

Teaching Agricultural Students to be Creativity

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Abstract

Agriculture is very important to the world's population because it is one of the answers to human's basic needs. Teaching agricultural students to be creative is necessary in order to come up with new and useful possible ideas. Creativity helps solve problems and discovering new knowledge. An instructor's teaching method is crucial in encouraging students' creativity. The essence of this article is to increase understanding on creativity, its importance in agriculture and how to enhance creativity among agricultural students. Moreover, teachers in other scientific fields may find it rewarding to teach for creativity development among their students, which may prove beneficial in the long-run.

Keywords: Agricultural students, Creative Creativity, Creative thinking

Introduction

Agriculture is the economic basis of many countries, especially the less developed ones such as Sudan, Malawi, Afghanistan, Laos, Timor-Leste, Cambodia, etc. (UN-OHRLLO Online Resources, 2010) and the developing ones as Bolivia, Indonesia, Chile, Philippines, Thailand, etc. (www.ams.org, 2011). However, success in agriculture is not easy because it is often beset with problems including storm, flood, soil erosion, soil degradation, aridity, etc. On the other hand, technologically progressive countries such as United States, Canada, Switzerland, Japan, Singapore, etc. (www.aneke.com, 2011) can control various factors that govern the production systems in agriculture. The use of technology in agriculture usually needs high investment, which is often difficult for less developed and developing countries to meet.

Agricultural success in less developed and developing countries is possible, if human resources are creative. Education is an important mechanism in creating human capital resources. It is mainly focused on cognitive domain. In the 1950s, psychologists began to study creativity (Kaufman & Baer, 2005). Many scientists averred that human creativity is no less important than cognition (Henry, 2001; Stamm von, 2003; Barnett, 2000) because it can be applied to solve urgent problems. Agriculture is faced with plenty and different forms of questions. Therefore, preparing manpower in agriculture involves developing the agricultural students' creativity, which in turn rests mainly on the shoulders of agricultural teachers.

This review serves to clarify in creativity and how to teach agricultural students to be creativity. Three main topics consisted of creativity's clarification, need for creativity in agriculture, and teaching creativity to agricultural students are detailed. It is expected that readers will know how to teach creativity to agricultural students and/or apply to teach with students in other fields.

Creativity

The Renaissance period, began to give way to the idea that creativity is a matter of genetic inheritance. In the beginning of this century, the debate turned to an argument over the relative contributions of nature versus nurture. In recent decades, there has been growing acceptance of biopsychosocial theory, that is, the belief that all creative acts are born of a complex interaction of biological, psychological, and social forces (Dacey, 1999). Creativity involves doing something. People are not creative in the abstract; they are creative in something – in mathematics, engineering, writing, music, business, whatever. One cannot be creative unless actually doing something. In this respect creativity is different from imagination (www.artssmarts.ca, 2010).

Creativity is what makes something better or new. It is the best path to creating value (DeGraff, 2002). Some definitions of creativity focus on the characteristics of individuals whose work is determined to be creative (What is a creative person like?), whereas others consider the work itself (What makes this creative?).

In either case, most definitions have two major criteria for judging creativity: novelty and appropriateness.

Novelty and originality may be the characteristics most immediately associated with creativity. Scientific discoveries that are merely a rehash of earlier work are seldom considered creative. To be creative, an idea or product must be new. One important factor in determining appropriateness is the cultural context in which creativity is based. Just as intelligence is viewed differently in various cultures (Lubert, 1999); so, the vehicles and focus of creativity vary from culture to culture and across time (Starko, 2005).

Creativity is expected in acts where there are controlled serendipity issues in valuable novelty proper. Consequently, the criteria of creativity are: (1) created outcomes have intelligible structures that are irreducible; (2) the structures of created outcomes are unpredictable; (3) the structures of created outcomes are inherently and usually instrumentally valuable, and (4) the acts that lead to created outcomes include an element of spontaneity so that although they are directed and controlled, they are discontinuous (Krausz et al., 2009). One of the most obvious differences between intelligence and creativity is that intelligence requires convergent thinking, or coming up with a single right answer, while creativity requires divergent thinking, or coming up with many potential answers (Jackson et al., 2006).

