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K(OIM) - A New Model of Creativity Based on the Concept of Knowledge Clusters

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Abstract: The World Economic Forum states that by 2025, the top five skills employers will be looking for are innovation, complex problem-solving, critical thinking, creativity, and originality. Looking at these qualities closely, one can argue that all these skills are somehow related to creativity itself. However, despite a myriad of publications, there are many myths and misconceptions about creativity. To date, there is no unique model that can assimilate all different views on creativity. The present work is an attempt to empirically create a new model of creativity called the "K(OIM) Model of Creativity". The concept of Knowledge Clusters, proposed by the author in his earlier work, is at the center of the K(OIM) model of creativity. The proposed creativity model is based on the three simple cognitive processes; O-observation, I-imagination, and M-manifestation operating under the influence of K-knowledge clusters. The author suggests that the knowledge clusters corrupt an individual's observation, limit the imagination, and inhibit the manifestation process and that the crux of creativity lies in the individual's ability to control these knowledge clusters. The greater the control over knowledge clusters, the better is the creativity of individuals. The author further suggests that the creative contribution happens in five ways based on different combinations of stock of knowledge and knowledge clusters. Based on this, the difference between scientific and technical creativity (which comes from implicit knowledge), artistic and literary creativity (which comes from social knowledge and the knowledge clusters) and managerial creativity (which comes from the ability to effectively control knowledge clusters) has been explained for the first time in this paper.

Keywords: Creativity, K(OIM) Model of Creativity, Knowledge, Social Knowledge, Knowledge Clusters

1. Introduction

It is generally accepted that a child is more creative than an adult. If it is true, what makes a child, with little to no knowledge, more creative than an adult? What makes people consider Maqbool Fida Husain's paintings (with seemingly meaningless lines and figures) a creative piece of art? Why do people pay millions for such supposedly creative work? How is a particular piece of poetry considered creative while some others are not? Moreover, how can we differentiate between art and literary creativity, scientific and technical creativity, or managerial and leadership creativity? Creating a universal concept of the creativity and a model for the creative process that can answer all such questions has been the motivation behind this work.

Creativity is the attribute that makes us human, yet the subject did not get enough attention till the late 19th century. At first, creativity research focused on the study of the personalities and traits of exceptional creators. The second wave of creativity research focused on cognitive psychology, the internal mental process during creative activities. Here, creativity was often subsumed under the study of intelligence. Later, after the realization that creativity and innovation were essential factors for business excellence, the progress of societies, and the economic progress of a nation, the research shifted focus to the socio-cultural aspects of creativity including research on creative social systems. Studying creativity as a learning process and measuring creativity through psychometric tests got special attention during this phase.

Older models of creativity tend to imply that creative ideas result from subconscious processes mainly outside the control of the thinker. Freud [1] proposed that writers and artists produce creative work to express their unconscious wishes.

These unconscious wishes may concern power, riches, fame, honor, or love [2]. Kubie [3] emphasized that the preconscious, which falls between conscious reality and the encrypted unconscious, is the true source of creativity. In contrast to Freud, Kubie claimed that unconscious conflicts actually have a negative effect on creativity because they lead to fixated, repetitive thoughts. Campbell [4] and Simonton [5] also propose that creative ideas emerge from a largely uncontrollable Darwinian process of random variation and natural selection. Barron [6] also placed great emphasis on subconscious and chance processes. Barron's model supports the popular view of creativity as a mysterious process involving subconscious thoughts beyond the creator's control.

More modern models of creativity tend to imply the purposeful generation of new ideas under the direct control of the thinker. These models imply that the creative process involves purposeful analysis, imaginative idea generation, and critical evaluation. Sternberg and Lubart's [7, 8] investment theory of creativity suggests that the creative process involves a confluence of six distinct but interrelated resources - intellectual abilities, knowledge, styles of thinking, personality, motivation, and environment. In addition, they added that the creative process also requires a drive to action and the implementation of ideas.

