



# Designing for Children

- With focus on 'Play + Learn'

## Teaching visual language of design and implementing it to teach other subjects in primary school

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**Abstract:** Design, in Indian preprimary and primary education is perceived, largely, as 'art and craft'. Even this subject of art & craft is seen as an optional subject which is obtained by children as a 'hobby' to get break from their long hours of 'study.'

Design education has a potential to change the way a person sees the world. It has a capacity to generate strong skill base and qualities like self-awareness, critical thinking, observational and analytical skills and problem-solving aptitude. This study proposes restructuring the subject of 'art education' and giving it formal name of 'design', with art and craft remaining integral part of it. The detailed framework is divided in two parts. First part suggests experimental ways of teaching 'Design as a language' at the preprimary and primary stages, imagining 'design elements as alphabets' and 'design principles as grammar' for Visual language of design. Part two discusses about, how learnings from subject of 'Design' a tool and language can contribute in the learning of other core subjects as well. In this part, author takes chapters from textbooks of upper primary CBSE curriculum as an example and tries to suggest ways to teach these chapters using visual language of design and design methods as tools.

**Key words:** *Subject of Design in school, Visual language of design, Design thinking in school*

## **1. Introduction**

There are many reforms which are being proposed or thought upon in Indian school education system. The textbooks are becoming more interesting and interactive with space for discussion, hands-on learning, games and explorations outside textbooks. The inclusion of coloured pictures for relevant topics have made textbooks feel like they are made for children. The National Curriculum Framework (NCF) (NCERT, 2005) is also focused on addressing the problem of 'load' and 'stress' created by books and exams.

All these suggestive guidelines and proposed reforms give a strong hint at 'Design' being thought upon as a methodology to teach various subjects. But if we want design methodologies to be part of mainstream subjects, shouldn't design fundamentals and design methodologies be taught first? Design should be taught as formal, skill and thinking based, mainstream subject and not only as a hobby-based subject of 'art education'. It must become a statutory mainstream subject rather than just guidelines in curriculum.

In quest of finding answers to these questions, this paper takes the NCF (NCERT, 2005) and Syllabus of Art Education (NCERT, 2008) as a base to further explore how design as a formal subject can be introduced at different stages of preprimary and primary school education. The acquired skills, sensitivity and learnings from design education can help in enhancing learning experience for other subjects as well. The paper is divided in four parts. First part explores current place of design in education, Students' perception for design education and design as a career option. Second part justifies need of introducing design as a mainstream subject. Third part proposes restructuring of subject of design for preprimary, primary and upper primary stages, keeping the NCF (NCERT, 2005) and Syllabus of Art Education (NCERT, 2008) in background and as a base for proposing framework for subject of design. The final part discusses how the subject of design can help in building methodology to learn other subjects in more inclusive and explorative ways.

## **2. Design in current school system**

### **2.1 The essential question: what is design and why design?**

A discussion session was held during one of my class with around 25 design foundation students during first month of their design education. I put two simple questions in front of them.

1. Why they choose design as a career option?
2. How did they expect design education to be?

Some of the answers I got from them for both the questions are as mentioned in Table 1 and Table 2.

<b>Answers got for question 1: Why they choose design as a career option?</b>	<b>Similar answers by no of students</b>
Because I did not like Mathematics or science. I did not understand the equations at all.	5
The subjects which are taught in school are very boring. I don't want to do boring things.	6
Because I was loved creating things with my hands.	5
Because I loved doing drawing and paintings.	4
I loved animations and I wanted to make animations.	1
I am big fan of marvel movies and I keep sketching characters in my sketchbook.	1
One of my relative is a product designer and I really like what he does.	1
I love decorating my room and that's how I want to do interior design.	1

Table 1. Answers for Q.1

<b>Answers got for question 2: How did they expect design education to be?</b>	<b>Similar answers by no of students</b>
We would be making huge things	2
Talking and learning about new trends and ideas in fashion	1
Creating new things	6
Making things on software	3
Rest of the students were not able to answer the question	

Table 2. Answers for Q.2

Being in design education, I get chance to observe how new students, who have recently joined foundation year, perceive design and their changing perception throughout the first semester. Many of the students are not able to cope up with the fact that design education is much more than just skill-based subjects. Many times, students refrain from doing exercises which are based on generating sensibility, empathy or thinking ability. This mental block, later, lead to making designers who can create designs, but they fail to understand the larger picture where design can impact like finding opportunity, design intervention, addressing challenges, grassroot level design solutions, etc. They see design only as a tool to create outer shell of products and not as a process which can be collaborated with other fields and professions to create systems and products which can change lives and help in creating a better world.

## 2.2 Design in current curriculum

While mostly all the mainstream popular career has some prerequisites in school education, design is still struggling to get its position into that privileged group of professional education.

The nearest subject to design is art education in current school education system. According to Syllabus of Art Education (NCERT, 2008) one fourth time of total working hours of school should be allotted to art education which is divided in visual arts, theatre, music, dance and crafts. The nearest topic which are related to design is visual arts and craft which get approximately 4 periods (3 hours) per week (Figure 1).

Age Group	Stages/ Classes	Drama	Visual arts	Music	Dance	Crafts	Total hrs./ Hrs. for Arts Edu.
6 – 10	Primary Stage/ Classes- I - V	26-30	26-30	26-30	26-30	26-30	600/ 130-150
10 – 13	Upper Primary Stage/ Classes VI - VIII	26-30	26-30	26-30	26-30	26-30	780/ 130-150
13 – 15	Secondary Stage/ Classes IX - X	----- 130-150 -----					780/ 130-150*
15 – 17	Higher Secondary Stage/ Classes XI - XII	----- 120 (practical) ----- ----- 40 (theory) -----					800/ 160

\* Since the students will study any one of the above 5 subjects of arts education during classes IX-X.

Figure.1 Hours dedicated to art education at different stages of school education (NCERT, 2008)

Along with art education, the textbooks of mainstream subjects are also suggestive of inputs of design as a teaching methodology. To try to understand the role and importance of design and creative inputs in the current education system, I studied and analysed the syllabus (NCERT, 2005) and textbooks which are recommended by NCERT (NCERT, 2007). From this analysis I tried to extract out various methods for learning different subjects which are suggestive by textbooks (NCERT, 2007) for different stages of preprimary, primary and upper primary school. Teacher`s intervention while teaching is ignored for the sake of understanding the suggestive methods by textbooks to its fundamental core.

The **preprimary school** curriculum is completely based on the method of “learning by doing” with all the activities focused around three goals (NCERT, 2018) (Figure 2).

