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Exploring the Potential of Design Thinking as a Tool for University Curriculum Revision

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Abstract: The present article intends to discuss the possibility of bringing robustness to the process of curriculum revision exercises at the university level. The article deliberates the traditional means followed at higher educational institutes (HEIs) for curriculum revision and explores the possibility of integrating the Design Thinking (DT) approach into the same. All five stages of DT including empathy, defining, ideating, prototyping, and testing are discussed in principle and in line with their application in the traditional means of curriculum revision exercises. The article concludes that using DT as a tool would refine the process and outcomes of curriculum revision exercises. Further, It is encouraged to conduct action research-based studies to evaluate and quantify the efficacy of the same.

Keywords – Education, Curriculum Revision, Design Thinking.

The socioeconomic progress of society largely depends on the institutional frameworks focusing on education, welfare, and training programs. (Facacci, 2022) Education plays a significant role in determining the future of any society. It contains the potential to construct and deconstruct generations. The process of education happens through both formal and informal means. Societies have developed many formal systems to impart education. All such systems are expected to comply with the vision that society aspires to achieve. Over a period of time, such aspirations have been changing basis the axis of economic gravity. The modern education system seeks to maintain a balance between utilitarian and humanitarian approaches. In order to achieve such equilibrium, the institutions and central functionaries have been consulting with various schools of thought. Such interactions have served as seeds to advance the state of the education system. A variety of measures, practices, and systems have been developed to keep a track of the market requirements and the education imparted in formal structures.

There have been a lot many regulations and advisories issued in the interest of the education system in India. NEP2020 is one such recent development that aspires to serve as a guiding document to improve the existing state of the Indian education system. It also contains guidelines and recommendations for curriculum revision. It emphasizes that the curriculum revision exercises should aim at developing an interdisciplinary, holistic, and flexible curriculum. It is expected that Higher Education Institutes (HEIs) should incorporate critical thinking, problem-solving, creative thinking, and innovation. The curriculum should offer flexibility to the learners by giving choices and blended learning options. It also focuses on experiential and project-based learning. Further, NEP highlights developing a curriculum that is more relevant to 21st-century needs so that learners can be prepared for a rapidly changing world. NEP2020 contains a lot many suggestive measures for the improvement of the overall teaching and learning system in the country. Many HEIs have started compliance actions on the same note whereas many are still in a row and building capacity for their implementation. On the other hand, a series of mandates and guidelines have been issued by the UGC and other regulatory authorities in line with the NEP2020 such as Blended learning, Indian Knowledge System (IKS), Deeksharambh, etc.

Traditionally, all HEIs in India follow a channel to streamline their curriculum to meet the industry and societal requirements. Universities constitute a board of studies (BOS) to develop and review curriculums. Meetings of the board of studies are conducted in universities biannually or annually. Experts from various related segments usually become members of the BOS. Various internal and external committees are constituted to make this exercise a participatory venture. Such an inclusive approach allows a variety of ideas to be discussed at a common forum. Still, there are several gaps identified in the reports presented by various govt. and other independent bodies. Like, a report presented by AICTE and the Confederation of Indian Industry (CII) in 2018, identified that there is a lack of industry-related and entrepreneurial skills among fresh graduates in India. In another report presented by the Federation of Indian Chambers of Commerce and Industry (FICCI) and Ernst & Young (EY) in 2020, it is emphasized that more importance should be given to industry-integrated curriculum, internships, and research collaborations. It can be inferred that the systems that have been opted to fill the gap between academic and industry expectations require interventions for further improvements. There are a number of suggestive measures which have been advocated and also implemented by many researchers and academicians and still, research is going on in this direction.

A number of researches have been conducted by academicians, researchers, and thinkers to discuss, explore, and share the curriculum revision processes. Some of them follow theories propagated by educational theorists and some have presented mixed approaches followed at ground level. M. Root Kustritz, et.al, (2017) in their study entitled “Curriculum Review and Revision at the

