

Creative Questions Preparing for the Future

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The concept of creativity has for too long been regarded as applying exclusively to the fine arts. Even today most people still think that the qualities required in a scientist are quite different from those of an artist. It is still too little understood that every individual can be creative, that every life situation can call forth creativity.

The idea that creativity is a special gift (which is comfortable, an indolent idea) has actually suppressed the creative capacity in many people. In my view, creativity is a phenomenon to be found in all types of human being. Both Picasso and Einstein possessed it. Both thought in concepts which were familiar to other people too, but they saw them in new relationship, which resulted in a new artistic school or scientific theory. In both creativity did not arise out of the void but was based on knowledge and experience, and on the courage to break out into new, unknown and uncharted fields.

Creativity involves daring: anything that is new is uncertain, is non-conformist. The creative individual needs inner

freedom and outer security in order to be able to leave the known and familiar for unknown and unfamiliar fields. If we cannot be creative, then, we are deficient in either knowledge, inner freedom or environmental security.

The need to conform: to be unable to dare to be different, is the reason that many promising young people become "average" scientists, artists, or human beings, or human beings. After all, there is hardly a school or place of learning in the world, which does not aspire conformity.

Creativity means communication: the individual is in constant contact with his outer and his inner world. The open-mindedness with which he experiences the world around him enables him to recognize problems and to be sensitive to them. His relationship with his own inner world stimulates associations with what he knows and has experienced, which enable him to arrive at solutions. The resulting, initially subjective, insight is then translated into an objective form, comprehensible to others. Curiosity and the urge to know makes us open to the

outer world. The person who is inwardly free is able to use the knowledge which the world around him, the fact that he is part of that world, enables him to translate his insight into comprehensible forms. If we cannot be creative, it means that we lack freedom and are unable to communicate with our own inner world and with the world surrounding us.

To be creative also means that one may fail. The confrontation between our inner world and the problem of the outer world may give rise to conflicts and contradictory situations. The attempts to resolve these conflicts and contradictions are not necessarily always immediately successful.

This failure can bring the creative process to an abrupt end if it is taken too seriously, if one takes oneself too seriously (why should this happen to me?), if one gives up. On the other hand, a failure can become a new point of departure, if one can look for another approach in a light, playful, not too self-important way (what can I do to make something of this situation?) in order to achieve new insight. Does anyone know how many unsuccessful scientific experiments proceed the creative invention?

Failure to be creative means that one is not capable to integrate contradictions, of taking things lightly and playfully, that one experiences failure in an ego-centered, self-pitying way. For "to be" means to choose, to function, to act, to try again and again, without being sure in advance that our choices are good or correct, because what is good and right at the moment is not necessarily good and right tomorrow. The aim of education is to give the student the confidence that he has the strength not only to adapt himself to the demands of the environment, but also to go out and meet its challenges.

It is the acceptance of the student's anxiety and to help him to live actively in the present in spite of this anxiety and insecurity - thus preparing him for the future.

In the educational process we should make the student aware of the fact that there is no framework in which there is complete security, yet there is not framework, narrow as it may be, in which there are no alternative, from which we can choose.

Creativity is a quality existing to greater or lesser extent in every individual, which enables him to associate items of information, materials and

experience which were previously unrelated. This association or relationship usually originates in new insight into familiar situations and reflects a new or improved idea, experiment, product or structure. This quality is the common base of every creative process in science, art or any other field.

Creative experience is not what happens to you but what you make of what happens to you (Aldous Huxley).

Since research into creativity developed from criticism of the existing methods of measuring intelligence, these two concepts (creativity and intelligence) came to be regarded as being in opposition, and not as complementing each other. In my view, creativity complements intelligence. In the hierarchy of human capacities, it is the highest order of intelligence.

Intelligence is defined as the capacity to gather information and to apply it to different situations. Creativity is based on this capacity, but enlarges it by creating new relationships between the items of information.

Intelligence looks for answers in what has been learned, in the particular category from which the problem arises, makes use of convergent thinking, which leads to the "correct" (previously known)

answer. Creativity uses divergent thinking, seeks various answers, finds them in wider, varying fields of knowledge. These interdisciplinary answers cannot always be "correct", since what is new in the answer is not related to any previously known frame of relevant (adequate in terms of the problem) and if it enlarges the field of experience or knowledge.