Recent thoughts indicate that creativity does not occur within individuals but is the result of the interaction between the individual's thoughts and the socio-cultural context. Csikszentmihalyi stated that Creativity must be understood not as an individual phenomenon, but as a systemic process [9, 10]. All approaches broadly agree-on notion that existing knowledge plays a role in creativity at all levels, and that the quality of creative outcomes will be influenced heavily by a person's knowledge and the manner in which elements of that knowledge are accessed and combined [8, 11, 12]. For a summary of existing theories, one can check the work of Runco and Albert [13] and Kaufman and Glaveanu [14], who provided an excellent overview of existing theories on creativity.

For the purpose of this paper, the author considers that creativity is the result of the individual's actions based on one's stored knowledge in a specific social environment. Cognitive processes and knowledge have commonly been addressed in most approaches while understanding creativity. Creative cognition is concerned with explicating how fundamental cognitive processes, available to all human beings operate on stored knowledge to yield ideas that are novel and appropriate.

2. Background on Knowledge

2.1. Explicit, Implicit, and Tacit Knowledge

Defining knowledge in a non-abstract and non-sweeping way is extremely difficult. Knowledge easily becomes everything and nothing [15].

Polanyi [16] explained that all knowledge acquired by an individual is personal knowledge since it is stored in the individual's mind and remains implicit. This personal knowledge can be classified into two categories - Explicit knowledge [17] and Tacit knowledge [18]. Tacit knowledge is that part of knowledge that remains within the human mind. It is challenging to articulate this knowledge and hence is difficult to capture in hard form. This knowledge develops over a long period of time and is proprietary to individuals. Problem-solving skills, expertise, belief, intuition, empathy, attitudes, and perceptions are few examples of tacit knowledge. This is why sometimes, individuals can perform actions without being able to explain them, and they can explain actions without being capable of performing them.

Explicit knowledge is that part of human knowledge that can be easily articulated (codified) and converted into hard forms such as reports, books, manuals, engineering drawings, process sheets, etc. This knowledge can be easily captured, stored, and disseminated efficiently using the latest information technology tools. If properly managed, this knowledge can help organizations enhance their product quality and productivity.

A similar typology was introduced by Spender [19], who differentiated between implicit knowledge (produced through action) and explicit knowledge (produced through communication). Li and Gao [20] further differentiated between implicit and tacit knowledge depending upon their degree of codifiability. Implicit knowledge lies in between explicit and tacit knowledge in terms of codifiability.

2.2. Knowledge Defined

The author defined Knowledge in his earlier paper as the connectivity (relationship) between two or more Information points in an N-dimensional conscious mind [21]. The author, based on his definition of knowledge expands on Polanyi's concept and gives a reason as to why tacit knowledge cannot be easily articulated.

He suggests that while information points are easy to be articulated in explicit form, connectivity among information points (knowledge) is challenging to express. This is because knowledge arises from interaction among two or more information points. To articulate the connectivity or knowledge, we need first to explain the context (all dimensions of the context) of interconnected information points. The larger the connectivity among information points, the larger the difficulty in explicit expression and hence the more tacit nature.

As per the author, information points that have a limited number of context dimensions and are connected with only a few other information points can be partly expressed in explicit form through research, analysis, and imagination. Nonaka and Takeuchi [17] explained this as the conversion of tacit knowledge into explicit knowledge. The author however classifies the knowledge with limited connectivity as implicit knowledge as suggested by Spender [19]. Scientific and technical knowledge falls under this category. This is the knowledge from observations and interactions with nature and natural phenomena and is based on scientific queries. Most scientific studies are made on two or three dimensions at a

time, so they can easily be explained in explicit form; however this knowledge cannot be understood without understanding its full context and background. That is why this knowledge is likely to be understood by domain experts only and not by all. Scientific theories, mathematical formulae, engineering drawings, and technical manuals are a few examples of implicit knowledge expressed in explicit form. The non-explicit part of implicit knowledge is in tacit form and results in domain expertise.

These observations are similar to structural knowledge, as suggested by Jonassen, et al. [22]. Although, Jonassen et al. suggested implicit knowledge as purely explicit knowledge, empirical findings indicate that structural knowledge can also be non-explicit [23]. The author's explanation also suggests the same. Rata [24] further categorized tacit knowledge into two categories: disciplinary knowledge (implicit knowledge) and social knowledge. Disciplinary knowledge includes scientific and technological knowledge. The author, in this paper, refers to scientific and technological knowledge as domain knowledge.