University of Minnesota College of Veterinary Medicine” described the approaches and steps followed by the university to review and revise the curriculum of the program. It was discussed that the university formed a committee including teachers, and students to review the existing curriculum and share feedback on the same. It was concluded that faculty voting, student engagement, and administrative assistance are of utmost importance in the curriculum review process. G. Icarte and H. Lavate (2016) in their article entitled “Methodology for Reviewing and Updating a Curriculum Design of a University Career Incorporating the Concept of Competency-Based Learning” presented and reviewed the process of curriculum revision in the university system. The review included a discussion about the five steps including students’ competencies, progression mapping, analyzing the course contribution to developing competencies, syllabus upgradation, and elaboration. Y. Sugai and K. Suzuki (2011) in their study entitled “Change Over Time in Spatial Ability of Students Entering University – Impact of Revision of National Curriculum Guidelines up to High School” studies the impact of national curriculum guidelines in the education system. The effectiveness was analyzed using MCT (Mental Cutting Test). K. Becker, et. al, (2000) in their article entitled “Using KDD to Analyze the Impact of Curriculum Revisions in Brazilian University” shared the experience of using KDD (Knowledge Discovery in Databases) to investigate the impact of curriculum review and revision in a Brazilian university. The study also shares the framework of analysis required for measuring the efficacy of curriculum revisions.

Meanwhile, there have been a lot many ideas propagated and utilized by the industry and many researchers to solve problems and design processes. Design Thinking (DT) is one of the approaches which have been discussed on many platforms. DT is a non-linear, iterative process that is used by teams to understand users, challenge assumptions, redefine problems, and create innovative solutions. The approach involves five steps including:

- 1- empathy,
- 2- define,
- 3- ideate,
- 4- prototype, and
- 5- test

The approach was first discussed by Herbert A. Simon, a noble laureate cognitive scientist in his book *The Sciences of the Artificial* (1969). It is noted that Simon advocated rapid prototyping by observations. Further, in 1982, Nigel Cross in his paper entitled “Designerly Ways of Knowing” discussed how designers solve complex problems. He shared his comprehension of the topic of problem-solving. Later, there were a series of academic explorations on DT which converted into books, papers, and interviews but in 1991, the approach started gaining more popularity when many companies like IDEO brought the concept of DT into the mainstream and started using it to solve industry problems and design process.

DT has been potentially grabbing the attention of researchers, and scholars from a variety of fields. The studies indexed on the Scopus database were explored to understand the approach and its usage. The studies conducted in the field of arts & humanities containing the keyword ‘design thinking’ in their titles, were studied in examined and It was found that most of the researches on the DT approach have been conducted in the past decade only. It reflects that it has gained more popularity in the past decade. The analysis of the result reflecting the trend of DT research in the field of arts & humanities indexed on the Scopus database is as follows:

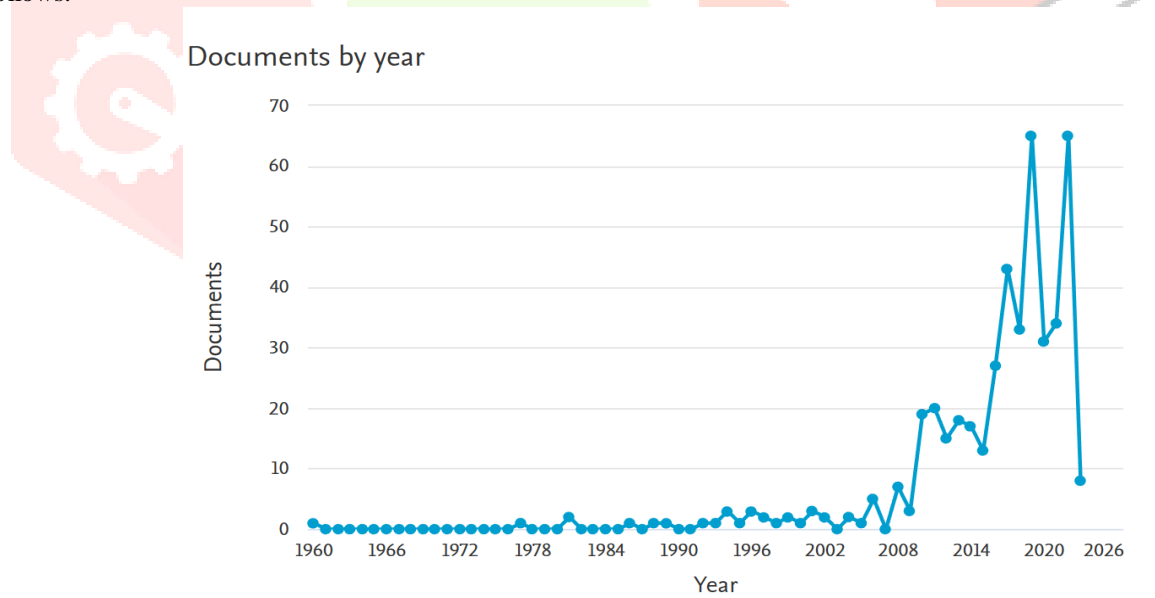


Fig. 1 (Obtained from Scopus data analysis)

Bar graph fig. 1 portrays that the number of researchers from arts & humanities backgrounds discussing DT is increasing every year.

