4 ■ DESIGN OF AN INNOVATION PROGRAM

Hrridaysh Deshpande

Director, Elephantversity Institute of Innovation, Pune, India. Tel.: +91-0(20) – 22951055,
Fax: +91-0(20) – 22951055. E-mail: hrridaysh@elephantversity.com

In this paper we discuss the pedagogical approach to teaching innovation to professionals. We shall put forth our planned pedagogical approach outlining strategies that generate qualities such as inventiveness (developing novel ideas and being creative], transfer (applying learning to new situations], and innovation (developing new ways for solving problems]. We hope for uncommon success with common learners with the use of our pedagogy. The methodologies discussed in the paper will establish a curricular framework with which it will be possible to instill people with the kind of skills and attitudes that will make them more likely to be innovative.

Keywords: Innovation, Design Thinking, Pedagogy, Competencies, Elephantversity.

1. INTRODUCTION

No one would disagree that Innovation remains the most important strategies an organization can use to survive and thrive. Innovation is the extraction of economic value from knowledge. Innovation is about action and outcomes. It involves putting ideas, knowledge and technology to work. It is a comprehensive process with various elements. An innovation can be an item, a process or a service, or a form of organization.

Indian industry is at the crossroads. Our past and current successes with IT, BPO's, KPO's have been largely based on wage differentials between India and customer countries. This wage gap is closing gradually and may disappear in next few years. What then, is the question? The only answer for Indian industry is to focus on Innovation.

One of the most common misconceptions about innovation is that somewhere in the organization, someone will get a bright idea and innovation will happen. Innovation is not magic. The resultant of innovation seems like magic, but behind it is a process. It is this process that one needs to learn and master. Organizations need to understand this and develop the training and resource development programs to build innovation process skills as a core competency within the organization.

Innovation is a process a long sustained process. Innovation is a skill that can be learnt. We feel that the gift of creativity and capability of innovation is with every individual. What is needed is to bring it to the fore.

Most of the times individuals deem themselves to be non-creative. This is due to the generally understood meaning of creativity and also associating creativity with things such as painting, writing, music, etc. Sometimes we also associate creativity with getting wild ideas. While part of it is true not the full of it.

Similar myth about Innovation is prevalent. Innovation is seen as a creative process. It is seen as the domain of a select few who are endowed with this ability at birth. I feel that this view be changed. Innovation is a reliable, measurable process which yields positive business results.

People in the company need to be equipped to contribute to the innovation goal of the organization. To develop innovation capabilities organizations must provide innovation process training to its people. Companies need to invest in training programs to help disseminate innovation expertise throughout the enterprise. Top management should ensure that innovation be developed as fundamental skills for its employees.

2. INDIAN EDUCATION SYSTEM

It is essential to consider the Indian Education System while defining and developing the pedagogy for the innovation curriculum. All our participants in at least the first few batches are expected to be an output of Indian education system. The Indian education system is one of the most complex systems with a lot of anomalies. However here we discuss just the problems of it as it forms the basis of our consideration.

We've been educated to become good workers, rather than creative thinkers; we are educating people out of their creativity," says Sir Ken Robinson. It is so true in Indian context. Our education system has become Markist – meaning the students are all running after marks and this is the very peril of the system. We expect qualities like problem solving ability, initiative, and leadership skills in our students. What we get are students with amazing capacity to store information and reproduce it uncontaminated by their own thoughts. The problem begins at school and continues till the student graduates. This lack of instinct and following of rote methods continues even in organizations where more often than not, the entry level, middle level people are ones who are obeyers. There also the opportunity to think is not there. Rather thinking is penalized from school to office. In such a situation all of a sudden to ask people to think is asking a bit too much.

This situation requires special consideration in our scheme of things. It is through a motivating, lively, environment, passionate, goal oriented teaching and outcome based learning we can alleviate part of this problem.