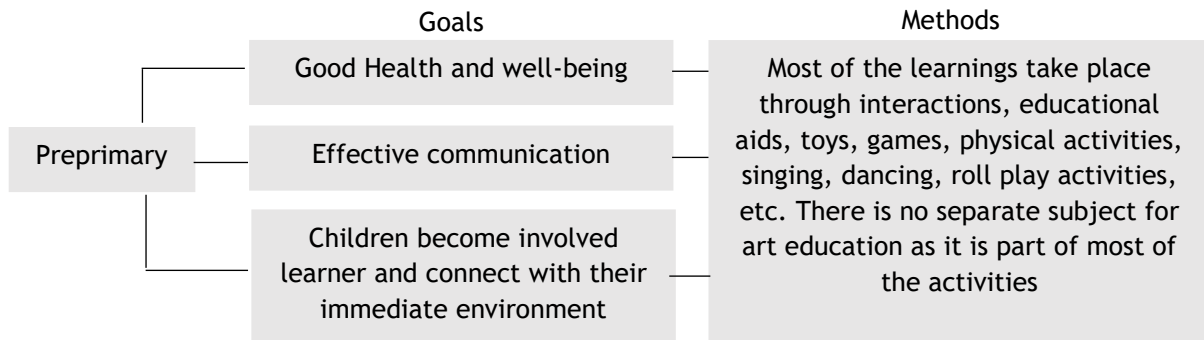


Figure 2. Goals vs some creative methods of teaching at preprimary stage (NCERT)

At **primary school** stage, from 1<sup>st</sup> standard onwards, the textbooks are introduced. The role of the textbook is to provide a framework of the subject, explanation of the topic through stories, poems, examples, facts, information in a language that can be understood by students and directions for further explorations for students and teachers. For lower primary education, there are many repetitive topics which are taught in mainstream subject as well as in art education. The teaching methodology for mainstream subject remains combination of writing, verbal communication, drawing, activities, explorations, interactions, games, etc. In a way not there is no much difference between methods for art education and other subjects, except the structured course suggested by textbooks for mainstream subjects (Figure 3, Figure 4)

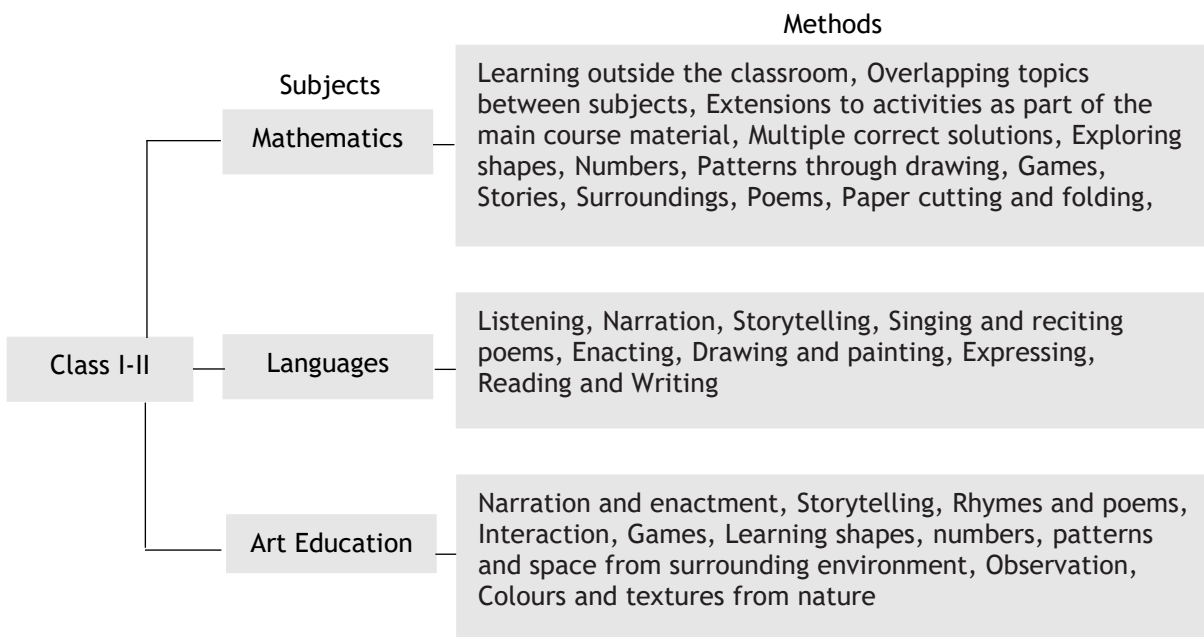


Figure 3. Subjects vs some creative methods of teaching at class I-II (NCERT)

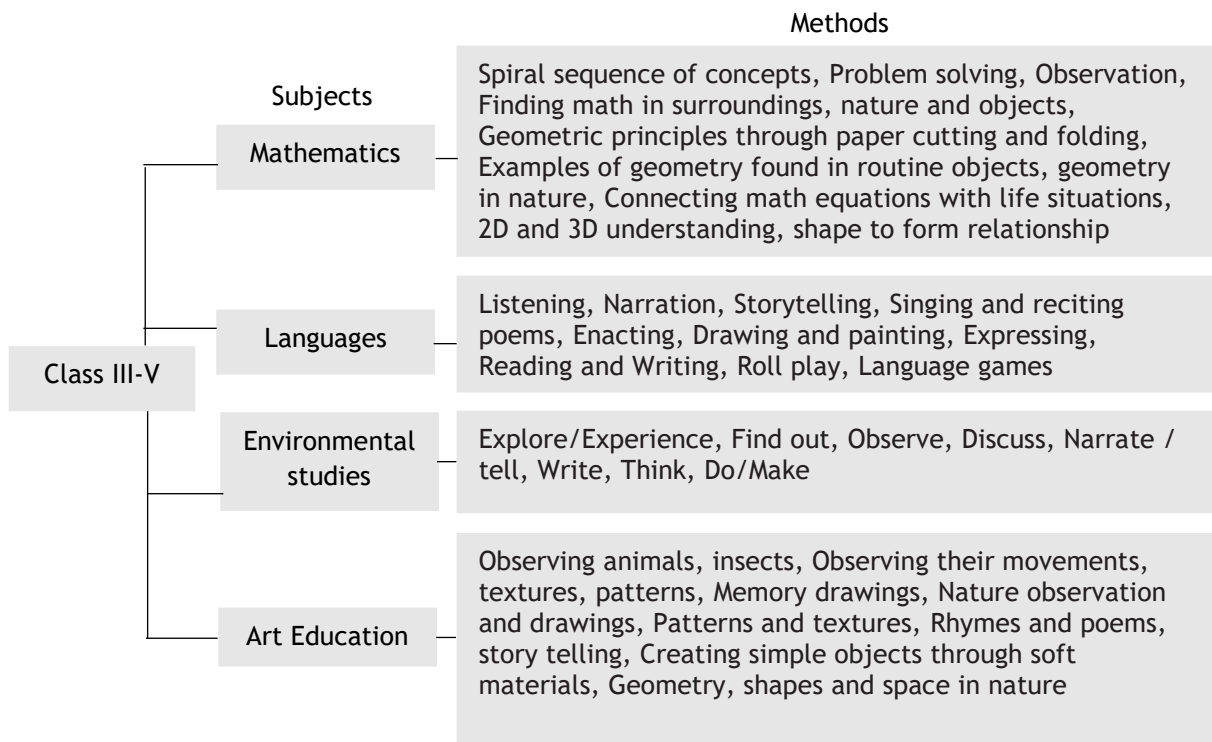


Figure 4. Subjects vs some creative methods of teaching at class III-V (NCERT)

