it reaches a point of balance of gravity. Also, it takes the shape of container holding it. This is analogous to "acting without acting". It appears that the water is acting when it flows or changes shape, but in reality it is executing a balancing act in response to the imbalance of gravity of the surroundings. The actions of water are not of the water itself but are manifestations of hidden potentials of the surrounding.

If water is not disturbed then its presence will not be felt. So, the truth of existence of water can be known only by disturbance in water in the form of waves. So, the manifestation of waves is not the true nature of water, but rather a hint of existence of water and partial truth of its nature. Similarly words used to express truth are discrete distortions of the continuous truth, but without words no knowledge of truth is possible.

The above description implies an attitude as well. A work of research can be understood by others only up to a level, allowed by their cognitive ability. Research is an effort in pursuit of knowledge. The effort is always flowing towards lack of knowledge. Unless the surrounding presents a lack of knowledge, research will not flow (just because one individual researcher has found a potential sinkhole underneath). The researcher has to either wait for the sinkhole to open or use "plan B" (mentioned during the interactive session, "Moving beyond traditional academic scholarship: obstacles and ideas"), and start digging to open the sinkhole under the knowledge surface, so that the research can flow. The right attitude is to keep up the effort by executing "plan B" with the goal of flow of "plan A." The analogy also implies that greed, jealousy or other vices of individuals cannot hold against true research effort when the environment is ready for it; as a mighty body of water will swiftly wash away all obstacles in a flood or great fall. So, it is better to leave the way for greater research if any individual vice is obstructing the flow of real research, otherwise the flow will buildup and one day the obstacles will be flown over, no matter how big of a dam the obstacles may pose.

Practical application of this paradigm in the practice of martial arts implies that the correct balance of the body (so that the moves are the results of the circumstances presented by the opponent). If any movement of the body leads to slight off-balance, it will give an opportunity to the opponent to use gravity against the person. For example, a proper stance is pre-requisite before a hand strike using the center of the body to generate the force of the strike, so that the body's center of gravity is within the limits of the two legs while the center of the body swings from distance to near of the target (creating the force by change of momentum of the body) to release the force through hand at the time of contact between the hand and the target of the strike. If the swing is not controlled properly, then the body's posture will become weak and the gravity will work against the person and diminish the power of the strike. The same way a researcher should not push the edge too far prematurely, which might give opportunity to detractors to destroy the research by raising question about lack of experimental evidence (or other data to support the hypothesis).

5. CONNECTING THE DOTS

The stage is ready now to connect "water" with the first verse of Lao Tsu, quoted in the abstract. The first four lines of the verse, e.g.,

"The Tao that can be told is not the eternal Tao.
The name that can be named is not the eternal name.
The nameless is the beginning of heaven and earth.
The named is the mother of ten thousand things."

imply that as many different shapes and sizes and motions of waves do not express the total nature of water, similarly no word can express any truth in its entirety; or even the key truth of the universe or the true way of our existence. If seen through a water surface, disturbed with waves, the perceived truth is a distorted truth. Similarly, truth that is expressed through words and names can mean many distorted version of partial truth or ten thousand versions of partial truth, ten thousand being a metaphor for many. An undisturbed water surface is the beginning of elevations and depressions in the form of waves. Similarly, the nameless is the beginning of heaven and earth (or the waves of partial truth and lies).

The next four lines of the verse, e.g.,

"Ever desireless, one can see the mystery.
Ever desiring, one can see the manifestations.
These two spring from the same source but differ in name;
this appears as darkness."

imply that desires only create distorted understanding from observation of manifestations only, in the same way as greed, jealousy and other vices a distorted view and as a result of that human beings are collectively destroying the supporting ecosystem of nature. In the age of materialistic possession as a measure of success in life, the human kind is destroying the environment that is essential for its survival. The greed of corporate profit has left the air, water and food contaminated because the environment is viewed through the glass of greed and domination. Even after proven facts about the danger from smoking, or drinking alcohol, or eating fast-food people indulge in those activities in large numbers. Desireless or "unblemished witnessing" will lead to true understanding of what otherwise appears mystery. The manifestation of distorted truth turns the actual truth into a mystery when the truth is viewed in a state of desiring. A desireless state, like that of undisturbed body of water, removes the distortions and without distortion there is no mystery about the truth. Hence "the two spring from the same source but differs in name". The unmanifest nature of the real truth appears as either a "mystery" when desireless or "manifestation" in a state of desiring and this unmanifest truth is identified by "this appears as darkness".

