IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Reshaping Elementary School Curricula To Incorporate Design Thinking To Make Them Future Ready

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Abstract: Elementary school students have an intrinsic capacity for curiosity and inquiry, which might lead them to opportunities that others are unable to recognise. Teaching design thinking to young students' aid in the development of a growth mindset as well as crucial analytical, spatial, and problem-solving skills. Therefore, we may conclude that all components of the curriculum and pedagogy at the elementary level need to be reoriented and revamped. In Section 4.24 of the National Education Policy (NEP) 2020, it is made clear that coordinated curricular and pedagogical initiatives, including the introduction of modern subjects like Artificial Intelligence, Design Thinking, Holistic Health, Organic Living, Environmental Education, Global Citizenship Education (GCED), etc. at pertinent stages, will be undertaken to help students at all levels develop these various crucial skills NEP 2020 noted that due to the dramatic changes in learning, students today require a unique set of skills in order to be prepared for the workplace of the future. Students that are proficient in design thinking not only comprehend what they are learning, but also go beyond it to critically analyse their own work. Design thinking abilities are useful outside of the classroom and are highly sought after by businesses everywhere. Present paper tried to make an attempt to discuss design thinking and its importance for students and reasons for its inclusion in elementary school curriculum.

Index Terms - Design Thinking, Empathy, Elementary School, Prototype, Learning Approach

I. INTRODUCTION

India has been a land where education is meant for spiritual development and improving the quality of life of an individual, job seeking was never cemented with education in ancient India. It was in colonial India that educational degrees have been set as an eligibility for getting a job and since then job seeking became one of the main objectives of education. Now a days when India is stepping towards becoming self-reliant a need has been felt to transform a traditional educational viewpoint from job seekers to job creators and building a start-up ecosystem in Indian educational set up, as these start-ups are going to be backbone of new India. For developing innovative and entrepreneurial skills among our young generation there is need to focus on promoting design thinking and providing this a place in school curriculum from elementary stage. Teaching young students design thinking helps them develop a growth mindset and important problem solving, analytical and spatial thinking skills. So, we can say that there is a need to reorient and revamp all aspects of curriculum and pedagogy at elementary stage.

National Education Policy (NEP) 2020 clearly stated under section 4.24 that concerted curricular and pedagogical initiatives, including the introduction of contemporary subjects such as Artificial Intelligence, Design Thinking, Holistic Health, Organic Living, Environmental Education, Global Citizenship Education (GCED), etc. at relevant stages will be undertaken to develop these various important skills in students at all levels. NEP 2020 acknowledged that with drasitical changes in learning, students need the extraordinary skill set to be capable of transitioning into the future of work. Design thinking skills not only help students to understand what they are learning but also help them go beyond and question the work they are doing. Design

Thinking Skills are not just helpful in classrooms; these skills are high in demand by employers all over the world.

Now let us comprehend about the design thinking and why learning such skills is crucial for school students to be incorporated in curricula?

Design thinking refers to creative problem solving or exploring solutions to some real time problems employing creative thinking and innovative mindset. With design thinking one can break all the barriers and can explore the unexplored and undiscovered places to unveil imagination and creativity. Following five steps are involved in the process of Design thinking –

Empathize: Whole process of design thinking puts the needs and requirements of the individuals first. In this step the problem is comprehended explicitly and efforts are made to empathise with the individuals who are facing the problems. This stage of the process is dedicated to building empathy with the target individuals and understanding their needs, expectations, and behaviors.

Define: In this step the problem identified has to be defined by analysing all the needs explored in empathize phase, and based on those needs and challenges problem statement is framed outlining the issue or challenge that needs to be addressed. Problem statement provides direction throughout the design process. This will form the basis of ideas and potential solutions.

Ideate: This stage of design thinking dealt with brainstorming and generating ideas to solve the individuals' problems. This stage encouraged to think creatively venturing away from expected norm, to explore new angles, and to think outside the box. In ideation sessions as many ideas as possible are generated —regardless of whether or not they're feasible. In order to move ahead in the process few ideas that seems feasible are picked which later turn into prototypes to be tested on real users.

Prototype: Prototype means presenting the ideas in visual form through 3 dimensional models, digital interactive representations. This assists one in decision making regarding the feasibility of design of the idea. It informs about the successfulness of process. Prototyping provides a set of tools and approaches for properly testing and exploring ideas before too many resources get used.

Test: This is the final stage of design thinking process. The prototypes developed are tested in this stage by giving them to end users and collecting their feedback to improve and enhance the final product.

