



MANAGEMENT TODAY

-for a better tomorrow

An International Journal of Management Studies

home page: www.mgmt2day.griet.ac.in

Vol.8, No.1, January-March 2018



Design Thinking: Indispensable for Indian Business Schools

Irshad Nazeer¹ and Dula Babu, T.²

¹Associate Professor, Dept. of Management, Presidency College, Kempapura, Hebbal, Bengaluru, Karnataka 560024

²Professor & Area Chair - General Management, Alliance School of Business, Alliance University, Chikkahagade Cross, Chandapura - Anekal Main Road, Anekal, Bangalore-562106, E-Mail: tdbabu17@rediffmail.com

ARTICLE INFO

Article history:

Received 21.02.2018

Accepted 20.03.2018

Keywords:

design thinking, wicked problem, design pedagogy, management education

ABSTRACT

Business environment is more complex and turbulent in nature. Every day the intensity of complexity is increasing and a lot of ambiguity is being faced by the decision makers. The skill set being imparted is not sufficient on the part of the management graduates to cope up with the deadly uncertain situations. This research paper enunciates the need of inclusion of design thinking in the curriculum of business education to improve the performance of the graduates in business organization and also the author articulates that effective teaching of design thinking brings innovativeness for the business schools on one hand and brand building on the other.

Thinking – Meaning

Webster's dictionary defines thinking as the action of using one's mind to produce thoughts. In other words, it is stated as the use the brain to plan something, solve a problem, understand a situation.

1. Types Of Thinking

The broad classification of the concept of thinking is presented as follows:

- a. Abstract thinking– defined as thinking at general or macro or aggregate level.

- b. Analytical thinking– defined as dividing the whole in separate parts or components to verify the relationship and interaction among the components to make all into a single and can be compared to anatomy.
- c. Concrete thinking– defined as a skill to comprehend and apply factual knowledge. This is further specific and to the point.
- d. Convergent thinking–defined as collecting different ideas from different sources or participants to determine a one and only the best solution to an intelligibly and clearly defined problem.
- e. Creative thinking– defined as the ability to conceive very new and innovative ideas by deviating from regular thinking process. This may be keeping things together in new or peculiar and different ways. Creative thinking is often referred to as “thinking out of the box”.
- f. Critical thinking– defined as the capability to judge about something to know it's worth, value and validity. Critical thinking is to do critical examination of a thing

Responsibility of Contents of this paper rests upon the authors and not upon GRIET publications

ISSN: 2348-3989 (Online)

ISSN: 2230-9764 (Print)

Doi: <http://dx.doi.org/10.11127/gmt.2018.03.22>

pp. 109-118

Copyright@GRIET Publications. All rights reserved.

in terms of accuracy and authenticity in addition to its value.

- g. **Divergent Thinking**– defined as the process of creating many unique solutions in order to solve a problem. It involves collection of data together from all exhaustive sources and then applying logical sequence and knowledge to solve problems or make decisions.
- h. **Holistic thinking**– defined as the ability to see the big picture and recognize the interconnectedness of various components that form the larger system. It involves expanding your thought process in multiple directions, rather than in just one direction, and understanding a system by sensing its patterns. This is also called non-linear thinking.
- i. **Sequential thinking**– this is also called linear thinking and is defined as the process by which “linear thinkers” arrange things in a sequence or order while expressing based on their experience. Their thinking process ensues in a logical sequential manner, like a straight line. A straight line between two points is the most efficient way to get from one place to another.

2. What is Design Thinking

Design Thinking is defined as an analytic and creative process that engages a person in opportunities to experiment, create and prototype models, gather feedback, and redesign. Many characteristic features namely, visualization, creativity etc., that a good design thinker should possess have been identified from the literature. In the words of Tim Brown (2008), ‘design thinking is neither art nor science nor religion. It is the capacity, ultimately, for integrative thinking’. Dunne & Martin (2004) describe design thinking as “*approaching management problems as a designer approaches design problems, with an open mind*”.

Design thinking orientation brings ‘integrating decisions at different levels of an organization, involving customers (Bloch et al. 2003) to meet the common goal. Further Venkatesh et al. (2012) opine that design thinking represents an ‘organizational vision and includes the set of conscious, reflective and creative ways of conceiving, planning and artful making of products and services that generate value for customers and enable them to engage in their individual or social endeavors, whether these are utilitarian, functional, material, communicative, symbolic, or experiential’.