Intelligence facilitates the application of knowledge, of what had been learned, to different situations. Creativity is not merely application of knowledge but actualization: the realization of the potential as applied to the relevant situation.

This latter relationship of the development from adjustment to actualization seems to me to be a field in which creativity research can make one of its most important contributions to extending the concept of intelligence. It seems to me that such an extension, i.e. enabling the individual to realize his full potential, should be the goal of all creative education, of every humanitarian society.

Creative Behavior

A considerable number of researchers see the motivation for creativity based on curiosity. Some call it "the drive to

explore", "intellectual drive", "the drive for innovation", "the drive to discover". This latter drive is sometimes ascribed to the urge to incorporate in oneself as much as possible of the environment. The environment contains challenges; to meet them, the individual must constantly devise new strategies of communication.

Experiments with animals have shown that curiosity is a motive for problem-solving, and that the pleasure arising from the satisfaction of this is at the same time a goal of the activity. An increasing number of animal experiments show that new stimuli are sought for their own sake. Primates, for instance, will solve the most difficult problems in order to be able to sit in a place where they can enjoy new experiences. Rats learn more quickly when they are rewarded by electrical impulses in their cortical centers. Observation of apes has shown the fun they get from the gratification of inquisitiveness. Apes will play with objects containing food, show obvious pleasure in their play, and will only later take the food.

Something similar may be observed in children who arrive at better solutions through the sheer pleasure of satisfying their curiosity. However one may regard the impulse of curiosity, whenever it

serves as a motivation, the individual's enjoyment arises from the process of communication with the environment, not simply from the product and its social consequences.

The urge to communicate is more pronounced in creative than in non-creative people. This need to communicate relates not only to the environment, but also includes the individual's communication with himself, with his inner world.

All the abundant research should be brought to bear on education in general, and on the education of the gifted especially. Acquisition of knowledge comes easily for the gifted, but intra- and interpersonal communication has to be challenged and explained even to the most gifted child. It is of utmost importance to develop the creative attitude by challenging the gifted child to become aware of his/her potentials, to enjoy the process of learning and to use the product (achievement) not as a goal but as reinforcement for further learning.

As the goal of education I see the creative behavior or the creative attitude towards environment. In my Daseins-hierarchy this is the intellectual, social and artistic interaction.

For me creative behavior does not mean

crashing through borders but the courage to daily test one's own limits, one's own borders anew. This behavior leads towards finding ever-new alternatives even within one's own limit; creating again new possibilities within the given frame.

Creative activity can be compared to playful behavior in which (within the general rules of the game) one looks for individual ways - one plays individually and thus perhaps finds a new assessment which may lead to a new way of playing. Play, not for the sake of intra- and interpersonal communication, creative behavior makes it possible to discover oneself and one's surroundings anew. It does not wait for an anxiety-free condition before confronting a situation - that would be Utopia. We are born with anxiety and attempt to create relationships in spite of anxiety, uncertainty and vulnerability.

In order to be creative, a person needs an encouraging atmosphere. The more creative and receptive of the "new" a person is, the more he or she will dare to use their talent and the less they will need encouragement from the environment. But even the most creative person needs stimulation from its environment.

An open-minded and stimulating atmosphere can prevent this stifling of creativity at an early age. The influence of the environment is very important, because creativity is interaction between the environment which encourages him/her to see the differences between what was previously known (and what she/he is used to) and what is really happening now. Without this difference our thinking and learning is mechanical and not creative-progressive. To see this difference, is the basis for any learning experience.

We are dealing with a process of communication which takes place between the individual and his environment - the external stimulation, and the activation of his own abilities as a result of this new stimulation - a process which in fact continues throughout our entire lifetime.

Creative Gifted Thinking

Creative thinking, like intelligence, is a general factor and not, as was maintained for centuries, a specific factor that finds expression only in a certain field. One of the manifestations of creativity is creative thinking that can be applied to any field. Creative thinking is

a bi-polar activity between logic and imagination, a result of intra - and interpersonal communication. At first it is a subjective reaction to a specific stimulus which later leads to the objective definition of the subjective perception. Creative thinking can be demonstrated as the balance of scales:

be understood if we see thinking as a creative process. As stated before, I think that in each stage of the process we need another ability and characteristic of our personality and a certain reaction from our environment in order to actualize our potentials within this creative process.

