

An Analysis of Creativity

The problems of modern life cry out for creative solutions.
Hence the growing interest in creativity.
But what is it?
Can it be taught?

Mr. Rhodes takes some of the fuzz off the concept of creativity and assures us that it can indeed be developed in children.

By MEL RHODES¹

Just as I finished writing the first draft of this paper I had an irrepressible urge to start over. I knew suddenly that I could reorganize and rewrite my material for greater clarity. Then I thought to myself, isn't this experience an example of the creative process? Isn't creativity, in simple language, the process of reorganizing knowledge (general or specific knowledge), and of articulating that synthesis so that other people can understand the meaning. Also, I thought, haven't I in this instance visualized the key to the secret nature of creativity? That secret being that original ideas are the by-products of (1) a human mind grasping the elements of a subject, (2) of prolonged thinking about the parts and their relationships to each other and to the whole, and (3) of sustained effort in working over the synthesis so that it can be embodied or articulated competently. The United States Supreme Court has ruled in numerous cases that an invention is an idea rather than an object. If a man can prove that an idea was his by demonstrating or providing evidence that only he had the knowledge from which it was synthesized, he can claim patent to the invention. Collaborators who might have helped to embody the idea into object, provided it can be proved that they lacked the basic knowledge components in the idea—even though they do all of the crafting—are classified as technicians or craftsmen.

Likewise with art. Art was defined, after lengthy trials in the highest courts of our land, as concept rather than object. The shipping charges for a piece of metal are based on weight. But in the now-famous court trial of 1927, Roumanian-born Constantin Brancusi made art history when he contested the decision of United States customs officials concerning the proper charges for a curving brass column which he labeled Bird in Space. The customs officials contended the object was metal. Brancusi contended it was art. When sculptor Jacob Epstein was asked if a good mechanic could not polish up a brass rail and pass it off as art, he replied, "He can polish it up, but he cannot conceive of the object. That is the whole point." The court agreed. Its decision: "Objects which portray abstract ideas (in this case, "flight"), rather than imitate natural objects, may be classified as art."

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My answer to the question, "What is creativity?", is this: The word creativity is a noun naming the phenomenon in which a person communicates a new concept (which is the product). Mental activity (or mental process) is implicit in the definition, and of course no one could conceive of a person living or operating in a vacuum, so the term press is also implicit. The definition begs the questions as to how new the concept must be and to whom it must be new.

1 Surge of Interest in Creativity

The big push of interest in the subject of creativity began in 1950 when J. P. Guilford of the University of Southern California was president of the American Psychological Association. Guilford said in his presidential address to that organization that he found an appalling lack of research on creativity. He said he had searched Psychological Abstracts for a quarter of a century and found that only 186 out of 121,000 entries dealt in any way with creativity, imagination, or any topic closely related.

In the years since 1950 more than a dozen books have appeared on the subject, and I have approximately 300 reference cards to articles and monographs. The research undertaken since Guilford gave his speech has yielded results of basic significance to the field of education and to the archives of knowledge. These studies have rendered into baloney many former sacred cows. For instance, the idea that the IQ is a lump sum and that it is constant, the idea that "well-adjusted children" (often meaning conformers) will become the most useful citizens, the idea that people are born to be either creative or lacking in creative ability, the notion that creativity is more a way of feeling than a way of thinking, the idea that creativity is something mysterious, and the notion that the word creativity applies to a simple, uncomplicated mental process that operates in unrestraint.

It is now clear that, instead, intellect is complex, that divergent thinkers and people of complex temperament have more original ideas than conformers and people of placid temperament, that environmental factors at all times in life form a psychological press that may be either constructive or destructive to creativity, that the technique of getting ideas can be learned and can be taught. It is also clear that whatsoever factors of personality or of intellect, of learning process or thinking process, or of environment are congruent with creativity, the same are congruent also with the educative process in general.

It would be difficult to describe the scope of the contributions to knowledge and to the field of education rendered during the last ten years by scholars on the trail of creativity. This is why I was perturbed when I read in the October, 1960, issue of *Harper's* magazine what Jacques Barzun, provost and dean of faculties at Columbia University, had written about "The Cults of 'Research' and 'Creativity'." Here is a quotation from the article:

What "creative" means in common usage is hardly clear?it seems to correspond to the idea of fullness, to the completion of effort, a syn thesis of parts, while it also conveys, like "research," the notion of something new and un expectedly good. . . . Use of the word creativity is a device by which we give ourselves easy satisfactions while avoiding necessary judgments.