In **upper primary** curriculum, the mainstream subjects are becoming more intense, focusing more on verbal and written knowledge gain. The textbooks, at these levels, are suggesting activities and projects which can be carried out by students to understand and explore the subject practically. Art education is becoming more focused on realist drawing and painting with addition of material explorations, craft, history and philosophy of art and craft (Figure 5).

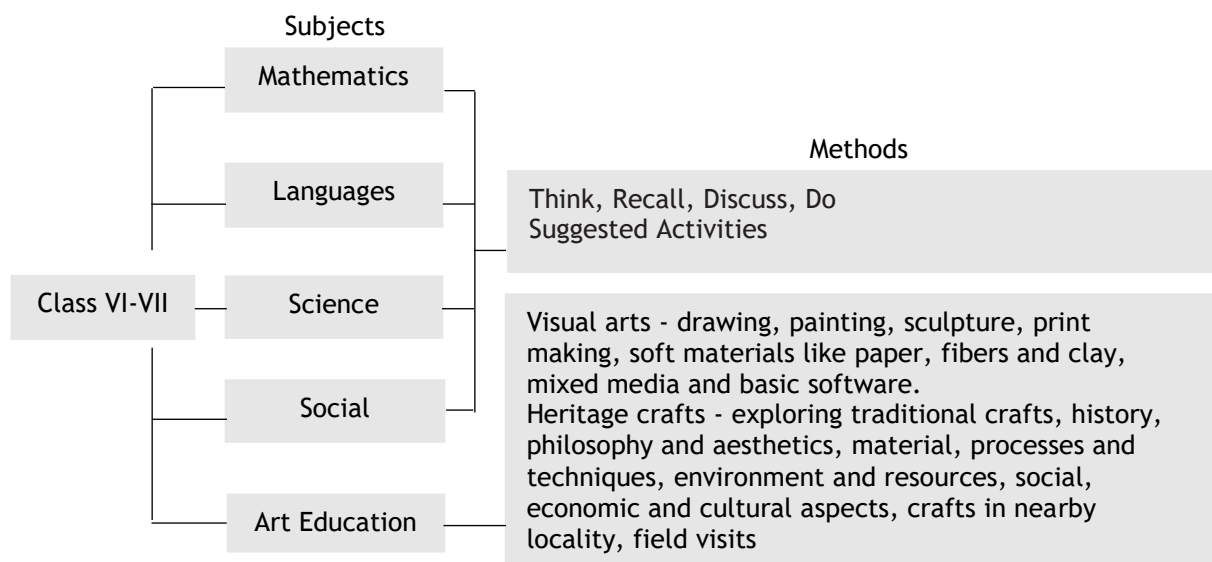


Figure 5. Subjects vs some creative methods of teaching at upper primary stage (NCERT)

In a way, the mainstream subject textbooks are suggesting many creative inputs and ways through which students can gain knowledge, but are they been provided enough understanding about how these activities and explorations can be carried out methodologically? The art and craft are still taught in the form of drawing, painting and self-expression but the aptitude for its application, critical thinking, and technical approach is completely lacking in it, restricting it to be a skill-based subject rather than a thinking-based subject. Design is the only subject which works as a bridge between creativity and technicality, facilitating students with capabilities to explore different subjects methodologically, imbibing other aspects like empathy, culture, society, global challenges, local issues, etc.

By the time students reach **secondary school**, they are so engrossed in their mainstream subjects and so overwhelmed with the exam-based evaluation that they don't have any time, focus or energy left for the "hobby-based subjects". Subjects like applied arts and fine arts are offered as compulsory subjects in secondary school and as elective in higher secondary school making their understanding of design limited only to art, craft, sculpture, material exploration and software in the end.

### **3. Need to include design as a visual language and a method to teach**

#### **3.1. As said by a legend**

*As mentioned in the book Divaswapna - "They keep their eyes open. They observe. They see people at work and play—carpenters, potters' tailors, etc. They listen to what people say and observe their mannerisms. They hear their descriptions in the stories they are told. Besides, God has given them imagination. So, they create a synthesis from their imagination and experience and act their parts spontaneously and naturally. They are their own critics. All the time they watch and observe to see whether their imagination and their experience are properly projected on the stage." (G.Badheka, 2005)*

#### **3.2. Why Design education?**

Below are some justifications for introducing design as a formal subject right from the beginning of school education.

##### **3.2.1. Developing skills, sensibility and aptitude to carry out tasks and activities suggested by textbooks of mainstream subjects**

For most of the design foundation students in higher education, composing a sheet is about 'decorating' the sheet with different colours and materials. They don't

have sensibility toward fundamentals of design like alignment, scale, size, composition, fonts, margin, focus, sequence of content, colour scheme, etc. The focus is more on creating background, pasting border, using glittery colours to highlight, rather than content itself, in a way making sheet 'beautiful' and 'attractive'. There are many project-based activities which are suggested by school textbook but when the students are making their 'first cube' in UG level design foundation, they completely miss out on sense of perfection and technicality. Most of them don't even know how to cut a perfect square out of paper. Most of the time, school projects are made as temporary, subject-oriented task and not as a long-term project which can be built over the time, as students learn new things. The design fundamentals at primary school level can make them serious for carrying out practical tasks and project-based activities, creating sense of interest, pride and affection for what they have made and achieved through creating a well finished sheet or project.

### **3.2.2. Generating aptitude for self-awareness, critical thinking, observation, analytical skills, curiosity, empathy and problem solving**

There are certain qualities which make humans different from other creatures of the world. They are the basis of human evolution. The book-based curriculum of schools is not capable to generating these qualities to the core. Though the textbooks of primary stage have evolved to become quite interactive and interesting, their scope is still limited as they are instruction based in nature. It does not give flexibility to relate and make connections between two topics of the subject or subjects. Unless one goes down the road of exploring a topic, it is not possible to find those connections. Design is the only subject which can imbibe the aptitude for exploring various tangible and intangible aspects surrounding the topic.

