What Happened To Thinking?

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Numerous national reports emphasize the need for educators to teach students to think. The new high performance competitive workplace needs people who can think. Creative thinking uses the highest level of thinking skills. Schooling methods of the past undermine creative thinking. Broad suggestions for teaching and understanding creative thinking are offered.

During the mid to latter part of the 1980's, agriculture and agricultural education scrambled to meet a crisis. Farm numbers declined each year and the enrollment in agricultural programs dropped. Agribusinesses and agricultural education looked for new directions and for alternatives through conferences and committee reports. Successful Farming magazine conducted two ADAPT (Agricultural Diversity Adds Profit Today) conferences. In the second of these conferences, Dr. Booker T. Whatley opened his presentation by stating "Thinking is hard work. If you don't believe me, look around and see how few people really do it." This attitude about thinking is shared by Alder (1977). Numerous national surveys emphasize the need to teach people to think as a part of education (Table 1).

So what happened? After all, can anyone really be successful in education or in a career if they can't think? Agriculture and agricultural education continue to change demanding more from those who will succeed, more thinking, more creative thinking. Educators must know how to teach or train students in thinking. This paper suggests a few reasons, methods and resources to help educators unleash creative thought processes.

What is Thinking?

Thinking means different things to different people. A typical dictionary definition includes: To produce or form in the mind, to examine in the mind, to believe, to expect, to remember, to bring about mentally, to intend, to use the mind to exercise judgment, form ideas, to reason, or to have a particular opinion or feeling.

The SCANS Report from the U.S. Department of Labor (April 1992) identified thinking skills as:

Creative Thinking--Generates new ideas by making nonlinear or unusual connections, changing or reshaping goals and imagining new possibilities; and uses imagination freely, combining ideas or information in new ways, making connections between seemingly unrelated ideas, and reshaping goals in ways that reveal new possibilities.

Decision Making--Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternatives.

Problem Solving--Recognizes that a problem exists and identifies possible reasons for the discrepancy, and devises and implements a plan of action to resolve it; and evaluates and monitors progress, revising the plan as indicated by findings.

Mental Visualization--Sees things in the mind's eye by organizing and processing symbols, pictures, graphs, objects or other information.

Knowing How to Learn--Recognizes and can use learning techniques to apply and adapt existing and new knowledge and skills in both familiar and changing situations; and is aware of learning tools such as personal learning styles, formal learning strategies and informal learning strategies.

Reasoning--Discovers a rule or principle underlying the relationship between two or more objects and applies it in solving a problem.

Whittington and Newcomb (1992) classify thinking into cognitive levels starting with the most basic to the highest level. The levels are memorizing, translating, interpreting, applying, analyzing, synthesizing and evaluating.

Perhaps, too, we spend too much time classifying and dissecting the process. What the future needs is creative thinkers. Creative thinkers make use of all levels or parts of thinking. Creative thought represents the highest and best use of all thinking skills and creative thought represents value and progress (Hill, 1960). To paraphrase Von Oech (1983), creative thinking requires an attitude or outlook which allows an individual to search for ideas and manipulate knowledge and experience.

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Deterrents to Creative Thinking

Learning to think is part of the educational process. At the same time, the educational process undermines creative thinking. According to Adler (1977), the fundamental activity that is involved in every kind of genuine learning is an intellectual activity known as thinking. Any learning that takes place without thinking Adler calls external and additive. This learning is passively acquired and is commonly known as information. Creative thinking is needed during learning to transform the mind, give new insights, enlighten deeper understanding and stimulate a desire for more.

Knowledge or information is the stuff of creative thought. Much of an individual's knowledge comes from schooling or education. Knowledge alone does not make creative thought. While the educational system served the purpose of relaying knowledge or information to students, the workplace changed and the educational processes did not. Too much of education still promotes the regurgitation method where the instructor provides facts and information then the student regurgitates the facts and information back on an exam or quiz. *Students take lecture notes which pass from the mouth of the instructor to the hands of the students without going through the minds of either.*

Educational processes actually inhibit creative thought. Von Oech (1983) identified ten mental locks to creativity thinking. Most of these locks can be identified as a component of the traditional educational process. These include:

1. Requiring the right answer
2. Always follow the rules
3. Accept only what appears to be logical
4. Be practical
5. Avoid ambiguity
6. To err is wrong
7. Play is frivolous
8. That is not my area of expertise
9. Do not be foolish
10. I am not creative

While it is true that lives need to be governed by rules and routines, these become mental locks when life or the workplace requires creative thought.

Besides schooling, the old workplace could not use and, in fact, did not want too much creativity or ingenuity among the workforce. A small number of people acted as decision makers--gathering and sifting information, setting up systems, organizing work flow and office arrangements, manipulating data to solve problems and, above all, handing out orders to govern the minute-to-minute actions of employees. For this old workplace, the public schools were ideal. The schools did a significant job of turning out the kind of product required. Now with the emerging high performance workplace, the old school game cannot be more of the same with more old rules. To prepare individuals for the new workplace, a new game requires new rules--a creative approach to a new educational invention (U.S. Department of Labor, 1992). High performance, competitive companies expect employees to think up better ways to do their jobs. Yet, this concept is slow to develop in the U.S. (The National Education Goals Report, 1992). Education needs to challenge the means and methods used in the past.