That the faculty of judgment is at stake can be shown from a simple enumeration:

_ Creative may mean the neglect of technical competence-witness a great deal of so called new writing, new painting, and new art generally.

_ Creative may falsely dignify certain ordinary virtues-quickness of mind, sense of order and relevance and skill in using words-all of which can be subsumed under intelligence and intellectual training.

_ Creative may suggest modern, fresh, or unshackled by convention or tradition. In that sense it can be used to justify waste of time, as when students analyze contemporary writers and attribute to them as innovations literary de vices that are found in Homer and Virgil.

_ Creative may also stand for a conscious or unconscious denial of the tremendous range of human ability. If a child in kindergarten is called creative for the finger-painting he produces, the distance between him and Rembrandt has somehow been shortened. Through a likening of potential and actual, a kind of democratic equality has been restored. ... If small talents are creative, then since everyone has them, everyone has a Leonardo-like mind.

I understand what Barzun is saying. Indeed, the words creative and creativity have been loose ly used and overused. In many examples "creative" means or implies nothing more than emotional freedom, relaxing of tensions, disinhibition, or freedom from censorship. Examples of such usage occur in expressions like "creative dancing" (when the activity referred to is shimmying), "creative art" (when the activity referred to is finger-painting), and "creative writing" (when the activity is "kitsch"-i.e., stories that follow a formula and are essentially the same, even though slightly different in details, as in pulp magazine trash).

What is happening here is that a word which should be reserved to name a complex, multifaceted phenomenon is misused to name only one part of a phenomenon. It is like explaining a hurricane by describing wind or explaining a bird's flight by describing its perchings. But creativity cannot be explained alone in terms of the emotional component of the process or in terms of any other single component, no matter how vital that component may be.

About five years ago I set out to find a definition of the word creativity, I was interested also in imagination, originality, and ingenuity. In time I had collected forty definitions of creativity and sixteen of imagination. The profusion was

enough to give one the impression that creativity is a province for pseudo-intellectuals.

But as I inspected my collection I observed that the definitions are not mutually exclusive. They overlap and intertwine. When analyzed, as through a prism, the content of the definitions form four strands. Each strand has unique identity academically, but only in unity do the four strands operate functionally. It is this very fact of synthesis that causes fog in talk about creativity and this may be the basis for the semblance of a "cult." One of these strands pertains essentially to the person as a human being. Another strand pertains to the mental processes that are operative in creating ideas. A third strand pertains to the influence of the ecological press on the person and upon his mental processes. And the fourth strand pertains to ideas. Ideas are usually expressed in the form of either language or craft and this is what we call product. Hereafter, I shall refer to these strands as the four P's of creativity, i.e., (1) person, (2) process, (3) press, (4) products.

2 PERSONS

The term person, as used here, covers information about personality, intellect, temperament, physique, traits, habits, attitudes, self-concept, value systems, defense mechanisms, and behavior. Basic questions in this department are: What is the coefficient of correlation between intelligence test scores and creativity? Is everyone potentially creative, to some extent? Is creativity a function of temperament as well as intelligence? More than intelligence? Do physique or physiological factors have any bearing on creativity? How important are attitudes, habits, and value systems? And what kinds of habits, attitudes, and values? In what way are they significant? What about neurotic personality- is neuroticism essential or is it detrimental to creativity?

Lewis Terman of Stanford made extensive psychological studies of approximately 1,000 gifted children over a period exceeding thirty years. He observed a difference between high intelligence and high creativity and said in one of his last papers that not more than one-third of his people with IQ's over 140 showed a marked degree of creativity. On the East Coast, Leta Stetter Hollingworth observed essentially the same thing with children of 180 IQ or better. In Chicago, Thurstone studied the Quiz Kids and remarked afterwards that they had phenomenal memories for details but that they were noticeably lacking in creativity.

Guilford hypothesized that intelligence tests were not measuring creative factors. Now he hypothesizes, on the basis of factorial studies, that intelligence is made up of 120 or more kinds of abilities and has devised tests to measure approximately fifty factors. In the future he hopes to build instruments to measure additional factors of intellect. Guilford's studies indicate that people who stand out [from their fellows] as creative thinkers, are characterized by

sensitivity to problems, fluency of ideas, mental flexibility, divergent thinking, and ability to redefine familiar objects and concepts. Getzel and Jackson note that children with quick humor are more creative. Frank Barron found that people of complex temperament are more creative than people of simple temperament. Mary Cover Jones submits the guess that late maturers are more flexible thinkers than early maturers, possibly because they have to be quick to keep up.