### **3.2.3. Being aware of your surroundings and opportunities**

Design is not limited to product innovations and technology. It is also about finding opportunities to upgrade one's surroundings. There are many challenges and opportunities for intervention which are found in one's routine. Being sensitive and sensible towards these local challenges is a quality which can make a person a good citizen of the country. An ability to question everything around can lead to addressing problems and opportunities on a grass root level. In India, having large no of rural and urban-rural population, it is very essential to think and act locally.



#### **3.2.4. Acquiring knowledge through exploration and not compulsion**

Very aptly portrayed in the movie - '*Gods must be crazy*', the tribal community of Kalahari Desert of South Africa found an empty glass bottle of soft drink, thrown out of an airplane. They don't know what that thing is and how it's used. They explored multiple uses of the bottle - as whistle, as a toy, the neck finish used as stamp to create circular marks on cloth, as mortar and pestle, as tool to break coconut, meat, to make dough soft, and to store water as well (Uys, J., *Gods must be crazy*, 1980).

We, humans are explorative in nature since the birth of our race. Finding new things, new ways to create the same thing and using the same things in multiple ways are the qualities which has led humans to reach to this level of technological explosion. Exploration is all about finding answers to unexplored questions and questioning the answers of resolved question. Solving questions of which answers are given in the textbooks is not an exploration, It's a compulsion. The whole system of written examination is based on the compulsion - remembering answers, recalling them and write them during exams. Understanding facts are important but do the facts of textbooks provide enough evidences? Many incidences are found where text of a chapter is altered as per facts drawn by ruling government of that particular time. Rather than stating things as facts, design gives liberty to explore various point of views on a topic. Students can find out their own facts based on evidences and explore further connections with other topics. The process of exploration gives them confidence, develops research and analysis-oriented nature, creates quality of self-initiation and helps in decision making process.

#### **3.2.5. Qualitative method of learning instead of quantitative method**

Each human being is different and so as how they think and perceive the world. The facts which are taught in the textbooks are also perceived differently by different students, but they are all told to give answers in a same manner. Design education poses students with practical challenges to which there is no one 'right answer'. Students have to explain their findings and analysis, the context, they have to give logical reasoning based on their research, provide technical details, justify the solutions which are best for a particular situation. The evaluation in design education happens on individual bases where students are not compared with each other. They are compared with their own capabilities and aptitude.

### **3.2.6. Addressing global challenges**

Many sustenance related challenges, world is facing today- pollution, water crisis, health and wellbeing, reduction in natural resources, etc. Many of the challenges are created because of the innovative and curious nature of human race and we need more innovative and curious minds to address them now. Design thinking is playing vital role in solving some major challenges world is facing. Design is the tool which can facilitate students with practical foundation to address those challenges. It prepares them to not only find solutions but also to design sensibly keeping in mind the effects and impacts of any design on local and global level.

### **3.2.7. Growth of the country**

This is the age of entrepreneurs. There are many initiatives taken by various governments to make India powerhouse of production like startup India, Make in India, tax benefits for startups etc. But still Indian products and systems are not seen as quality oriented. This huge gap between the manufacturing and market can only be filled by design. Design is the subject which can prepare the next generation of designer and innovators who can take up challenges of design, innovation, systems and manufacturing. It is most essential at this stage to make students aware about career of design, which is combination of both technical and creativity, or rather a bridge between the both. It is required to show them design as a profession which beholds huge opportunity to convert into an entrepreneurship. They also need to appreciate the potential which India has, its culture, craft and resources, to become one of the countries providing best designs and design solutions.

## **4. Design as a subject and a visual language at Preprimary and Lower Primary stages**

### **4.1. The context**

The proposed model for design as a course in this paper is based on below mentioned current / proposed situations in its ideal state.

- 4.1.1. As per NCERT guidelines, the schools are supposed to offer compulsory Art Education subject which, at primary and upper primary stages, have been given 25% of total instructional hours in school. So at least one full day is dedicated to this subject out of five days (NCERT, 2008).
- 4.1.2. At least half a day from five days of school is dedicated to Design education. The period for design education is a block period of 3 to 4 hours.

4.1.3. The textbooks (NCERT) of primary school have been made keeping in mind creative and explorative nature of kids. The model is based in context of an ideal situation where the suggested activities of textbooks are carried out religiously by students with support from teachers.

4.1.4. The guidelines given by NCERT for syllabus of art education are followed by schools with activities based on experience and skills of the teacher.