Liedtka & Ogilvie felt (2011), design thinking focus portraying a human-centered process incorporating insights and understandings of the needs and problems experienced by users’. The same thought has been expressed by Lawson (2006) and Brown (2009). The design thinkers do have a very good quality of imagination. Fraser, in his research (2007), Junginger in 2007 and Brown in 2008 disclosed the design thinkers show empathy for users or customers and shift their point of view to ‘better imagine solutions that meet both expressed and unexpressed needs’.

Research works by Nussbaum (2006), Moultrie & Livesey (2009) and Dell’Era Marchesi & Verganti (2010) revealed that companies, who use design thinking in their business decision making processes, perform better economically in the marketplace. Further, a research report by the UK Design Council on the performance of firms and the impact of design on firms’ performance found that over a ten-year period of analysis, the benefits of effective use of design include an improved share price performance and therefore greater shareholder returns.

Hence design thinking concept is gaining the growing recognition at a company level for the potential impact and its contribution to successful business practice.

3. Design Thinking - Features

The general features of design thinking are identified as follows:

- a. It is *human-centered* implying people are the source of inspiration and focus on *problem solving*.
- b. Design thinkers employ an iterative methodology to explore numerous possible solutions and learn from failures hence it is a *mindful* activity.
- c. It is to successfully solve an individual’s problem, by considering individual’s feelings, thoughts, and attitudes and experience, it is *empathetic* in nature.
- d. It is an important tool with which to communicate observed user needs and therefore it is *storytelling*.
- e. It is experimental and iterative, builds on past experience, and tests intermediate solutions hence it has a culture of *prototyping*.
- f. It is biased toward action: all skills and tools should be practiced therefore it is called *action oriented*.
- g. It includes radical open-minded collaboration among disciplines: multidisciplinary teams will produce better results and it is called *result oriented*.
- h. It includes integrative thinking: using abductive reasoning (Martin, 2004) dramatically improves existing products very innovatively and cost effectively.
- i. It is optimistic: establishing there is always a solution implying positive approach.
- j. It challenges constraints and supports *creative solutions*: obstacles and constraints need to be challenged in order to be more creative and sometimes highly unorthodox solutions to succeed.

4. Characteristics of Design-Thinker

The characteristics of design thinkers are discussed as follows:

Characteristics	Description
-----------------	-------------

Human- and environment-centered concern	Design thinkers focus on human needs on one hand and environment protection. Designers must continually consider how what is being created will respond to human needs. They should also consider environmental interests at a level with human interests as primary constraints for the design process.
Ability to visualize	Visionary leaders and visionary business persons do have design thinking quality. Design thinkers work visually (i.e., depiction of ideas).
Predisposition toward multifunctionality	Design thinkers should look at different/multiple solutions to a problem and keep the big picture of the problem in mind while focusing on its specifics.
Systemic vision	Designers should treat problems as system problems with opportunities for systemic solutions involving different procedures and concepts to create a holistic solution.
Ability to use language as a tool	Designers should be able to verbally explain their creative process forcing invention where detail is lacking and expressing relationships not obvious visually (i.e., explanation should go hand in hand with the creative process).
Affinity for teamwork	Designers need to develop interpersonal skills that allow them to communicate across disciplines and work with other people.
Avoiding the necessity of choice	Designers search competing alternatives before moving to choice making or decision making. They try to find ways to come up with new configurations. This process leads to a solution that avoids decision and combines best possible choices.
Source: Rim Razzouk, Valerie Shute, (2012), What Is Design Thinking and Why Is It Important?, Review of Educational Research, September 2012, Vol. 82, No. 3, pp. 330–348.	

5. Concept of Wicked Problem and It’s Characteristics

Wicked problems are defined as "class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing." (West Churchman, 1967).

In 1973, Horst W. J. Rittel and Melvin M. Webber, in their research paper, "Dilemmas in a General Theory of Planning," describes about wicked problems and explains about the ten properties that highly distinguished wicked problems from hard but ordinary problems. They are explained as follows:

- a. There is *no definitive formulation* of a wicked problem implying that it’s not possible to inscribe a well-defined statement of the problem, as is possible in the case of an ordinary problem.