In order to encourage this integration

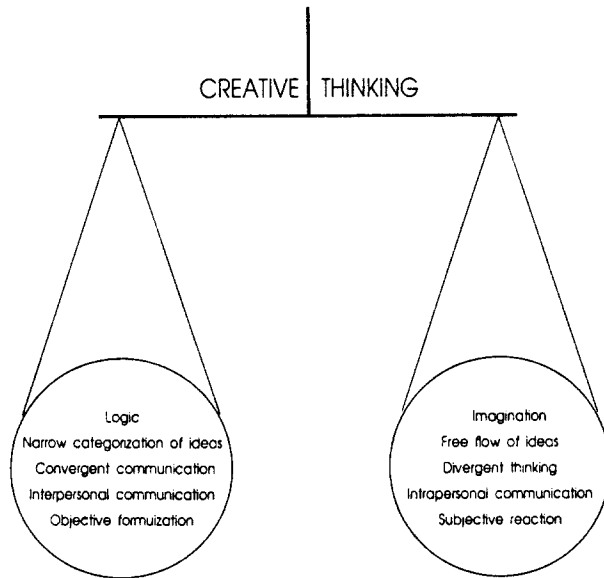


Figure 1. The scale of creative thinking

Creative thinking is the balance of these poles, which at first seem opposed. Creative thinking is the integration of these contrasts.

This integration on opposites could

we must try to release the free flow of ideas and the flexibility of thoughts diverging in the student's inner world. All this focuses upon the imagination which in daily life is totally put off by logic.

We try to leave little to imagination and to widen the narrow categories of thought.

In the study of thoughts among children, one very soon discovers that from a very early age they supply us with answers we expect to hear. They only dare to say things they are sure of. Since all creativity involves some degree of innovation, the child will not take the risk of expressing creative, innovative, uncertain things.

A gifted child that has obtained the status of a "logical and clever" child would not wish to jeopardize this position and therefore will not dare to be creative.

Conformist thinking conditioned by environment is based safely on the well-known and accepted. Why should one, therefore, take the risk of losing accepted? Taking the road of the least resistance, which is safe and free of fears of failure and ridicule, generally suggests a deeper existential insecurity. The greatest danger here lies in the fact that conformist thinking is mechanical. Mechanical thinking moves on known, safe and well-trodden paths. It arrives only at accepted and well-known solutions which lead to stereotypical and conformist behaviour. This way of

thinking provides security, yet it involves boredom and grants no pleasure. Mechanical thinking is one of the greatest obstacles of creative thinking which takes unsafe, unaccepted and challenging paths that also allows for new experiences.

Premature criticism can create an additional obstacle. Unconventional associations, which seem remote and irrelevant may often turn out highly creative when examined closely. Postponed criticism returns us to the known and the familiar and limits the possibilities for new, creative communication.

Creative thinking is a self-product and therefore it is precious. It enables insights, encourages one to bravely cope with feelings and brings about responsibility to accept even anxiety. This breakthrough, from the closed and limited circle, in which we move within the known, the familiar, the tedious and the stereotypical, into the spiral from which the students can view themselves from different angles and distances. This breakthrough is the existential gain in education for creative thinking.

Creative Questions

Creativity is the ability to ask questions, questions that are open, unconditional, future-oriented, which integrate

opposites. It means to have the creative courage to confront life. The opposite of the creative question - full of self pity, which confines the creative process and limits existence instead of expanding it.

Levels of Questioning

I have learned from my own experiences and that of others that starting a mental process by asking the causal questions "Why?" and "Wherefore?" are actually a childish and irresponsible approach. These questions are passive, deterministic, conditioned by the past and not sufficiently challenging to maintain interest for further questions.

The first approach, should be that be descriptive questions: Who, what, where, when, how. These questions are of the present, the here and now and describe a current situation. With these descriptive questions a confrontation with the given situation is created. The child learns to observe, describe and create his/her own security for understanding what is going on. This type of questioning is particularly encouraging for disadvantaged gifted children.

It is only after the situation or problem has been accurately described we can ask the causal "Why?" which relates the "Who?, Where?, When?, How?",

to each other. This second level, the causal question, promotes insights and relations concerning information supplied by the teacher or from a book. These two levels are important in teaching the child to objectively (as far as possible) observe, describe and relate, and to assimilate new knowledge.