Thus, the author divides the tacit dimension of knowledge suggested by Polanyi [18] and Rata [24] into three parts:

I. Part of implicit knowledge that can be converted into explicit form through research and analysis, in a specific subject domain.
II. Part of implicit knowledge that remains with the individuals in tacit form and results in expertise in a specific subject domain.
III. The other part of tacit knowledge exists due to the social observations and interaction of the individual with society and the environment. The author calls this knowledge as Social Knowledge. Over time, individuals develop a large amount of knowledge about themselves, other people, social relationships, and social groups. This knowledge guides the responses to the people they interact in everyday life.

This has been further explained with the help of a Venn diagram.

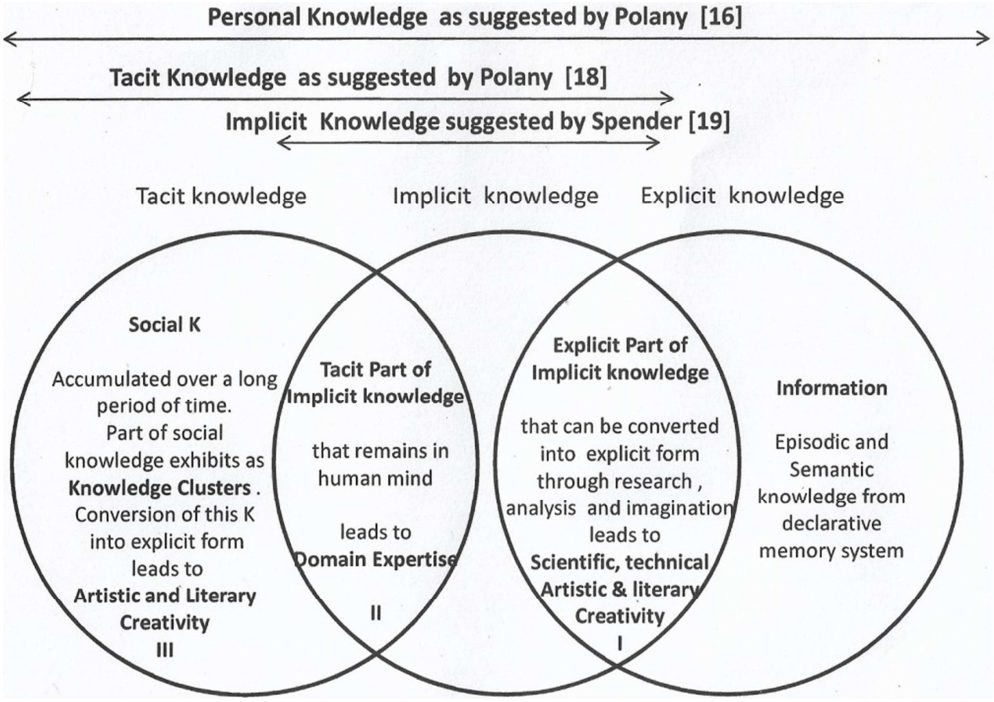

Figure 1. *Division of Knowledge.*

3. Social Knowledge and Knowledge Clusters

Social knowledge refers to the ability to analyze and reason out social situations in relation to social rules which are essential for the development of social skills and social behavior. This plays a crucial role in the understanding of how the social world is organized and regulated. The correct understanding and judgment of one's own and others' behavior influence the selection of the behavioral response to a situation. Although knowledge in any form is the result of social interactions, observations, and learning experiences, scientific and technical knowledge is very different from social knowledge. While scientific and technical knowledge can be verified by scientific reasoning, sound explanations, and satisfaction of certain criteria as scientific truth, most of the social knowledge is poorly understood, lack formal explanations, and are deficient in scientific rigor. The main reason behind this difference is the characteristic of the acquisition of two types of knowledge. While scientific and technical observations are related to natural systems and natural phenomena (and hence are repeatable), social observations are made on individuals and social systems which are not exactly repeatable. It is because, the context dimensions in the case of scientific and technical knowledge

are limited, usually two or three dimensions which remain the same during the repeated observations, while in the case of social interactions context dimensions are plenty and keep on changing in repeated social interactions/observations. This results in different observations and experiences made in different interactions even with the same social object/system.