- b. Wicked problems have *no stopping rule*. One can tell when one can reach a solution with an ordinary problem. On the other hand, for a wicked problem, the search for solutions is continuous and never ends.
- c. *Solutions to wicked problems are not true or false, but good or bad*. However ordinary problems have solutions that can be *objectively* evaluated as *right or wrong*. Choosing a solution to a wicked problem is largely a matter of judgment through human intelligence.
- d. There is *no immediate* and *no ultimate test of a solution* to a wicked problem. It’s possible to determine right away if a solution to an ordinary problem is working. But solutions to wicked problems generate unexpected consequences over time, making it *difficult to measure their effectiveness*.
- e. *Every solution to a wicked problem is a “one-shot” operation*, because there is *no scope to learn by experiment* or trial and error, every attempt counts in time and money factors significantly. On the other hand solutions to ordinary problems can easily be tried and derelict.
- f. Wicked problems do not have an *exhaustively describable set of potential solutions*, nor is there a well-described or standard set of permissible or routine operations that may be incorporated or practiced. Whereas ordinary problems come with a limited or fixed set of potential solutions.
- g. Every wicked problem is a *unique and distinct in nature*. An ordinary problem belongs to a class of similar or same set of problems that are all solved in the same or standard way. A wicked problem on the other hand is significantly without a standard model; experience of one problem does not help to address another wicked problem.
- h. Every wicked problem can be considered to be a *symptom of another problem*. While an ordinary problem is independent and autonomous, a wicked problem is knotted with other problems but they *don’t have one root cause*.
- i. The existence of a discrepancy representing a wicked problem can be explained in numerous ways. A wicked problem involves many stakeholders with different goals and contradictory to each other. The stakeholders will have different ideas about the nature of the problem and its origin in terms of root causes as far as understanding of it.
- j. *The planner has no right to be wrong*. The people who deal with a wicked issue are held liable for the consequences of any actions they take, because those actions will have such a large and significant impact and are hard to justify.

6. Present Status of Management Education & Need of Design Thinking

The degree of complexity of the global and Indian business environment is increasing on an exponential way as data is being created exponentially. It is a fact that business schools are ‘sending graduates into an increasingly complex and turbulent business environment without adequately developing their skills to adapt’ (Bennis & O’Toole, 2005; Dyer, Gregersen, & Christensen, 2011; Waddock & Lozano, 2013). Hence the graduates in management are not well-equipped with the tools of decision making to deal with such uncertain and highly confusing situations where means–end relationships are not understandable and in fact unknown. Imparting statistical tools to analyze the data is not sufficient to overcome such business situations. Leavitt (1989), in his research paper calls for thick and deeply involved interaction between industry and institution and commented as “*business schools have been designed without practice fields*”. Gordon & Howell (1959) also observed that “*the passive absorption of knowledge by the student can hardly be called education*”.

In fact Beckman & Barry (2007) revealed through their research that the students of business schools have become more innovative in searching solutions to given problematic and uncertain situations after they were trained in design thinking. Boni, Evenson, et al (2009), Kimbell, (2011) and Liedtka & Ogilvie (2011) also endorsed the same observation. Hake (1998), had found in his research that the need of providing students with a “*clinical educational component in business education*”, coupled with opportunities to solve complex problems motivates the students in active learning. Besides, Prince (2004), Michael (2006), Hoellwarth & Moelter (2011) and Stewart, Houghton, & Rogers (2012) are of the same opinion based on their respective research works.

March (1991), in his research paper rightly put as, ‘*design thinking is a way to achieve a balance between the tensions of exploration and exploitation*’. This view was agreed and was endorsed by Martin (2004) through his research revealing. Design thinking leads to business competitiveness, Brown (2008), promoting innovation in new products and services and giving a means to managers to create new alternatives to solve a wide range of organizational issues (Dunne & Martin, 2006). Based on the research by Dym, Agoigno, Eris, Frey, & Leifer (2005), Beckman & Barry (2007), Korn & Silverman (2012) and Razzouk & Shute (2012) observed that the use of concept of design thinking has been spread from schools of design and engineering to business schools and other higher educational institutes.

