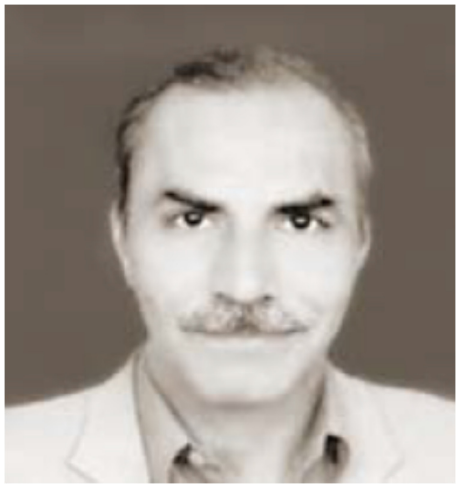
A Publication of Design For All Institute of India October 2015 Vol-10 No-10

Design for All

Design and Children

Chairman's Desk:



Dr. Sunil Bhatia

What is the significance of dust in human life? Why does man wish to dispel dust? Dust is sign of death and man wants to keep it as far as possible and it reminds him future of his non existence. Man's biggest achievement is he tries to forget the fear of death and thinks beyond that and other side animals are limited to living under the fear of death and are confined to survival. A locked room gradually wraps under dust and that indicates there is no life. As someone sweeps and dispels dust and we notice that again life resurfaces. In primitive time, people experienced dust storm and it was so strong that they either experienced death like experiences or died because of choke. Reason might be that dust was lifeless and it did not provide proper oxygen to lung and other side design of lung's cells were in such a way it could function with proper oxygen for supply to blood that was essential for life. As our knowledge improved we found it carried many bacteria in dormant condition and it comes to life as our exposed body parts or wound those were highly vulnerable came in contact and later on it might have proved reason of death . People

used many techniques to keep away dust from damaging human life. Those primitive experiences are still alive in modern mind and we do not have liking for dust. The moment we encounter dust we instinctively cover our face or other exposed part.

Even machinery where lubrication is proper and exposed to air attracts dust and it affects the performance for it is designed and notice there wears and tears are also high. That's why we generally cover the lubricant parts to prevent exposure to air for enhancing the life of machine or products and it out to be the reason of beginning of idea of packaging industries and later on various other factors were incorporated to make it viable and convenient. Where ever we are using floor ceramic tiles we look at foot fall and how far person to steps to reach that tiled surface matters a lot. If it is at second floor and person are climbing by using stairs there is less abrasion because shoes with dust reaches tiled area with minimum dust where ground floor experiences high abrasion because of dust. Knowledge of dust creates abrasion helps in designing sandpaper.

How to keep dust away from the people for prolonging lives was biggest challenge for primitive people. They might have used by bending palm or used branch of tree or imitate the feature of animal body and observed that they shake body to get rid of dust or before sitting they clear the dust with tail or feather or use hind or rear paws for rubbing against the earth surface. They might have experienced a log could not do what broom sticks of same size were tied from one end could do. It was simply an observation designed and tying one end

for holding and other lose end allowing the broom sticks to spread and helped in covering more surface area for cleaning and it demands less physical exertion while brooming. Sweeping could not be performed by standing straight and needed little bending of back of the individual. He kept the length of broom in such that he did not feel pain in the back while brooming and it should be that thick that could be held by grip without pain in hand from tied end. It was the best example of human interface. Before design of broom he might have tried mouth blow to clean the area with air pressure and since it was effective for limited area. They also tried by bending palm for collecting dust for throwing in dust bin and still we practice at the time of collecting dust but it was ineffective technique. Then he followed the nature and used bunch of leaves with branch for keeping dust away or used animal feathers .The idea of broom with broom sticks struck and it is still in use. Rain water settles the dust that concept allowed him to think of sprinkling of water around or use water with mopping or spray design. He learnt the art that jerk helps in removing dust and they applied to clear it from dress. Later they mixed cow dung believing it settled the dust as well killed that was unseen to them but harmful for humans what we call bacteria. As we designed cotton clothes we designed duster for wiping dust and to minimize vulnerability attack of bacteria in wounded body part they started wrapping with piece of long cloth and we call it bandage. This dust management was primarily responsible of designing the clothes to keep it away from bodies. Brush made with animal hair or artificially has helped in dust management but it also opened new vista of art and painting by designing various size of brushes. Eraser was extension of broom made with natural

plant rubber. When painter overlaps to correct or paint desire picture it is nothing but concept of brooming. With the discovery of chemical we designed disinfection of floor and discovery of petroleum allowed them to design cream, jelly or liquid for controlling further damage of wounded area by applying any one. Invention of electricity led us to extend the design of broom to vacuum cleaners and automobiles further added new dimension in broom by designing sweeping machines for road . Knowledge of quantum particles made us to think in terms of positive ion for designing air purifier for settling dust as well as help in killing bacteria in air.

In escalator close to moving steps both side has soft brushes to keep away long flowing with high flair dress to be struck in steps and may prove fatal. Why they thought to use brush is example of good design because it is soft and easily bend and cover the gap in between moving steps and does not harm if someone is struck accidently. Brushes attach with strips covers the gap and opening toward steps prevents and does not allow any dress to accidently struck. If we use capping with plastic strip it leaves minor gap and it may prove reason of accident with trap dress. Electric motor has two major concept of rotating shaft one is brushless and another is with brush. Brush design is similar to broom.

In human body static broom is present in nostril in form of hairs to prevent entering foreign element. Similarly presence of hair in outer ear is design as broom to keep foreign elements to damage ear drum. Man has designed soft as well as hard broom .Soft one gained as mark of respect and it was used when king or religious functions were organized. Hard

one is for day to day cleaning. Garden and agriculture tools to clean dry leaves from grass we designed cultivator like comb broom and to clear earth we designed shovels , mattock, hoe and many other tools based on the concept of broom . To remove spider web or cob web from the roof of house we have designed broom with long stick. Tooth brush is another broom to clean the teeth. Another is hand bush to remove tough strain from the clothes. Scrubber is another broom to remove tough dust from elements. It is interesting to record design of iron press to remove the wrinkles is one kind of broom where we use heat and water for producing steam for generating high latent heat. Detergent is chemical broom to remove dirt from clothes. Sometime we use dust to remove the dust and best example is sand paper. For sailing boat we use extended form of broom as tiller or oar to push water backward and in that attempt it helps in motion of boat. Whisker or churner has basic concept of broom where we take out the unwanted from liquid but it is human knowledge that waste is made useful for human body. As our knowledge will improve broom will take new form with basic idea to dispel dust for making human life longer.

We are thankful to Prof Ravi who has kept his word and submit all the publishing material for special issue before last date of submission. We have covered children and design in one occasion but it was not covering wide perspective of design for children the way he has handle. In this issue he has covered all possible issues related with exploring minds of children and how children faculty of minds can be open with tool of design and allows our readers to explore more in progress of these areas. He has invited the contributors from

different institutes to publish other person's point of views in this area.

"We are less than dust"- Mahatma Gandhi

With regards

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Content of October 2015 Vol-10 No-10

Forthcoming Issues

November 2015 Vol-10 No-11

Ewa Golebiowska, Poland is the president of EIDD Design For All and she has accepted our invitation of Guest Editor and she will invite the authors from European countries for special issue.

December 2015 Vol-10 No-12

Mara Kaplan is an educator, an advocate for inclusive play and a parent of a child with profound disabilities. She has more than 20 years' experience reviewing toys and designing playgrounds.

Mara's consulting business, Let Kids Play!, designs inclusive playgrounds, reviews and recommends toys and edits the website accessibleplayground.net, which includes a comprehensive listing of accessible playgrounds in North America.

Mara facilitated the creation and writing of the *Inclusive Play Design Guide* in conjunction with Playworld Systems. She has also worked with Playworld Systems to train their staff about inclusion and worked with their designers on new products.

Mara speaks around the country about her journey as parent of a child with disabilities as well as on topics such as

universal design, inclusive playgrounds, and playgrounds for children with autism, and inclusion.

Special issue

Julie Irish is an interior designer with long experience in both the public and private sectors in the UK specializing in universal design. She has an M.Sc in Inclusive Environments from the University of Reading, England. She currently lives in the USA where she is studying for a PhD at the University of Minnesota. Julie's research interest considers how the design of the physical environment could support children with autism spectrum disorder (ASD) in the educational setting. She is a strong advocate for evidence-based design. This special issue will focus on current and innovative design for children with ASD from a variety of perspectives.

January 2016 Vol-11 No-1

Dr Peter graduated with a PhD in Sociology and since then he has researched as an honorary fellow at the University of Melbourne, writing over 50 articles. Peter Gibilisco, B Bus (Acc) Ph.D. (Melb).
Honorary Fellow University of Melbourne. His New Book: The Politics of Disability is out and available in market See my web-site http://petergibilisco.com.au/ **He will be Guest Editor for our inaugural issue of 2016**

February 2016 Vol-11 No-2

Professor Jan Staël von Holstein Visiting Professor at Hong Kong Polytechic London, UK will be the Guest Editor

March 2016 Vol-11 No-3

Dr. Shatarupa Thakurta Roy is presently an Assistant Professor at the Indian Institute of Technology Kanpur. She is associated with the discipline of Fine Arts in the Department of Humanities and Social Sciences offering courses in Art Appreciation and Criticism and History of Art. She has been jointly associated with the Design Programme at IIT Kanpur teaching courses on Design Theory, Graphic Design, and several other courses on visual communication. She completed her art education in Kala Bhavana, Visva Bharati Universtity, Shantiniketan followed by a PhD in Design from IIT Guwahati.

April 2016 Vol-11 No-4

Prof Beth Tauke is an associate professor in the Department of Architecture at the University at Buffalo-SUNY, and project director in the Center for Inclusive Design and Environmental Access (IDEA), the leading research center on universal design in the built environment in the U.S. Her research focuses on design education and inclusive design, especially the empowerment of minority groups through design. Tauke was principal investigator of the Universal Design

Identity Program and Increasing Access to Universal Design to Meet the Needs of African American Communities, both sponsored by the U.S and Prof Korydon Smith is an associate professor and associate dean in the School of Architecture and Planning at the University at Buffalo-SUNY, USA.

May 2016 Vol-11 No-5

Prof Pekka Harni Artist ,Professor; architect and designer at Harni - Takahashi Ltd will be the Guest Editor. He is an architect MSc. and industrial designer MA., who works widely on applied art, furniture design and architecture.

He has been teaching at the University of Art and Design (now Aalto University) in Helsinki since 1988. He has been a visiting lecturer in several European design universities and a leader of several design workshops in Europe and in Mexico.

His study about morphological "object categories", delves into the possibility of dividing basic home objects into seven main categories, that correspond to different functional and morphological categories of objects, has already been applied in several European design schools. This study is published by Aalto University in his book "Object Categories" 2010.

In 1999, he received the Design Plus Award from the Ambiente Frankfurt Fair. In 2011 he was awarded as "the industrial designer of the year" by the Finnish Designers association. Since 2012, he is Artist Professor for 10 years, appointed by the Arts Council of Finland.

June 2016 Vol-11 No-6

GAATES(GLOBAL ALLIANCE ON ACCESSIBLE TECHNOLOGIES AND ENVIRONMENTS) Mukhtar Al Shibani – President will be the Guest Editor for special issue

July 2016 Vol-11 No-7

Prof Cigdem Kaya Associate Professor at Istanbul Technical University, Turkey will be the Guest Editor.

August 2016 Vol-11 No-8

Asst. Professor Yasmeen Abid Maan In charge Architecture Program, LCWU,Lahore Pakistan. (Associate MIAP , MPCATP) will be Guest Editor

September 2016 Vol-11 No-9

PROFESSOR YRJÖ SOTAMAA

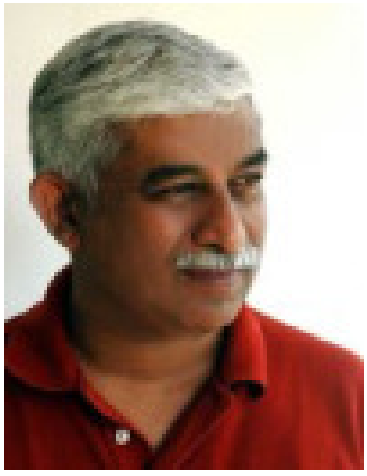
PRESIDENT EMERITUS University of Art and Design Helsinki and Cumulus Association, ADVISORY DEAN AND PROFESSOR College of Design and Innovation, Tongji University and DEAN LOU Yongqi of Tongii University will be the guest Editor

October 2016 Vol-11 No-10

David Berman Accessible design thinker, expert speaker, author (Do Good Design), UN advisor on IT accessibility, GDC ethics chair .Communications strongly believes that we can design a better world that leaves no one behind. We've been leaders in the online accessibility field for over 15 years, and we're eager to help you gain from the benefits of inclusive design. David is a senior strategic consultant to the Canadian government, as well as other governments on four continents

Guest Editor's Contribution:

***Dr. Ajanta Sen**, International Director, Project Solar Eclipse, Bombay, India, and Visiting Research Scientist, Nanyang Technological University, Singapore*



Prof. Ravi Poovaiah, Industrial Design Centre (IDC), Indian Institute of Technology (IIT)Bombay, India

Into a world of the "really not real": leveraging a child's make-belief abilities for design clues to build a cross-cultural collaborative environment

Dr. Ajanta Sen, International Director, Project Solar Eclipse, Bombay, India, and Edward James Foundation, Chichester, UK

Prof. Ravi Poovaiah, Industrial Design Centre (IDC), Indian Institute of Technology (IIT)Bombay, India

Keywords: shared ideas-domains, computer-mediated exchanges, synchronous/asynchronous, networking technologies, collaborative tool, Constructionists, content vs. process, co-construct, fantasy play, story-telling, visual haptics, physical 'primitives'

Introduction:

This paper is based on research that predicates itself on the use of computing as a representation of "action in which humans can participate"*(Laurel, 1991)*. Which is to say that the functionality of the computer moves into the background to allow for computer-mediated human-human interaction to occupy center stage. According to Laurel, computer-based representation without a human participant is like "the sound of a tree falling in the proverbial uninhabited forest."