#### 4.2. Proposed broad framework for design as formal subject in school education

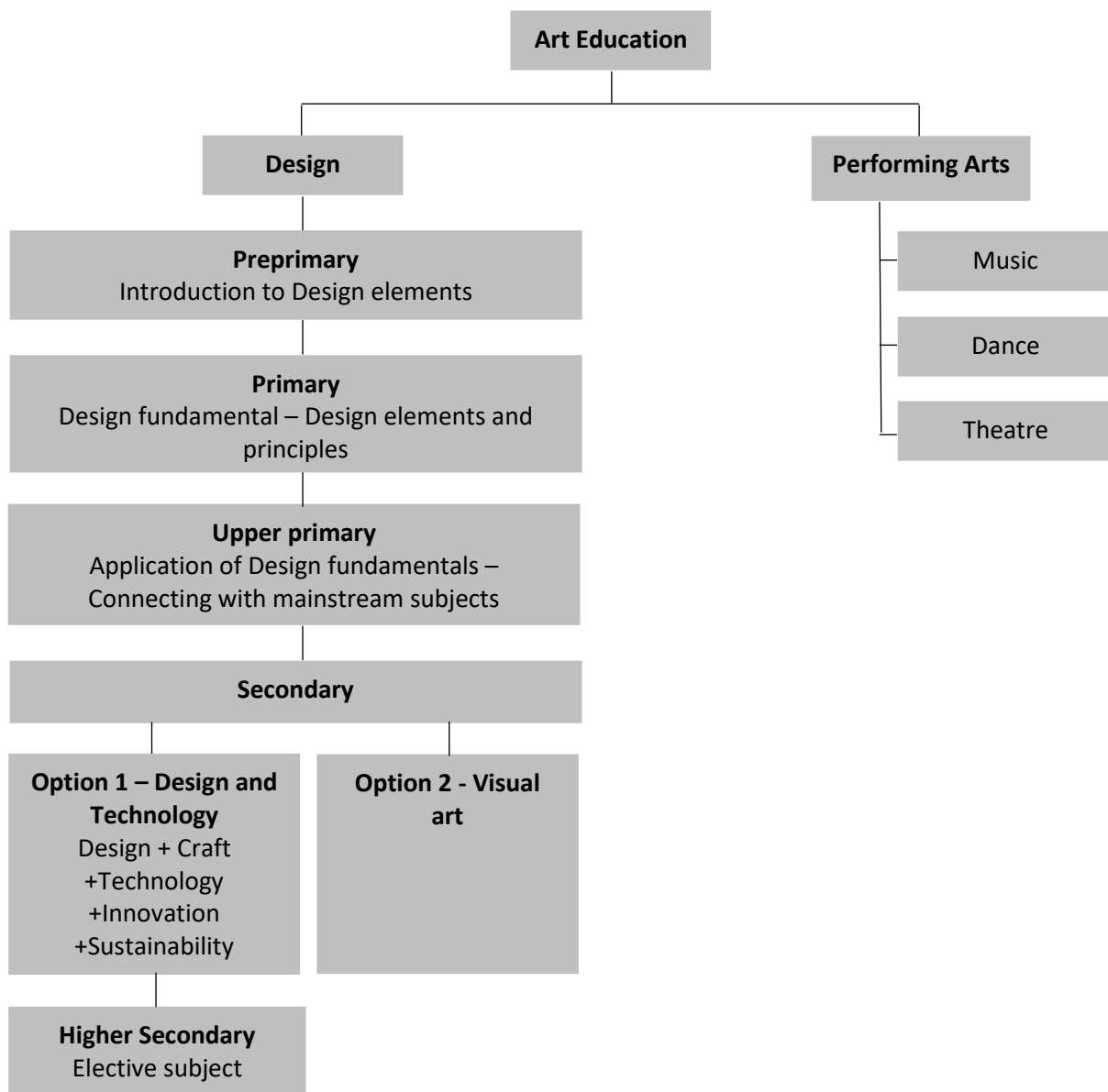


Figure 6. Proposed restructuring of subject of Art education

#### **4.2.1 Overall framework**

The subject of art education, in current situation, is divided into five sub-topics namely Art, Craft, Music, Dance and Theatre. The proposed model for restructuring of art education suggests dividing art education into two parts - Design and Performing arts. Art and craft will be part of design; music, dance and theatre will be part of performing arts (Figure 6).

As mentioned in the Figure 6, the subject of design starts right from preprimary stage in form of 'learning by doing', progressing into more formal introduction to design fundamentals at primary level further progressing into application of design fundamentals and peripheral learning at upper primary stage. At all three stages, all other creative fields like art, craft, design and architecture would remain integral part of subject of design. At secondary stage, it can further be divided in two parts giving students a choice from the subjects of 'Design and Technology' and 'Visual arts'. At higher secondary stage where students are mature enough to decide what they want to do next; design can become an elective subject.

#### **4.2.2. Considerations**

Some points to remember while going through the proposed framework

- Proposed framework is suggestive of the guidelines and methods which a teacher can adapt and mold according to his/her own design sensibility and methodology.
- The broad framework for every stage of school education to be seen only as a context for detailed proposal for preprimary, primary and upper primary stage. The paper does not provide detailed framework for secondary and higher secondary stages.
- The role of teacher is most important in this. A collaboration between schools and designers/design industries/design firms plays a very important role in introducing design as a formal subject.
- Teacher`s training also needs to be conducted before one takes up a role of design educator at school level. There must be certain guidelines for selection of teachers for the role, a background of design, applied arts or architecture must be one of them.

### **4.3. Proposed detailed framework for subject of design in preprimary and primary stages**

#### **4.3.1. Visual language of design at preprimary stage**

At preprimary stage, most of the guidelines suggest creative and fun ways of learning different skills and qualities. The teaching methods are based on enjoyment, interactions,

exploration, creativity, experience and action. The way they are been introduced to alphabets and basic words at this stage without understanding much of the application part, they can be introduced to the basic design elements through toys, construction blocks, activity sheets, nature observation, relation between shape and object, explorations with clay and other soft materials etc.

#### **4.3.2. Visual language of design at primary stage**

At **primary stage** the focus is given on teaching visual language of design. It is all about making them understand design as a language which empowers one to communicated visually. Visual language of design is a universal language which binds all the creative fields together. Whether its graphic design, product design, fashion design, interior design, architecture or visual arts, they all need to study the visual language of design and further explore to see how it can be formed and manipulated according to need. The learning of language is divided into two parts - Design elements and Design principles.

- Design elements - Dot, line, shape, form, space, colour and texture. The whole physical world (not only limited to world design by humans) is designed through combination and manipulation of these seven elements of design. The way verbal and written languages have their alphabets which are foundation of languages, these elements are foundation for visual language of design. One needs to learn and practice writing alphabets multiple times to learn the structure of alphabet and their use form word and sentence, one needs to learn the alphabets of visual language, in this case design elements, to understand and form visual language of design. It is required to understand how these seven elements can be combined in multiple ways to form a visual language which can symbolize and convey certain message.
- Design principles - Balance, symmetry, asymmetry, focus, emphasis, movement, harmony, rhythm, unity. Design principles are like grammar of language. Grammatical rules are necessary to form sentences and understand how to use word wisely which can convey not only the message but also emotions, expressions and hidden meaning attached to it. Grammar not only set some restrictions but also gives freedom to manipulate and twist some rules to flourishing the beauty of language when required. In a similar way design principle are the rules of grammar for visual language of design. They give guidelines for composing the design elements in such a way that the composition makes sense and can convey a meaningful message, but the rules can be twisted and manipulated to create a different perception for the same message.

The written language and visual language differ by the fact that, there is no single formation of elements to convey a specific message in visual language. Visual language of design does not teach thumb rules for design. It enriches one`s perception toward seeing things by filtering the emotions and meanings associated with them, by seeing hidden signs and symbols in the surrounding environments and then converting those signs, symbols, emotions and feelings into formations of visual language, the meaning of which can be perceived by others very simply and naturally. The visual language enables students to think beyond the verbal and written information as it deals with the right side of the brain, the creative side. It stimulates the brain to see beyond words and sentences, to find deeper, hidden meaning in the message needs to be conveyed, to see spatial arrangements in various objects and surroundings, to filter out the information an create and abstract imagery in mind which can lead to simplified and logical understanding of various topics and to create a structural mapping of environment around. Kids perceive their surrounding in very abstract way and the education system right now structured in such a way that abstract way of thinking is converted into a hard reality of life by restricting them from expressing themselves in their abstract manner. Design fundamental encourages them to think in their own `weird` and `abstract` way, rather than pushing them towards the realities of life.