The concept of knowledge clusters was proposed by the author in his earlier work "Revisiting the concept of Knowledge'' [21].

The third part of tacit knowledge referred to as social knowledge can be further divided into two parts. One part is due to our interactions with individuals and society in general while the other part is due to our continuous interaction with our immediate social environment. Here, data is accumulated by the five senses on varied context dimensions over a large period of time. Because of the large number of observations and many context dimensions, the connectivity among these information points appears as clusters. The author defines them as 'Knowledge Clusters (KC)' [21]. These clusters exhibit attractive and repulsive forces on all cognitive processes and are responsible for the formation of perception, attitude, values, emotions, habits, intuition, beliefs, and other human traits. These clusters give rise to barriers and inhibit creativity.

The three most important characteristics of knowledge clusters are:

I. Knowledge Clusters consist of social knowledge and exhibit attractive and repulsive forces on incoming data and information points. As a result, this incoming data and information get corrupted. This raises the question of the authenticity of the knowledge generated. If data and information used to create knowledge are corrupted, then the knowledge generated is also corrupted or biased. Thus, in the presence of strong knowledge clusters, one cannot acquire true knowledge. Knowledge clusters also affect the entire cognitive process. The intensity and structure of knowledge clusters are usually different in different individuals.
II. Absence of knowledge clusters or reduced influence of knowledge clusters enable one to see the true knowledge. This result in high creativity and other positive human traits such as independence of judgment, self-confidence, aesthetic orientation, risk-taking, openness to experience, tolerance to ambiguity, ability to handle complexity, drive, problem sensitivity, flexibility, the ability to analyze, synthesize, evaluate, and reorganize information, and more.
III. Knowledge clusters can be controlled by a conscious mind and people can be trained for it.

The author suggests that since the knowledge acquired in the absence of knowledge clusters is true knowledge, it may be defined as "Justified true belief", the concept proposed by Plato while defining knowledge.

4. K(OIM) Model of Creativity

As evident from the available literature on creativity, there is no unique way of defining creativity or the creative process as of now. In the present paper, the author attempts to present a simple model of creativity based on empirical studies.

In K(OIM) Model, the letter' K' represents Knowledge clusters present in the human mind, 'O' stands for observation, 'I' stands for imagination, and 'M' represents the manifestation process. Knowledge as explained earlier remains the most important component of creativity and the level of creativity is highly dependent on one's stock of knowledge.

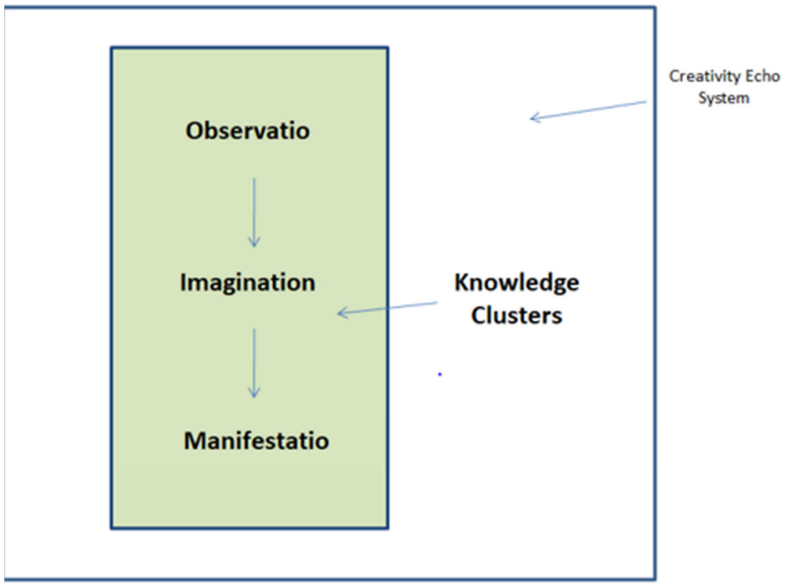

Figure 2. *K(OIM) Model of individual Creativity.*

The proposed creativity model consists of three basic cognitive processes: Observation - O, Imagination - I, and Manifestation - M. Manifestation is the most critical process because, without this process, the other two processes have no meaning. Creativity is there only when there is a manifestation of an idea in the physical form. Since these three processes are

common to all human beings, all human beings are creative by nature. Limitation to creativity comes from the role of knowledge clusters - K in the human mind, which corrupt the observations, limit the imagination and inhibit the manifestation. As we grow old, these knowledge clusters become stronger, thus reducing our creativity substantially.