The last two sentences of the verse, e.g.,

"Darkness within darkness.
The gate to all mystery."

is more esoteric in nature. One tangible example that I can think of is when eyes are closed it creates a darkness. When the thoughts are stopped then the darkness within darkness is reached. When a body of water is without waves then it is the first darkness but the actual truth is at the bottom of the water which is darkness within darkness. Stopping the thoughts is one level of darkness, after that disconnecting from the sensors is another level of darkness or darkness within darkness. Thus in knowing any truth the mind has to be stopped from producing thoughts as thoughts triggering emotions will distort the truth. The truth of existence can be experienced after disconnecting the sensors from natural reflex to achieve the darkness within the darkness.

Note that the same word "darkness" is used with different meaning in three different contexts. This emphasizes the fact that contradictory connotations are put in a way that, the words are used to trigger the mind to start pondering.

6. HIDDEN HOPE

The problems faced by the researchers pursuing multidisciplinary research are very old. Since ancient times, religious sects have persecuted one another. Religion is a discipline in pursuit of understanding of the truth about existence and meaning of life. The Taoists follow the tenets of Lao Tsu and the book, "Tao Te Ching". The verse, quoted in the abstract, has similarity in meaning to some verses and teachings of the holy Bible.

The first verse of Genesis in the old testament says, e.g.,

"In the beginning God created the heaven and the earth'.'

In the first verse of "Tao Te Ching", this is almost exactly the same, e.g.,

"The nameless is the beginning of heaven and earth."

The word "nameless" in the verse of Lao Tsu is replaced by "God" in the verse of Genesis. Jesus had said, e.g.,

"Those who have eyes will see and those who have ears will hear."

This means that the literal words that Jesus spoke and the physical body of Jesus were not the complete truth, as Jesus was not speaking to blind and deaf people. Also, Jesus was aware that his words will be spread by word of mouth and will be heard by people who were not present at the time he said the words. So, he was implying the truth cannot be found in the words and pictures. This complies with the verse of Lao Tsu, that the "The Tao that can be told is not the eternal Tao." If one attains a level of expertise, where the truth can be experienced, only then will one know the real 'I' in the verse, e.g.,

"I am the way, and the truth, and the life; no one comes to the Father but through Me."
"I am the gate; whoever enters through me will be saved. They will come in and go out, and find pasture."

If the true Jesus could not be seen by physical eyes or could not be heard by physical ears then one had to experience Jesus (without physical eyes and ears). The word "the way" (or "Tao" in Chinese) along with "the truth" and "the life" are expressing manifestation of the same. "The Life" is a deeper existence, because a person can be revived by CPR and other means even if the heart had stopped for a while. That means that all the parameters, used to indicate being alive, are just manifestation of life and not the actual life itself. Did Jesus really mean that simply by making sounds in the gross physical world to expresses the name "Jesus" one can be transferred to the source of existence (e.g. "the Father")? When Jesus said that one has to pass "through" "the way, and the truth, and

the life". If "the life" is so subtle then how is it possible to pass through "the life" by making ripples in the gross physical world? Could it be that Jesus is implying that one has to experience a state of "the way, and the truth, and the life" (e.g., like a body of undisturbed water) to reach the source (e.g., "the Father")? Is it then much different than the verse of Lao Tsu, emphasizing the need to be "ever desireless" (e.g., like the state of a body of undisturbed water), and to be able to "see the mystery" (e.g., reach "the Father")?

The similarities should not be surprising. The common theme of every religion is the truth beyond words and subjective opinion. The confusion of the words not only lead to distortion of truth but to rivalry and war. The history of religious wars holds the lessons for managing the problems faced by researchers in pursuing multidisciplinary research. In general, humankind has become more tolerant of foreign religious beliefs. In the same way, it will be easier to do multidisciplinary research in future if sincere effort continues.

7. CONCLUSION

In the spirit of the first verse of Lao Tsu, this article is not the whole truth but is a finite effort to express the vague and infinite truth by using words that embody vagueness. The various sections in the article are approaching the truth from various crisp aspects but the aspects blur as they are explored deeper. In some cases, both problems and solutions are found as inseparable in their vagueness. At a very refined level, the notion of the problem itself is the problem. If one believes climbing the Everest is not possible then he or she will never even try and will never climb the Everest. Removal of the notion of problem removes the notion of solution, leaving only the pure truth. Thus, acceptance of a state of being as a valid state of being is the best solution. This will lead to act like water to find a course through the various potentials of the state of existence without a need to identify problems in the state of existence. Identification of problems leads to forced changes in the state as a solution. The forced changes will potentially induce unintended changes in the state s well, resulting into a polluted solution. This concept can be abused if not understood in the correct spirit. One has to empty the mind of any thought like, e.g., a body of undisturbed water (before even considering this notion). Until then we have to strive towards the actual truth with all honesty and sincerity.

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