Only now do the subjective questions appear: What do I know about this? How do I feel about it? When did I see or experience something like it? These questions often demand an emotional commitment for which the child is now ready since s/he has been strengthened by means of the two previous levels of "objective" observations. By means of association and analogies children now approach the problem from various aspects, something which encourages flexibility and challenges their engagement since here they "invest" their associations, knowledge and feelings. The unknown problem is now known. The circle widens into a spiral, a "daring to leave" the known and the trusted. When we have come to the point where the child dares to approach these problems with his/her intellect and emotions and in seeking a solution has dared step out into the spiral, we can begin with imaginative questions: What would happen

if... this or that would come together? A number of alternative solutions are given which might lead to a solution - a further step up into the spiral. This demands further courage to now invest imagination.

The question of judgement "What is important, what is better, what is worse"? following all the alternatives that have been set up, is a further climb up the spiral. Now is the time for judgement. If it is made sooner, we limit our raw materials in the thinking process. New techniques of relationship between individual factors of the problem, and of the alternatives, are sought for.

Though we now have the solution, we want to keep the children in suspense in order to prepare them for the continuity of the present into the future and so we have one further question: "What else interests you about this problem, what else can you, yourself, still do with it?" This question challenges the child, makes him/her curious, stimulates the imagination to search his/her limits. This question is most important for giving the child a hope for future accomplishments and participation in human continuity.

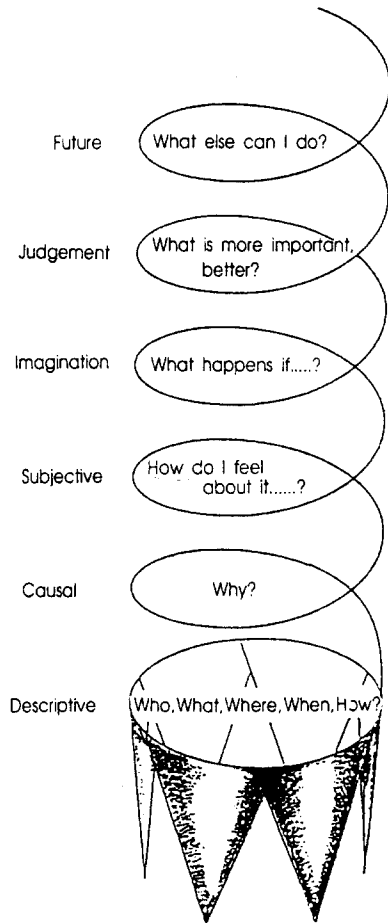


Figure 2. Spiral of Creative Questioning

Gifted Children Ask Questions about the Future

The dominant procedure in the task of creative education is teaching through questions, and we hope that the outlook it engenders also provides the children with the tools to cope with the problems of the future, so that in this positive way, their future will appear to them to be in some part their own responsibility. The questions the children ask are always the products of their own life experiences, and must be seen in that context of their here and now (the descriptive questions). The missing bits of their limited knowledge can always be filled in by instruction about the past. By giving the children the opportunity to question the future, their subjective, imaginative and judging questions, we aim to give them the means to work with their imaginative, cognitive and affective abilities.

We ask the children this question because fundamentally we do not know what are their hopes, their expectations and their fears? Is there something that directs their thought of the future? Does their education provide them with security and faith in their potential powers to deal with future problems?

How will they bridge the gap between the past facts we are teaching them in school and the actual life they will lead in the future?

Another goal is to teach children to think about the future. To do this it is necessary to help them to be aware of different outlooks on the future, and thus help them to be aware of different outlooks on the future, and thus help them to understand the different futures from which they can choose. The idea here is that the children's interest in the future will strengthen their security and faith in their own potentials, and this in turn will enable them to share in the construction of their own futures. This interest also creates a strong motivation towards learning and towards the acquisition of the knowledge and skills they will need in the years to come.

Creative Asking of Questions

Let us hope that our creative children will be the leaders of the future. We cannot prepare them for this task with today's facts since today's facts may no longer be relevant in the future. If we teach them how to ask creative questions and how to look for the answers, then we can prepare them. We cannot teach the facts of the future but

enables a clear formulation of the problem,

through questioning we can bridge the gap between today's facts and tomorrow's challenges. We want not simply to teach them what to think but how to ask questions which indicate in the direction to go in seeking the answer. Through questions we can also teach children how to satisfy their curiosity in spite of the anxiety which every new question can bring. This existential mode of education challenges not only the intellectual abilities but also the emotional development of children. It especially challenges the courage of gifted child to test his/her talents and abilities. It gives him/her the utensils for confronting problems in the future.