2.1 How Important Are Attitudes and Habits?

Eric Fromm observes that a creative person has the capacity to be puzzled, the ability to concentrate, a genuine sense of self and confidence in self, the ability to accept conflict and tension. Fromm accepts the concept that equality does not mean sameness. A person who is truly creative is one who is willing to be born everyday. He is willing to let go of all "certainties" and illusions. Tuska, in his book *Inventors and Inventions*, says, "If you would invent, acquire the good habit of observing. Observe and question! Ask yourself questions: Why did that happen? Why did not something happen? What started that? What stopped that? For example, why can a spider walk on its own web without getting tangled? To what can I attribute the wonderful characteristics of a spider's thread? Where might I use such a thread to advantage? Could a spider's thread be synthesized? How? In brief, daydream with a purpose."

Thomas Edison said that invention is 1 per cent inspiration and 99 per cent perspiration.

2.2 Can a Creative Person Be Identified?

Almost any group of people, including school children, can name individuals among them who have off-beat ideas. Often the group will argue that so-and-so's ideas are crazy. But the question is, how crazy? Crazy enough to be useful? Crazy enough to change a trend? Crazy enough to revolutionize an industry-or a way of life? Gilfillan, in his book *Sociology of Invention*, talks about the great lapses of time that have occurred between the time when ideas for great inventions were first merely mentioned and the development of the first working model or patent. Also, he discusses the time gap between patent and commercial use. The average time elapsed between first mention of the idea and commercial use of the same for nineteen inventions voted most useful (who voted was not stated) was 226 years. (These were inventions introduced between 1888 and 1913.) Studies regarding theories of government, philosophical insights, and scientific discoveries confirm the fact of time delay in communicating such ideas to the masses.

This fact of inability or reluctance on the part of the social group to accept new ideas, particularly unfamiliar concepts, complicates the task of identifying creative thinkers. But is not an individual who thinks differently from his

associates and from sources of information doing his own thinking? And is he not the person who is likely to be creative?

3 PROCESS

The term *process* applies to motivation, perception, learning, thinking, and communicating. Essential questions about process include: What causes some individuals to strive for original answers to questions while the majority are satisfied with conventional answers? What are the stages of the thinking process? Are the processes identical for problem solving and for creative thinking? If not, how do they differ? Can the creative thinking process be taught?

When the German physiologist and physicist Hermann Helmholtz was seventy years old, he was asked at his birthday party to analyze his thought processes. Later, Graham Wallas, in his book *The Art of Thought*, formulated Helmholtz's ideas into the familiar four stages: preparation, incubation, inspiration, and verification. The preparation step consists of observing, listening, asking, reading, collecting, comparing, contrasting, analyzing, and relating all kinds of objects and information. The incubation process is both conscious and unconscious. This step involves thinking about parts and relationships, reasoning, and often a fallow period. Inspirations very often appear during this fallow period. This probably accounts for the popular emphasis on releasing tensions in order to be creative. The step labeled verification is a period of hard work. This is the process of converting an idea into an object or into an articulated form.

In an address at M.I.T. in 1955, Alex Osborn, author of the popular book titled *Applied Imagination*, summed it up as follows: "I submit that creativity will never be a science-in fact, much of it will always remain a mystery-as much of a mystery as 'what makes our heart tick?' At the same time, I submit that creativity is an art-an applied art-a teachable art-a learnable art? an art in which all of us can make ourselves more and more proficient, if we will."

Yes, the creative process can be taught. It is being taught in hundreds of classes across the nation-in colleges, universities, business organizations, military schools, and industries. Osborn's book has gone into twelve printings and over 100,000 copies have been sold. There is considerable research evidence to support the statement that the creative process can be taught. And in 1954 the Creative Education Foundation was formed solely for the purpose of encouraging a more creative trend in American education.