This paper addresses two crucial sets of questions towards the build-up of the proposed collaborative environment:

(1) Do children like to collaborate in a computer-mediated environment, as well as collaborate cross-culturally? Is there a pedagogic and technological basis underlying such preference? And
(2) How do we build-in collaborativeness onto the Net? Can we tap into children's aptitude for make-belief to create such an environment?

The idea is to attempt this from the perspective of the designer – arguably "keepers of the larger picture" *(Saffo, 2001).* And leverage their ability to look at things from an outside-in perspective that adds dimensionality in a way that traditional engineers and computer-scientists don't because they are too close to the machine. Critical to this perspective is the desire to bring technology within the scope of the human being. And, for the specific purposes of this paper, a desire to articulate the relationship inherent between technology and our user-group focus, viz., children.

Empirical and pedagogic assumptions underpinning children as a special interest group for the Net:

Inspiration for our specific interest in addressing the needs of children as a user group stemmed from two sources that enabled our progression towards the natural synergies between technology and children's learning:

(i) *An empirical basis* derived from an ongoing initiative going back to 1997 and named Project Solar Eclipse (http://www.colorsofindia.com), which was conducted as a series of 'events' (synchronous and asynchronous). The

Project had displayed a distinct *joie de vivre* resembling a carnival-like environment as well as a large degree of conviviality *(Sen, Poovaiah and Pulley, Wales, 2002).* And all of this emerging from interactions between children from different countries played out via computer-mediated interactions combined with exchanges in the real world *(Sen and Poovaiah, Sydney, 1999).* The exchanges had made it evident that children adapted with ease to technology, in general, and certainly to the Net in particular *(Sen and Poovaiah, Bangkok, 2001)*. The Project also demonstrated, quite conclusively, the Net's own specific ability as a medium to bring players together to collaborate and create ideas and artefacts over shared and new knowledge domains *(Sen, Falmouth, 2000; Sen, Poovaiah and Pulley, 2003).*

(ii) There was also *a pedagogic basis* for wanting to focus on children. This was inspired after the Constructivists' school of thought that maintained that a certain kind of learning environment (detailed below) could actually create a sense of joy in children rather than create the pressures that the present learning systems seem to engender. In particular, there was Seymour Papert's vision from way back in the sixties *(Mindstorms, 1980)* about the efficacy of computer-mediated learning methods in fostering effective learning. The question was: *could we use these propositions as benchmarks/models for purposes of integrating learning systems into computer-mediated collaborative environments?*

At the heart of the pedagogic basis driving our assumptions for a collaborative environment was the proposition that children learnt best via *experiential learning* (often termed as

home-style/Piagetian learning **after its proponent Jean Piaget) by actively constructing new knowledge rather than by having information "poured" into their heads through *verbal learning/school-style*. In the latter instance, which is what unfortunately prevails, children are made entirely dependent on individuals (teachers) and systems (conventional schools) and which singularly decide what children should learn. In Papert's words, the idea instead should be to "preserve the child's natural strengths as a learner" *(Schwartz, 1999)* through constructional means (which children are best adept at) rather than via instructional means (that is imposed upon them).**

This formed the very kernel of the Constructivist school of learning and education led in the early 20th century by John Dewey (interaction, reflection and experience as key to education) and Maria Montessori ("children teach themselves")

Followed from the mid 20th century onwards by Jean Piaget (founder of the Constructivist Theory of Intellectual Development and genetic epistemology and who said "children have real understanding of that which they invent themselves, and each time that we try to teach them something too quickly, we keep them from reinventing themselves") and Seymour Pappert (founder of MIT's Artificial Intelligence and Media Labs, student of Piaget's and the one to have defined the theory of Constructionism).

Closer home in India (between early 1880's to 1980's) progressive thoughts in experiential learning came from

founders of educational setups, viz., Aurobindo, an educationist-philosopher ("information cannot be the foundation of intelligence"), Rabindranath Tagore, Nobel laureate poet and educationist ("by devoting our sole attention to giving children information, we accentuate a break between the intellectual, physical and the spiritual life") and J.Krishnamurti, an educationist-philosopher (cultivation of a global outlook, a spirit of inquiry and concern for man and environment).

Children as special interest group for the Net: children's relationship with technology - a story foretold:

Between our empirical and pedagogic propositions and literature, what clinched the children-technology relationship for us were two sets of correlations:

(i) firstly, the observation that the above Constructionist proposition of learning exactly complements Papert's assertion about technology, viz., that, the true power of the computer as an educational medium lies in "its ability to facilitate and extend children's awesome natural ability and drive to construct, hypothesize, explore, experiment, evaluate, draw conclusions – in short to learn - all by themselves" *(Schwartz on Papert,1999).* In other words, technology is endowed with certain *constructionist attributes* of its own and ones which incidentally and significantly match with children's natural learning ability through constructing knowledge. It is an assertion that has since been empirically proven and used as basis for constructing storytelling and other computing tools for children (*Ryokai and Cassell, 1999 and others)*.

(ii) the second correlation between children and technology taps into the notion of *imaginary worlds* related to both children and computers:

(a) on the part of children - the possibility of leveraging their innate ability to transport themselves to 'make-belief' worlds;

(b) on the part of the computer - the benefit of the knowledge that designing human-computer experience is about creating imaginary worlds that have a special relationship to reality. This notion itself taking a leaf out of a very early assertion that computers are representation machines that can emulate any known medium. In fact, "the protean nature of the computer is such that it can act like a machine or a language to be shaped and exploited. It is the first metamedium, and as such it has degrees of freedom for representation and expression never before encountered and as yet barely exploited" *(Kay,1982).*

Human-computer experiences are, in effect, represented by imaginary worlds inside the computer and now the Web. And which tend to hold out their very own and special relationships with reality. In effect, it is all about converting reality into representation via "make-belief".

It is this 'make-belief' ability incipient in children as well as in the computer (and now the Web) that contains the germ of our experimentation. As a critical basis to our attempt at constructing for children, a collaborative environment on the Net with cross-cultural features, we rely on asking the question: *Could we combine to advantage two conditions*

already in existence: (a) children's propensity to travel to fantasy worlds and (b) the computer's innate ability to represent reality in imaginary worlds as also the Web's ability to make these fantasies reside within its domain?

Modules proposed for the intended collaborative environment based on synchronous and asynchronous modes - deriving design clues from a makebelief world as basis for Project New Century's first initiative:

The proposed collaborative tool, the first of the initiatives under Project New Century (following Project Solar Eclipse), goes a step further than this in enabling children to not only design and construct their own projects within a given domain. But to construct and create *with each other*, around themes mutually designated for the purpose, and as opposed to constructing and creating unilaterally with a computational kit.

The focus thereby shifts to *shared domains,* preferably cross-cultural ones, given that the computer can now actually "connect up" the user with different countries through the Net. The proposed environment would, therefore, make the proposed collaborative tool an enabler for children to "meet" with each other, exchange ideas and then build and construct on the basis of these shared ideas across time (fixed or open modes).

In other words, the users (viz., children) will not just communicate with a computational system. They will use a computational system to communicate with each other to

create (collaboratively), in the process constructing and further building into these communications.

(1) Groundwork for experimentation: Our desire to build a collaborative environment for children obviously tapped into the confidence gained from Project Solar Eclipse that confirmed for us the efficacy of collaboration between children across different cultures, as well as the efficacy of the networking technologies in delivering the same. Equally, in recognizing the difficulties of sustaining an organizational enterprise such as Project (Solar Eclipse) as an everyday-use instrument of collaboration to be employed by children. Attempting a stand-alone environment on the Net was the next obvious step.

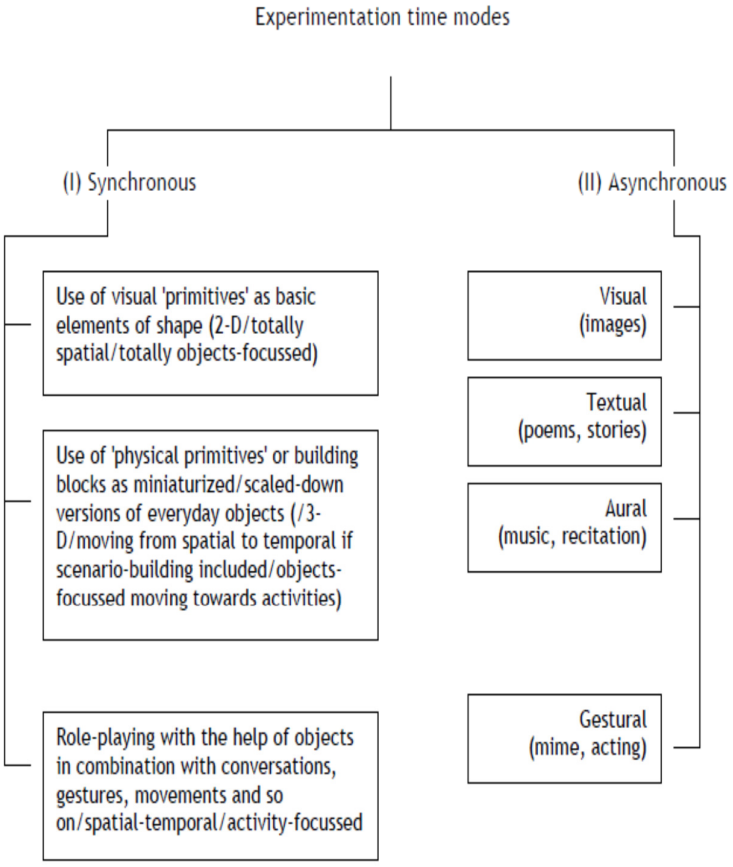
The idea of creating an environment on the Net was akin to creating a parallel world of representation. In this case, it would have to be a world for children, and one that would be inhabited by activities arising out of their own particular mind-sets. Hence, what we needed to build into the representational world were a set of 'social proxies' that would mimic/recreate/relive the ways in which children built and constructed objects and activities in real life.

We needed to set up a framework of parameters based on factors that were germane to children's learning process as well as instrumental in their ability to collaborate with one another across thoughts and activities. The questions that naturally arose were: *what were the traditional, time-worn ways, in which children were likely to collaborate with each other in the real world? could we employ them in*

experimental setups in the real world? and then translate them/simulate them on to the Net?

(2) The actual experimental setup: We designed two sets of experiments for the purpose of observing children in interaction with each other in real environment. The age group chosen was 8-10 years which is the Period of Concrete Operations' (7-11 years) after Piaget's classification of the development stages of children according to cognitive structures. Which, during this period, is logical and hence capable of concrete problem-solving combined with ability to perform multiple classification tasks, but depends upon concrete referents The intention was to pick up clues about distinctive attributes driving these interactions. Which, in turn, could work as 'social proxies' for integration into the Net.

The experiments followed across two time modes time modes (diagram): Diagram depicting ways in which children are likely to collaborate with each other



(I) In the synchronous mode we moved across the entire spectrum of abstraction from completely object-focussed, two-dimensional interactions to the highest level of abstraction in the domain of activity-focussed, spatialtemporal interactions. The intention was to observe if (given the respective medium/aids), children were able to collaborate with each other towards constructing a given task.