Utterback Vedin Alvarez Ekman Sanderson Tether & Verganti (2006) researched on large successful international firms such as GE, P&G, Sony and Philips and found that they use a design perspective as a problem-solving tool across the company. The need of design thinking in business has been strongly rooted and the contributions of this were best visualized and valued in innovation of new product and new service development.

Fleetwood (2005), Verganti (2006 & 2008) and Camillus (2008) have observed in their respective works that design thinking has moved from product and process design (specific application) to becoming a key element in company strategy (whole enterprise application). The management graduates are need of design thinking ability while dealing with such complex, uncertain and ambiguous situations on one hand and to get a career opportunity in such large corporations.

7. Design Pedagogy

It is already observed that design-thinking instruction is students-centered and the pedagogy generally emphasizes project-based, multidisciplinary and cross-functional learning using student teams. The design challenge should allow opportunities for students to go out and directly observe potential users (Kelley, 2001). The merit of multidisciplinary and cross functional approach is to identify and address project complexity, technical, economic, business, and human skill challenges and risks of a problem (Holloway, 2009).

The comparison between rational-analytic and design thinking approach with respect to process of problem solving (Roy Glen, Christy Suci & Christopher Baughn 2014) is depicted as follows:

Comparison of Rational-Analytic and Design-Thinking Approaches

	Rational analytic thinking	Design thinking
Problem formulation	Well-defined goal and constraints.	Goals and constraints uncovered during the design thinking process.
Criteria	Objective definition of criteria, established Before generation of alternatives.	Both objective and subjective criteria used to define design objectives, since the end user is the ultimate judge of efficacy.
Method	Planning and analysis— thought precedes action. Sequential process	Iterative exploration of the design “space,” where thinking and doing are intertwined.
Information-processing emphasis	Preference for objective formulations, especially verbal and quantitative.	Preference for visual and spatial representations, which evoke both objective and subjective insights.
Solution process	Ideally based on conscious, rational-logical reasoning process, which, over time,	Solutions evolve as the result of interaction with users and the ongoing creation and refinement of possible

	becomes formalized into a set of rules.	solutions. Incorporates experience-based insights, judgment, and intuition.
Rationale	“Get it right.” Reduce chances of failure though careful prior analysis.	Use rapid experimentation and prototyping to learn from early, inexpensive “failures.”
Outcome	Solution optimizes predefined criteria to arrive at “best” answer	Obtain “better” answer. Process may expose additional problems and solutions.

Source: Roy Glen, Christy Suciú & Christopher Baughn (2014), *The Need for Design Thinking in Business Schools, Academy of Management Learning & Education*, 2014, Vol. 13, No. 4, 653–667. <http://dx.doi.org/10.5465/amle.2012.0308>

The concept of design thinking is well received by the industry and gradually the industry is adopting the concept in order to survive in the highly fuelled and cut-throat competitive business world. The industry in India is also marching forward for higher and healthy growth rates. For example in 2014 Infosys Ltd was undergoing decreasing trend of profitability and the entry of Vishal Sikka with an initiative of zero distance made all types of employees from top to bottom to think for ideas to improve the performance of the enterprise. Tech Mahindra’s acquisition of Satyam, keeping it separate for some time till it gets rid-off all its financial black spots and then absorbing it into Tech Mahindra Ltd to widen the verticals of its software services to create wealth to shareholders. Also the turnaround strategy of Phillips Carbon Black Ltd, was started before independence, also is an example. There are innumerable companies in India looking for organic and inorganic growth and formally and informally adopting the concept of design thinking and growing exponentially.

8. The Need of Design Thinking – Indian Business Schools

The b-schools in India need to adopt the concept of design thinking in their curriculum to enable the graduates to fit into the current needs of industry. A survey was administered to know whether the faculty of management is aware of the concept and whether they feel the need of design thinking to include in the curriculum and how can it be delivered.

9. Research Design

The research framework of the paper is described as follows:

- a) *Objectives of the Research*: The objectives of the research are as follows:
- To find the degree of awareness of the management teachers about design thinking.

- To find the perceptions of management teachers on the utility of the concept of design thinking.
- To study the opinions of management teachers about the applications of design thinking.