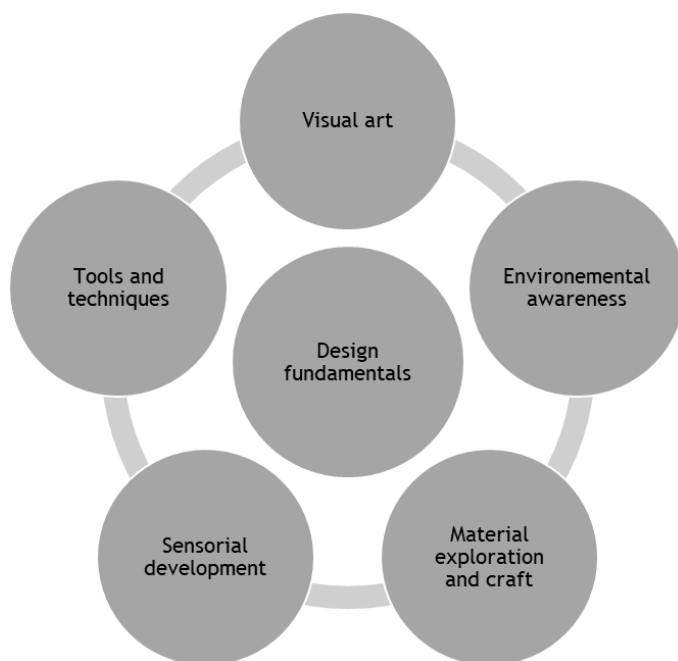


Figure 7. Design fundamental as a core learning incorporating peripheral learnings

The proposed framework for subject of design at primary schools suggest design fundamentals as a primary focus. The fundamental cannot be taught in a direct way as the

subject of design by nature is non-linear and design education also has to be non-linear in nature. There are five suggestive peripheral aspects of design which can become methods and tools to learn design fundamentals in a non-linear way (Figure 7). At each step of design fundamental, all five these topics can be chosen as a method for exploration. Some of the examples of activities / exercises / explorations are given in tables below. (Table 3, Table 4, Table 5, Table 6)

Design fundamentals	Methods / Tools	Exercises / Activities / Explorations
<b>Design elements - Dots Lines Shapes</b>	Visual art	Line exercises - vertical, horizontal, parallel freehand lines, Line properties - stroke, type and thickness, Freehand sketching of shapes, Creating objects through shapes, Addition, subtraction, combination of lines, shapes, Understanding shapes in surrounding objects, Lines and shapes explorations through mediums like crayons, water colours, poster colours, Imaginary drawing and painting through lines and shapes Types of shapes
	Environmental awareness	Observing and finding lines and shapes in surroundings, Seeing patterns in nature and environment, Observing movements of animals, birds and insects and depicting them through lines and shapes
	Material exploration and craft	Soft material explorations - paper, fabric, Cutting dots, lines and shapes and pasting them on paper creating patterns, Cutting parallel lines from paper / fabric, creating weaving patterns, quilling patterns, More exploration on creating collages, compositions using cutting and pasting of paper, Creating patterns on fabric using stamping / block printing technique
	Tools and techniques	Hand eye coordination using tools like crayons, pencils, brush, Drawing regular shapes using scale, compass and protractor, Cutting regular shapes with precision, Drawing parallel lines using scale and measurements, Creating patterns using parallel lines though scale

	Sensorial development	Representing emotions, expressions actions through dots, lines and shapes, Depicting a song, recipe, incidence through dots, lines and shapes
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Table 3. Design elements: Dots, lines and shapes along with suggestive methods and exercises

Design fundamentals	Methods / Tools	Exercises / Activities / Explorations
<b>Design Elements -Form Space</b>	Visual art	Understanding depth, shadow, distance, focus in relation with object and space, Visually breaking down objects into its basic geometry and sketching, Object drawing, Nature drawing and painting Finding geometry in nature, Converting 2d shapes in 3d through sketching, Shape to object relationship, Live drawing sessions, Understanding addition, subtraction and combination of forms in surrounding objects, Types of form, Shape to object relationship, Putting one object at different location in a space and sketching each to understand how object changes the perception of a space
	Environmental awareness	Observing form in surroundings environment, Observing form of animals, birds, insects, trees, etc. and breaking them into basic solids, Understanding basic solids hidden within manipulated forms of surrounding objects, Exploring ways to set loose furniture inside an empty room, Understanding different types of spaces - open, semi open, closed, Observing and analysing a familiar space and objects and their relationship
	Material exploration and craft	Making platonic solids through surface development, Manipulation of paper, cardboard and fabric, Converting 2d material into 3d using various techniques like rolling, folding, crushing, joining, Understanding manipulation of solids through clay modeling / thermocol, Exploring paper and textile product, their manufacturing Handloom techniques, handmade printing techniques
	Tools and techniques	Perspective drawings, Isometric drawings, Orthographic projections, Size, scale and proportions, Measurement and unit conversion games,



		Negative and positive space, Structuring of space, Composition using dots, lines, shapes, form and space, Imagining and converting 2d composition into 3d one by techniques of stretching, pushing, pulling, squeezing, extruding, etc.
	Sensorial development	Being aware of one`s senses, Painting with music, Drawing with closed eyes, Memory drawings, Remembering food/smell/taste and translate them on paper

Table 4. Design elements: form and space along with suggestive methods and exercises

Design fundamentals	Methods / Tools	Exercises / Activities / Explorations
Design Elements -Colour Texture	Visual art	Painting techniques - handling material, choosing right colours, combination of colours, application of colours, Expressing depth, focus, distance, shadow through colours Creating textures through lines / shapes / dots Learning to show materials through shading and rendering Create textures using various mediums like pencil, crayon, water colours, poster colours, Shading and rendering techniques, Showing surface properties through texture, Colour mixing exercises, Live painting sessions - nature / object / still life
	Environmental awareness	Find colours in nature and try to replicate them, Observe natural elements and paint, Find colours in surrounding objects and try to express if colours play role in their function, Find tactile objects in surrounding, observe their texture Find textures in nature and try to translate them on paper through pencil / crayons, Create textures using different materials and object found in nature, A small design projects which can use all learnings from design elements,
	Material exploration and craft	Explore textures of different materials and try to represent them using different mediums, Creating installations using various shapes and forms, colours and textures using soft materials, Create mood board for various types of spaces showing wall textures and colours, Create things out of waste material, Find out paper and textile craft product and see how

<b>Design Elements</b> -Colour texture		colours influence their design, Create textures using papers and textiles, Create patterns using stamping / block printing on papers and textiles, Create objects using colourful clay and justify the choice of colour
	Tools and techniques	Colour theory, Colour schemes, Colour properties, Colour value
	Sensorial development	Representing emotions, expressions actions through colours and textures, Aligning colours to moods, Creating compositions which can stimulate all senses, Finding out products which stimulate more than two senses, Conceptualize products and spaces which can stimulate more than two senses, Identifying object only through touch without looking at them

