

## Effects of Instructional Media on Creativity

*A look at possible  
positive and negative effects.*

LITTLE is known through research about the effects of various instructional media on creativity. Consequently, not only research work but also considerable developmental work on instructional materials and techniques will be required before their introduction into the classroom (Taylor *et al.*, 1962a). The research findings on creativity that formed the basis for this report are largely taken from the four Utah research conferences on creativity (Taylor, 1955, 1957, 1959, 1961, with a fifth conference planned for 1962).

Though the ideas herein are educational implications from basic research findings, they are practically all speculative and could all be introduced by the question, "Is there any merit in my hunch that . . . ?"

Creative talent has been relatively ignored in the identification and development of talent in educational programs to date. Yet, creativity may be even more important than the intellectual character-

istics incorporated initially into educational programs. Furthermore, Torrance has suggested, in the 1961 Utah creativity report, that perhaps many things may be learned creatively more economically and effectively than by authority.

Recent research on human characteristics has indicated that a number of other thinking and learning processes have also been largely ignored in the identification and development of talent in education. A forthcoming educational report (Taylor *et al.*, 1962b) proposes that all of the known learning and thinking processes should be experienced in students while they learn subject-matter content. Consequently, we feel a need for techniques and instructional media which are most effective in developing each of the known intellectual characteristics, including creativity.

These unfortunate oversights will not automatically be overcome with the

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emergence of new instructional devices, such as television and teaching machines, because present developments in these new media tend to preserve traditional educational practices. These new media focus on the transmission of certain standard subject matter without great attention to the nature of the thinking and learning processes in the student while subject matter is being transmitted. Teaching-machine specialists usually program to accomplish the same learning as traditionally occurs in the classroom, only with more efficiency. Few, if any, of these approaches have yet paid attention to the problem of developing in students creative thinking or other newly-found thinking and learning processes. However, three or four creativity researchers are planning work that will bridge between new instructional media and creativity.

In considering powerful mass communication media, we should recognize that there are potential dangers as well as positive features in them. Certain media, such as TV and teaching machines, as typically programmed, may have little positive effect and possibly some negative effect on the creativity of students. One danger is that of producing single views, single structures, single approaches in the minds and experiences of students. As television and teaching machines emerge in education with their lure of the audience because of their gadgetry and other features, we should boldly proclaim, as in political campaigns, that equal time in education must be devoted to the new findings on creative and other characteristics, until we have obtained sound demonstration that these new instructional media can and will require the use of creative and other important thought processes.

If new instructional media can accomplish the same things more efficiently, some time would automatically be freed in the teaching program to focus upon creative and other thought processes heretofore largely ignored. Other instructional media, including teachers, could then specialize in creativity and utilize TV and teaching machines on those things for which they prove to be most efficient in the total learning situation. Yet, we as teachers may not know how (and will have to learn how) to do things which require and cultivate these creative and other thought processes in students.

### Discussion-Recitation-Interaction Situations

In using instructional media to develop creativity, we could encourage various types of attention—not solely the type that slavishly follows the instructional output in the learning situation. We need to learn better how to produce stirred imaginations with their unique attentional features.

We also need to recognize and develop certain kinds of performance observed in group discussion, wherein some pupils help by setting the stage while others make crucial leaps ahead by not slavishly following the discussion. Instead, the latter think at “right angles” on an unusual train of thought (perhaps even turn off their listening for awhile), but later re-enter the discussion to send it down new, fresh routes. Recordings showed that one person did this several times, whereas others merely contributed minor variations or refinements around already existing themes. However, one wonders, if a student replied in class that he did not hear the question, whether he would be given an opportunity, without fear

of reproach, to express his thinking in case it was on the problem although along different lines than expected?

Many settings and materials could be designed to encourage students to think up multiple alternatives to problems of the type where any of several solutions might be quite successful.

We should encourage students to think on their own and to be both able and willing to toss their suggestions into the arena of ideas. We should also aid them in learning what the consequences may be, by somehow letting them experience typical group reactions to new ideas, including possible strong tendencies in others to close their minds to these new ideas or to react with hostility toward the ideas and toward their originator. We need to help them to live successfully through any such consequences. Too often we may discourage this idea-producing behavior through much of our school program and then, late but suddenly, switch the "nature of the ball game" to encourage some of it in graduate school. Partly for the sake of education, research is needed to learn the details about how evaluation and decision making can effect the birth and survival and also the death and even the resurrection of new ideas.