- b) *Questionnaire*: is prepared and administered after pilot study and conforming the reliability (Cronbach alpha=0.7209) and validity (94.725%) of the instrument.
- c) *Sampling unit, Sample size, Sample tool, Data collection*: the sampling unit is a management teacher. The effective sample is 55. Convenient sampling tool was used in selecting the management teachers and assigned the work of data collection to the field assistants to proceed for the collection of data. Data was collected from 63 management teachers and after the scrutiny, 55 responses were kept for the further analysis.
- d) *Classification and Tabulation*: The data (of management teachers) collected is classified based on profile factors such as gender, teaching experience in years, industry experience, doctoral qualification and specialization.
- e) *Statistical tools*: To analyze the data appropriate statistical tools are applied such chi-square test to validate whether profile factors are significant on the subject variable.
- f) *Assumptions*: The following are assumed
- Teaching experience is grouped into two; less than 10 years and greater than or equal 10 years to assuming that there can be difference in awareness between senior and junior teachers.
 - Management Teachers with industry experience assumed to have more awareness of the concept.
 - It is assumed doctoral qualification may have significant influence on the awareness of the concept.
 - Similarly it is presumed that the specialization what the teachers are teaching will have influence on the degree of awareness.
- g) *Research hypotheses*: The following are the research hypotheses: The following hypotheses are framed to dig out any hidden insights of the research:
- Management teachers’ awareness of the concept of design thinking is independent of their gender.
 - Management teachers’ awareness of the concept of design thinking is independent of their tenure of experience.
 - Management teachers’ awareness of the concept of design thinking is independent of their industry experience.

- Management teachers’ awareness of the concept of design thinking is independent of their doctoral qualification.
- Management teachers’ awareness of the concept of design thinking is independent of their specialization what they are teaching

h) *Limitations of the research: The concept of design thinking is not new one but was restricted to engineering especially design shops. Gradually got extended to*

product and service design and strategy design. Present we can hardly find the business schools teaching design thinking.

10. Survey Results

The survey results are discussed and presented in two parts; profile of the respondents and findings of the research as follows:

- a) Profile of the respondents: the profile of the respondents is presented in table No.1

Table 1. Profile of the Respondents

S. No.	Profile	Factor	No. of Respondents	Percentage
1	Gender	Males	39	71
		Females	16	29
		Total	55	100
2	Teaching Experience	< 10 Yrs	32	58
		≥ 10 Yrs	23	42
		Total	55	100
3	Industry Exp	Yes	12	22
		No	43	78
		Total	55	100
4	Doctoral qualified	Yes	28	51
		No	27	49
		Total	55	100
5	Specialization	Finance	12	22
		Marketing	18	33
		HRM	9	16
		Operations	8	15
		General	8	15
	Total	55	100	

Source: Authors’ surveyed data basis

As per the table 1, it is found that 71% of the sample respondents are male and only 29% are the females; less than 10 years teaching experienced teachers are 58% and greater than or equal to 10 years teaching experienced are 42%; just 22% of the teachers are with industry experience and 78% of the teachers do not have industry exposure; 51% of the respondent-teachers with PhD and 49%, are without doctoral qualification; 33% of the respondent-teachers are with

marketing specialization, 22% are finance, 16% are HRM and 15% each are OM and general specializations.

In table2.1 awareness of management teachers about the concept is classified with respect to gender and presented. It is found that majority of the teachers for both the genders are aware of the concept. Further it is investigated that gender is not significant.

Table 2. Analytical Tables

Table-2.1: Gender–Awareness				Test of Hypotheses – Chi-square test @ 5% level of significance Gender is not significant at 5% level of significance as $\chi^2 = 1.911$ less than critical value 3.841 implies that gender is <i>not significant</i>
Awareness	Males	Females	Total	
Yes	32	10	42	
No	7	6	13	
Total	39	16	55	
Table-2.2: Teaching Exp - Awareness				Teaching exp is not significant at 5% level of significance as $\chi^2 = 1.687$ less than critical value 3.841 implies that teaching exp is <i>not significant</i>
Awareness	< 10 Yrs	≥ 10 Yrs	Total	
Yes	26	16	42	
No	6	7	13	
Total	32	23	55	
Table-2.3: Industry Exp - Awareness				