(1.1) Use of visual 'primitives' as basic elements of shape (2-D/totally spatial/totally objects-focussed) and represented by materials such as broken glass bangles, sticks, pebbles,

marbles, seeds, ice-cream sticks, big and small match sticks, sand grains, etc. *([Although haptic, the 'primitives' go to construct objects in the visual domain/2-D and hence they may be considered as being visual primitives]*

Inspired after Maria Montessori's turn-of-the-century observations (in 1906) through her 'Casa Bambini' ("Children's House") experimentation, the following insights seemed compelling: that children effortlessly absorbed knowledge from their surroundings, that they were endowed with an untiring interest in manipulating materials and thirdly, that children did these manipulations and creations "naturally" by themselves unassisted by adults. This allowed us to venture forth on testing a two-fold ability scale seemingly inherent in children, viz.,

(1.1.a) their ability to manipulate with materials (as well as their love for such material - as compared to adults who would consider them messy and useless), and

(1.1.b) children's ability to visualize beyond the obvious condition of the given materials. And figure out shapes and pictures (as basic visual elements/visual 'primitives') from these otherwise incoherent materials. E.g., they were able to see the tail of an animal in the curved section of a broken glass bangle.

And further, construct a coherent picture or story. E.g., a large dinosaur quickly emerges from these given materials (on the floor of experimental activity). Or objects such as a house, a tree, etc., depicted on a smaller scale.

(1.2) Use of 'physical primitives' or building blocks as miniaturized/scaled down versions of everyday objects (/3-D/moving from spatial to temporal if scenario-building included/objects-focussed moving towards activities) and represented by objects such as trees, arches, brick walls, pillars, roofs of houses, water bodies such as ponds, wells and rivulets, doors/doorways, vehicles, cooking utensils etc. This category of interaction was intended to tap into their innate ability to reconstruct/build, with the aid of scaled-down objects, environments familiar to them. Examples of constructions were a zoo, a village, a forest and so on. There was also distinct inability to give shape to environments unfamiliar to them.

While it is this very ability to construct the familiar that Lego sets tap into. Our intention would be to leverage the opposite, viz., the factor of the unknown, in order to make collaboration with physical primitives challenging and exciting for the child.

Such as the Indian child attempting to build the Sphinx from Egypt or possibly the American child the Taj Mahal - situations rife with potentials for cross-cultural collaborations, or children collaborating over new knowledge domains of the other's and complementing each other's information gap with situational knowledge.

(1.3) Role-playing with the help of objects in combination with conversations, gestures, movements and so on/spatial-temporal/activity focussed:

This was meant to tap into children's innate ability to imagine real-life situations and build narratives/scenarios into them through mimetics/imitativeness

Examples of activity on the ground were playing out house-house, running a restaurant, enacting teacher-student situation at school, playing at hospitality through roles of host-guest, playing at air-travel through characters such as the pilot, the passengers, etc.,

(II) In the asynchronous mode we examined collaborative practice across sequential time purely to test out children's ability to create narrative structures collaboratively, but in terms of building on each other's ideas across sequential time. With the difference here that ideas would have to be generated and developed individually (not collectively in a group) and then passed on to the collaborating partners as inputs for a larger common, collaborative task. The closest to

an analogy for this mode of communication could be the 'Chinese whisper' *(footnote 5).*

The ensuing narratives were expected to be articulated in the sensory domains of the visual (images), textual/verbal (stories, poems, haikus, songs), aural/auditory (sounds, music, eloqution, recitation, etc.,) and if possible, in future, through gestures and actions (as in theatre, mime, acting).
This is a form of collaboration that requires less group coordination and a lesser frenetic pace than synchronous group activity. And could work additionally well with children who are a bit reticent and introverted by nature. Or amongst children with slightly challenged social skills as a result of physical handicaps such as cerebral palsy, dyslexia, hearing/speech impairment and so on.

In conclusion:

"As digital technology begins to give children greater autonomy in exploring larger worlds" it will necessarily underscore a concomitant shift in power relationship away from the 'teacher' to the 'taught' (with parents and teachers having less control over what children will learn). Equally, as children begin to see these gateways they will demand better and they will demand more. Our own attempt at devising a technology-driven learning environment that harnesses the innate qualities of children to construct, invent and learn in their everyday lives remains a tribute to the learning-theory seers long before our time. It is also a tribute to the children-technology relationship foretold by half a century. And a small step in the direction of the anticipated power vacuum in the

wake of a potential paradigm-shift from treating children as empty vessels to be filled with knowledge (content-based learning) to children being considered as active builders of knowledge (process and skill-based learning).

Our modest attempt to build a collaborative environment into the Net for children has been overarchingly driven by a design understanding which reflects the Constructionist reality that children don't think like grown ups. What children have in place of the adults' world of intellectual constructs are their own primitive laws for comprehending life, such as: "things disappear when they are out of sight", "big things float and small things sink", "going faster can take more time (which had intrigued Einstein since his own theories of relativity ran so contrary to common sense)" *(Papert on Piaget, 1999a).*

While liberally referencing the thoughts of early Constructivists, we are also sorely aware of certain anachronisms. That, when John Dewey had espoused democracy in education-systems he had not foreseen the power of the new media technologies because they simply did not exist even at the time of his death (1952). And yet, a hundred years after Dewey it would seem, almost by serendipity today, that technology alone will make it incumbent upon the established school-style/verbal-learning system to give way to what was always evidently more conducive for the development of children's minds: viz., home-style/experiential learning.

However, technology by itself is like the proverbial Trojan horse. Seymour Papert, the great advocate of technology for

children, raises this analogy to place technology-for- learning in true perspective. He says it wasn't the horse that was effective, it was the soldiers inside the horse. And maintains that "technology will be effective in changing education only if you put an army inside it". This is the army made up of a changed profile of children and parents in future - a politically potent force. Without the proverbial army, technology could be just what the vendor sells to a school - a computer as a mechanical device, devoid of human participant. Or like the pencil in a classroom full of pre-school children, with the hope that it will somehow make the children learn how to write. And, at the end, all of this amounting to nothing but the mere token presence of technology with the further hope that it will somehow revolutionize education *(Papert,1999b).*

Acknowledgements:

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Picturing a World: impact of images on young readers

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Humans make sense of the world in multiple ways; from what they perceive, experience and what they are exposed to. Words and images are the basic means by which communication takes place between people and learning is often imparted through language and imagery. Words and images are thus present in all forms of media of communication, especially in stories and picture books for children. Children grow up listening to stories and often their learning begins with them. They hear stories at bedtime from parents and grandparents, from teachers and now increasingly through TV, comic books, and picture books (Sabnani, 2014). So strong is the impact of the images and stories that they leave an indelible mark in the imagination and worldview of children. Stephen's (1992) believes that

" Children's fiction belongs firmly within the domain of cultural practices which exist for the purpose of socializing their target audience. Childhood is seen as the crucial formative period in the life of a human being, the time for basic education about the nature of the world, how to live in it, how to relate to other people, what to believe and what and how to think – in general the intention is to render the world intelligible." But could we say the literature and its illustration are free of any values?

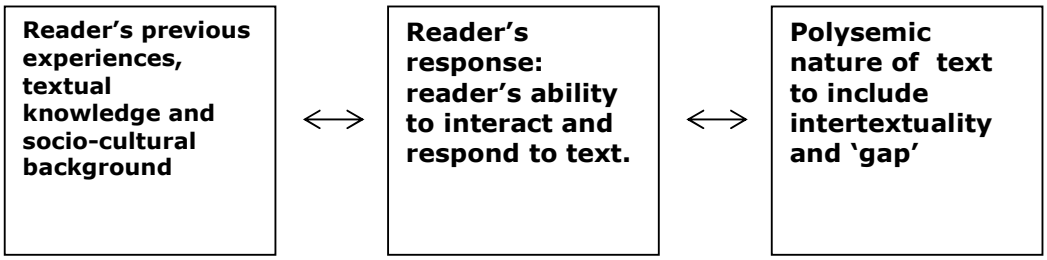
The picture book itself reflects the perception and worldview of the author and illustrator and this in turn impacts the reader who approaches it from their own understanding and associations with those words and images. The focus of this paper is to understand both aspects, and explore the impact of words and images in picture books on children and the challenges they pose for illustrators and authors who design books for children.

Images and their impact

Just as adult lives and ways of living are driven by their cultural context so are the lives and worldviews of children shaped by what they observe, learn and are told. Besides this, race, gender, and social class all have an impact on how images are received, interpreted and assimilated (Evans, 1998). As an exercise in an illustration class, students were asked by the author to describe a typical Indian family scene on a Sunday afternoon. Ten out of twelve described the family unit to comprise of a father, mother, son and daughter. The activities in which they were involved were also stereotypical: the father would be shown reading a newspaper, the mother cooking in the kitchen, the boy playing with a ball and the girl arranging clothes for her doll. When asked how they came to this description they said this is the kind of imagery they had always seen in their books and this had subconsciously become a part of their imagination. This brought home the point that images contribute to memory and 'often patronizing and patriarchal gender relationships are portrayed as normal and are simply taken for granted.' School textbooks in India often represent families and children, their clothing and

environments in a de-contextualized way in order to reach children from all states. However, they may not necessarily be understood or identified with by any. The reading of an image is not as natural as breathing.

Exploring the relationship between the readers and the text, Louise Rosenblatt came up with the reader-response theory, outlined in the table below (Evans, 1998).



Scholars like Roland Barthes furthered this theory to question the very existence of the author. However, this paper is limited to examining the relationship between images and the socio-economic context of the readers, and the impact that images may have on them.

The images children grow up with become a part of their construction of reality and this in turn contributes to their perception of what life is and how it must be lived. As Sheila Egoff (1998 cited by Evans) asserts: "The picture book which appears to be the cosiest and most gentle of genres, actually produces the greatest social and aesthetic tension in the whole field of children's literature." A picture is not simply an image to be read; it invokes memory, imagination and will be interpreted differently by each viewer or reader (Mitchell, 1984). This was clearly evident in an exercise using a picture book 'Home' conceived and designed by the author. Children

from various segments of society were shown the book and their narratives revealed a close relation between the child's social context and their interpretation of the images.

The Design and Intent of the book Home

The *Kaavad*, a storytelling tradition from Rajasthan, inspired the design and intent of the book. In the *Kaavad* tradition a storyteller points at painted images and narrates a story or the genealogy of his patron (fig.1).

Figure 1

Figure 2

He may also use the same image to identify other patrons. Likewise, Home is a children's picture book without a narrative, and readers are invited to use the same images to narrate different stories (fig.2). The structure of the book is also derived by the unique structure of the *Kaavad*. Accordion folded panels flank a central panel where a cut-out window invites the child to look out at the world through a frame and yet know that what is seen through the frame is a only a part of a whole (Figure 3).

Figure 3

The window frame makes them aware of choices of what to include and through that extension know that something is left out. The book is constructed such that it can be opened from the front or back without any loss of meaning. The 'pages' are designed more like display panels and have painted images on a red background. There are a few words printed on each panel that refer to homes and families from the world of humans and the animal kingdom. The panels can be folded into each other. There is no assigned sequence to the images. However, they are arranged thematically on individual panels and each image is separated by grid lines, as found in the *Kaavad*. Themes include family, homes, gendered identities and animals (Sabnani, 2014).

The images include diverse representations of houses, people and animals that live together or alone. Multiple images of the same object, for instance a house to live in, or different units of families, were intentionally created to make images more inclusive and for children from all backgrounds to identify with their own homes and own families. The premise was that if pictures are provided without narratives with just a few words, they may stimulate children to narrate their own

stories or discussions around those themes. Through their narratives children may share what they confront in life and perhaps even find resolutions. Their stories would reflect their associations with images and meanings they attach to forms and colours.

Children's Interpretation of the Images

The book was tested with several children by the author and independently by other researchers in multiple locations and cities. At first it was not apparent to anyone as to what this object was, since it did not sync with any association with a book. Nevertheless it did arouse a lot of curiosity. In all the places where the book was taken, irrespective of what segment of society or city, children wanted to open it from all sides and kept turning the panels without reading anything. Most adults thought the book was for very young children to make associations between words and images or recognize and label the figures. To demonstrate how the book may be used a story was told using an image from the book. Then children were invited to tell a story using the same image. Soon, everyone wanted to tell their own story and held the book in their hand while telling their story. It also appeared as if they were willing to tell a story just so that they could hold the book in their own hands. Some told a known story and others made up their own stories, or repeated the story they heard from a child before them, but with a different image. Some children invented a story around one image and others combined several images to construct their narratives (Sabnani, 2014). There were certain images that prompted more stories than others. There were some images that

caused a lot of confusion: specifically a gay couple family was not recognized as such. Some children could not decide which was the mother (Achuthan, 2011) and others thought they were two brothers looking after their sister. A man selling balloons was identified as a thief because of his dark complexion although the intent of the image was to show different professions.

Figure 4

A nomadic family of Rabaris of Kutch (fig.4) was interpreted in diverse ways. A child from a privileged background in Delhi suggested that the nomadic family was touring the country to share their unique culture with people, a veritable museum. And when the same image was shown to children from a disadvantaged segment in Mumbai, by researcher Anisha Dalvi, the child described the image as that of the mother going to leave her naughty son in the jungle as she was fed up of his tricks. And yet another child described it as a homeless family looking for a place to stay. The polysemy of the image produced multiple narratives and provided insights into the worldview of different children.