In a way, knowledge clusters are like valves over the knowledge that open the gates of creativity. If not adequately controlled, they reduce creativity. The entire process operates within a creative ecosystem, which also helps in controlling knowledge clusters in the human mind.

Knowledge is an essential requirement, like a raw material for creativity. Different combinations of knowledge and knowledge clusters, as described later, result in different types of creativity. It will be further discussed under the justification of the creativity model.

5. The Three Cognitive Processes

5.1. Observation - O

Before being compacted as an information point, data packets pass through knowledge clusters and get distorted due to attractive or repulsive forces exerted by the knowledge clusters. This distortion somewhat blinds one and does not allow one to see the truth. This leads to the first limitation to human creativity. The quality of observation depends upon the number of dimensions on which the data is recorded (richness of information) and to what extent the knowledge clusters have affected the observation process and corrupted the data and information.

5.2. Imagination - I

Back in 2007, Ruth and Byrne [25] stated that imagination is a cognitive process used in mental functioning and sometimes used in conjunction with psychological imagery. It is considered such because it involves thinking about possibilities. Here, the author attempts to define the imagination process differently and explains the difference between imagination and analysis. Imagination is about creating connectivity (knowledge) among two or more information points, present in the subconscious human mind. The analysis is the same process of creating connectivity among information points present in the conscious human mind. Since subconscious mental space is much larger and contains much more data and information, the process of imagination often offers a larger number of solutions to a particular problem. Usually, knowledge clusters encourage the analysis process and discourage the imagination process. This is the second limitation to the creativity of individuals. With good control over knowledge clusters, one can imagine the solutions without boundaries and create plenty of options for a particular problem. Later, with the help of analysis, the appropriate solutions can be narrowed down.

5.3. Manifestation - M

In the simplest form, manifestation means the act of showing. As per the English dictionary, manifestation implies creating something or turning something from an idea into a reality. In psychology, manifestation generally means using our thoughts, feelings, and beliefs to bring something to our physical reality. Manifestation is the most important and difficult step of the creative process because unless an idea or an image is represented in the explicit form, it has no meaning to anyone except the person who created it. Knowledge clusters limit manifestation ability to a great extent. We often cannot express our ideas due to fear of being ridiculed or due to peer pressure. Sometimes, imagination does not match our beliefs or value system and sometimes it doesn't hold well with our past experiences.

5.4. Creative Ecosystem

Although the Creative ecosystem is not part of the K(OIM) model proposed here, its influence on individual and group creativity should not be ignored. Hence, we take a look at it as well.

Creativity is not an individual act, but a systemic act of interaction between the creative person and their socio-cultural environment. According to Csikszentmihalyi's [10, 26] systems perspective, an individual creator is surrounded by an environment consisting of a field and a domain. While the field represents a part of society, and therefore human beings, the domain represents a part of the individual's and the field's culture. It is a symbolic system containing information such as ideas, physical objects, behaviors, styles, and values. An ecosystem is a system formed by communities and their environment that functions as a unit [27, 28]. These living systems are an example of organized complexity, in which the integrated behavior of the system coordinates the actions of many elements [29-31]. Thus, an ecosystem is not a single final unit but is made up of subunits and it may itself be the subunit of broader collectives and the dynamic interactions between them [32]. It is about how people talk, trust, share collaborate, team experiment, and grow together. In a way, the author describes this as collective knowledge clusters of the society forming a culture of the society. When an ecosystem thrives, it means that the people have developed patterns of behavior or culture that streamline the flow of ideas, talent, and capital throughout the system [24, 33]. A creative ecosystem also helps in controlling individual knowledge clusters.