Awareness	Yes	No	Total	Industry experience is significant
Yes	11	31	42	
No	1	12	13	
Total	12	43	55	
Table-2.4: Ph. D Qualification - Awareness				
Awareness	Ph. D	No Ph. D	Total	PhD qualification is not significant at 5% level of significance as $\chi^2 = 0.405$ less than critical value 3.841 implies that doctoral qualification is <i>not significant</i>
Yes	22	20	42	
No	6	7	13	
Total	28	27	55	
Table-2.5: Specialization - Awareness				
Specialization	Awareness		Total	Specialization being taught is significant at 5% level of significance as $\chi^2 = 7.112$ greater than critical value 5.99 implies that doctoral qualification is <i>significant</i>
	Yes	No		
Finance	6	6	12	
Marketing	11	7	18	
Others	20	5	25	
Total	42	13	55	

Source: Authors' surveyed data basis

In table 2.2, awareness of management teachers about the concept is classified with respect to teaching experience and presented. It is found that majority of the teachers for both the groups of experience are aware of the concept. Further it is investigated that the tenure of experience is not significant.

Awareness of management teachers about the concept is classified with respect to industry experience and presented in table 2.3. It is disclosed that majority of the teachers having industry experience are well aware of the concept when compared to that of the teachers having no industry experience.

Awareness of management teachers about the concept is classified with respect to doctoral qualification and presented in table 2.4. It is disclosed that doctoral qualification is not a significant factor.

Awareness of management teachers about the concept is classified with respect to specialization what they teach and presented in table 2.5. It is observed specialization is significant as for as awareness of the concept concerned.

11. Implications and Strategies

The implications of the study are presented as follows:

Design thinking is being seriously thought and promoted in the industry. The application of the concept has been widening and deeply rooting in all spheres of the functions and in fact the whole enterprise to improve cost effectiveness and profitability without harming the society and other stakeholders. It is inevitable on the part of business schools to include in the curriculum, to teach the graduates and to make them fit for the ever growing needs of the industry.

Industry-institution interaction has to be intensified to give latest and frequent industry exposure to the management teachers by way of industry seminars, colloquiums, round table conferences, making the participating in the weekend of media-industry interface events. Enabling to undertake research projects funded by the industry, providing sabbaticals hence

they work with the industry for not less than six months in a year.

Induction of industry and business leaders in the committee of syllabus framing and introduction of frequent revision of the curriculum (at least once in a year) to meet up to the current trends of the industry is essential. Introduction of industry-specific courses/topics to make the teachers industry specific, across the management functions of the industry (more practical) rather than keeping them function specific (concept oriented or theoretical).

Designing the course curriculum should strictly be followed by the industry trends happening across the globe. Curriculum be flexible in such a manner that faculty should be able add the things that are happening in the business world with due credit after thorough verification. For an open-end question on the format of delivery, the respondent-teachers responded (those who are aware of the concept of design thinking) is tabulated and presented in table 3:

Table-3: Format of Delivery – Preference of Teachers who are Aware (N=42)

S N o	Format	Respo ndents	Perce ntage	Ra nk
1	Separate course/subject	32	76	1
2	Include in every course/subject	22	52	4
3	Form of case studies for all subjects/courses	20	48	5.5
4	Form of additional project/internship	28	67	3
5	Collaborate with online course by a foreign university	30	71	2
6	A separate dept. to interact by the students	20	48	5.5

Source: Compiled based on the survey based data

a) Design thinking as a separate course:

As per the table 3, it is understood that majority (76%) of the teachers have opined that design thinking should be introduced as a separate subject course, faculty who are exposed to all functions of management with industry experience at senior level and having trained in problem solving through design thinking will be of great help to students to match with industry needs.

b) Design thinking through foreign university collaboration:

71% of the respondent-teachers have felt that institution can have collaboration with a foreign university offering online certificate course on design thinking such as MIT, USA. If this is the option the course should be made compulsory for all the students. To execute this effectively proper monitoring system is required and trained faculty be assigned the task.

c) Design thinking as an additional project study/internship:

67% of the respondent-teachers have voted for 'form of an additional project/internship' saying that design thinking be introduced in project study or be introduced in the form internship in addition to the regular things being taken care of by the wards. To make this effective the business school needs trained faculty, sufficient apparatus and networking with the industry.