Teach Creative Thinking

If creative thinking or learning to think and thinking to learn becomes the subject of schooling, what is the curriculum? The popular press has done a better job recognizing and promoting the importance of creative thought in an individual's day-to-day life and work. People like Earl Nightingale and Napoleon Hill recognized the need for teaching people about creative thought while schools were simply transferring information. More recently, authors like

TABLE 1. Some National Reports Indicating Need for Thinking Skills

Title	Agency	Year
Employment Policies: Looking to the Year 2000	National Alliance of Business	1986
Building A Quality Work Force	US Dept. of Labor US Dept. of Education US Dept. of Commerce	1988
The Bottom Line: Basic Skills in the Work Force	US Dept. of Labor US Dept. of Education	1988
The Learning Enterprise	American Society for Training & Development US Dept. of Labor	1989
The Strategic Plan for Agricultural Education	National Summit on Ag. Educ. (Eleven organizations)	1989
Investing in People: A Strategy to Address America's Work Force Crisis	Commission on Work Force Quality & Labor Market Efficiency	1989
Literacy & Employment Readiness	US Dept. of Education	1990
Time for Action	National Council on Voc. Educ.	1990
The 1990 Agenda for the National Center for Research in Voc. Educ.	National Center for Research in Vocational Education (NCRVE)	1990
Occupational Competencies	National Council on Voc. Educ.	1991
What Work Requires of Schools (SCANS Report)	US Dept. of Labor	1991
Skills for Success: Training & Developing the Work Force of the 1990s	The Olsten Forum on Human Resources Issues & Trends	1991
America 2000: An Education Strategy	US Dept. of Education	1991
Learning A Living: A Blueprint for High Performance (SCANS Report)	US Dept. of Labor	1992
The National Education Goals Report: Building A Nation of Learners	National Education Goals Panel	1992

Tom Peters and Anthony Robbins (1991) promoted the value of creative thinking in the modern world of work. Peters and Waterman (1982) refer to creativity as innovation, champions and "skunk works."

As an educator then, some new approaches are required to teach creative thought during the educational process. Von Oech (1983) provides some ideas for unlocking creativity:

1. Ask "what if" questions
2. Question assumptions
3. Use soft thinking tools such as metaphors and ambiguity
4. Hunt for ideas outside of a specialized area, for example:
   a. Magic
   b. Acting class
   c. Trips
   d. Junk yards
   e. Different people
   f. Daydreaming
   g. Flea markets
   h. Old magazines
   i. History
   j. Want ads
   k. Sports
   l. Study a subject on a shallow level
5. Play the fool and break up "group think" ideas
6. Evaluate old ideas that no longer serve a purpose for productivity and growth
7. Develop lists of alternatives
8. Look for new applications for old products
9. Cultivate outside activities
10. List benefits derived from some failure
11. Take risks

To stimulate the creative thought processes, Adams (1986) cites a checklist published by Alex Osborne in 1953:

1. ***Put to Other Uses?***
   New ways to use as is? Other uses if modified?
2. ***Adapt?***
   What else is like this? What other idea does this suggest? Does past offer a parallel? What could I copy? Whom could I emulate?
3. ***Modify?***
   New twist? Change meaning, color, motion, sound, odor, form, shape? Other changes?
4. ***Magnify?***
   What to add? More time? Greater frequency? Stronger? Higher? Longer? Thicker? Extra value? Plus ingredient? Duplicate? Multiply? Exaggerate?
5. ***Minify?***
   What to subtract? Smaller? Condensed? Miniature? Lower? Shorter? Lighter? Omit? Streamline? Split up? Understate?
6. ***Substitute?***
   Who else instead? What else instead? Other ingredient? Other material? Other process? Other power? Other place? Other approach? Other tone or voice?
7. ***Rearrange?***
   Interchange components? Other pattern? Other layout? Other sequence? Transpose cause and effect? Change pace? Change schedule?
8. ***Reverse?***
   Transpose positive and negative? How about opposites? Turn it backward? Turn it upside down? Reverse roles? Change shoes? Turn tables? Turn other cheek?
9. ***Combine?***
   How about a blend, an alloy, an assortment, an ensemble? Combine units? Combine purposes? Combine appeals? Combine ideas?