The structure of the book too was interpreted in multiple ways. The book was intended to imitate a house and a *Kaavad*. It was designed to arouse curiosity and to bring children together. While some described it as a house or hotel, others called it a rocket and a toy. Yet others used it as a theatrical prop to enact a mock performance.

Conclusion

The findings reinforced the notion that reading of an image is heterogeneous and complex. The challenges of designing for children are multiple and perhaps not all are recognized. Currently the images are segregated on the page without any background. Future research will involve in placing the same individual images against various backgrounds to examine if that will influence perception and associations of the image.

The author and illustrator have to be alert to representing their own perceptions and prejudices that may not be apparent, as they themselves belong to a milieu with their belief systems and knowledge of the world. Authors and illustrators need more dialogue with each other together with the editor publisher to create content that reaches its audience in a meaningful way.

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Reflecting on the play of children with special needs: Differences and similarities to typical children

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Abstract

The aim of the present article is to develop a better understanding of exhibited play behaviour of children with mild to moderate intellectual disability in the context of a special school in a metropolitan city in India. The article attempts to demystify existing perceptions about the differences (and similarities) in play behaviour of these children from their typical peers, elaborating on possible causes and suggesting areas for focus in research and practice to enhance the play opportunities for these children. The insights are aggregated from multiple research studies conducted by the author.

1. Introduction

"Play is the highest expression of human development in childhood for it alone is the true expression of what is in a child's soul." **(Froebel, 1899)**

The significance of play has always been acknowledged from historical times by philosophers, poets, thinkers to modern day scientists and play researchers, across cultures. The role of play becomes much more important in childhood as child

learns about the world through experimentation in play. In this domain of children's play, two of the most influential works have come from Piaget (1962, 1971) and Vygotsky (1967). While their theories contradict having adopted universal-equilibration based and cultural-social learning based perspectives respectively, both have agreed that play leads to development of thought and imagination of the child. Policy-makers have also been active in recognizing the need to play and its implementation for children. According to the article 31 of the UN convention[1], - "Children have the right to relax and play, and to join in a wide range of cultural, artistic and other recreational activities". Recently in 2013, UN has reiterated its stance on importance of article 31, clearly defining the responsibilities of governments to promote play.

Play and its role in the development of child is one of the most frequently seen discourses in studies on children's play. Froebel (1826) and Montessori (1967a; 1967b; 1972) were the pioneers in bringing play into schools, coining terms like experience-based learning and playful learning. More recently, Singer et al. (2006) boldly equated play to learning to emphasize the importance of play in human cognitive and social-emotional growth. The role of play in development becomes much more significant in case of children with special needs since traditional pedagogical methods are often not effective for them. 'Special needs' is an umbrella term used to describe individuals with disabilities that may be, physical or mental in nature, thus needing auxiliary assistance much beyond the requirements of their physical age even in day to day activities. *The present study specifically focuses on*

[1]***For summary of children's rights in UN convention, refer http://www.unicef.org/crc/files/Rights_overview.pdf***

children with intellectual disability having mild to moderate mental retardation, however in this article, the subjects would be addressed by the term 'children with special needs' as author feels that it is a better representation of the users. **Since play can act as a medium that can engage these children and thus aid their learning, it is a worth-while exercise to understand what does and what doesn't constitute play for them, and if at all, the scope is different from their typically developing peers. It becomes clear while reviewing that play literature for children with special needs is relatively limited and it is still an emerging research domain. There is still a lack of consensus on the extent of difference in the play behaviour of children with special needs and typical children. Malone and Langone (1995) in their study reported similar patterns of categorical and sequential play behaviour in children with and without cognitive disabilities, both showing higher sophistication with gender-stereotyped toys. A number of studies have shown that disabilities in children have had a significant negative effect on their play behaviour (e.g. Pierce-Jordan & Lifter, 2005; Poulsen and Ziviani, 2004). It is worth noting that most of these studies involved children having multiple disabilities. Weiner, Ottinger and Tilton (1969) said that children with mental retardation showed lesser variety in play as seen based on the ability to use toys in different combinations, as compared to typical children. Malone (1999) points out that the difference in behaviour could occur because children with disability may experience greater horizontal and vertical variability in their attainment of developmental stages. On the other hand, studies have reported children with mental retardation show more sophistication in their predominant categorical and sequential**

play while playing in home context, as compared to their typical peers (Malone, 2006). The existing contradictory results from research studies do not give a clear picture on comparability of play behaviour of children with special needs and typical children.

Furthermore, it is very probable that the socio-cultural conditions in schools and play spaces would differ for children with special needs. Malone (1999) also emphasized on the need of research on play-based development of ethnically diverse children with disabilities. Studies on play for children with special needs living in developing nations like India have been very few. The significance of cultural influence of the region is substantiated by Prochner (2002) in his study of Indian preschools, stating "local ideas about play in early childhood settings are created out of the tension between culturally and historically situated beliefs and international ideas" (p. 436). The present study attempts to understand the possible differences (or similarities) seen in the play behaviour of children with special needs and factors influencing the play in a special school setting in a metro city in India, as compared to their typical peers, based upon the insights obtained from a series of studies during a period of last 3 years.

2. Methods and procedure

The present study summarizes and derives from a combination of observational and interventional studies performed at a special school in Mumbai, to comment on the possible difference between play behaviour of children with

special needs (having mild to moderate intellectual disability) and typical children. This includes a brief ethnography based observation study complemented by semi-structured interviews with school staff and special educators (Johry and Poovaiah, 2014) which focused on understanding the state of play and the associated environmental factors along with the belief pattern on play within the special school. Figure 1 and 2 show available play artifacts and play spaces in the special school. This study was performed with children from a specific class with mental age varying between 3 to 6 years approximately. There were 3 children having other etiological conditions along with intellectual disability and hence they are excluded from the analysis in this article. Another study used a controlled experiment design based methodology to understand the emergence and nature of competitive play in children with special needs (Johry and Poovaiah, 2015). This study used a pair of children each from the age-group of 2-4, 4-6, 6-8 and 8-10 years of mental age.

(a) (b) (c)

Figure 1.Some of the outdoor play equipments in park at the special school: (a) climber web, (b) Slide, and (c) Swing.

(a) (b) (c)

Figure 2.Some of the indoor play equipment in Occupational Therapy room: (a) trampoline, rope ladder, therapy balls, (b) platform swing, and (c) ball pool.

Lastly, insights were also built from the analysis of a rigorous qualitative research study using a method derived from Classical grounded theory (Glaser, 1992), involving data collection over a period of several months. The study was interventional in nature ensuring children were introduced to variety of play possibilities by selecting toys from pretend play, sensory play, constructive play and challenge-based play categories as classified by Kudrowitz and Wallace (2010). Again, the last study was performed with children ranging from 3 to 6 years of mental age. Figure 3 shows one of the children during the free play session.

Figure 3.A child playing with a set of toys from different play types, in a free play session.

3. Discussion

A lot of rich insights have been developed to aid the comparability between children with special needs and typical children, based on the set of studies performed earlier, discussed briefly in the following sub-sections.

3.1 Socio-cultural conditions

The socio-cultural and political environment at special schools, which would include the space and facilities/equipment as well as the pedagogical strategies and world-view of school staff, played a major role in affecting the exhibited play by the children, thus possibly leading to a difference from typical children, as discussed below.

- **The notion of *free play* or play for its own sake seems to be absent at the school, visible from negligible possibilities and negative perception from the teachers about play for its own sake. In-fact, play is always seen as a scaffolding tool for learning in all activities and associated with a pre-determined developmental objective. This is a clear differentiation from a school**

where typical children are allowed free play or play for its own sake, especially in pre-school years. This perspective also appears in research studies conducted with children with severe and profound disabilities where play and toys are not seen as a goal in itself and rather as a tool for learning and development (Brodin, 1999). While it can't be denied that play acts as a natural medium for child to learn where traditional methods of teaching are ineffective at school, the importance of free play cannot be completely ignored. As rightly pointed by Johnson and Johnson (1992), a balance is needed between teacher-led or convergent thinking activities and child-initiated or divergent activities.

- **Challenge-based toys are much more prevalent and frequently used for children with special needs, especially in therapy sessions due to the developmental aspect associated with them. This category of toys can be classified to elicit play which is primarily motivated by a challenge, an outcome to be achieved e.g. jigsaw puzzle, shape/ size sorting boards, etc. It is again important to note that these toys often become too learning-oriented and low on playfulness, thus leading to lesser engagement.**

- **Contrary to challenge-based play, pretend play and constructive play has been found to show high level of playfulness among children with special needs. However, in the existing setup, it is negligibly seen due to a lack of toys and resources to support these play activities,**

unlike typical schools which normally include toys from these categories.

- **Subjects considered in the set of studies earlier showed a positive response to social play with their classmates. However, social play was minimally present at the school since the children did not get many opportunities to play as a group. This is again different from typical schools where children are often engaged in group play activities. Also, children are always seen playing in presence of facilitator introducing an extra agent in play, thus strategies employed by facilitator become much more important. Interview with school staff showed that teachers express concerns of passivity and safety while discussing on the situation of unsupervised play for children. This notion is not entirely incorrect since research also shows that children with cognitive delays may not spontaneously engage with toys that promote optimal growth in critical areas (Malone & Langone, 1998). However, it is important that facilitator should allow children with freedom to explore and not interfere too often in their play.**

- **Unlike other forms of play, gross motor play is seen to be easily available, both indoors and outdoors, for children with special needs, and thus shows a similarity to play of their typical peers. A lot of these playing aids stimulate vestibular and proprioception sense, and also serve a developmental need for these children.**

3.2 Characteristics of toys

While there are adaptive toys and assistive technologies gaining importance in Western countries, special schools in India generally use the standard toys available for typical population in the market, or developmental aids whose primary purpose are to teach a learning concept and thus shouldn't be classified as toys meant for play. While the toys are largely similar to those seen for typical children, the usage shows some critical differences for children with special needs, as discussed below.

- **One of the challenges working with standard toys meant for typical population is that they do not account for the difference in mental age and chronological age, a characteristic of children with intellectual disability. If toys are matched on physical age, they may become too complex for these children due to the level of cognitive ability demanded, whereas when matched on mental age, a lot of toys show issues related to physical ergonomics. This creates problem in material handling, force application etc. An example from one of our study showed that when presented with a good quality drum with sticks (sensory toy) to a child, matched on his mental age, he played the drum so hard that it broke. This was because of his physical age, level of force applied was too large than what the toy was supposedly designed to handle. Another issue could be seen while playing with doctor set when equipment seemed too small for the children (matched on mental age).**

- **Another issue related to usage of standard toys meant for typical population is that they often do not offer enough feedback. Toys that involve structured play e.g. challenge- based toys need to give feedback on the on-going action especially for children with special needs. The available feedback was not found sufficient in many cases. An example of this could be seen with the shape matching bucket toy where child would force blocks into wrong holes since the visual feedback was not sufficient. An interesting design intervention could have been used of multi-modal feedback to help the child in informing about the fidelity of the action. Also, it is important to understand the optimum intensity of feedback for these children.**

- **While the present article focuses specifically on children with mild to moderate intellectual disability, the conducted studies gave an opportunity to observe play of children with different etiological conditions. A critical flaw seen in a number of playing aids and equipment was that they do not acknowledge etiological differences and thus fail to fulfil the variety in needs of some children. e.g. Outdoor park play equipment (figure 1) have no arrangement for access and safety of children with Cerebral Palsy. These issues do not become a factor for typical children and thus standard equipment purchased from market do not provide any special arrangements.**

3.3 Characteristics of exhibited play behaviour

There have been varying perceptions about the play behaviour of children with special needs, owing to the contradictory literature, as discussed in the earlier section. The present set of studies showed more similarity in the observed play behaviour of children at special school than difference from their typical peers. Some of the key insights are discussed below.

- **One of the study which specifically looked into the emergence and variation of competitive play as a function of age showed a negative correlation between the mental age of the children and the degree of competitive play shown by them when competition was explicitly introduced by the facilitator (Johry & Poovaiah, 2015). Although the study did lack in validity because of limited number of participants, findings suggested that competition during play does not increase in children with their age as seen in typical children (Greenberg, 1932; Owens, 1969).**

- **It was seen in multiple studies that children at special schools showed a preference for social play over solitary play, despite of having limited opportunities. In an earlier study, Guralnick and Groom (1987) studied the peer relations of children with mild developmental delay with typical children and stated that delayed children showed a deficit in social interactions. Our observations have been contradictory when it comes to social interactions within children with special needs at the**

special school, and quite similar to what is expected of typical children. There were instances of cooperative, associative and parallel play which showed that these children have the capability to socialize like their typical peers. However, speech delay does impact the communication, which could be the cause for some children resorting to solitary play.