"A large number of courses have been instituted in this country whose aim is to develop creativity . . . [but] no one knows at this stage what are the most effective ways of bringing about greater creative performance."-/ P. Guilford, 1958

4 PRESS

The term *press* refers to the relationship between human beings and their environment. Creative production is the outcome of certain kinds of forces playing upon certain kinds of individuals as they grow up and as they function. A person forms ideas in response to tissue needs, sensations, perceptions, and imagination. A person receives sensations and perceptions from both internal and external sources. A person possesses multi-factorial intellect, including ability to store memories, to recall and to synthesize ideas. Each idea that emerges reflects uniquely upon the originator's self, his sensory equipment, his mentality, his value systems, and his conditioning to the everyday experiences of life. Each person perceives his environment in a unique way; one man's meat is another man's poison and vice versa. Studies of press attempt to measure congruence and dissonance in a person's ecology. Stern and Pace have introduced instruments designed to take two temperatures-(1) the climate of a particular environment, and (2) the reaction of a person to his environment. If and when these two scores can be obtained they can be coordinated to show the congruence and dissonance between individuals and their environment.

Liphshitz, writing for the *Journal of the Patent Office Society*, opened fire, a few years ago, on the authors of most histories and of biographical studies of inventors for treating the inventor as something apart from the world in general. He said that an intensive study of the history of inventions makes clear that they originate in a response to social needs and that there must be a sufficiently advanced stage of culture and a proper technical heritage to foster or allow an invention to be made. History proves that great inventions are never, and great discoveries seldom, the work of any one mind. Every great invention is either an aggregate of minor inventions or the final step of the progression.

Gilfillan said, "Inventions are not just accidents, nor the inscrutable products of sporadic genius, but have abundant and clear causes in prior scientific and technological development. And they have social causes and retarding factors, both new and constant, of changed needs and opportunities, growth of technical education, of buying power, of capital, patent and commercial systems, corporation laboratories and what not. All such basic factors causing invention give means of predicting the same.

"The existing and overwhelming influence of causes for invention is proved by the frequency of duplicate invention, where the same idea is hatched by different minds independently about the same time."

5 PRODUCTS

The word idea refers to a thought which has been communicated to other people in the form of words, paint, clay, metal, stone, fabric, or other material. When we speak of an original idea, we imply a degree of newness in the concept. When

an idea becomes embodied into tangible form it is called a product. Each product of a man's mind or hands presents a record of his thinking at some point in time. Thus an idea for a new machine reflects the inventor's specific thoughts at the moment when the concept was born. And by probing backward from the moment of inspiration it may be possible to trace the thoughts and the events leading up to the idea. Products are artifacts of thoughts. Through the study of artifacts, archeologists reconstruct the way of life of extinct peoples, officers of the law reconstruct the events leading up to a crime, and psychologists reconstruct the mental processes of inventing. Objective investigation into the nature of the creative process can proceed in only one direction, i. e., from product to person and thence to process and to press.

A system is needed for classifying products according to the scope of newness. For example, theories such as relativity or electromagnetic waves or mechanical flight are of tremendous scope. From any one of these theories thousands of inventions may germinate. Therefore ideas in theory are of higher order in the scale of creativity than ideas for inventions. After inventions appear, numerous innovations or new twists in design or structure are suggested by users. Thus the idea for an invention is of higher order in the scale of creativity than an idea for an innovation to an existing invention. The significance of this suggestion to classify ideas by degree of newness is that it would place emphasis on higher mental processes rather than on dazzling objects.

In the history of the sciences, every branch floundered until facts were organized and classified. After a classification system was devised, the branch advanced rapidly. When astronomy grouped the heavenly bodies, outside of the sun and moon, into planets and fixed stars, it took a considerable step forward. When physics separated its phenomena into the broad categories of dynamics, sound, heat, light, electricity, and magnetism, the way was clear for more penetrating analyses. When Linnaeus devised the system of binomial nomenclature, biology became a science. This bit of history seems to suggest that the mystery surrounding creativity could be dissipated by organizing artifacts into categories, first by kinds and then within each kind by degrees of newness. If this were to be done, data could be collected concerning the person responsible for a given idea, concerning the circumstances leading up to the idea, and concerning the mental activity producing the idea.

Ideas have been described in various ways for different purposes. One system distinguishes ideas by media of expression: for instance, music, art, poetry, and invention. Another system recognizes mood: for example, pastoral, satiric, and didactic moods in poetry, and allegro, andante, and adagio moods in music. Still another system recognizes values: in art, pictures are classified according to their utility or their associative or esthetic value; while in the realm of mechanics, machines are recognized according to the use to which they are to be put. There are other classification systems based on form, as for example sonatas, concertos, and symphonies in music; and ballads, sonnets, odes, and elegies in poetry.