Need for Creativity in Agriculture

It has become a truism that agricultural production today faces a wider array of competitive pressures than ever before. Practitioners of Agricultural systems believe they cannot afford to do what they have always done. They must be constantly changing and innovating, reinventing themselves to stay ahead of technological change, new competitors from around the globe, and the continually shifting demands of consumers. Creativity is a means of envisaging solutions and ways forward, of thriving in a 'supercomplex' environment (Barnett, 2000) with numerous different needs. In economic terms, the innovation agenda is driven by a number of factors relating to competitiveness, including trade liberalization and a rapid fall in communication and transport costs; developments in technology and scientific understanding, and the speed at which consumer tastes and demands are changing (Jackson et al., 2006).

As a result, the future prosperity of developed and

developing countries will increasingly depend on their capacity to innovate, develop ideas into new products and services, develop new technologies and new forms of production, introduce products and services to new markets, and as they do so quite probably engaging with consumers or beneficiaries in new ways. In a fast-changing world, the ability of ideas to create social and/or economic value, whether they emerge from the public, private or third sector enterprises, needs creative dynamics among knowledge-creation, entrepreneurialism and consumers or beneficiaries. Without new knowledge there will be no products or services to offer, and possibly no effective platforms through which to deliver them. Without entrepreneurialism it is not possible to take advantage of the potential or benefit within new knowledge and to take that to market. Without take-up by the market, be it social or economic in conception, there will merely be novelty (Jackson et al., 2006).

As a result, innovation, and the creativity that underpins it, is not just about radical, disruptive and paradigm-shifting outcomes; it is also about incremental and cumulative forms that rely on the enhancement of existing products and practice in agriculture. In this way, the creativity that underpins the creation of value comes from understanding a particular domain, and an ability to feed off the traditions it is challenging whilst at the same time mindful of its likely reception and its capacity to change that domain or establish a new one (Csikszentmihalyi, 1997).

The breadth, pervasiveness and urgency of the innovation agenda, the fluidity of the process, and the multiple means of engagement have considerable implications for the workforce of the future, the focus of its endeavours, and the skills and attributes it might need. A knowledge-based economy needs workers and enterprises that are highly adaptable, that can respond more effectively to changes in technologies or product markets (europa.eu.int, 2010). Significant investment in human capital is essential: work must be a real option for all, and the stock of well-educated and well-skilled agricultural workers, who will have to update their skills regularly to respond effectively to change and enhance their employability, needs to be enhanced. It is now creativity, knowledge, innovation and learning that add value, rather than land, labor or capital (Henry, 2001).

Teaching Creativity to Agricultural Students

Teaching to enhance agricultural students' creativity can be applied in various methods. Teaching methods

for creativity include brainstorming, broadcast media, buzz groups, case studies, competitions, debates, demonstrating processes or techniques, diaries, dictation of notes, directed study tasks, discussions, experiments, games, individual or group projects, interactive, CD ROMs, Internet searches, lectures, posters, presentations by students, problem solving in small groups, programmed learning, pyramid exercises, question and answer, questions based on reading matter, role play, seminars, shadowing, simulation, supervision of practical work, surveys, team teaching, telephone enquiries or surveys, thirty-second theatre, tutorials, visits and field trips, and witness sessions (Ashcroft & David, 1999).

A scholar proposed four techniques for teaching creativity are problem finding, SCAMPER, using metaphors and analogies, and visualization and creative dramatics (Starko, 2005).

1. Problem Finding. Thinking about the strategies used by creative individuals to identify the very challenges they address raises both curiosity and awe. It helps students think about their own problem finding. "Will they find better problems?" seems a potentially important question. The problem finding and problem solving skills are associated with more adaptive personal coping strategies in college students – and less linked with confrontation, avoidance, and the like as means of dealing with stress. Can we help students gain this advantage? To the question is much to learn about creativity, the answer to that is not clear (Krausz et al., 2009).