Understanding the creative process allows an educator to teach creative thinking and to use it in the classroom. Aristi (1976) cites three explanations of the stages or steps. The first was prepared by Joseph Wallas in 1926 who said, creative thinking consists of four stages: preparation, incubation, illumination and verification. In 1931, Joseph Rossman expanded the four stages to seven steps:

1. Observation of a need or difficulty
2. Analysis of the need
3. A survey of all available information
4. A formulation of all objective solutions
5. A critical analysis of these solutions for their advantages and disadvantages
6. The birth of the new idea--the invention
7. Experimentation to test the most promising solution

Then in 1953, Alex Osborn divided creative thought into seven stages using different terminology:

1. Orientation: pointing up the problem
2. Preparation: gathering pertinent data
3. Analysis: breaking down the relevant material
4. Ideation: piling up alternatives by way of ideas
5. Incubation: "letting up," to invite illumination
6. Synthesis: putting the pieces together
7. Evaluation: judging the resulting ideas

Von Oech (1986), a creative consultant, indicated that creative people must play four roles: Explorer, Artist, Judge and Warrior. The Explorer gathers the raw materials for new ideas: facts, concepts, experiences, knowledge, feelings, etc. The Artist forms patterns from the raw material and may rearrange things to view them from different perspectives. The Judge evaluates, critically weighs the evidence, looks for drawbacks, checks timing, runs risk analyses, questions assumptions and then makes a decision. The Warrior takes the creative idea into battle as it is implemented. Warriors overcome excuses, idea killers, temporary setbacks and other obstacles. These four roles represent each individuals' creative team for generating and implementing new ideas.

Adams (1986) offers the same information as Von Oech (1986) for using creativity except he provides a checklist that corresponds to Von Oech's roles.

Adams	Von Oech
Understanding the problem	Explorer
Devising a plan	Artist
Examining the solution obtained	Judge
Carrying out the plan	Warrior

Von Oech's explanation of the creative process is more interesting and easier to remember. Writing is a thinking activity (Howard and Barton, 1986). Writing taps the crea-

tive processes frequently. To help understand the creative processes Cook (1992) offers some myths and truths about creativity.

Myth 1: If I like it, it must be creative.
Myth 2: If there's a lot of it, it must be creative.
Myth 3: If it feels good, it must be creative.
Myth 4: If it is made up, it must be creative.

Truth 1: Creativity is the triumph of originality over habit.
Truth 1A: Creativity is often born in frustration and surrender.
Truth 1B: The farther you are from a piece of paper and pencils, the more likely you are to experience a breakthrough.
Truth 2: Creativity involves making new combinations.
Truth 3: The first step in creativity is saying yes instead of no.
Truth 4: Creativity means getting out of the way of your conscious self and controlling your ego.
Truth 5: Creativity means being all of what your potential holds.

No matter which explanation of creative thought, the process is rewarding. According to Maslow's hierarchy of needs, creativity satisfies some of the higher level needs like esteem, cognitive, aesthetic and self-actualization (Adams, 1986). Von Oech (1983) called creative thought mental sex.

Summary and Conclusions

The workplace continues to demand workers who tap the creativity thinking process. For the agricultural educator, this presents a two-fold challenge: First, educators need to stimulate and use their own creativity to find new and better ways to train students for the new and changing workforce. Some of the old reliable methods of teaching will no longer work. Second, educators must incorporate, as part of their curriculum, methods that enhance and improve the thinking skills of all students. Working smarter is the way of the future, but it does not necessarily mean no more hard work. Thinking is hard work.

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INSTRUCTIONAL MEDIA REVIEWS

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How to Construct a Rope Halter

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How to Construct a Rope Halter is a twenty-minute VHS videotape designed to teach the step-by-step procedure for making a rope halter. It is intended for 9th grade through baccalaureate using the individual instruction method. Having taught these techniques for more than 40 years, Dr. Brown felt there was a need to create this videotape so that students can learn at their own pace.

The average rating of all reviewers was good. Although the introductory portion of the videotape was a little weak in content and clarity, it quickly focuses on the task of constructing the rope halter. The primary strengths of the video were the camera angle (over the shoulder approach) and the precise step-by-step procedures demonstrated. Any student should be able to make a quality rope halter. The average reviewer ratings follow:

	Excellent	Good	Fair	Poor
Picture Quality		X		
Sound Quality		X		
Editing		X		
Content	X			
Currentness (NA)				
Organization	X			
Accuracy	X			
Vocabulary	X			
Interest	X			
Technical Quality		X		
Overall (Average of Reviewers)	X			

Summary Remarks

General Panel Member

If your goal is to construct a rope halter, all you need is a proper rope and this video. **Gene Pesti, University of Georgia**

Media Panel Member

Overall, the video is good. The pace of the demonstration is especially good. The viewer has enough time to see exactly where the strands of rope are placed, and is led into the rhythm of constructing the repetitive movements very naturally and easily. The only weakness is at the beginning. While it is attention arresting to have the presenter appear on camera before the copyright and title, it would be better to have Brown appear again to introduce the tape, briefly. It would be useful to name the steps, then say a list of necessary items follows. It might be possible to reshoot the intro.

Virginia Book, University of Nebraska

Content Panel Member

The videos purpose was the individual instruction on how to construct a rope halter. The producer does just that, short, step-by-step instruction is very good. Video picture clarity at start is questionable. I had difficulty reading materials list. Also, showing the completion of the crown knot was not centered on screen. However, this is a good individual instruction method of constructing a rope halter.

Harold Severance, Cloud Co. Community College

The videotape *How to Construct a Rope Halter* is available directly from Murray A. Brown at P.O. Box 2088, SHSU, Huntsville, TX 77341-