By encouraging questions, we can help keep the children's natural curiosity alive, stimulate their imagination and sense of adventure, and at the same time keep the learning process enjoyable. Once children enjoy learning, they become more involved in the subject, and venture to ask more questions, all of which leads to their continuing enjoyment and progress. Though obviously we cannot assist children with knowledge of the future, we can help them acquire the mental means to deal with it more effectively. This creative asking of questions, not only provides solutions but

a discovery in its own right. The quality of the problem, the creative question, determines the creative solution.

The general tendency of young people in the world is to find the solution to the problems by going back to the ways of life of the fifties, or going back to the God that failed their parents. In our gifted adults we could see they did not give up (in spite of their anxiety and pessimism), the search for their own individual way of coping with the problems. Although the profession they chose were mostly in the exact sciences and technology, they did not back away from the problems of society as can be seen from the questions they asked.

We devised a question in our questionnaires for the children and the adults to check their values* regarding their responsibility towards the personal future of man: By which ways do you think man has a say in his future?

- (C) By learning up to a certain age.
- (E) By learning all your life.
- (I) By saving money.
- (I) By building up human relationships.
- (C) By using the well known, sure and accepted ways of your society.
- (E) By daring to use new ways in

each situation.

Our gifted adults rated highest in existential values while the children rate highest in instrumental values. Children are usually more possessive, more manipulative than the adults. But their second choice was the existential values. Interestingly enough both groups rated lowest in the cognitive values. They do not see the solution to the problem of knowing about the world, a product of short term study, they do see it in life long education. Building up human relationships was not seen as a primary aim for preparing the future.

The existential values are for us the highest in the hierarchy of values because they imply the courage to be creative, to dare to use your own judgement in going new ways and learn from them all your life.

Creative Thinking For The Future

In our course in creative thinking we have worked out exercises meant to challenge children to ask questions

regarding their lives today, their social responsibility and ideas for the future. Several of these are presented here.

Definitions

To provide the children with mental and emotional strengthening the course begins with several concept definitions such as the broad concepts of curiosity, openness, flexibility, imagination, surprise and sense of humor (Landau, 1976, 1981). With this they are stimulated to take the function and values of these characteristics into account, as well as their opposites.

For instance, in reply to the question "What is play?" a child might answer "Something that is fun." Here the opposite concept of play might be boredom. To the question, "What is the opposite of play?" a nine-year-old answered with "Sleep". When I'm awake, I play. "How about school?" we asked. "That's child's play" was the answer. Here we can recognize the far-reaching and adventurous thinking of a wide-awake "challenged" child. We saw the same courage in their replies to the question: "What kind of teacher would you like to have?" For the most part they rejected the suggested answers such as "understanding warm, not too strict, gives the chance to work

C: cognitive values E: Existential values
I : Instrumental values

on one's own" and preferred teachers who suggested new, challenging ideas and were challenging themselves.

Imagination

We said to the children, let's try to imagine the world we will live in 30 years from now - houses, food, clothing, transportation, communication, leisure time, work, family life and so forth. After each child searched for the answer on their own we worked out the possibilities in common. Here are some of their ideas: One child saw a house of the future as an autonomous unit floating in air, but wished for a path to his/her friend's house. Another chose houses containing all electronic discoveries, also floating in air. A third said nourishment would consist of pills only but these had to be covered with very delicious coating, then a kind of chewing gum to activate the lips to keep them in good shape and flexible. The mouth would not be put to much use since one would not speak much. All communication would be carried on by means of television, body movement or brain waves. Transportation would be unnecessary. Goods would be transported by means of underground pipelines. Several children talked about the problem of space. Since one would

live in self-contained blocks of houses, infections and bacteria could be excluded. The eating of pre-programmed nourishment in the form of pills would eliminate illnesses, people would live forever and there would be no place for them.