Table 5. Design elements: Colour and texture along with suggestive methods and exercises

<b>Design fundamentals</b>	Methods / Tools	Exercises / Activities / Explorations
<b>Design principles -</b> Balance symmetry asymmetry focus emphasis movement harmony rhythm unity	Visual art	Creating compositions / paintings / sketches representing all the principles using design elements, Creating theme-based paintings using all design fundamentals
	Environmental awareness	Find out these design principles in nature, surrounding environment, society, culture, Find out design principles in tangible as well as intangible aspects like - emotions, behavior, incidences, etc by observing and talking to people
	Material exploration and craft	Create sculptures depicting all the principles using mix media of soft materials, Understand properties of materials
	Tools and techniques	Create compositions through cutting and pasting for each principle, Create a poster on a theme using all design elements and design principles, Software learning - Basics of photoshop / corel draw

	Sensorial development	A project which can revolve around stimulating all the senses Create a pop-up book using all the learnings from design fundamentals
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Table 6. Design principles along with suggestive methods and exercises

## 5. Design as a language, tool and method at upper primary stage

### 5.1. Introduction

Design education becomes a tool to teach, learn and explore topics, given in other subject textbooks at upper primary stage. There are many areas where application of design as a tool and methodology can be the approach for alternative way of exploring a topic.

Framework for two modules is given in this part.

Module 1: Design as a tool and method to teach, learn and explore the chapter.

Module 2: Design as an approach to find out real world application of a chapter.

Some point which must be kept in mind while designing or executing the module,

- Framework is suggestive of the guidelines and methods which a teacher can adapt and mold according to his/her own design sensibility and methodology.
- An introduction of the chapter needs to be given by subject teacher in consultation with design teacher so that they can synchronize the process together.
- Wherever group work is required, the group should be formed which are mix of students with above average, average and below average aptitude level.
- The module cannot be completed in one or two periods. If the school system allows, two modules can be made of 2-3 days or it can be divided into period of 3 hours per week for 6 to 8 weeks.

### 5.2. Module 1: Design as a tool and method to teach, learn and explore the chapter

#### 5.2.1 Introduction to chapters

This model is based on explorative and creative ways to learn chapters of 'Mughal empire' and 'Rulers and buildings' given in textbook of Social science - Our pasts - II, a textbook in history for class VII (NCERT, 2007 Mar).

The chapter of 'Mughal empire' gives an introduction to Mughal clan, their journey to India in brief, Mughal emperors, expansion of their empire in India, focusing on reign of Akbar and its decay.

The following chapter of 'Rulers and buildings' talks about various buildings and structures built by Mughals and other king, who ruled before Mughals. This chapter give information

about structures and buildings like Qutub Minar, temple of early eleventh century, Taj Mahal, Humayun's tomb, their construction, engineering and structure and planning, etc.

Both the chapters have many links within themselves as there are significant buildings and structures which are built by the Mughals in India. In fact, the Mughal Architecture is a huge area of study in Architecture. Both the chapters can easily be overlapped and linked to form a holistic understanding about Mughal empire in India which is completely missing in textbook. The architecture of a particular time period is reflection of the society, their cultural, philosophy, art, craft, science and technology, traditions and symbols. They portray the fascinations and mindset of an emperor through their scale and details. The stories behind a particular building, its concept, designs and drawings, engineering, material, construction, characteristics and surrounding reflect a lot of information about the time when it came into existence. The other buildings which are part of the chapter of 'Ruler and buildings' can be taught while coming to the chapters related to the ruler who build them. '

The framework of the model proposes to explore reign of 'Mughal empire' not only as chronological advancements of different rulers but as a 'time period' which was very significant for India in many aspects.

### **5.2.2. Part 1: Overview of Mughal Empire**

An introduction of the topic should be given by the teacher in form of a story of Mughal empire in relation to explanations in textbooks overlapping parts of 'rulers and buildings.

The module progresses as mentioned below thereafter:

- Whole class is divided in groups of 3-4 students. They all are given a task to do research on Mughal empire, the story of their struggle, settlement, flourishing of their reign, the emperors, timeline of their ruling period and their significant contributions and mistakes. They have to gather data from various sources like books, stories, videos, movies, etc. The teacher would discuss with them to analyse and filter out data to make their own story.
- A rough storyboard / script is made by them which shows their perspective on 'Mughal empire' along with facts and information.
- They have to convert this story board in a presentation, not limited to verbal, written or visual presentation. Presentation can be done with, but not limited to, following techniques - Picture book/ graphic novel, a small play/ skit, Interactive map

combining with storytelling and visual boards, Posters or multilayered presentation on sheets, pop-up book

### **5.2.3. Part 2: Emperor and his influence on society**

After finishing the first part of the module the same group of students carry out the second module as mentioned below:

- In this module, each group has to do research on the life of a particular emperor, his years on throne, political, cultural and socio-economic situation during his ruling period, his influence on people, culture, town planning, art, architecture, science and technology.
- The process of research, analysis and filtration of data needs to be performed. They can be taken to see structures of Mughal era, if any of them are there in their village/town/city, museums and art galleries to see textiles, clothing, weapons, accessories and art of that era.
- The report, in form of visually represented sheets, can be made for each aspect of society under rule of the emperor. Each aspect can be represented in different sheets which can include following content
- Politics - maps, wars, expansion and military strategies, governing systems, etc
- Culture - religion and religious tolerance, traditions and customs, festivals, clothing and jewelry, symbolic meanings, entertainment etc
- Socio-economy - currency, trading systems, taxes, human rights, etc
- Town-planning - forts and palaces, strategic town planning, significant transportation, drainage, water systems, etc
- Art - painting styles, craft, philosophy, writings, material and medium, progression in performance arts, famous artists, etc. The techniques of painting can be replicated to understand it more practically. Materials and craft can also be explored further with practical application.
- Architecture - Significant buildings, their planning, concepts, design, philosophical and political aspects, engineering and construction, material and techniques, art and craft influence on buildings, religious and cultural significance, etc. They would also be asked to make models of these buildings through thermocol, paper, cardboard, sun board, etc.
- Science and technology - New inventions and innovations, techniques, developments, etc.

#### **5.2.4 Advantages of bringing design into history**

- The beauty of this study is that student is not seeing the emperor as someone who is out of this world but as a person and a leader under whose influence all these factors of society have flourished or decayed.
- They are understanding how different aspects of society can affect design.
- The learnings of visual language of design in primary and upper primary stages can enable them to carry out the presentations in a mature and systematic way.
- Learning from all creative fields can happen holistically. Instead of teaching various subject in fragments without understanding their application, this exercise can bring in learnings from various creative fields like art, architecture and craft and make them understand their applications as well.
- The art and craft are become integral part of subject but with a purpose.
- The history of art, craft and architecture also goes hand in hand with general history making them understand interrelationship between all the aspects of human environment and society.