3. ADULT LEARNING

3.1. Characteristics

It is imperative to consider how adults learn best when working on the pedagogy for the innovation program. Adults have special needs and expectations as learners. Malcolm Knowles the pioneer in the field of Adult Learning has identified following characteristics of adult learners:

Adults are autonomous and self-directed. They need to be free to direct themselves. Faculty must actively involve adult participants in the learning process and serve as facilitators for them. Participants are to be allowed work on projects that reflect their interests and assume responsibility for presentations and group leadership. Faculty must show participants how the session will help them reach their goals.

Adults have accumulated a foundation of life experiences and knowledge that may include work-related activities, family responsibilities, and previous education. They need to connect learning to this knowledge/experience base.

Adults are goal-oriented. Upon enrolling in a course, they usually know what goal they want to attain. Instruction must be designed to help participants attain their goals.

Adults are relevancy-oriented. They must see a reason for learning something. Learning has to be applicable to their work or other responsibilities to be of value to them.

Adults are practical, focusing on the aspects of a lesson most useful to them in their work. They may not be interested in knowledge for its own sake. Instructions must be useful to them on the job.

As do all learners, adults need to be shown respect. Participant's wealth of experiences must be acknowledged.

3.2. Barriers and Motivation

Adults have many responsibilities that they must balance against the demands of learning. These responsibilities act as barriers against participating in learning. Motivation factors can also be a barrier. Adults could be anxious or nervous when faced with a learning situation.

3.3. Considerations

The teaching should stimulate as many senses as possible in order to increase their chances of teaching success. Motivation and friendly, open atmosphere is needed to achieve the desired participation. The

tension and level of difficulty in the class should be fine tuned to the comfort level of the participant. Stress can often be a barrier to learning. Stress levels are to best to keep to low or to moderate stress. The degree of difficulty should be high enough to challenge participants but not so high that they become frustrated by information overload. The instruction should predict and reward participation, culminating in success. All this must be followed by feedback which must be specific, not general.

Participants must retain information from sessions in order to benefit from the learning. The participants should be able to see meaning and purpose in the information that is delivered. They must also understand and be able to interpret and apply the information. Retention is directly proportional to the quality of teaching. If something is not taught well, it would not be retained.

4. INNOVATION PROCESS

We started with defining Innovation process. We felt that the Innovation curriculum should shadow the innovation process so that the parallels could be drawn at every juncture. We are herewith putting forth the Innovation process as seen by us. It is a 7 step process divided in three phases.

Phase	Process Element	Element Explanation
Intuitive	Sensing	Opportunity, recognition of possibilities
	Envisioning	New realities, discovering latent needs
Analytical Phase	User Research	Deep understanding of users, their characteristics, needs and motivation
Inductive Observation Measurement Reasoning	Analysis	analyze data to develop user insights, data to actionable insight to defining a problem
Creative Phase	Synthesis	Idea generation, Idea Screening, Narrow focus Investigate options and process ideas, Concept Development
Deductive Decision Evaluation Judgment		
Execution Phase	Visualization & Prototyping	Embody, Refine Validate, Review Concepts, Answer question, Discover New Needs, Explore potential, Iterate
Translation Description Transmission	Executing	Diffusion & Adoption of Innovation, Build a business case

5. COMPONENTS OF CREATIVITY

Amabile[1] describes three components of creativity viz. domain relevant skills, creative — thinking skills and motivation. Domain relevant skills refer to an individual's education and experience. It forms the basis from where the performance must proceed. Creativity relevant skills depend on personality characteristics related to self-discipline, ability to delay gratification, perseverance in face of frustrations, independence, and an absence of conformity in thinking.

In addition, creativity relevant skills depend on training or an experience with idea generation, through which an individual may devise his or her own strategies for creative thinking.[1] The third component is task motivation.

Broadly speaking, motivation is either intrinsic/expressive (doing something for its own sake) or extrinsic/ instrumental (doing something for some other reason). Amabile says that intrinsic motivation is critical for creativity. She professes that creative solutions occur more when individuals engage in an activity for pleasure than for possible external rewards. Individuals are intrinsically motivated when they seek enjoyment, interest, satisfaction of curiosity, self-expression, or personal challenge in work. From the above explanation following is the treatment of the innovation curriculum

• Domain Relevant Skills — Innovation Methods will be taught to improve the Innovation domain expertise of the participant.
• Creativity Relevant Skills — Different methodologies are to be used to open the minds of the participants and make them thinking again.
• Motivation — To create a learning atmosphere from wherein the participants gather intrinsic motivation.