6. Types of Creativity Contributions Based on K(OIM) Model

When we use the term creativity, many different images might come to our minds. There are bright people who express unusual, interesting and stimulating thoughts. There are other people who experience the world in novel and original ways. There are individuals whose perceptions are fresh, whose judgments are insightful, and who make important discoveries. Then there are a few who change our culture in one or more important aspects. There had been several publications on

differentiating the types of creative contributions including Kaufman and Beghetto's [34] 4C model of creativity. They suggest creativity as a continuous variable expressed as four types of creativity; Mini-C (transformative learning), Little-C (everyday problem solving and creative expression), Pro-C (exhibited by people who are professionally or vocationally creative), and Big-C (eminent creativity).

The K(OIM) model of creativity supports four types of creativity which are a little similar to the 4C model but it does not treat creativity as a continuous variable. Rather, K(OIM) model suggests four types of creativity based on five different combinations of knowledge and the role of knowledge clusters in the creative process.

6.1. Creativity with Explicit Knowledge and Knowledge Clusters

This creativity is similar to Mini-C creativity and is inherent in learning. Whenever one attempts a new task, they try to do it either by copying someone, with oral instructions or with the help of written text. In this learning attempt, one uses only explicit knowledge. In the early stage of learning, there is no tacit knowledge about a particular activity. Later the presence of knowledge clusters limits the learning ability and hence the learning ability goes down with age. Also since the knowledge clusters are different with every individual, learning ability is different with different individuals.

6.2. Creativity with Implicit Knowledge and Knowledge Clusters

This creativity is related to the scientific inquiry on natural objects and systems and results in scientific and technological creativity based on implicit knowledge. Knowledge clusters although present, are ineffective on implicit knowledge because implicit knowledge can be verified and tested scientifically. This creativity is similar to Little-C and Pro-C creativity depending upon the creator's knowledge and expertise.

6.3. Creativity with Total (Social, Implicit, and Explicit) Knowledge and Knowledge Clusters

If one acquires sufficient implicit knowledge at a professional level in the subject domain after years of deliberate practice and training, this may result in domain expertise and a higher level of scientific and technical creativity. Creativity with social knowledge results in artistic and literary creativity. Both types of creativity may fall into Mini-C or Pro-C categories depending upon the total stock of knowledge in a particular domain and the effect of knowledge clusters.

6.4. Creativity with Total (Social, Implicit, and Explicit) Knowledge with Controlled Knowledge Clusters

If one learns to control the Knowledge clusters, the knowledge acquired by the individual is nearer to the truth. The cognitive process responsible for creativity also works freely in absence of less effective knowledge clusters. This results in Big 'C' or 'Eminent' creativity. Since controlling knowledge clusters is very difficult and very few individuals fall into this category.

6.5. Creativity Due to Knowledge Clusters

As explained earlier, knowledge clusters are part of social knowledge and because of being highly tacit in nature, they are difficult to be expressed in explicit form. Few individuals have the ability to convert even these knowledge clusters into explicit forms. With the help of total knowledge and expertise in language, vocabulary, colors, and musical nodes, they express their creativity in the form of art, music, and literature. This creativity may fall into Pro-C or Big-C categories depending on the individual's knowledge and expertise. This is what was proposed by Freud (1) that artists and writers express their unfulfilled desires as creativity.

7. Justification and Discussions on K(OIM) Model

The proposed creativity model revolves around the concept of knowledge clusters. To recap, Knowledge clusters corrupt the observation, limit the imagination and inhibit the manifestation during the creative process. The concept appears similar to the well-accepted neurological model for creativity by Martindale's theory of cognitive disinhibition. According to Martindale [35], the frontal lobe is responsible for the inhibition of creative behavior, meaning our natural state is a wildly creative one, but our brains wisely intervene and tone our creativity down so that we may function in day-to-day life. As per Adams [36] and von Oech [37], "People often construct a series of false beliefs that interfere with creative functioning. People can become creative by identifying and removing these mental blocks." Groth and Peter [38] studied and identified these factors in detail.