### **5.3. Module 2: Design as an approach to find out real world application of a chapter**

#### **5.3.1. Introduction to chapters**

The example taken here is also from Class VII textbooks. There are three chapters dedicated to 'water' in textbooks of science and social sciences of class VII.

In social sciences, our environments, a textbook in geography for class VII (NCERT, 2007 Mar), the chapter on water is about water cycle, distribution of water bodies, ocean, etc. including the natural disasters related to water.

In science, textbook for class VII (NCERT, 2007 Jan) there are two chapters dedicated to water. The first chapter is 'water - a precious resource', it talks about saving water, availability of water, forms of water, ground water, water table, connection between lack of water and pollution, industries, population, agriculture. It also introduced them to ideas of water management, water harvesting, etc.

The second chapter is 'waste water story' which give understanding of clean water and waste water, their uses, sewage and sewage disposal, treatment of polluted water on city level, housekeeping practices to keep water clean, sanitation and diseases.

So, in a way, through this three chapters they would be able to gain knowledge related to water, its role in emergence and sustenance of life, water sources, uses, water scarcity and its effects, water pollution and its effects, waste water and its issues, and basic

understanding of how all these can be addressed. This module is all about converting this knowledge into application.

### 5.3.2. Proposed design process

The module is all about finding ‘out of the box’ solutions to address the issues related to water. The textbook study for water should be done before initiating this module to prepare them for further explorations. The process of module is shown in the figure below (Figure 8).



Figure 8. Design Process

Observe - The context for exploration is only their village/ town/ city which can allow them to have firsthand experience of the problem/ opportunity. To narrow down the topic any one area of focus is selected. In this example, assumed area of focus is lack of clean drinking water at public spaces.

The methods of observation would be as following,

- To observe and study the availability of water, they can be taken to various public spaces where water is available in through various sources- public water taps, water hand pumps, volunteering roadside water pots maintained by local people, water bottles, pouches, etc. They should be told to observe how the system works, find out problems there, take samples of water and check if it is clean enough to drink, study how people are drinking and storing water. In case of bottles and pouches, what do they do with them after having water?
- They can also be taken to water well, baoli, natural reservoir, which were source of water in earlier times and if they can be revived to provide drinking water.
- They can go to a nearby market street with an adult and see how the shopkeepers, vendor and buyers are storing and drinking water and from which sources.

Find opportunity - In an interactive guided session, students can put their observations forward and with the help of teacher those observations can be segregated as per broad areas they are related to; like sources of drinking water in public areas, problems with public drinking water taps and other sources, observations for water wells, hand pumps

and other old traditional sources of water, water storage systems for outdoors, water quality, etc.

After having data and segregating them in broad categories, further discussion can be done to find out areas which can be addressed further to solve issues or to create a better system. Whole class can be divided into group of 3-4 students and they can be given the one area / topic to address using design methodology.

**Ideate** - A formal brief can be generated before starting with ideation so as to streamline the process of design. The brief can lead to selecting technique for ideation. Teacher can introduce them to basic ideation techniques and games which can be happen within their groups, like mind-mapping, brainstorming, empathy mapping, role play, collaborative sketching, reverse thinking etc. After generating bunch of ideas, filtration of ideas can be done with help of teacher by discussions and through methods of SWAT analysis and situation mapping. And finally, one idea could be selected which can be further refined to make it workable.

**Refine** - The refinement stage can further lead them to research on various topics which are related to the concept/idea like mechanism, material, process of making, technical details, form, design language, etc. Refinements can be done through sketching, rendering and model making. The idea finally takes a shape of a product, system, policy or any other form of solution which can further go for prototyping stage.

**Make** - If the concept has reached to the level of maturity, it can go for the prototyping stage where students can be funded to make the real-life working model of the product or a prototype in any other form. We do not expect children to make the whole prototype themselves but it can boost their confidence to the next level if they can see their product in reality. At least a full-scale model of the product, giving them idea about its usability, aesthetics and function should be made.

**Test** - The model can then be displayed along with sketches and presentations inside the school or in a public space where people can see and judge its functionality, inspiring other students to take up the challenge of reviving the systems.

## **6. Limitations**

- There could be many system level limitations for this proposed framework like;  
Limited no. of hours for design or shift in no. of hours of other subjects to



accommodate more hours for design, infrastructure upgradation, teachers who can teach the subject of design, strengthening co-ordination between teachers of design and other subjects, Making full curriculum for design and implementing it in such a way that it creates minimum disturbance to current system, etc.

- The proposed framework and model are completely based on my experiences and explorations in design education at under-graduate level and my experience with kids as a toy designer. No practical experimentation specific this framework, has been carried out as it addresses the whole school education system. However, a strategy for experiments has to be drawn out and experimentations on practical ground have to be thought upon in modules and units so as to check its functionality and viability.
- The paper is based on the fact the exercises of foundation year of UG level design education are so simple and basic that they can be introduced during school level so that UG design education can become a bit more intense. How this framework can affect the framework of UG level design education would remain a debatable topic.
- Proposed framework should only be seen as guidelines to develop curriculum and not to be seen as a syllabus or curriculum itself.

## **7. Conclusions**

The framework is designed keeping in mind need of the hour - Design as a mainstream subject in school curriculum. Introducing a completely new subject would create many turbulences like cutting down hours from other subjects, repetition of exercises between art education and design education, imbalance between creative subjects and other mainstream subject, etc. The proposed framework is based on study of current syllabus suggested by NCERT for mainstream subjects as well as for art education. From the findings of this study, I have proposed to split art education into two parts namely; Design and performing arts, without changing number of hours that were dedicated to the design part of art education subject. So, the design education fits well into current timetable. Art and craft remain not only integral part of Design but also gets their purpose and applications instead of remaining a 'hobby-based' subject.

The concept of this framework is to not only to introduce design as subject but also to introduce design as a language, tool and method which can enhance learning experience of other subjects. The suggestive activities given in subject textbooks of primary and upper primary school should get their results, not only in terms of homework but in terms of systematically and methodologically carried out assignments and projects. The visual language of design, which can be taught from the beginning of school education, can play a very important role in developing aptitude towards self-motivation, critical thinking,

perceiving hidden meanings, seeing signs and symbols and sense of perfection, which can help them to implement the given activities with a proper skills, thinking and methods. The idea is not to demoralize students from reading, writing or learning other subjects, as all teaching methods and subjects are equally important, but to introduce design methodology through which students develop interest in the mainstream subjects and further explore them, not by compulsion but by choice.

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