6. INNOVATION COMPETENCIES

Competencies could be divided in two parts viz. Individual Competencies and Organizational Competencies. Individual competency is the knowledge, skills, and ability the individual should posses and organizational competencies are those things that characterize collective action at the organizational level. Here we would discuss the Individual Competency, Individual competency as related to Innovation. We have identified the following competencies that we feel are a must in an individual to be an innovator.

• The ability to "Recognize Potential" in a given problem statement
• The ability to "Work with Abstraction" by simplifying and eliminating details
• The ability to "Visualize and Model" for analytical purposes.
• The ability to "Evaluate Alternatives" by creating alternative and significantly different solutions effectively in a given problem.
• The ability to add or retain "Value of Integration".
• The ability to establish "Solution Testing in Context"
• The ability to "Communicate Ideas and Value" in an effective and appropriate manner.

Each module within the syllabus is identified vis-à-vis these competencies. The relation between the competencies and modules is shown in the table.

Tools Competencies	User Research	Analysis	Ideation	Co Creation	Prototyping	Business Plan	
Recognize Potential	■	■		■		■	
Workwith Abstraction		■	■				
Modelling & Visualization		■			■		
Evaluation of Alternatives			■	■			
Value by integration			■	■		■	
Solution testing in the context	■				■	■	
Communicating ideas & values					■	■	

7. DESIGN THINKING

Design thinking forms the basis of the innovation curriculum. Design thinking is the latest and hottest methodology to help a company to innovate. Design thinking is a human centred approach to problem solving and therefore innovation. It encompasses people (by observing them and gaining insights

through their behaviour patterns), ideating (brainstorming, looking at a problem from multiple perspective), prototyping (visually representing the thinking) and story narration (implementation by selling compelling narratives not "concepts").

Design thinking is multidisciplinary and collaborative. Design thinking looks at the problem from multiple perspectives. It is a team-based approach which synthesizes information from multiple disciplines.

Design thinking is iterative and visual. Prototypes afford tangibility to an idea and provide a platform for getting feedback from people. The feedback mechanism sets into motion an iterative process which goes on till the concept is fully tested for meeting maximum user-needs.

Design thinking often begins by simply identifying a problem and seeing an opportunity. Design thinking is creative because its outcomes are not predetermined. It is practical because it produces things to satisfy human needs and aspirations.

Design thinking is a generic process, not restricted to any particular domain. It is a process that may be applied to anything to produce or do something that is not already determined.

Unlike critical thinking, which is a process of analysis and is associated with the 'breaking down' of ideas, Design Thinking is a creative process based around building up of ideas. There are no judgments. This eliminates the fear of failure and encourages maximum input and participation. Wild ideas are welcome, since this often leads to the most creative solutions.

8. CONVERGENT AND DIVERGENT THINKING STYLES

Hudson[2] said that there were two different forms of thinking or ability. In convergent thinking material is brought in from variety of sources to produce a correct answer. In divergent thinking ideas are elaborated prompted by a stimulus. Convergent thinking operates in knowledge domain and divergent thinking operates in concept domain. In innovation curriculum both of these thinking styles need to be used. In the first phase that is Analytical Phase convergent thinking is needed followed by divergent thinking in the second phase i.e. creative phase. The third i.e. execution phase uses the results of both these thinking styles.

9. BLOOM'S TAXONOMY

There are many types of learning. It could be classified in 3 domains viz. cognitive, affective and psychomotor. Bloom developed taxonomy (hierarchy) of cognitive learning skills. This allows educators to evaluate learning of students systematically.[3] This taxonomy suggests a way of categorizing levels of learning, in terms of the expected ceiling for a program and gives a framework for planning that incorporates higher level thinking.