In support of creativity, we could indicate to students how some persons have been more encouraging to new ideas, have allowed others to be more creative, and have suspended their judgments about new developments rather than feeling that they must give an immediate judgment—which too often might prove to be a negative one. In other words, students should learn that a judgment of a truly new idea, based on present-day, common-sense notions, might tend to be negative, since one feature of the new idea will be its unique-

ness rather than commonness as seen from the current common-sense framework.

Various classroom situations, teachers, fellow students, and other instructional media should be studied to see to what degree they "program" or "fence in" students, thereby continually reducing their chances of being creative. We should discover what current features have the effect of building in restrictions, inhibitions, and various other forms of deterrents which hinder or block the possibility of generating fresh solutions in problem areas. These built-in restrictions, whether self imposed or instructionally imposed, may reduce the freedom and potentiality of a person.

Fellow students can sometimes be the most powerful instructional media in influencing other students to learn or to fail to learn. Torrance found that students may devise many social controls over those showing creative characteristics. We, therefore, need to learn how to utilize the instructional media of fellow students to bring about positive in place of negative effects in the creativity of other students. Alternately, we should learn how other instructional media might be used to neutralize any negative effects by fellow students on the creativity of their classmates. A related question is how to use instructional media to develop effective questioning ability and other forms of curiosity in action. Stated conversely, we need to know how we can overcome environmental features in teachers, fellow students, etc., which tend to suppress, curtail or otherwise stamp out questioning and other curiosity behaviors. We need to learn how to prevent unnecessary rules

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and needless restrictions from being built into our organizations and into our students which bring about any unfortunate narrowing down of potentialities.

Another challenge is to use instructional media to develop creative reception as well as creative expression in students. How can we teach students to listen creatively, to read creatively, as well as to write and to speak creatively?

Instructional materials could be developed to give students practice in manipulating, organizing, and increasing the number of ideas dealt with at one time. Perhaps an increased flow of ideas in all students can be brought about by requiring them to manipulate things in their hands. An increase in ideas and discussions about a topic will probably occur among students after having a rich, active experience pertaining to that topic.

One type of contribution is to be a creative teacher or administrator by developing an atmosphere very favorable to the creativity of others. Maybe teachers and students can learn to serve as catalysts or spark plugs to stimulate and provoke new ideas in others, rather than being new-idea men themselves. Through appropriate instructional aids, perhaps students can also learn how to have other people interact with them to spark themselves to new ideas of their own.

### Multiple Media and Instructional Materials

We should determine how effective different teachers and different instructional materials are in informing, in explaining, or in provoking new thoughts in students. We need to discover the best combination of instructional materials for each of these purposes. We also

need to find out how instructional material should vary in order to inform, or explain, or stir critical thinking, or stimulate questions, or stimulate new ideas and other aspects of creativity in the receiver. What modes of presentation and what types of questions will lead to wonderment and curiosity and to continual searching on the parts of students? Do some media more readily stir increased thinking, increased library reading, and other forms of increased search for new information?

The maintenance of a combination of instructional devices may be important especially when a new device is installed into the learning situation. When texts are introduced in about the fourth grade, there may be a tendency to discontinue giving the students as wide a variety of experience as occurred in the earlier grades prior to their having full-fledged texts. If we are not forewarned, similar curtailment in the variety of experiences may occur if teaching machines or television are installed widely.

What instructional media are most effective for having students utilize creative or other specified processes, in contrast with media most effective for teaching subject-matter content? Another content-process problem is whether creative thinking is best stimulated by first freeing a student from external stimuli or whether the input of information through all sensory channels of the student at one time should be maximized as in an airplane pilot's receiving information through several senses simultaneously.

Perhaps enrichment can occur by having a variety of relevant information transmitted through various sensory channels of the receiver. Following this saturation of the individual with new information, we could instruct him to strive for new creative combinations of

various portions of this material. This procedure can be illustrated by having a child see and mimic a variety of dances on TV, after which the child would be asked to dance freely to a variety of recorded music.