When we integrate the creative processes (OIM) and knowledge clusters as a Creativity model and analyze the model based on existing theories and concepts of creativity, the three processes proposed in K(OIM) model are similar to Guilford's [39] three human attributes of creativity: sensitivity, fluency, and flexibility. Overall, the K(OIM) model of creativity agrees with the older models, which advocate a larger role of subconscious processes, similar to proposed Knowledge Clusters, mainly outside the control of the thinker. Campbell [4], Simonton [5], Barron [6], and many other researchers have also placed substantial focus on the role of the subconscious process that cannot be directed. Kubie [3] proposed the hypothesis that the pre-conscious, which falls between conscious reality and the encrypted unconscious, is the true source of creativity. This hypothesis is similar to the author's discussions on implicit knowledge that falls between explicit and tacit knowledge and results in domain expertise. This expertise is the source of scientific and technical creativity through research and analysis in a particular subject

domain. Another claim by Kubie that unconscious conflicts have a negative effect on creativity is also similar to the negative effects of knowledge clusters on creativity as suggested by the author.

Maslow [40] distinguished between two types of creativity: Primary creativity - the kind of creativity a person uses to become self-actualized and secondary creativity - the kind of creativity that leads to creative achievements, typically recognized by domain experts. The author also proposes something similar based on the distinction between implicit knowledge that results in expertise and is the source of secondary creativity and deep social knowledge (Knowledge Clusters), if controlled, resulting in primary creativity. Furthermore, the incubation time proposed by Csikszentmihalyi [9], and the divergent and convergent thinking concept proposed by Guilford [41] can also be further elaborated based on the proposed K(OIM) model of creativity.

The existence of the 'Potentiality state' proposed by Gabora, L & Saab, A [42] in the Honing theory of creativity, which is reflected as a unique structured worldview of the creator, is also due to the unique knowledge clusters within an individual's mind through which one looks at the world.

Freud's [1] observation that writer's and artist's creative work is nothing but the expression of their unconscious wishes too supports the existence of knowledge clusters. Usually, writers, poets, and artists' creative work is highly influenced by their knowledge clusters. At a higher level, creative artists, writers, and poets attempt to express their own knowledge clusters in the explicit form of art and literature which might appear as their unconscious wishes being expressed. Since knowledge clusters are highly tacit and are very hard to express in explicit form, this form of creativity is considered to be a very high level of creativity.

The famous study by Land and Beth [43] suggests that children are more creative than adults while children have little or no knowledge. The answer to this question has been one of the reasons behind the proposed concept of knowledge clusters. A child has no knowledge clusters because knowledge clusters are due to the accumulation of social knowledge over a substantial period of time. In the absence of these knowledge clusters, a child can see true data without any distortion or corruption. Hence, information created based on this data is somewhat pure and has the potential to create true knowledge. Similarly, the imagination process also, in the absence of knowledge clusters, is without any limitations. However, the manifestation process in a child is very limited in the absence of knowledge and analytical abilities. So, generally, a child's creativity ends with creating highly imaginative and valuable options. Since in K(OIM) model manifestation has been the most important cognitive process for creativity, the question arises if one can really call a child more creative than adult in the absence of manifestation.

Regarding types of creative contribution, the K(OIM) model suggests that creativity emerges from five different combinations of knowledge structure and knowledge clusters which is similar to generally agreed approach that existing knowledge plays most vital role in creativity at all levels, and that the quality of creative outcomes will be influenced heavily by a person's knowledge and the manner in which elements of that knowledge are accessed and combined [8, 11, 12]. The creative categories as suggested by the 4C model are reasonable and acceptable.

The next question comes to whether the ability to control knowledge clusters can be enhanced by training. Most of the older models of creativity suggest that creative ideas are the result of subconscious processes mainly outside the control of the thinker. However, the concept of knowledge clusters suggests that although difficult, these clusters can be controlled to some extent. The author opines that it is possible to a large extent to train people to enhance their ability to control knowledge clusters. First, the creative ecosystem results in an environment where individual knowledge clusters are discouraged. Secondly, if one decides, a conscious human mind can control the knowledge clusters to a large extent. For example, in an organizational setup where employees are at work, they are always in a conscious mindset, and they can make a conscious decision not to allow knowledge clusters to dominate. One may choose to be positive and humble, tell the truth, respect others, and listen to them with an open mind. Moreover, technical creativity and managerial creativity are group activities. In such activities, a team may contain team members with different creative process abilities. One team member may be a good observer; another could be excellent in imagination; one member could be a strong implementer while another could be someone with great control over the knowledge clusters to guide the team.