It is assumed that the participants in their formal education would have covered knowledge, comprehension and application, but would not have been concerned themselves with analysis and above. In Innovation curriculum we shall focus on analysis and above.
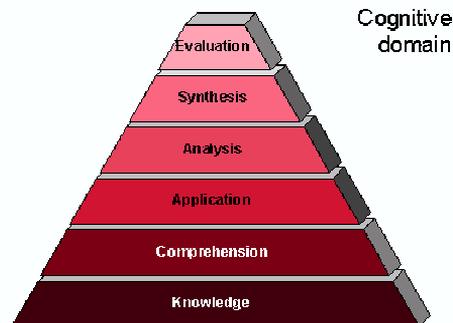
The model above is included because it is still common currency, but Anderson and Krathwohl[5] have made some apparently minor but actually significant modifications, to come up with:
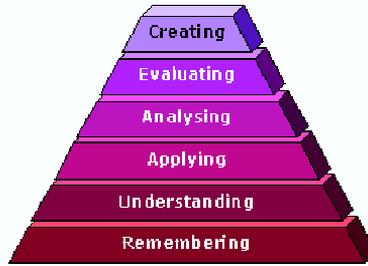
The expansion of this model in context of Innovation curriculum is as follows:

- **Creating** — Generating new ideas, products, or ways of viewing things, Designing, constructing, planning, producing, inventing.
- **Evaluating** — Justifying a decision or course of action, Checking, hypothesising, critiquing, experimenting, judging
- **Analysing** — Breaking information into parts to explore understandings and relationships Comparing, organising, deconstructing, interrogating, finding
- **Applying** — Using information in another familiar situation, Implementing, carrying out, using, executing
- **Understanding** — Explaining ideas or concepts, Interpreting, summarising, paraphrasing, classifying, explaining
- **Remembering** — Recalling information, Recognising, listing, describing, retrieving, naming, finding

10. LEARNING EXPERIENCE — KOLB'S CYCLE

The Kolb model describes an entire cycle around which learning experience at Innovation Program progresses. The learning activities are structured in a manner that they proceed completely around this cycle, providing the maximum opportunity for full comprehension. This model has been used extensively to evaluate and enhance teaching.

Kolb's Cycle
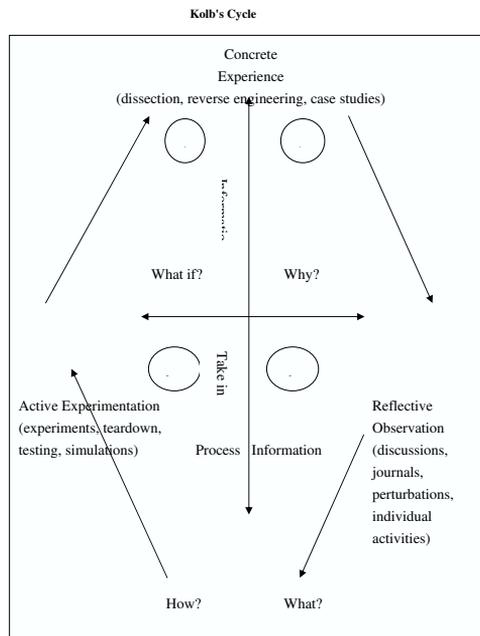
11. TEACHING & LEARNING

This program is a tailored as "Action-Learning". The program differs from traditional academic and training programs in focus, content and delivery. Our education model makes the following shifts:

- From theoretical education to experiential education
- From passive (listening) to active (doing)
- From teacher-driven learning to participant-driven learning
- From just in case (generic) to just in time (customized)
- From a teaching process to an advisory process
- From memorizing to brainstorming
- From question-based exams to project-based assessment
- From passing the tests to lifelong learning
- From knowledge transfer to knowledge creation
- From competitive learning to collaborative learning

12. ACTION LEARNING

Problem based learning, enquiry based learning and now action learning are nearly the same concepts, stated in different forms. All these concepts are aimed at Adult education. In 1979 Reg Revans wrote comprehensively about action learning. He differentiated between an expert and a leader. He said that an expert is someone who accumulates programmed knowledge. In conditions of risk, uncertainty, and confusion programmed knowledge may inhibit the exercise of leadership and freedom to pose fresh question.[7] Prof. Michael J. Marquardt suggested a model called Marquardt model. The model contains six interactive and interdependent components that build upon and reinforce one another.