- **As discussed earlier, gross motor play was easily available at the special school and children showed engagement and joy when involved in gross motor play requiring physical activity. Pellegrini and Smith (1998) have referred to this phase of physical activity play as 'exercise play' and reported that in typical children, it peaks in pre-school years thus showing a similarity in the affinity for this play form shown by children with special needs.**

4. Conclusion

The present article attempted to shed some light on the perceptions of play behaviour of children with special needs and how far it is different from typical children, having encountered contradictory research literature. It is concluded that the differences in the observed behaviour are largely due to the differences in socio-cultural and environmental factors at special schools. Although the scope of this article did not allow discussing all the similarities in detail, it can be said that the play behaviour itself and the categorical preferences in play seem to be more similar than apart from the age-matched typical peers. Malone (1999) in his review of literature also supports the notion of children with disabilities being similar

to typical children relative to levels of play organization, play repertoires, duration and diversity of play, etc. Brodin (1996) stated that the needs and wishes of children with disability are quite similar to typical children, claiming that even children with profound multiple disabilities will play if they are given right stimuli in form of adapted toys matched for the developmental age along with a supporting environment. The present article points out to a number of focus areas for design intervention related to toys and activities. Owing to the significance of challenge-based toys for children with special needs, having been used as learning aids, their design needs to become more playful and engaging. One of the possibilities for enhancing the design could involve working on the feedback mechanism of the toys and making them multi-modal. Research needs to focus on understanding aspects of feedback design which would lead to engaging play possibilities. Another issue seen in standard toys was of inadequate physical ergonomics leading to difficulty in handling, thus size, shape and textures for these toys need to address the special needs of the children. The toys also need to become robust to handle the force applied by children whose chronological age would be much higher than the expected age to play with these toys. While designing activities for these children, it is important to account for the presence of facilitator and assign him a suitable role in the activity, to optimize the play possibility. It is also important that children are given freedom to control the intensity and manner of play and exploration (Berlyne, 1969). However, studies have shown that children with cognitive disabilities may not show spontaneity to play with all toys which address critical developmental areas, by simple exposure to toys

(Malone, 1994; Malone & Langone, 1994). Thus, role and presence of facilitator becomes very important in the play activity as they can provide an enriched play environment including appropriate materials, time, space and experiences, and thus be an asset to children's development during play (Johnson et al., 1999). The facilitators at special schools need to maintain a balance between assistance and supportive guidance while allowing the child with freedom to explore and modulate his stimulation during play by following his lead more than participating in the play itself (Johry & Poovaiah, 2014).

There is also a need for addressing the over-emphasis on the idea of playful learning, as often seen in the opinion of school staff. In a number of situations, the playfulness of activities became questionable due to the structured and guided approach and limited freedom for exploration given to the children, owing to the focus on developmental aspects. It would be beneficial to keep some scope for unstructured, free play opportunities which have shown to have their own significance in child's development. In the context of Indian special schools, there is a need to introduce a larger variety in toys as the play opportunities are limited and repetitive. Studies have shown that children with disabilities need more play material than typical children as their attention span is smaller (Sinker, 1985). It is important to debunk the myths and mis-conceptions about children with special needs for a more main-stream acceptance and it is expected that more work in this domain, both in research and policy making, would be useful for the population and society.

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Children as game designers: Collaborative game design in a non-digital environment.

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***Keywords: Children, Collaboration, Game Design, Problem Solving,* Design Pedagogy**

1.1 Introduction

Games in recent educational research have proved to be intrinsically fun and motivating. Games open up a world of play, fun, competition, achievement and failure in a way which traditional methods of teaching seem to have not been able to match up for learning concepts and developing skills. This very reason has attracted many teachers, educators, developers and education researchers towards using games as a platform for learning and development of children. Various research studies reinforce the use of games in classrooms for better understanding of concepts and building social skills in classrooms where children are encouraged to work with other students irrespective of their background or class performance. While game playing in classrooms is found to be more common and different ways of applying game-based pedagogy are being researched; game-making is also becoming popular as a pedagogical method in education research and practice, where children are involved in the process of creating games. In this paper we will focus on this

ability of children to create new games and the design thinking process involved for their creation.

1.2 Games as a pedagogical technique

There exists a wide range of game-based learning options, depending on whether children want to play games for fun, learn from games, or create new games of their own. Games offer a constructivist approach towards learning and development. It has been observed that children as young as toddlers have an innate ability to make their own rules and game play while playing with any object,toys or games. Constraints such as lack of availability of material or environment does not stop children from playing, rather it leads to imagination and creative thinking and at times invention of new gaming techniques and game play. Education researchers have repeatedlyacknowledged that game based learning can aid in developing many 21st century skills like creative and critical thinking, collaboration and problem solving. Game-making can also support the development of 21st century competencies like creative problem solving, collaboration, ICT literacy, systems thinking, and positively affect engagement in STEM subjects (e.g. Zimmerman, 2007; Clark & Sheridan, 2010).

1.2.1 Game playing and game making

Game based learning can be broadly classified into two categories as learning through game playing and learning through game-making. It may also be used for individuals as well as for groups. Game playing is used more often by teachers and students for curriculum concepts. Following the learning through game-playing pedagogy lately gamification is

also becoming popular with researchers and educators where game-like elements such as points, leader boards and batches are used for motivation in non-gaming contexts like education.

In a game based learning setup students are involved in learning curriculum subjects by playing specific games. These games can be either digital games or board games which can be played inside the class or even at home. There's an increasing number of means created for educators and parents in the learning and games sphere, including step by step tutorials that show procedures on how to play a game in the classroom, managing student interaction, and even assessment. Teachers at times can also choose to design a game or appropriate a game of her own, to meet a specific education goal.

Although the game-based learning domain remains largely focused on game play as the primary mode of learning, researchers are increasingly looking at game creation as a prospective pedagogical tool in a range of learning context. Since Kafai's early work on game creation with young people (Kafai, 1995), there has been ever-increasing interest in the benefits of game-making. The pedagogic idea of learning by making games assumes that the construction of games helps learners to reformulate their understandings of the subject and express their personal ideas and feelings about both the subject of the game and the games constructed (Kafai, 2006). Game creation is a process where children participate as active designers to create new games either for learning purposes or for fun. This domain although new, has been

explored as a means of introducing children to learning such as computing concepts (Overmars, 2004; Repenning, 2010)teaching mathematics (Habgood, 2011; Kafai, 1998; Papert, 1993), and encouraging learners to develop their meta cognitive skills (Kafai, 1995; Robertson, 2006).

1.2.2 Game-making- digital versus non-digital

In previous research, several different kinds of game-making tools have been used, such as Gamestar Mechanic (Torres, 2009) and Scratch (Brennan & Resnick, 2012). Game-making activities can vary a lot and tools should be selected based on learning objectives and the skill levels of students. Game-making software offer ready to use tools which children can use to easily create objects, play themes and characters just by dragging and dropping GUI elements. Wizards and menus allow users to configure in-game events, including interactive conversations between the player and other characters. However, creating games without guided tools and visually appealing interfaces remains a challenging task for young children.

The design and development of games is creative teamwork, which is assumed to support reflective thinking and co-construction of knowledge (Roschelle et al., 2000). However, a review of existing literature revealed that the social aspect of game-making activities has been neglected. Collaborative game-making is mainly considered in relation to helping adult game makers, making games for commercial purposes, and designing for others. Collaborative game-making research has been very narrow and almost nil in the Indian context. (Earp et al, 2013). A need for robust

empirical research clearly exists, especially regarding the inherently social nature of game-making activities, with their multiple skills and roles. Hence, our study is focussed on design education and collaborative game creation to support non-digital brainstorming and design thinking for children in the age group 11-14 year old.

1.3 Study on collaborative game-making

We conducted threeseparate design workshops as part of this study with thirty children in each workshop in the age group 11-14 who volunteered for the study of design thinking at schools. Three different design problems were given to groups of children who participated in groups of two and for all three experiments children participated with new partners to avoid redundancy in partnership. The groups were a mix of same gender and mixed gender groups who participated to create new games as per the design problem.

Game design as a design problem offers a diverse variety of thinking strategies and design approaches to enable divergent thinking. Also, a game design problem can be solved in parts and later combinations make the final game. It encourages group participation as the task to ideate and produce a game is a big task and needs to be shared within the team members. Game design also gives more opportunity of combinations of different ideas in a group which may lack in other design problems. Figure 1 shows examples from design teams and their effort to design games for children living at a distance.

Figure 1 Samples fromdesign of game for children at remote places.

Design problems were given in form of a story to children and the design task and instructions were embedded in the story itself. The three different design problems were: 1) To redesign the game of Snakes and Ladders 2) To design games for a young visually impaired girl and 3) Design games for children in two different locations who can see each other but cannot play together. Children had to design games which can be played only through windows. We did not define a set of preconditions for children other than being able to commit to participating on the team. No training in design skills or design thinking was provided to children for these tasks as we were interested in investigating the natural behaviour of collaboration while working on a design problem to further design probes for thinking later. These probes are not discussed in this paper. A few samples from the participating design teams are shown below in figures 2, 3 and 4 and the findings are discussed in the next section.

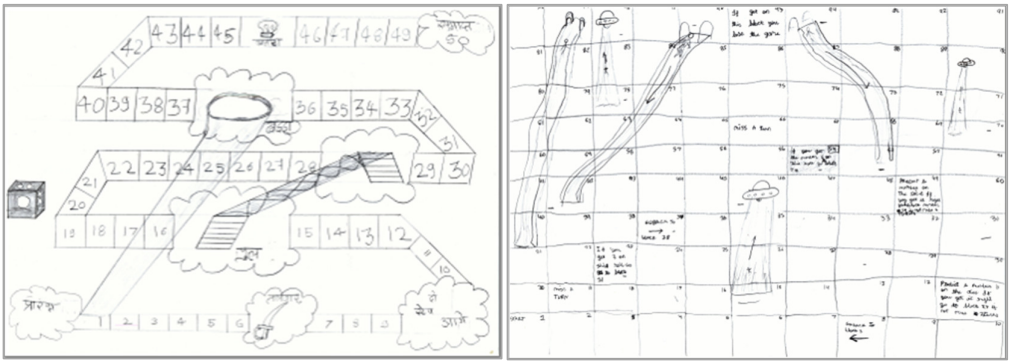

Figure 2 Samples from redesign of game of Snakes and Ladders.

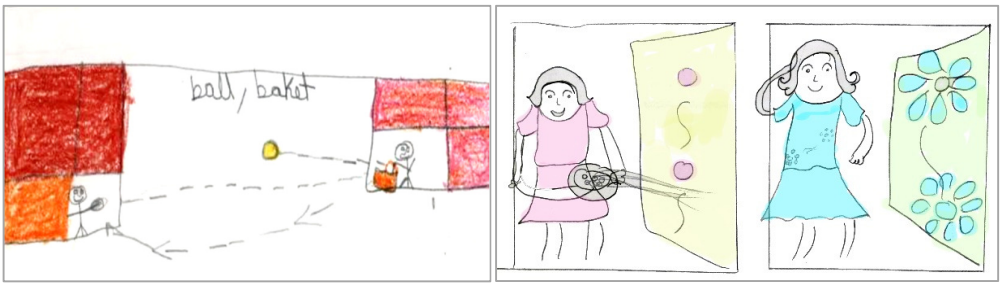

Figure 3 Samples from design of game for children at remote places.

Figure 4 Samples from design of game for a young girl with visual impairment. The first game is a sound based game and the second one is a touch and sense game which can be played with others.

1.4 Findings of the study

Analysis shows that broadly three types of problem solving approaches were followed by children. First was the approach of idea generation followed by execution. A few teams thought

of concepts while executing their ideas. And thirdly, some of the participants used a mix of both approaches. Along with the difference in thinking approaches, there was a difference in the thinking strategies used to solve the game design problem. The thinking strategies used were namely (explained here in detail with the redesign problem as an example but was common for all three design problems):

1. **Substitution i.e. using real life situations: Snakes were replaced by an electric shock, a sword, a pothole, a bomb. Ladders were replaced by a tunnel, a bridge, a river and a boat, a UFO.**
2. **Adaptation: borrowing rules from (a) existing game (b) other games: An obstacle to forcefully restart the game. More hurdles than bonus points. Hurdles like 'Miss a turn', 'Go back', etc.**
3. **Role play: Thinking of real life situations like man going up in the UFO, sliding down, jumping on a boat to move ahead or using a tunnel. The idea of covering the bridge to give it a real look as the participant says the player will fall otherwise.**
4. **Invention: thinking of a new ideain the absence of a precedence.**

The three design workshops conducted with children helped us in finding the primary factors which aid and hinder collaborative thinking in children with no exposure to design thinking. Factors which aid in positive collaboration ideation are as follows:

- ***Active listening and continuous participation aids collaboration. Alertness to actions, gestures and talks of***

team members relevant or irrelevant to the task, being responsive often ignited ideas which were turned into good concepts.