d) Design thinking as a part of every subject/course:

52% of the management teachers are of the claim that the concept of design thinking be introduced in every course/subject what the students study in their MBA program. To execute this, the business school needs well trained faculty and they required to think out of the box. In consultation with the business leaders; both successful and failure, one can frame a business problematic situation and involve the students to discuss and come out with a feasible solution. More often, teachers feel more possibility to introduce the concept in Strategic Management, Marketing Strategy, and Entrepreneurship related courses followed by Financial Management, Operations Strategy and HRM spheres.

e) Design thinking in the form of case studies for all subjects/courses:

48 percent of the respondent-management teachers have felt the need of introducing design thinking in the form of case studies for all courses. The merit of the scheme is that all faculty involvement is assured. But case studies on complicated, confusing and wicked in nature problems are rare in nature. The school needs to have collaboration with top business schools such as Harvard, MIT, and Stanford Business School etc to make use of such featured cases. At the same time, in-house case development center be established with good content

writers having exposure to business case writing from design thinking perspectives.

12. Conclusion

Globalization fuelled the degree of competition. Everyone wants to excel the competition. Technology speeded-up innovations, new needs are being created hence new products and services are continuously created. Similar is the case in marketing; once upon a time people never believed online purchases and now business volumes are rapidly increasing on online platforms. Also radical changes and cost effective financial innovations are happening in finance, from work off-home to work at home, a paradigm shift in human resource management, revolutionary changes in job profile, emerging of new jobs etc. Paradigm changes in production and operational strategies all speak about continual improvement toward undefined and unknown effectiveness.

Business situations are continuously and steeply changing, highly confusing due to contradictory reports and availability of enormous data with lack of clarity and of course no guarantee of arriving at a solution to reach undefined goal necessitate the inclusion design thinking in today's b-schools' curriculum. Mintzberg (2004), observes "*design thinking facilitates learning at speed and low cost and serves to supplement the analytic component of business education with both the "art" (imaginative insights) and "craft" (learning through practical experience) dimensions as essential to effective management*".

13. Scope for Future Research

The following are the topics identified for future research:

- a) An analytical study on the effectiveness of design thinking in B-schools.
- b) Design thinking: a pedagogic tool in enriching the effectiveness of students learning.

Bibliography

- Beckman, S. L. & Barry, M. (2007). Innovation as a learning process: Embedding design thinking. *California Management Review*, Vol. 50, pp. 25–56.
- Bennis, W. G. & O'Toole, J. (2005). How business schools lost their way, *Harvard Business Review*, Vol. 83, pp. 96–104.
- Bloch, P. H., Brunel, F. F. & Arnold, T. J. (2003). Individual Differences in the Centrality of Visual Product Aesthetics: Concept and Measurement. *Journal of Consumer Research*, Vol. 29 (March), pp. 551–565.
- Boni, A., Weingart, L. & Evenson, S. (2009). Innovation in an academic setting: Designing and leading a business through market-focused, interdisciplinary teams. *Academy of Management Learning & Education*, Vol. 8, pp. 407–417.
- Brown, T. (2008). Design thinking. *Harvard Business Review*, Vol. 86, pp. 84–92.