1. **A problem (project, challenge, opportunity, issue or task) —** Action learning centers around a problem, project, challenge, issue or task, the resolution of which is of high importance to an individual, team and/or organization.
2. **An action learning group or team —** The core entity in action learning is the action learning group (also called a set or team).
3. **A process that emphasizes insightful questioning and reflective listening —** Action learning emphasizes questions and reflection.
4. **Taking action on the problem —** Action learning requires that the group be able to take action on the problem it is working on.
5. **A commitment to learning —** Equal emphasis on the learning and development of individuals and the team.
6. **An action learning coach —** Coaching is necessary for the group to focus on the important (i.e., the learning) as well as the urgent (resolving the problem.

The innovation curriculum delivery is set in action learning format, where participants with the help of a coach (faculty), in a team, study their own actions and experiences thereby reflecting and reviewing the actions they have taken and learn from them.

13. TEAM FORMATION

Learning in teams is crucial in a knowledge intensive society. Currently, organizations increasingly rely on teams to solve a variety of complex tasks and problems. In order to be effective and successful in the solving of problems, it is crucial that knowledge is continuously shared and constructed in teams (Derry, DuRussell & O'Donnell, 1998; Billet, 2004).

It is critical in the context of this course that the learning happens in teams. Teams those are interdisciplinary in nature. More diverse the team, the better it is. Because interdisciplinary groups

have different skills and perspectives, they have the potential to tackle broad issues, select problems that go beyond the confines of any discipline, answer complex questions, frame problems with greater accuracy and breadth of understanding, combine resources, and capitalize on differing skills in pursuing solutions to problems, and develop innovative solutions to problems (O'Donnell, DuRusell.[9] People working in teams generate more ideas. This is caused by different people bringing in different ideas. Also exchange of ideas causes more ideas to be generated. Generating Ideas being the effect, team formation is the cause.

Formation of teams is the starting point of this premise. A team is a small number of people with complimentary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable.[10] Teams cannot be formed just by associating a few individuals together. A systemic approach is needed. This is where we decided to use Myers Briggs Type Indicator (MBTI) to form the teams.

The MBTI Personality Inventory is based on Jung's theory indicating how the interactions among the preferences of perception and judgment (mental functions) and attitudes of orientation toward external world would result in 16 distinctive personality types. The MBTI is most often used by educators to identify students' learning styles, by student development professionals to provide career guidance and to improve student retention, as well as by management consultants to develop leadership and group dynamic/ teamwork training among employees.

It is planned to subject the participants to MBTI profiling on the first day of the program. The number of participants for each batch is restricted to 30 only. These 30 participants will be divided in groups of 5. Odd numbers in group is preferred to allow conflict and the decision making process by majority. While consensus is favoured, in case where consensus cannot be arrived majority method remains the only option.

The teams shall be formed after matching MBTI profiles of each participant. Each person is of distinct type and each one has a role in team. Matching the team roles with the type of person is likely to yield better results. The relationship chart between personality types would help achieve this purpose.

13.1. Other Uses of MBTI Profiling

The use of MBTI profiling goes beyond team formation. We would be using the data collected from MBTI to develop instruction and classroom environment that is conducive to active and cooperative learning.

We plan to use MBTI as a tool to achieve effective communication between the faculty and participants, participant to participant, admin and participants. Each of us processes received information in different ways and acts on it accordingly. If the information is delivered as per the preference of the person concerned, the effect of that communication in a feel good environment would occur. This profiling data will also help us to work on participants with difficulty in coping up with the course work.