2. NEED OF RESHAPING ELEMENTARY SCHOOL CURRICULA TO INCORPORATE DESIGN THINKING

Most of the job opportunities that will come up in future are not invented yet, future of present young generation is highly uncertain, so how can we best prepare our students for this unknown future? How can we teach our students to be creators, innovators and problem solvers who can adapt and pivot when necessary to flourish in a rapidly changing world? In order to prepare our young generation to adapt and succeed in this rapidly changing working environment there is need to equip them with 21st century skills. Empathizing, defining, ideating, prototyping and testing are all the stages that prepare students for the skills they will require in tomorrow's workplaces. In 21st-century workplaces, collaboration, working on teams, problem-solving, risk-taking, creative thinking, and flexibility are some of the highly valued skills. Incorporating Design thinking in elementary stage curricula can help in inculcating these skills right from classrooms to help students transition for a competitive and challenging work environment in the future by enabling them to –

- Identify problems and reframe them as actionable opportunities.
- Understanding the value of collaboration and feedback.
- Viewing setbacks and failures as valuable learning moments.
- Appreciating the value of hard work and persistence.
- Developing self-belief as problem solvers.
- Developing empathy.
- Developing a growth mindset with a focus that is both future and solutions-oriented.
- Developing entrepreneurial and community-minded behaviours.

Design thinking needs to be incorporated in elementary stage curricula as it has following benefits –

- Students learn **how to have creative confidence in their abilities to adapt and respond to new and difficult challenges.**
- Students acquiring design thinking skills **are able to identify and develop innovative and creative solutions to problems** as and when they face them.
- Students **transform as optimistic, empathetic, and smart working members of the society** who can solve complex challenges of the coming future.
- Students **learn the fundamentals of Problem-solving with Design Thinking.**
- Students are able to **use and integrate design thinking skills learned to solve real-life problems.**
- Students get to **learn the top in-demand skills like problem-solving, decision making, and creative thinking from top industry experts.**
- Students **prioritize learning as part of the course in design thinking instead of just gaining certificates.**
- Students take away the benefit of learning the top skills and become future-ready for their dream job.

3. RELATED LITERATURE ON DESIGN THINKING AS LEARNING APPROACH IN ELEMENTARY SCHOOLS

According to IDEO (2009), an award-winning global design firm, progressive universities like Rotman and Stanford have trailblazed some successful early models in applying Design Thinking in the curriculum of primary and secondary schools. Carroll (2010) implemented a 45 inter-disciplinary design curriculum by a team of university instructors in a public charter school to teach creativity through collaborative activities challenging students through emphatic problem solving to find answers to complex and difficult problems that have multiple viable solutions. And as a teaching strategy, Caroll (2014) and Lee & Wong (2015) argued that design thinking is anchored upon the Vygotskian Socio-cultural constructivist learning theory as it utilizes the scaffolding framework and predisposes a constructive way of learning: "motivation for exploration, openness for new ideas, creative thinking and other metacognitive competences. Application of design thinking as a learning approach in higher education is well established and several studies are there to prove its worth but aside from its application in higher education, several studies highlights importance of application of Design Thinking in basic education or K-12 education (Carroll, Goldman & Britos, 2010; Donar, 2011; O'Donoghue & Berard, 2014; Carroll, 2014; Becker & Mentzer, 2015; Mentzer, Becker & Sutton, 2015).

Maddie (2021) did a design thinking project with 2 class students. The purpose of this project was to help students understand and practice empathy. The title of project: How can we design a useful and meaningful gift for a family member? Over the course of 4 weeks, she worked with 2 class students on a design thinking project that she adapted from the Stanford design school. The students come up with different designs grasping and understanding all the key phases of design thinking process.

Robin (2016) started a design thinking workshop with 3 class students where students started with lists of problems that they wanted to solve. As students worked on designing apps to solve some of these problems, they interviewed each other, sketched designs on index cards, and "tested" the usability and effect of their ideas and come up with various usable designs.

4. DESIGN THINKING IN ELEMENTARY SCHOOL

In order to incorporate design thinking a part of elementary school. There is no need to build things physically as long as students have materials to draw with. Design Thinking can be incorporated in elementary classrooms in following ways –

- Sensitize students towards several local problems by creating a list of problems for students, which can be big or small, design based or issue based.
- Prepare materials to build and prototype with.
- Divide students in to several groups and have them interview each other about the problem.
- Asking questions and listening to answers is one of the most important parts of the process. Students might not interview each other at this point -- they might be paired up with the people affected by the problem.
- Give students time (but not too much time) to come up with some solutions to the problem, which they will sketch or plan out on paper.
- Pair up again to share ideas, explain, question, and take notes.
- Give students time to design and refine the prototype they chose with/for their partner.
- Pair up one more time for feedback.
- Make time for whole class or individual reflection.

This process can be completed in 90 minutes to two hours, or it can run for several days or weeks. If the problems under consideration are complex and if students are going to actually build a solution, design thinking can transform a final assessment into a meaningful source of project-based learning.

5. CONCLUSION

Traditionally our educational system overweighed better marks than comprehension level, creativity and inquisitiveness. But in today's changing learning environment there aroused a need to transform this system by introducing process of design thinking in elementary school curricula to reshape it to make future ready as it is an approach to learning that focuses on developing students' creative confidence—teaching them to celebrate design and bring about problem-solving to drive innovation. Students of elementary stage have an innate quality of curiosity and questioning, which can help them discover opportunities that everyone cannot see. Moreover, incorporating design thinking in curriculum of elementary schools can help students to be great problem solvers, future leaders, or visionaries.

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