- ***Diversity in ideas enabled effective and positive collaboration leading to ideational flexibility.***
- ***Constantly recalling and reiterating the task within the group***
- ***Collaboration helped in understanding and interpretation of the task.***
- ***Embodiment and demonstration of (clear and unclear) thoughts proved to be a useful collaborative strategy. It supports communication and often leads to questioning and explaining which is good for developing ideas and convert them into concepts.***

Along with positive collaboration and its benefits on design thinking we also found a few factors which may hinder collaboration and ultimately effect design thinking. These are discussed below:

- ***Collaboration need not always lead to ideational flexibility.A team member may be dominating either by nature or may become one in the process of problem solving. This may lead to fixation in a group due to a single way of thinking.***

- ***Hesitation seemed to have effected elaboration and explanation of ideas while sharing with others. Young children especially the ones who thought were not good at 'drawing' hesitated to share their ideas or to explore them further. As a result thoughts are either not shared or not expressed confidently.***

- ***Disregarding responses and indifferent attitude towards each other in a group badly effects group bonding and eliminates interest in working towards a common goal. On the other hand, encouragement and proactive responses towards even a confused or hesitant member builds respect and teamwork.***

1.5 Conclusion

As the first exposure to formal creative problem solving, children showed potential for creative work and collaboration without any training. Most of the individuals initially struggled to understand the design task. But understanding and ideation improved when children formed groups and discussed each other's solutions. The study clearly shows game design as a design problem opens up a range of design elements that can be thought of for creative thinking such as visual design, problem solving, game play, product thinking and packaging. Children used multiple design strategies to solve the design task. A mix of skills and design approaches were also used to create new games. Collaboration helped in understanding of the task and ideation because of immediate feedback and suggestions which led to improvised and iterative thinking in groups. The findings of this study revealed many useful insights on collaborative game making and design ideation in children which reinforces research on learning through game-making is not limited to curriculum learning but is open to a wide range of domains such as design education and learning.

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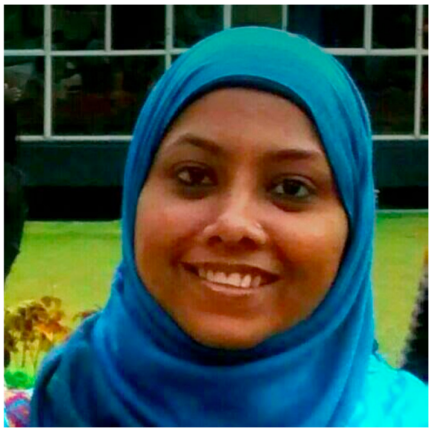
Anisha Malhotra



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After receiving her doctorate, Farhat worked for a short period at RV Educational Consortium (Bangalore) as a facilitator with D.Ed Teachers in a Pedagogical Content Knowledge Project where she was involved in the development of a source book for D.Ed teachers. Farhat is currently a faculty at CERTAD (Centre for Education, Research, Training and Development) in Srishti Institute of Art, Design and Technology, Bangalore. She teaches courses related to technology education at the undergraduate level. She is also involved in teaching in the PhD programs.

Design Education in Indian Schools: Initiatives and Challenges

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Key words: ***constructionism, creativity, Design and Technology Education, Indian schools, STEM education***

Introduction

More than five decades ago, constructivist thinkers like Dewey, Piaget, and Bruner discredited the transmission model of formal education system altering the role of learners from mere passive recipient of information to active constructors of knowledge. They stressed the need to engage students actively in the learning process. *Hands-on* learning or learning *by doing* was conceived as one of the ways in which students can get actively involved in their own learning process. Working with hands provides students opportunities to engage directly with materials, objects, or phenomena and help them build a better understanding of the subject matter.

While all these thinkers emphasized unanimously that creative learning involved learning *by doing*, the nature of 'doing' in 'learning by doing' entailed different kinds of 'doing' in different school subjects. It primarily involved students to take actions on their environment based on their inquiry and

in turn allowed them to construct personal meanings of the entire learning experience. As for example, 'doing' when learning abstract concepts might involve direct encounter of the phenomenon being studied, 'doing' in science education might involve 'hands-on' science wherein students get actively involved in the scientific process of inquiring, predicting, experimenting.

Seymour Papert went a step further and advocated that not just any action but actions of students that results in overt production of a 'public entity' would allow for real learning where students can monitor their own learning, through feedback from others on their constructions. Thus for Papert 'doing' involves more than just 'hands-on' learning and involve students to problem solve through tinkering, designing and construction. Papert termed his constructivist theory as 'Constructionism'. If as educators, we accept this to be true, our challenge thus remains to designing creative learning environments that allow students to engage in different kinds of 'doing' and 'sharing' and make meaning for themselves.

Creativity and Design Education

In countries such as USA and UK, Technology Education or Design and Technology Education (D&T) have been considered special in the school curriculum since these subjects are meant to foster creativity among all students (Lewis, 2005) by allowing them to 'design' and 'share'. Various D&T educators have identified the role of design problems in enhancing creative potential among students as these problems have the

characteristic of being open-ended. This provides students opportunities to engage in designerly activities in diverse ways and come up with multiple and divergent outcomes. Design problems which deals with the real world also give students opportunities to take risks and deal with uncertainty unlike problems in physics and mathematics which are well-structured, have single right answers and can be derived by following a logical step-by-step process.

Besides D&T deals with humans needs and wants. What if these needs are related to students' own needs/wants? Certainly it can then provide meaningful learning experiences to students by engaging them actively in their own learning process. In traditional classrooms where learning is not tied to students' own experiences and their needs with the content being taught, students often tend to find recourse to memorization and rote learning through textbooks.

It has been observed that while other forms of knowledge such as the sciences or the humanities are concerned with either describing or analysing the existing realities of the world, design is concerned with imagining and constructing new realties. Therefore the nature of design activity makes it more amenable to study creativity among those who design. Dorst and Cross (2001) argue that creativity can be recognized in every design project, even if creativity is not apparent in the form of a distinct creative output or event. It might be reflected in the evolution of a unique solution to the problem. Regarding creativity in the classroom, Shall cross (in Spend love 2005) suggests that creative outcomes could be of two kinds: creative outcomes that are merely new to the

learner (even if the outcome has existed before) or creative outcomes that are unique and have not existed before.

Why should design be taught to students when most people can engage in design in their daily life? Design is also something that has helped our ancestors to thrive and survive in severe living conditions. Even Archer (2005) and Cross (2006) suggest that design ability is possessed by everyone to some extent. It has also been shown that the complex skills of a professional engineer/designer are simply the development of abilities that we all have (Baynes, 1985).

It has been observed in most countries where design is taught at the school level that the teaching and learning of design are found to be challenging (Atkinson, 2009). Teachers struggle to help students acquire the knowledge and skills to design as well as have a better understanding of design. Therefore, what differentiates and makes school design challenging from everyday design is the fact that in case of the latter 'design' is hidden in the act of making while in school or any design profession, students/professionals need to dissociate design from making by drawing out their designed plan on paper or any external medium. This implies that although design is basic to all humans, it needs to be taught.

Status of Creativity and Design Education Indian Schools

The need to develop creativity among Indian students is still in its infancy stage in the educational policy documents (Madan, 2011). The National Curriculum Framework, India

(NCF, 2005: 46) recognizes the lack of opportunities in the classroom, which stimulate children to become creative and inventive, *"People today are faced with an increasingly fast-changing world where the most important skills are flexibility, innovation and creativity. These different imperatives have to be kept in mind in shaping science education."* It also claims that *"science education in India, even at its best, develops competence but does not encourage inventiveness and creativity"* (NCF, 2005: 49).

Despite the worldwide recognition and demand for creative thinking individuals in all works of life, Indian schools least prepare their students to enter the world of creative workplaces. Not to mention, the examination centred curricula and the over-reliance of teachers on textbooks have all contributed to the rituals of rote memorization of contents and facts by students. Although there are evidences of exemplary variations in the mainstream systems of schooling, they are rare and peripheral.

NCF (2005) posits several subjects in the curriculum which could foster creativity, such as arts and craft, science, literature and even social science. The framework envisages for a paradigm shift in the science curriculum and recommends for emphasizing on explorations and nurturing creativity and inventiveness through contextual activities, experiments and technological modules. The framework goes further ahead in recommending for the usage of non-formal channels such as project exhibitions and launch of large scale science and technology fair at different levels as local, district,

state and national for providing students a platform for developing and demonstrating their creative potentials.

While NCF also recommends the inclusion design based activities in schools. However, this inclusion is recommended merely to improve the quality of science education by supplementing verbal learning with hands-on science in order to improve and help students understand science concepts better. Design education is generally considered specialist education aimed at preparing future designers rather than educating the general population. It is taught in specialized institutes providing professional design education to students after K-12 or even higher education.

The NCF's recommendation of including hands-on approach to science education is getting widely acceptable in schools. This has also led to the development of several initiatives by the government and non-governmental organizations to integrate science with technology. For example, the Initiative for Research and Innovation in Science (IRIS) started by the Department of Science and Technology (DST) and Intel in 2006, organizes annual Fair which encourages students from classes 5 to 12, from both government and private schools to create and demonstrate innovative projects. The aim of such initiatives is to increase students' interest and temper in science and technology while developing a sense of curiosity and a spirit of innovation.

Initiatives to address creativity in schools

Interestingly in the last 5 years, there has been a spurt in the growth of STEM (an acronym for Science, Technology, Engineering and Mathematics) education in India, especially the inclusion of Robotics and computers based programs in secondary and higher secondary schools. What started out as summer camp training workshops and after school programs gained a lot of popularity in schools and among students and parents. In not much time, many private schools started considering STEM as an academic discipline and have already included it as a separate subject in their curriculum.

While private schools had already included STEM in their schools, the formal inclusion of robotics in government school began only in 2014 when the Department of State Educational Research and Training (DSERT) partnered with the Japanese company LS Creative Learnings Pvt. Ltd. Several initiatives are now being taken both at the government and private levels to promote STEM in schools. There is also a growing trend in companies coming up with new and innovative solutions to integrate STEM education in Indian schools. There are several other examples such as IBM working in collaboration with the NGO, Agastya International Foundation are aiming to improve the quality and access to STEM education for Indian rural and low income group students (Bhargava, 2014).

Similar in the line of IRIS, the Government of India recently launched the Rashtriya Avishkar Abhiyan (RAA), a framework that aims to nurture inquiry and creativity and scientific temper among students. In this program, the government

schools will be mentored by premier Degree Institutes like Indian Institute of Technology (IIT) / Indian Institute of Management (IIM) and other Central Universities and reputed organizations through innovative programs, student exchanges, exhibitions etc.

Although STEM education has the potential to engage students in designerly activities, the schools provide little scope for designing to students and the curricula seems best at preparing individuals who are passive recipients of technology rather than creators of new technologies. Also most of these introduced STEM programs are also seen as preparing students for competition at the state and national levels, encouraging a competitive learning environment in classrooms than a collaborative one.

Challenges and concerns

Interestingly the STEM education, at least in the urban areas, is increasingly getting influenced by a number of disruptive developments taking place in the world of technology. Some of these developments include the emergence and easy accessibility of low cost personal fabrication technologies and the international Maker Movement. The Maker Movement is steadily creeping into the Indian educational scenario influencing the STEM education. With the MIT media Lab from the Massachusetts Institute of Technology conducting a series of Design Innovation workshops in India, there has been an increasing growth in the number of informal learning and maker spaces like the Workbench Projects, Maker's Asylum, Arduino India, Makerspaces etc. These spaces have been

providing opportunities for inventors, designers, artists, engineers and students to come together, collaborate and share ideas. The web based social support and the affordability and easy accessibility of tools and technologies are beginning to create a culture of making with hands in out of school contexts. It is enabling adults and students alike to not just make things for themselves but also sell those things, thus challenging the traditional consumer culture of buying and using stuff.

Although the STEM education in India aims to provide a platform for students to develop skills like critical thinking, problem solving and decision making, it does so without any conceptual framework of either design or technology. There is no emphasis on design thinking or on the application of the design process to identify needs and wants and then create solutions. The recent influence of the robotics programs and the Maker Movement on STEM programs have actually laid more emphasis on tinkering and making and using computational thinking to come up with solutions. There is also a more emphasis on teaching production skills than on teaching knowledge and understanding about technology, cultural understanding about how products evolve and affect our choices, critical understanding and evaluation of designed products, the impact of designers' decisions on social, economic and ethical, perspectives or sustainability. Research studies on students' attitudes towards technology, across the globe (including India) have found students' strong association of technology with computers, electric and electronic equipment (Khunyakari, 2008; Jarvis and Rennie, 1998; Mehrotra, 2008; de Klerk Wolters, 1989). Thus there is

a fear that a lack of diversity in STEM activities and an inclusion of only computer and electronic based projects would actually reinforce these misconceptions among students leading them to consider technology as only hi-tech.