14. ONLINE ENVIRONMENT

The program is an executive program. In order to help people participate in the program without compromising on their personal or professional life, the program will be delivered alternate Saturday and Sunday. To keep the continuity within the program an e-learning infrastructure is facilitated. This online environment will provide following services:

- Overall Course schedule, Content introduction
- News — related to the course and related to the field of Innovation
- Knowledge — (Must Know) Module specific information and references
- Knowledge — (Good to Know) Direct or indirect information influencing Innovation
- Virtual Campus — Blog, canteen, Project Rooms
- Specified Templates for presentation and formatting of project documentation

- Faculty Interaction devices/Pod Casts of previous sessions
- Extra module — faculty introduction and module outline
- Project Books/Documents/Exhibition — initiative
- List of Readings before and after the module
- Assignment and Assignment Submission
- Collaborative/Group work

15. FINDINGS

With reference to be above discussion the principles of the program and learning framework for the program have been formulated. They are as follows:

15.1. Program Principles

- **User- Centred** — Gaining insight about your users and intensely researching their explicit and tacit needs, wants, and problems through ethnographic and anthropological methods, observations, realistic experiments, etc.
- **Analytical** — Probing the needs and wants with analytical rigor to accurately identify obvious and implicit problems and develop a new and deeper understanding of users' requirements.
- **Vision driven** — Taking an imaginative leap into a desired future – creating clear visions and ideas for future solutions — then integrating backwards to plan how to bring make that future a reality.
- **Knowledge based** — Building upon your research by applying the available bank of knowledge and emergent technology to create new solutions.
- **Prototyping** — Making ideas for solutions visible, tangible, and concrete via models, simulations, and prototypes.
- **Cross-disciplinary** — Drawing upon methods from various disciplines to complement and enhance your core capabilities and competency.
- **Intense** — Focusing creative brainpower on a specific problem in a high pressure atmosphere with continuous effort to arrive at ideas and solutions.

15.2. Learning Framework

- **Learning by Doing** — The emphasis is on learning rather than teaching.
- **Learning Environment** — The emphasis is to create an exciting and charged environment, where cutting edge solutions are created. A mix of youthful vibrancy with experience & maturity, global viewpoint with local reality, emerging technology with traditional wisdom, and existing knowledge with rebellion and constant questioning will lead to an exciting journey through the program.
- **Working as a Team** — Participants will be expected to practice being good team players and team leaders. Participants will have to work intimately within their group to realize the fruition of their projects while a healthy competition among the teams will be promoted to motivate the teams to excel.

16. CONCLUSION

Innovation begins in our minds. It is a human and a social process. It is the most important skill to master in the context of 21'st century knowledge economy. Innovation is influenced by knowledge and attitude at the same time. It is a complex evolutionary process which requires patience and self-motivation. The entire success of the program hinges on keeping the participants sufficiently enthused and motivated at all times. The participants are charged with a responsibility of not only learning about innovation, but also to lead innovation in their respective organizations. The Adult learning considerations and learning experience mapping along Kolb's cycle becomes the focal point of the entire program. The

curriculum proposal is made such that it follows the innovation process as independent modules so that the focus is not lost. In conclusion it is a program that inspires enquiry and expression in an environment conducive to adult learning.

REFERENCES

[1] Amabile T. M. (1983). *The Social Psychology of Creativity*. New York: Springer - Verlag

[2] Hudson L. (1967) Contrary Imaginations; a psychological study of the English Schoolboy Harmondsworth. Penguin

[3] Bloom B. S. (1994). Bloom's Taxonomy: A Forty-Year Retrospective. edited by L.W. Anderson, University of Chicago Press.

[4] Bloom B. S. (ed.) (1956). Taxonomy of Educational Objectives, the classification of educational goals — Handbook I. Cognitive Domain New York: McKay

[5] Anderson, L. W. and Krathwohl D R (eds.) (2001). A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives. New York: Longman

[6] Kolb, D. A. (1976). The Learning Style Inventory: Technical Manual, Boston, Ma.: McBer.

[7] Reg Revans. (1979) Action Learning: Its Terms and Character. Published in Management Decision Journal,21(1): 1983.

[8] Michael J. Marquardt. (1999). Action Learning in Action: Transforming Problems and People for World-Class Organizational Learning. Davies-Black Publishing

[9] O'Donnell, A. M., DuRusell, L. A. and and Derry, S. J. (2000). Cognitive Process in Interdisciplinary Groups: Problems and Possibilities. Lawrence Eribaum Associates.

[10] Katzenbach, J. R., and Smith, D. K. (1993). *The Discipline of Teams*. Harvard Business Review, March-April.