R. Rouse and J. Malazita (2023) in their study “Critical Disciplinary Thinking and Curricular Design in Games” details a large-scale curricular design project in creating and implementing an MS/Ph.D. in Critical Game Design. J. Montero (2023) in his study entitled “Developing Empathy Through Design Thinking in Elementary Art Education” discussed the importance of design thinking in improving the level of empathy among preadolescents and also concluded that design thinking is an effective way to teach empathy. B. Matthews, et.al, (2022) in their case study entitled “Design Thinking, Wicked Problems, and Institutioning Change: a Case Study” discussed the efficacy of design thinking in addressing genuinely wicked and complex problems. A. Marful, et.al, (2022) in their exploratory study entitled “Design Thinking As An Effective Tool For Architectural Pedagogy: Challenges and Benefits for Ghanaian Schools” identified the concepts of architecture to be taught at schools, and challenges to which students may refer to design thinking tool. The researchers concluded that the approach can assist students to improve their creativity level.

J. Gonzalez-Granado (2022) in his study entitled “Design Thinking as an Agent of Transformation in Training Processes” discussed the transmedia experiences in the education sector in Europe and Columbia. The research proposed a design of transmedia that inspires cooperative problem-solving using design thinking. B. Megchun (2022) in his study entitled “Integrating Design Thinking and Anthropology as Enablers in Addressing Responsible Innovation” used problem and project-based learning approaches and also integrated design thinking for responsible innovation. The article focused on understanding the benefits and implications of responsible innovation. M. Tramonti and A. Dochashonov (2021) in their article entitled “Game Environment and Design Thinking Approach For New Digital Careers” discussed a European case of teaching design thinking to students using a 3D game environment. S. Hogsdal and A. Gundmeier (2021) in their study entitled “Integrating Design Thinking in Teacher Education: Students Teachers Develop Learning Scenarios for Elementary Schools” discussed the effectiveness of design thinking training for teachers and students for integration of the technique in arts, and crafts, general science, and social sciences. A. Margiono and T. Hanafi (2020) in their article entitled “Design Thinking Corporate Training Effectiveness and the Attributes of Trainers” examined the connection between the attributes of the trainers and the efficacy of design thinking training. The research found that the perceived persona, knowledgeability, and prospects of the trainer are significant components in design thinking training. The finding emphasized that a trainer’s skills to engage the audience are of utmost importance.

NEP2020 suggests following a more inclusive approach and to make the processes of curriculum revision more participatory as it intends to prepare the learners for the dynamic world where the needs change rapidly. In order to develop a process for such inclusion and strengthen the existing systems of curriculum revision, the researcher proposes design thinking as a potential tool. It is anticipated that DT would bring more robustness to the process followed to conduct BOS at a university level.

- 1- **Empathy:** Empathy is the first stage of the DT process. It involves understanding the needs and requires observations at different levels. It is intended that the designer should minutely observe everything that is related to the problem.

For curriculum revision, empathy can be practiced at two levels:

- a) For constituting the board of studies: It is generally observed that select stakeholders are offered membership in BOS and they are invited on a fixed date where they discuss the existing curriculum and trends of the industry and other associated progressive paths for the learners. Being empathetic at this stage for refining the process of the BOS constitution, it is expected to list down various stakeholders.
 - Faculty members: Assistant Professors, Associate Professors, Professors, and Professors of Practice. Identify potential contributors from the institute as well as other institutes where the respective program or domain is flourishing.
 - Alumni: Recently pass out alumni who have just joined the industry and senior alumni members who had risen to higher levels in the industry
 - Industry: Identify various types of industries based on variations in industry segments, identify industries based on variations in the size of the industry, and identify various levels of people including technical and HR professionals for the select industries.
 - Bodies & Research Institutes: Various govt. and independent bodies and research institutes can also be identified who are committed to exploring and producing reports related to the future of the domain and emerging sub-domains in the field.
 - b) For conducting BOS meetings: Generally, the interactions among the stakeholders for curriculum revision are conducted not more than twice a year. Following the first stage of DT, it is urged that the number of meetings should be increased and in-house academic leaders should frequently interact with the members to empathize and understand. So that more refined inputs can be collected in a natural flow of information. Empathy would allow understanding of the necessity to do initial level brainstorming for structuring the right questions in the form of agenda items for the structured meetings with stakeholders. The entire process of conducting several formal and informal meetings with the stakeholders requires the in-house leadership to be very empathetic and open-minded. So that preconceived notions about the curriculum can be avoided and remarks, suggestions, and inputs can be captured, evaluated, and incorporated with an open mind.
- 2- **Define:** Define is the second phase of the design thinking process. In this stage, the information collected in the first phase is collated and the problems indicated there, are defined. For the execution of this phase in the academic exercise, it is expected from the in-house leadership who are driving or moderating the entire process of curriculum revision to collect the insights obtained from the stakeholders and study them in detail. So that a comprehensive understanding related to the problems can be gained and problem statements can be framed. In the curriculum revision exercise, a problem statement can be the gap that has been identified between industry and academia. Such problem statements or gaps will be addressed in the later stages of the design thinking process.
 - 3- **Ideate:** Ideation is dedicated to generating solutions. It is recommended that the team should do brainstorming sessions in order to address the problems identified in defining stage. And also it is suggested that the team shouldn’t jump immediately after a solution is generated. Brainstorming methods such as mind mapping, Six thinking hat, SCAMPER, attribute analysis, reverse thinking, etc can be used to address the problem as a whole. The ideation phase would allow the academic leaders and other stakeholders to break the boundaries of the linear thinking approach. It is expected that several solutions should be generated. In academia, solutions to curriculum-related problems could be incorporating some skill sets in the curriculum in the form of regular lectures or conducting practical classes or industry visits, or a combination of such types of solutions. Some sample triggering ideas that can be posed to smoothen the ideation phase would include:
 - What should be eliminated/reduced/added/modified?
 - What to change in the distribution of emphasis on several topics and courses?
 - Approaches for skilling up.
 - Required change in methodology (practical, theory, MOOCs,
 - 4- **Prototype:** Prototyping is the fourth stage of the design thinking process. The objective of this stage remains to finalize a solution from the suggested measures collected in the ideation process. The ideation phase produces a number of solutions that are further evaluated and their efficacy is anticipated. As a result, the designers are able to find out a solution or approach that they can go with to develop a prototype. It is suggested that the prototype should be cost-effective. In industry, a prototype can be a service or product that has been designed to solve some problem whereas, in an academic

exercise like curriculum revision, a prototype can be a curriculum design that the team developed and believes, would address the concerns raised, collected, and acknowledged in the empathy and defining phase.

- 5- **Testing-** Testing is the final stage of the design thinking process but as discussed previously, the nature of the design thinking process is iterative and non-linear. As a result, it is allowed to go back to any stage and repeat or refine the previously conducted exercises to improve upon the solutions. The main objective of the testing phase is to test the solutions developed in the prototype stage. It is required to test the solution in the actual environment rather than testing in the lab or controlled environment. The designer is expected to keep track of and observe the journey of the user whom the solution has been designed for. Academic leadership involved in the testing phase should test the curriculum by mapping the curriculum with the objectives coined and acknowledged in the empathy and defining phase. Further, the course content and the teaching methodologies finalized in the ideation phase should be tested in the semester teaching, and a report on the efficacy of the delivery and unaddressed gaps should be developed to refine the outcomes.

The efficacy of the outcomes of an exercise majorly depends on the commitment level of the executioners. It is recommended that the in-house leadership driving the entire process of using DT as a tool for curriculum revision should be passionate about the academic exercise and must have the capacity to drive the DT process to identify and address complex curriculum problems. As a result, the exploration suggests that some fundamental requirements should be fulfilled for the effective execution of the entire process of DT in curriculum, like:

- 1- Chairperson of the board including in-house board members should have a good understanding of the design thinking process or a moderator can also be appointed to drive the process.
- 2- The board should be authorized to function and interact (both online and in-person) more frequently with the stakeholders.
- 3- Usually, the important decisions are taken in the board of studies meetings only, whereas, to implement the design thinking approach it is recommended to have a series of pre-BOS meetings or rounds before putting all the proposals and findings in the final BOS.

It is anticipated that taking care of such prerequisites will enable the stakeholders to contribute to the curriculum revision process more effectively. The article contributes to enhancing and widening the existing understanding related to curriculum revision and proposes to use design thinking as a potential tool to conduct such academic exercises. It is believed that the usage of such techniques would be a positive initiative to improve the quality of the curriculum and to address the existing gaps between industry and academia. It is encouraged that future researchers should conduct process-driven research in this direction to understand and measure the efficacy of the design thinking approach in academic tasks related to curriculum revision.

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