2. SCAMPER. One of academician suggestions for improving divergent thinking is to use idea-spurring queries (Starko, 2005). "How can we simplify? What combinations can be utilized? What adaptations can be made?" When individuals or groups are generating ideas and suggestions begin to slow down, such questions can point to a new direction or point of view.

- The S in SCAMPER stands for *substitute*. It suggests asking questions such as "What can I use instead?" or "What other ingredients, materials, or components can I use?" Many new products and solutions to problems large and small are the result of substitution.

- The C stands for *combine*. It asks, "How can I combine parts or ideas? Are there two things I can blend rather than come up with something new?" Many common products are the result of combinations.

- The A stands for *adapt*. It suggests questions such as "What else is like this?" or "Could we change or

imitate something else?" In adapting, we change something known to solve the problem.

- The M can have several meanings. It can stand for *modify*. In modifying we ask, "Can we change a current idea, practice, or product slightly and be successful?" Modifications may include changing the flavor or color of toothpaste to be more appealing to children or adding nuts and raisins to a popular cookie recipe.

- The P stands for put to other uses. It suggests that we ask, "How can be used this in a new way?" The switch from advertising Kleenex as a makeup remover to billing it as a pocket handkerchief was a brilliant and profitable use of this strategy.

- The E is for eliminate. It leads us to ask, "What can be omitted or eliminated? Are all the parts necessary? Is it necessary to solve this problem at all?" Grocery stores are full of products from which fat or sugar has been eliminated.

- The R stands for rearrange or reverse. It suggests questions such as "Can I use a different sequence? Can I interchange parts? Can I do the opposite? What would happen if I turned it upside down, backward, or inside out?" Left-handed scissors, knives, and garden tools are examples of rearranging or reversing.

3. Using Metaphors and Analogies. Among the most powerful tools in this process are metaphors and analogies. Their use can also be considered a mechanism for divergent thinking because they can produce varied ideas, but are generally more focused on the types of ideas produced than on the number. In analogical thinking, ideas from one context are transferred to another in a search for parallels, insights, fresh perspectives, or new syntheses.

4. Visualization and Creative Dramatics. Both techniques involve bringing ideas to life, one in the imagination and the other in physical activity. The creativity challenges to educational development (Jackson et al., 2006) are:

- Having sufficient time and space in the curriculum to allow students to develop their creativity
- Having sufficiently varied and diverse working situations to enable all students to be creative
- Allowing students the freedom to work in new and interesting ways
- Challenging students with real demanding and exciting work
- Designing assessment that allows for outcomes which are not narrowly predetermined
- Fostering a departmental climate that encourages

reflection and personal development for both staff and students

- Continuing academic debate within the discipline, and dialogue with the various stakeholders, about the nature of the subject and the role of creativity within it

In all of the above, agricultural teachers are able to apply strategic teaching matched with circumstances. Teaching creativity to agricultural students is another way to help make progress in agricultural development. The benefit is that the world's population will not lack food because agriculture acts as a food warehouse for raising citizen.

Conclusion

Teaching to Thai agricultural students to be creativity is requisite. The teachers can be done with teaching analytical thinking, divergent thinking, using metaphors and analogies, including visualization and creative dramatics. Methods of teaching analytical thinking have been as problem finding, problem solving, debates, experiment, and others. To teach enhances divergent thinking can use method of substitute such as asking questions "What ingredients in your local can mix for animal complete feed?", modification as designing or planning, etc. While methods for develop metaphors and analogies, the agricultural teachers have taught by surveys, case studies, field trips, and questions based on reading matter, etc. They are also use teaching method of role play, shadowing, and simulation for visualization and creative dramatics to enhance student creativity. The agricultural students who pass those teaching-learning processes tend to develop agricultural work on trade liberalization and flourishing technologies situation. They are going to solve problems and barriers in agriculture. Moreover agricultural students today will be agriculturists tomorrow which can generate agricultural yields respond to need of people that increase every day. It is these because of agricultural students' creativity as a core competence can help who related with agriculture create products, services, processes, or ideas that are better or new.

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