In other studies in the Indian context, elementary and middle school students who did not have a formal design and technology education in school, were found to strongly associate design and designing with art (but less with technology) and designers with artistic professions (Ara et al., 2013, 2011). These studies continue to suggest that if students consider design as something artistic, it would be difficult for them to evaluate their everyday products on design grounds. They might find it challenging to engage in authentic design activities. Thus understanding the nature of design and technology and identifying the ways in which designers work, will enable these students to engage and participate critically in any design developments and discussions, as well as make use of designed products and appraisal in a critical manner.

Future Directions

The disruptive changes are here to stay and will continue to affect our students' and our lives. It is therefore imperative that we remain cognizant of these changes and try to create a design and technology curriculum that provides students opportunities to design and create new technologies using modern fabrication technologies and tools; a curriculum that not only enables them to engage with the online social networking community but also identify their own needs and

the needs of others and understand the impact of their designed technologies on the social, cultural and economic spheres of their own lives and the lives of others.

STEM offers opportunities to integrate science, technology, engineering and mathematics. It also does have scope to develop design thinking among students. The STEM education today seems to have been introduced in haste in response to the advancing technological changes influencing the current educational scenarios. In order to create a curriculum which is appropriate and meaningful to students' lives today and also prepares them for tomorrow and which also enables them to grow into design and technologically literate individuals, a more mindful and committed exchanges need to happen among policy makers, curriculum developers, schools and teachers.

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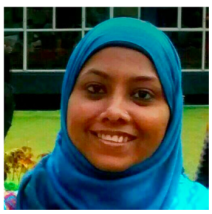

Farhat Ara

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Suggestions for Improvement of Activity Based Science Learning Approach in Upper Primary Science Textbooks and its Application in Himachal Pradesh DIET training.

Dr. Sachin Datt, Pratham Education Foundation, Delhi

Abstract

In 2005, government of India established the National Curriculum Framework (NCF). Objective of this framework was to re-structure the primary and secondary school curriculum in India. Apart from looking into age appropriateness of content, NCF 2005 also described in detail the educational philosophy that should guide each core subject of liberal arts education namely Science, Mathematics, Social Science, Language and Art. With the help of philosophical cues presented in NCF 2005, in subsequent years new school textbooks were published. This article is a critique of the "activity" based science learning approach as described in upper primary Science textbooks. We also propose a modification in the "activity" approach of conducting a scientific experiment. The modified approach for conducting science activities was accepted by teachers at DIET, Himachal Pradesh and Pratham Education Foundation provided training to government school science teachers in Himachal with this new modified approach for conducting science based activities in year 2014. The modified approach for conducting a science experiment is currently being used by

upper primary science teachers in Himachal in their regular classroom sessions.

Activity based science learning

Post NCF 2005, new science textbooks have been designed by keeping in mind learning by doing aspect of science. Each chapter in upper primary science textbook is filled with interesting activities that help students explore the physical world around them. The main idea behind this belief is inspired from constructivist approach to learning where knowledge is gained by student through her own individual exploration. The student arrives at the answers through their own observation of the world around them rather than someone telling them pre-defined facts (Glasersfeld, 1989). The background of this approach is firmly rooted in NCF 2005 which emphasises on making students aware of the method of science rather than on specific topic. The basic steps of scientific method as described in NCF 2005 are Observation, Looking for regularities and patterns, Making Hypothesis, devising qualitative or mathematical models for explanation, deducing consequences, verification and falsification of theories through experiments and arriving at principles, theories and laws governing the natural world (NCERT, National Curriculum Framework, 2005). We see this method of science being reflected to some extent in the way activities are described in upper primary science textbook. For example in class 7 science textbook, the first activity in chapter on "acids and base" starts with steps of conducting an experiment in which different solutions are applied on a litmus paper to observe any change in colour of the paper. The

observations are recorded in form of a table and then some questions are asked about data in observation table to help student lead to some inference (NCERT, Science Textbook for class 7, 2007). The steps in the process can be described as: a) General introduction b) Procedure c) Observation d) Probing questions and e) Inference. Similar pattern is observed in subsequent activities.

Objections to existing activity approach in upper primary science textbook and suggestions for its improvement.

We question whether it is right to start an activity directly with procedure. According to the literature on scientific method, the first step with which a scientific inquiry begins is by a Leading Question. The significance of asking a question in beginning has been stressed by John Dewey:

Inquiry and questioning, up to a certain point, are synonymous terms. We inquire when we question and we inquire when we seek for whatever will provide an answer to question asked. It is of the very nature of the indeterminate situation which evokes inquiry to be questionable (Dewey, 1955).

It is self-evident that when we ask a student to start assembling the raw material for an activity without any question, the child will simply be doing the activity mechanically without thinking because the child has no idea why the activity is being done. Even while making the observation table after the activity, the child is simply following procedures laid down by the book. The only point

when the child is required to think is when she is asked question based on the observation table.

Compare this process with the actual process of scientific method which begins by a question.

The above mentioned activity of identifying acids and basis can start by asking a question such as "How do we know whether a substance is Acid, Base or Neutral?" When a question is asked, the students immediately start thinking of some possible answers from their previous experience. Maybe the students have seen or heard that acids can burn or cause damage to a thing. Prior knowledge of the students get activated by a leading question. When the students actually do the activity after knowing the question, they have the new results available to compare with their previous knowledge completing the cycle of forming new knowledge on existing previous knowledge as described in constructivist approach to learning. Apart from the leading question, another thing that can activate previous knowledge of students is mind map. Mind map is a tool that helps students recall all the information that they already have about the subject in the form of keywords. The combination of mind map and leading question is the first necessary step in constructivist approach to learning for making student aware of their existing or previous knowledge of the topic (Harkirat S. Dhindsa, 2010).

Second objection to the existing approach of activity section in science textbook is the absence of element of Hypothesis formation. The whole activity ends up in making an inference. This gives the false impression that drawing inferences from

observed data is the end result or theory. But this is far from truth in scientific method. Inference is just the first impression of some observed regularity in the world. This inference drawn from initial data may or may not be true because we have generalised based on observing only a few samples. An inference has to be tested by making a prediction.

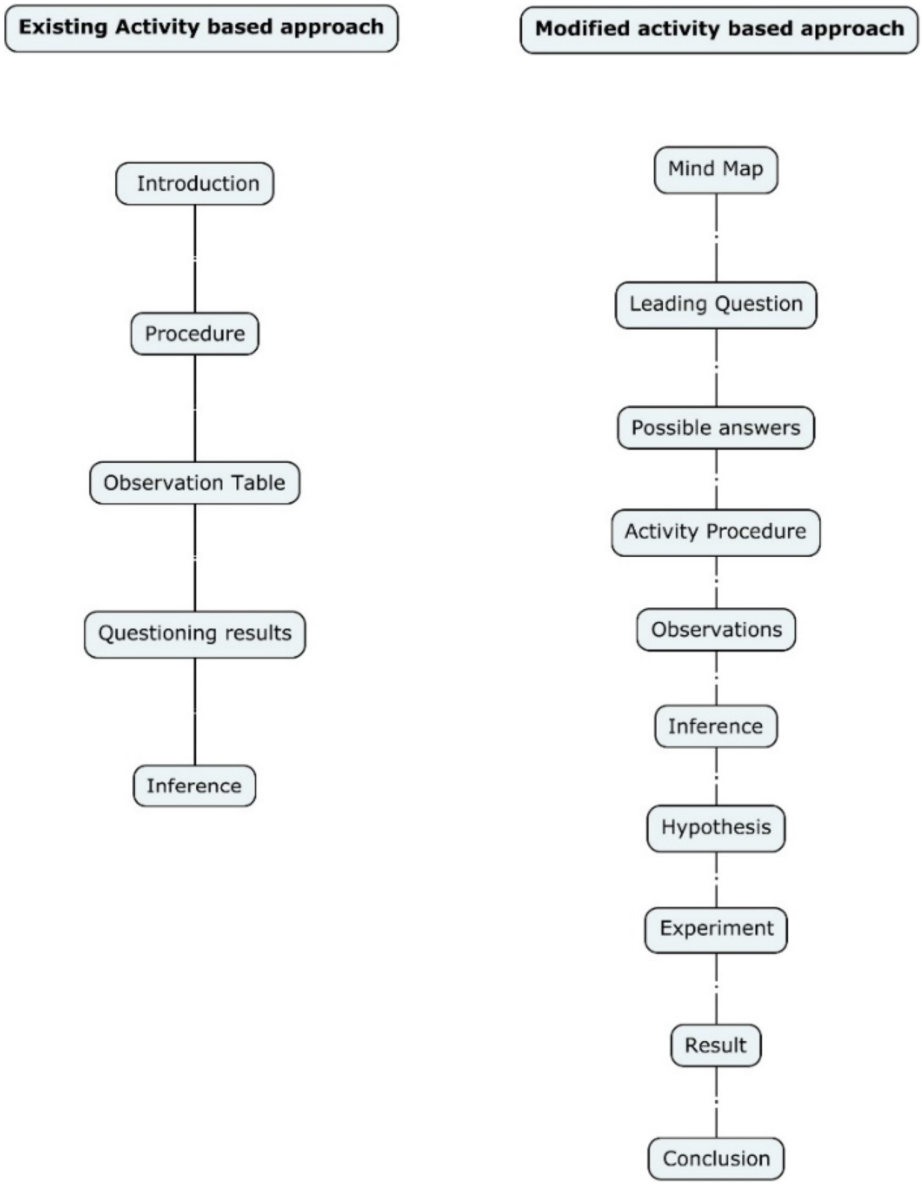

Figure 1: Comparison between existing and modified approach to activity based science learning

A statement of prediction to test an inference is what we call a hypothesis. It will most often contain an "if…then…" statement,, such as, "If I put a thermometer in a mitten and the temperature stays the same, then perhaps the mitten did not produce heat." Hypothesis is not mere guess or hunch, it is a based on experience and previous observations (Richard Konicek-Moran, 2013). And then we do a second activity which is specifically called as an Experiment designed to test a hypothesis and inference. The hypothesis in case of acid/base testing activity will be something like "Blue litmus paper dipped in any fruit will turn Red" This statement is essentially a prediction. An experiment is set up to prove this hypothesis. Results of experiment automatically set stage for debate and discussion and modification of hypothesis for further experiments. A flowchart of the modified process comparing it with existing activity process in science textbook is given in figure 1.

Some parts of the basic flow of the modified approach to activity based science learning are adopted from chapter 4 of doctoral thesis of sachin Datt (Sachin Datt, 2013).

Objections to the modified activity method

One of the objections to the modified approach to conducting scientific activities can be that it is lengthy and testing a hypothesis may take time. It is true, not all hypotheses can be tested in classroom set up nor in given time frame and availability of material. But Hypothesis can definitely be formulated based on available inferences. So even if a hypothesis is not tested immediately, that should not stop one

from formulating one. For example it was inferred based on empirical observations before 1st century AD that the Earth is round. What could be a possible hypothesis that emerges from this inference? Consider the following hypothesis; "If a ship sailed in westward direction, then, after some uncertain amount of time, the ship will arrive at the same location where it started from eastward direction." Setting up an experiment to prove this hypothesis not only requires intellectual skills but most importantly, courage. This hypothesis was proven beyond doubt many centuries later when Ferdinand Magellan's crew successfully circumnavigated the earth is 1522 (Asimov, 2015). Magellan himself died during the voyage but proved the hypothesis and firmly established the theory that earth is indeed round. Would anyone even have thought of going around the Earth if no one had formulated the hypothesis that leaving from one place will result in coming back to the same place? Hypothesis provides direction for future search. But most experiments if not all in upper primary science textbook are such that their hypothesis is practically testable within the limits of a classroom setup.

The next objection to the modified approach to doing science activities could be its length. A teacher has to cover a large amount of curriculum. Can she complete the course with such lengthy activities? This objection can be countered by asking whether quantity is important or quality. It may be better to complete less number of topics, but if they are used to establish firmly the method of science in minds of students then, why covering all volume of topics is necessary? The large volume of concepts is the main cause why students are forced to rot memorise predefined answers in order to

complete the syllabus. Do the educators want to promote rot-memorisation or scientific method? If the real intent is to promote scientific method, then number of topics in science syllabus has to be reduced and focus has to be on performing a scientific activity.