Notwithstanding these several ways of classifying products, there is no standard system for organizing artifacts according to idea value or degree of originality. Consequently, any artifact is called "a creation" and mystery surrounds them all.

Above the entrance to Washington Station these words are carved in stone, "Man's imagination has conceived all numbers and letters-all tools, vessels, and shelters-every art and trade-all philosophy and poetry-and all politics."

Ralph Waldo Emerson said, "Every reform was once a private opinion."

Within a year of our nation's founding, the U. S. Patent Office was established-on the concept that the country would profit by protecting the right of individuals to profit by their ideas and inventions. Between 1776 and 1960 more than 3,000,000 patents were granted.

In the last decade, as a direct response to Guilford's speech to the APA about the need for research in the area of creativity, new and tremendously significant knowledge has been collected and put to use-and this knowledge, as fast as it is being disseminated, is causing fundamental changes throughout Academe. Granted, the word creativity has been over worked. And it is used loosely. Also, the formal study of creativity has not yet reached the stage of advancement which botany reached when Linneaus organized flora into phyla and into classes. Students of creativity have not yet taken the time to distinguish the strands of the phenomenon and then carefully to classify new knowledge according to the pertinence thereof to either person, process, press, or product. I submit that the time has come for more precision in definition and usage, that only when the field is analyzed and organized-when the listener can be sure the knows what the speaker is talking about-will the pseudo aspect of the subject of creativity disappear.

My appeal is that as educators we recognize the importance of continuing our interest in the nature of creativity, that we be appreciative of the spade work that has been done in the decade just past, that we continue to identify the factors associated with the creative process, and above all that we do not throw out the baby with the bath water just because the water is cloudy.

The subject of creativity has interdisciplinary appeal. This is true because the phenomenon to which the term creativity applies is the phenomenon of synthesizing knowledge. Hope for greater unification of knowledge lies in the continuance of studies of creativity. There are adventures ahead in researching the four P's of creativity, in learning to identify the creative person, in teaching the creative process, in learning how to take the temperatures of a person and of his environment under changing circumstances and of arranging for congruence between the two, in developing a scale for classifying products by degrees of newness within a scheme of like kinds of products. And ultimately

there will be a new perspective of education with a backdrop of unified knowledge.

Now is the time for every teacher to become more creative!

6 Publications Dealing with Creativity

Readers interested in further refinement of the concepts of creativity will find a variety of approaches represented in *Creativity and Its Cultivation*, edited by Harold H. Anderson and published by Harper and Brothers in 1959. The book includes papers from interdisciplinary symposia on creativity held between April 19, 1957, and July 9, 1958, at Michigan State University.

Contributors include most of the leading figures in this area of growing interest: Alden B. Dow, an architect; Henry Eyring, dean of the Graduate School, University of Utah; Erich Fromm, professor of psychology, Michigan State; J. P. Guilford, professor of psychology, University of Southern California; Ernest R. Hilgard, professor of psychology and associate director, Laboratory of Human Development, Stanford; Harold D. Lasswell, professor of law and political science, Yale; Abraham H. Maslow, professor of psychology and chairman of the department, Brandeis University; Rollo associate curator of ethnology, American Museum of Natural History; Henry A. Murray, professor of clinical psychology, Harvard; Carl R. Robers, professor, Departments of Psychology and Psychiatry, University of Wisconsin; Edmund W. Sinnott, dean of the Graduate School, Yale; and George D. Stoddard, chancellor, New York University.

An NEA Journal feature on creativity (March, 1961) includes a list of other publications dealing with creativity. All may be obtained from NEA Publications Sales: *Creating a Good Environment for Learning*, 195A yearbook of the ASCD; *Creative Dramatics*, by Margaret S. Woods, the March, 1959, Elementary Instructional Service leaflet; *Creativity*, the October, 1960, issue of *Educational Leadership*, ASCD journal; *Creative Writing: Each in His Own Way*, the November, 1960, newsletter, *Keeping Up with Early Education*; *Human Variability and Learning*, an ASCD publication; *Language Arts Can Be Creative*, by Elinore Milstein; and *Learning Through Creative Sharing in the Middle Grades*, by Evelynne H. Maxwell.