In Table 1, the author has explained the creative process in different types of creative activities and the role of knowledge clusters in the creative processes. It may be noted that the role of knowledge clusters is minimal in scientific creativity because scientific studies involve natural systems. Scientific data can always be verified, tested, and reproduced; hence knowledge clusters do not affect observation and manifestation to a large extent. Moreover, scientific and technical creativity consists of studies with a maximum of two or three dimensions at a time which makes imagination and analysis also easier. On the other hand, the effect of knowledge clusters is high on managerial creativity because it involves social systems where knowledge clusters play a dominant role in the entire creative process. In the case of literary and artistic creativity knowledge clusters affect the quality of creative work which is very high when knowledge clusters are under control.

Table 1. *Types of Creativity and role of Knowledge Clusters.*

Type of creativity	Observation	Imagination	Manifestation	Knowledge required	Effect of knowledge clusters (KC)
Scientific creativity	*Observe the natural systems and their behavior*	*Imagine the reasons for their behavior.*	*In the form of theories and mathematical formulae.*	*Implicit knowledge (Subject / Domain knowledge)*	*Minimal* *Scientific data can be verified, tested, and reproduced; hence KC does not affect observation...* *Scientific studies mostly consider 2 or 3 dimensions in a context at a time, so imagination and manifestation become easy.*
Technical Creativity	*Observe individuals, social systems, and technical systems for the problems*	*Imagine the solution to the problems*	*In the form of physical objects, design, or processes with the help of scientific and technical knowledge*	*Social knowledge & Implicit Knowledge Subject / Domain specific and technical knowledge*	*Substantial* *One needs to interact with individuals and social systems to understand their problems and corresponding technical solutions. KC plays a significant role in the above processes. Technical development is a group activity. So, KC becomes effective while understanding others views and behavior.*
Literary and artistic Creativity	*Observe natural and technical systems for their behavior. Understand self-knowledge clusters and social systems at psychological level.*	*Imagine similarities in natural and social systems and their behavior. Understand tacit knowledge of self, individuals and social systems*	*In the form of art and literary work such as portraits, paintings, poems, texts, stories, jokes, idioms, and phrases etc. In case of acting manifestation is in the form of expression, voice modulation and body language.*	*Total knowledge Good Knowledge of language, words and colors.*	*Maximum* *Literary and artistic creativity is about description of natural and social systems. KC has strong effect while interacting with individuals and social systems.* *Entire creative process is highly affected by KC. Controlled KC may result in eminent creativity.*
Managerial Creativity	*Observe individuals and social systems behavior and their KC*	*Imagine the reaction of individuals and social systems and their consequences.*	*In the form of actions and decisions.*	*Total knowledge Understanding of KC of others.*	*Maximum* *Entire creative process is highly affected by KC. So high wisdom is required. Since the manifestation is in the form of actions and decisions, its effect on society are very high.*

8. Conclusion

The author has attempted to create a simple model of creativity which can assimilate, elaborate, and successfully explain most of the existing concepts of creativity proposed in the past. The model clears many questions, doubts, and myths existing about creativity. The concept of Knowledge Clusters proposed by the author is at the center of the K(OIM) creativity model. The creative process is based on the simple cognitive processes present in all human beings that make every individual creative to some extent. The crux to creativity lies in the ability to control knowledge clusters which makes someone more creative than others. The creative contribution happens in five ways based on the different combinations of stock of knowledge and knowledge clusters. The author suggests that the conscious mind can control these knowledge clusters. The difference between scientific and technical creativity (which comes from implicit knowledge) and artistic and literary creativity (which comes from total knowledge and control of the knowledge clusters) has been explained for the first time. The paper is based on empirical observations and research. Experimental research on the creativity model and knowledge clusters is required to evolve the concept fully.

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