- Brown, T. (2009). *Change by design* (1st ed.). New York: Harper and Collins.
- Camillus, J. C. (2008). Strategy as a wicked problem. *Harvard Business Review*, Vol. 86(5), pp. 99–106.
- Dell’Era, C, Marchesi, A. and Verganti, R. (2010). Mastering Technologies in Design–Driven Innovation, *Research Technology Management*, March-April, pp.12-23.
- Dunne, D. & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. *Academy of Management Learning & Education*, Vol. 5, pp. 512–523.
- Dym, C., Agogino, A., Eris, O., Frey, D. & Leifer, L. (2005). Engineering design thinking, teaching, and learning. *Journal of Engineering Education*, Vol. 94, pp. 103–120.
- Dyer, J., Gregersen, H. & Christensen, C. M. (2011). *The innovator’s DNA: Mastering the five skills of disruptive innovators*. Boston, MA: Harvard Business Review Press.
- Fleetwood, R. (2005). Design Audit by Research: Building a knowledge base for competitiveness by design, *Joining Forces*, University of Art and Design Helsinki, pp. 1-8.http://www2.uiah.fi/joining_forces/papers/Fleetwood.pdf
- Fraser, H. (2007). The practice of breakthrough strategies by design. *Journal of Business Strategy*, Vol. 28, pp. 66–74.
- Gordon, R. A. & Howell, J. E. (1959). *Higher education for business*. New York: Columbia University Press.
- Hake, R. R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, Vol. 66, pp. 64.
- Hoellwarth, C. & Moelter, M. J. (2011). The implications of a robust curriculum in introductory mechanics. *American Journal of Physics*, Vol. 79, pp. 540.
- Holloway, M. (2009). How tangible is your strategy? How design thinking can turn your strategy into reality. *Journal of Business Strategy*, Vol. 30, pp. 50–56.
- Junginger, S. (2007). Learning to design: Giving purpose to heart, hand and mind. *Journal of Business Strategy*, Vol. 28, pp. 59–65.
- Kelley, T. (2001). *The art of innovation: Lessons in creativity from IDEO, America’s leading design firm*. New York: Doubleday.
- Kimbell, L. (2011). Rethinking design thinking: Part I. *Design and Culture*, Vol. 3, pp. 285–306.
- Korn, M. & Silverman, R. E. (2012). Forget B-School, D-school is hot. *The Wall Street Journal*, [fromtp://online.wsj.com/article/SB10001424052702303506404577446832178537716](http://online.wsj.com/article/SB10001424052702303506404577446832178537716)
- Lawson, B. (2006). *How designers think: The design process demystified*. Amsterdam: Elsevier.
- Leavitt, H. J. (1989). Educating our MBAs: On teaching what we haven’t taught. *California Management Review*, Vol. 31, pp. 38–50.
- Liedtka, J. & Ogilvie, T. (2011). *Designing for growth: A design thinking tool kit for managers*. New York: Columbia Business School.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, Vol. 2, pp. 71–87.
- Martin, R. (2004). The design of business. *Rotman Management*, winter.
- Martin, R. (2009). *The design of business: Why design thinking is the next competitive advantage*. Cambridge, MA: Harvard Business Press.
- Michael, J. (2006). Does active learning work? A review of the research. *Journal of Engineering Education*, Vol. 93, pp. 223–231.
- Mintzberg, H. (2004). *Managers not MBAs*. San Francisco, CA: Berrett-Koehler Publishers.
- Moultrie, J. and Livesey, F. (2009). *International Design Scorecard: Initial Indicators of international design capabilities*. Institute for Manufacturing, University of Cambridge.
- Nussbaum on Design (2006). *Business Week*, May, 17, Cover Story.
- Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, Vol. 93, pp. 223–232.
- Razzouk, R., & Shute, V. (2012). What is design thinking and why is it important? *Review of Educational Research*, Vol. 82, pp. 330–340.
- Stewart, A. C., Houghton, S. M., & Rogers, P. R. (2012). Instructional design, active learning, and student performance: Using a trading room to teach strategy. *Journal of Management Education*, Vol. 36, pp. 753–776.
- Utterback, J, Vedin, B-A, Alvarez, E, Ekman, S, Sanderson, SW and Verganti, R. (2006). *Design inspired Innovation*. New Jersey: World Scientific Publishing.
- Venkatesh, A., Digerfeld-Mansson, T., Brunel, F. F. & Chen, S. (2012). Design orientation: a grounded theory analysis of design thinking and action, *Marketing Theory*, Vol. 12 (3), pp. 289-309.
- Verganti, R. (2006). Innovating through design. *Harvard Business Review*, December: 114-122.<https://hbr.org/2006/12/innovating-through-design>

Verganti, R. (2008). Design meanings and radical innovation: A Meta model and a research agenda. *Journal of Innovation Management*, Vol. 25, pp. 436-456.

Waddock, S., & Lozano, J. M. (2013). Developing more holistic management education: Lessons learned from two

programs. *Academy of Management Learning & Education*, Vol. 12, pp. 265–284.

West Churchman. C. (1967). Wicked Problems. *Management Science*, December, vol. 4 (14), pp.141-42.