Family life would be close-knit since everyone would be at home to work and study; still, it might be boring and lonely since each person would remain in a different part of the house. The house would be a kind of clan-domicile in order to provide a feeling of belonging. Personal restraint would be respected due to limitation of space and the giving and receiving of love would increase in importance. Work would be done mainly by computers and robots, one would only have to program them. A string of professions such as mailmen, chauffeurs, merchants, shoemakers, etc. would cease to exist unless they were picked up as hobbies by men and women wishing to realize their creative potentials. There would be no policemen since order and control would be maintained by means of "the eye", or even by means of a mutually acceptable code of behavior.

Comparisons

In order to simulate inter-disciplinary

thinking we have worked out exercises containing comparisons of paradoxical or analogous problems. For example: When an eleven-year-old was asked to compare a manifestation of today with that of 100 years ago, 50 years later, and then with life 10 and 50 years in the future, he chose the confrontation of religion and education, "One hundred years ago, he said, many people were religious and only a few were educated. Today they balance off. In another 10 years there will be more educated and fewer religious people and in 50 years ... there will be a new religion."

Another answer to this question was, "One hundred years ago man discovered the machine to free him/her for other tasks and to expand his/her fields of activity. Today the machine does the work of people both better and faster. In 10 years' time machines will think for people and in 50 years will command them." Another answered as follows: "One hundred years ago people dressed to stay warm and covered, fifty years ago clothes were a status symbol and today equality is emphasized by the wearing of jeans - the clothing for the poor and the rich. In another 10 years people will try to express their individuality in dressing and in 50 years people will

dress to impress and appease the beings of another planet." These are a few of many answers we received during courses at our Institute. They are the original creative products of the children of a time when science-fiction was not yet popular in Israel.

When I asked a gifted ten-years-old girl by which means she had gained most of her knowledge, she answered, "Through questions." I asked a gifted 10-years-old boy what he thought was the opposite of a question and his answer was "My teacher." I wanted to know why that was and he replied, "She never questions anything. She just keeps giving facts." Then I asked another gifted girl of the same age for an explanation of what a question is and she answered, "Something that keeps you touch with the world."

We want to reduce the gap between what is taught today and what will be needed 20 years from now. We cannot give the children any knowledge of facts about the future because facts change and we have no control over them. But we can give them tools with which to approach the problems of the future.

We must offer them an education built on the mastering of life situations and not on abstract knowledge. The

youth of the world is oversatiated with facts. It demands challenges and personal experience. We must teach them " to be".

By means of fostering questions we encourage adventurous thinking and we prepare youth not only for the future but also to take positions on current social problems, to participate and develop critical abilities impossible, but may be of use for the future. Every experience and every activity will strengthen their self-confidence and their ability to tackle problems.

Participation, daring, self-confidence and the wish to be active all these will help these children cope with the anxiety which becomes apparent in many of their questions. Anxiety can be an incentive to change one's orientation, to seek solutions not only in the external world but also to press inward from the outside and be capable of finding a solution in ourselves.

The encouragement towards action and the mobilization of the inner potential of a person leads to the development of a feeling of responsibility towards oneself and society, a responsibility which confirms one's right to a voice in decisions regarding one's activities, one's destiny and one's future.

When we teach children to ask questions we teach them how to "find" ensuing knowledge and experience. This can be illustrated by an old Chinese parable: A beggar once asked a fisherman to give him a fish in order to satisfy his terrible hunger. The old fisherman declined but offered to teach him how to fish. He explained to him that even if he were to give him a fish today the beggar would again be hungry tomorrow, but if he would teach him how to fish he would never need to be hungry again.

Disciplines, cultures and dimensions gradually become closer in our time. The gifted children should be given the opportunity to know the most current development and knowledge as well as the social problems of the present. Thus they might be prepared for the changes of the future. which are already hinted at in the present state-of-the-arts (e.g., the current concept "time-motion" brings the dimensions of time and space together). One of the most certain things in the life of these children will be change which high technology will make possible.

We, who are the closer and wider environment in the world of the gifted children must make them aware of their

intellectual, emotional and social potentials. We must convey to them the feeling of security and the freedom of responsible choices, so they will have the courage to actualize along their way towards the future. Like the old seaman's saying: "We cannot determine the direction of the wind, but we can prepare the sails." Our gifted children of today can determine their world as the adults of the future. We must help them develop their abilities to grow into full, rich and responsible personalities. We can challenge them with the problems of our society so they can be creatively productive in their own fields for their own good and for the good.