We need to know the effects of successive as well as simultaneous use of a variety of sensory channels of receiving information. For example, if a large number of channels are used simultaneously for input information, will the human machinery thereby be swamped so that no new thinking action of its own can occur during this intensive input? What are the aftereffects of such input experiences—does the person become more or less likely to think freely on his own immediately afterward?

With growing evidence that different students do *not* learn by exactly the same processes, will a diversity of instructional materials ensure that *each* individual's style of learning can function? If a teacher does *not* reinforce all of the ways that different students learn, a stamp of disapproval may be given to certain learning methods, no matter how effective they might be for some students. Instructional materials could be designed to permit and at times deliberately to cultivate different learning methods among individuals and also within individuals.

To what degree do different media carry with them some pretense of omniscience? In the transmission of the same information through different instructional media, would the students feel that they have a chance to toy with this information in some cases, whereas in other instances would they feel that it is more nearly perfect, sacred, unchangeable information? Even for a given medium, which of the following best promotes creative thinking in students: flaw-

less instructional materials or those containing typical human errors to be discovered and corrected as the instruction moves along? The latter may give students experiences that they will later encounter on their own.

A current speculative emphasis about creativity pertains to the need for an open system to encourage multiple approaches and a divergence of thought. Relatively unstructured situations presumably set the stage so that the mind is free to deal with the problem without much restriction. If this is a sound approach, we need some instructional materials without too much structuring to permit a free play of the mind. On the other hand, if a richness of exposure is important in the preparatory stage of the creative process, considerable relevant material should be transmitted to the receiver to give him adequate "stuff" with which to work as he creates or reconstructs insights in a given field. We should check students' responses during and after the exposure to instructional materials designed to accomplish the above purposes to see whether desired reactions occurred.

Another "open system" may be to expose students to a wide variety of separate closed systems and separate channels of information. To avoid compartmentalized thinking, the students could then be required to think and work across these systems two at a time, three at a time, etc., in order to get a rich cross-sectional view of a field.

An open system may stir some persons to do convergent rather than divergent thinking, as they attempt to crystallize and close down the openness which they do not particularly tolerate. Contrarily, a closed system might provoke some to a greater variety of responses as a counteraction to the over-tightness of

the system; the more narrow the system, the more strongly may some counteract the "propaganda" by thinking up a diversity of alternatives.

Whenever certain closed systems tend to make the majority think more alike, an accompanying effect may be to instill, unknown to them, certain restrictions in their thinking. Such restrictions may handicap their thinking in that area thereafter. Consequently, we need to know much more about the effects of open and closed systems upon divergent and convergent thinking of learners. It has been said that Eskimos function better as far as dealing with the total field of perception than do students who have been in typical classrooms where information is compartmentalized and where learning is much more piecemeal.

While there is debate as to the role of openness or lack of structure in the situation that would be ideal for creativity, there is little controversy about the need for great involvement of an individual to hope for high level creativity. Students should have some practice in getting deeply involved, in giving long sustained effort on one sufficiently difficult activity—possibly during school hours, since it might be more difficult to hope to attain such involvement after school in the many home environments.

Students need to be able to sustain intensive effort and to experience the feeling of mastery and of attaining closure on longer and more complex problems. Nowadays, a main experience students have is that of completing, without revision, a small, piecemeal task on which they can obtain quick closure and which they can cast off, without further concern, in the form of brief daily assignments.

In the 1959 Utah conference, Cattell stressed the importance of introversion

in contrast with extroversion in creativity, together with the need for more stress on introvertive education to develop more self sufficiency, independence, and inner directedness if the nation needs creative scientists more than salesmen. The need for a rich inner life should be recognized and developed through appropriate instructional media. He also felt that certain instructional approaches (such as TV) may be intrinsically more attractive, but that we should not fall into this attractiveness and thereby ignore things intrinsically more important.

A creative person may have an atypical concept of adjustment, namely, to adjust the environment rather than to adjust to the environment. Students, therefore, should learn when it may be better *not* to adjust to the environment but to try to adjust the environment in a way better for all concerned. Instructional materials might be designed to reinforce the behavior of students who best solve certain selected problems by deliberately changing the situation.

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