Application

30 DIET master trainers were trained by Pratham Education Foundation in using this modified method of activity based science learning. The master trainers then conducted training sessions in their respective districts to train school teachers in using this method. Prior to training, the new method was accepted by DIET management in a joint workshop that comprised of various organisations, senior Himachal teachers, and Himachal DIET management in April 2014 (Sharma, 2014). The acceptance of this approach to science learning by himachal state government is sufficient if not necessary proof for its validity. Validity of the activity based science learning approach may be placed under Pragmatist theory of truth validation. There are three main meta theories regarding acceptance and validation of truth of a proposition; namely correspondence theory of truth, coherence theory of truth and pragmatist theory of truth (Glanzberg, 2014). According to correspondence theory of truth, a proposition relates to some actual reality in the physical world which is independent of what individual humans think about it. A proposition states an objective reality which is universally true. Contrast this with pragmatist theory of Truth which believes that a proposition is accepted as true according to its application and usefulness of purpose for which it is employed (Glanzberg, 2014). We

cannot know whether a proposition defines any objective reality or not, but we can certainly know how useful that proposition is for a group of people involved. The mutual acceptance of a proposition by a community or group of people is enough to validate the truth value of a proposition in pragmatic world view. Since the method of conducting scientific activity that we propose was accepted by the community of DIET teachers, we can say that our proposition attains validity within the boundary of DIET Himachal program. However the methodology can be tested and applied in any education setup, but it will depend upon individual institutes and organisations to pass it as an acceptable method of teaching activity based science after mutual consent between various stakeholders.

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Sachin Datt

Proposal on introducing 'Design and Innovation' in school curriculum on behalf of 'participants' of the above meet held at the Industrial Design Centre (IDC), Indian Institute of Technology Bombay

Introduction:

'Design and Innovation' learning for India:

- ***Design in the context of a country like India can play a very significant role in finding appropriate solutions to its problems.***
- ***Design by its own nature is creative, collaborative, multidisciplinary and is inclusive of many other fields.***
- ***The methodology of how design is learnt by hands on experience can make a difference to the process of learning different subjects in schools.***
- ***Design process involves knowledge gathering, analysis, discovery, and conceptualisation resulting in a problem solving activity and this in turn leads to experiential learning.***
- ***Design can bring sensitivity and awareness to Indian 'Arts, Crafts, Culture and Environment'.***
- ***Design can help students develop values, attitudes, sensorial skills and critical thinking.***
- ***Design can make the students realize their creative and innovative potentials.***
- ***Design and Innovation can make a big difference to the expected growth of creative needs in our country.***

India – mapping ahead:

Educational Meet:

A National Meet on introducing 'Design and Innovation' in school curriculum was held in Mumbai, India from 6th and 7th of February 2009, hosted by the Industrial Design Centre (IDC), at the Indian Institute of Technology (IIT) Bombay, Mumbai.

This meet was meant to discuss and formulate guidelines for introducing 'Design and Innovation' as part of the school curriculum in the context of India.

Aim:

To come out with a set of recommendations with regard to curriculum, methods of learning design and modalities for implementing this proposal.
To prepare the groundwork for a white paper on this subject.

Output:

A set of recommendations to be presented to the Ministry of Human Resources and Development + to the various directorates of school education + to the knowledge commission.

Participants:

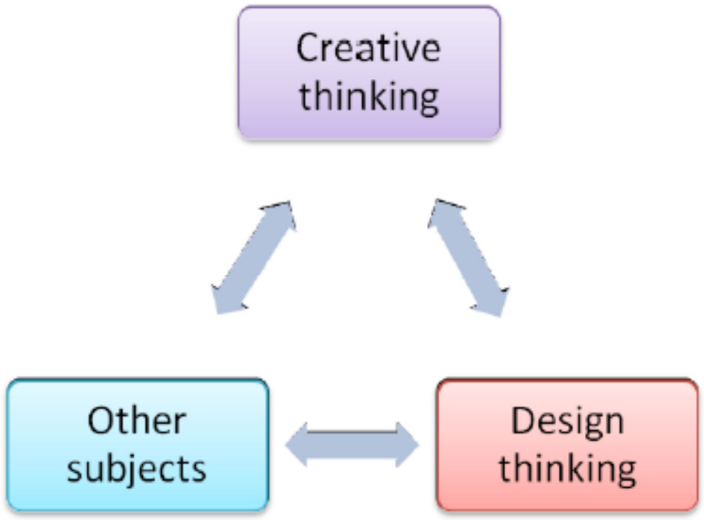
Faculty members in charge of the academic programs from design related schools in India + decision makers in different school directorates + others working in the field of Children's learning environment.

Number of participants: 41

Group 1–

Curriculum/Content:

Group 1 – Content



Philosophy

- **Design thinking should be integrated into the school curriculum at different stages which enables students developing values, attitudes, sensorial skills and critical thinking. The intention is to offer avenues that are creative and innovative and integrate conventional fragmentation.**

- **At the earlier stages (class 1 to 5) design thinking could be**

integrated in all the curricular areas. This grows in intensity as the understanding of the student increases and the ability to solve complex problems increases (class 6 to 10).

Goals and Objectives (class 6 to 10)

Introduce basic design thinking and skills.

- **To enable development of abilities needed to deal with unconventional situations that require creative, unique and multiple concepts.**

- **Develop sensitivity to the natural and manmade product and communication environments and relate the learning to real life situations.**

- **To emphasize a certain playfulness within the learning framework.**

- **To foster intuition, empathy and emotional faculty in the students.**

Contents

Class 1 to 5:

- **Observation of the immediate environment: body, clothing, food, class, school, home, family and society etc. Interpretation of the above points in visual, verbal and performing forms.**

- **Exposure through workshops, demonstrations, and visits to traditional art forms and vocations.**

Contents

Class 6 to 8:

- **Observation and understanding elements of Nature and their interdependences.**

- **Visual and verbal narration and presentations using collages, story boards and other methods.**

- **Problem identification from immediate environment, experiencing and understanding the product and user relationships.**

- **How things are made: exposure to elementary concepts like parts of a products, components of a system etc.**

- **The complexity of this exposure will increase gradually as the students' progress from class 6 to class 8.**

- **Introducing the concept of object and form affordances.**

- **Creation based on environmental principles.**

Contents

Class 9 to 10:

- **Design Insight: Case studies, stories of innovators (Indian and foreign).**

- **History of design and industrialization.**

- **Landmark products and innovations.**

- **Design project.**

Recommendations

- **20 to 25% time given to design in the current curriculum should be integrated with the core curriculum.**

- **Methods of teaching should improve: Remove the mental block of Art and Craft from Design thinking.**

- **Design and Creative thinking should be included in teacher education program.**

- **Creation of resource material for design teachers.**

Group 2 – Methods of learning in schools:

Group 2 – Methods of learning design

Philosophy

Design as a method for teaching? Or Teaching Design as a subject?

Design should be used as a medium to teach subjects.

Design and Innovation can be introduced as an alternate subject in 11th and 12th.

Learning Environment Set-up

1. *Teaching*

2.Teachers, staff, education inspectors

3. Learning Resources

4. Parents

What we envision

A Holistic teaching method Teaching

Current scenario	**We can make it better**
! Text book lesson	**! Projects** **-workout process of doing a project** **! Hands-on method** **! Do and learn – experiential method** **- Vigyan Ashram method**
! Subj. taught in isolation	**! Theme based learning**
! Rote learning	**! Problem solving method**
! School learning	**! Non-integrated approach**

Teaching

Current scenario	**We can make it better**
! No teacher-child	**! Child-teacher friendly interaction**
! No child-child interaction	**! Collaborative group learning** **! Games and Ice-breakers** **! Trips and outings**

How can we make it happen?

Current scenario	We can make it better
! Time table model	! Module model ! not teaching subjects in isolation club sessions ! can it be weeklong module ?

Teachers, staff, education inspectors

Current scenario	We can make it better
! Teacher has no power	! Empowering teachers – preparing new teachers - training senior teachers
! Domestic/ Admin. staff	! Encourage interaction with subj. teachers - impart appropriate training
! Edu. inspectors role	! Provide set of recommendation
! Teacher teaching alone	! Art Student helping teachers ! Professionals giving sp. talks

Teaching, Staff

Current scenario	We can make it better
! No interaction between Teachers,	! Meetings/Seminars/Festivals/workshops
Staff and other	! Provide a meeting ground for members of the interaction between various institution concerned people ! Balvividha / Shikshakvividha (State level, city level, village level)

Learning Resources

! ***Library***

! Teaching aids

! Resource sharing facility

! Role of media

- Documentation of methods used

- Broadcasted & published

- e-learning and online resources to be developed

! Visits to museums etc.

! Collaboration between professionals, local crafts people etc.

Parents

! ***Getting active involvement from parents in edu. matters***

! Orientation sessions for parents

! Child – parent interaction

Group 3 – Implementing 'Design and Innovation' in schools:

Group 3 – Implementing 'Design and Innovation' in schools

Concerns With regard to implementation we have certain concerns.

Concern 1: What is the subject to be called? Terms used before may carry past baggage and defeat the aim.

Recommendation 1: Call it Design & Innovation or D & I. This links up with National Knowledge Commission's concern to enhance capacities for innovation.

Concern 2: Design is not widely understood to be an approach to learning. It is more commonly seen as a training in various techniques that make objects pleasing to the eye.

Recommendation 2: Through sustained advocacy, draw attention to the fact that design uses a methodology for learning through questioning and hands-on experience, which can be mapped onto all the subjects offered in the school.

When we suggest implementing a curriculum in design in schools, we are speaking about creating scope for children:

. to think critically

. to investigate and make connections

. to innovate

Concern 3: There is enough of a burden of learning as it is, introducing one more subject may be perceived as adding to the difficulties of children and teachers and rejected.

Recommendation 3: We recommend integrating design within the various courses of the existing curriculum throughout school and offering it as a specific subject only in 10th, 11th and 12th stds.

Examples of such integration of design in the 1st to 9th stds:

. In Art, students may do a design project of conceiving the sets and costumes for a play being studied in Literature.

. the Geography class may call for making large maps on the ground and other exercises requiring thinking in three dimensional space.

. students of Marathi language may bring out a school magazine, giving them experience in graphic design and print production

Concern 4: With such a crowded timetable, what are the slots we can enter in the higher grades ?

Recommendation 4: Apart from bringing design into the teaching of all subjects, it is possible to work through the slots of Work Experience (formerly SUPW) of 4 periods plus 2 periods of Drawing, totaling 3 hours a week all told.

Allotting these to D & I would be in keeping with the two subjects themselves and result in better use of this time, which may be wasted in some schools for lack of adequate resources.

Concern 5: Design is not seen as part of education, but as an adjunct, used to make a dull textbook look happy or a drab school building more colourful. How can we change the status of design and designers within the field of education?

Recommendation 5: That good design be integrated into schooling and the classroom in every possible way. This will be the best form of advocacy for design education, as the outcomes will be selfevident within the system.

The entire built environment of a school (labs, libraries, dining hall), the textbooks and objects they use, the plants and natural environment around the school, all should be perceived as design issues. More significantly, these should be seen as issues to be approached through iterations of a process of thinking that comes from the discipline of design.

Concern 6: How is the idea to be diffused into the system?

Recommendation 6: Advocacy has to be done at many levels. Some of the places identified:

. CBSE and other boards such as ICSE, IGCSE etc. who do evaluation and certification.

. state government directorates, SCERTs and state exam boards,authorities of networks of schools such as the Kendriya Vidyalaya Samiti and Navodaya Vidyalaya Samiti, Delhi Public School, Dayanand Anglo-Vedic trust and others.

. National Council for Teacher Education(NCTE) of Govt of India, who set norms for teacher education courses and recognition of teacher education institutions.

. entry into in-service trainings of teachers in networks like KVS Teaching Learning Material (TLM) programme of SSA & DPEP are another place to dock on.

Concern 7: Are there models for inducting radically new approaches into a system, that have proved to be effective?

Recommendation 7: Example of English Language Training (ELT) programme which emphasised communication and discarded traditional training in grammar, spelling and vocabulary, now successfully integrated into system. We could adopt it for practical reasons.

The ELT pattern was:

three months training for 100 master trainers they train 3 resource persons each for 1 month, form teams. teams of 3 of them train 50 teachers for 1 month in holidays.

teachers implement programme in classroom

next vacation, they meet again for 1 month , drawing on their classroom experiences to take the experience further.

Concern 8 : India is a diverse country. We would like to see an education that is more local, more relevant and contextual than what is obtained at present.

Recommendation 8: The design process approach, when internalised, may help to sustain localisation in education. Some advantages: schooling can be local, autonomous (not one type fits all) it can be made relevant to the future lives of students teachers feel empowered and can enjoy their role parents and local people can enter as resource persons Experiences show that schools structuring their own timetable for the first 9 years can successfully prepare for board exams in the 10th year. Such students have repeatedly shown that a year of work is sufficient to tackle the board exams.

Concern 9 : How do we create wider social recognition for Design & Innovation ?

Recommendation 9 : Encourage industry, philanthropic trusts as well as government organisations to institute awards for outstanding D & I projects, scholarships of students from disadvantaged groups.

These are the recommendations in summary form:

- **Design & Innovation is a learning strategy where "learning to think and innovate " is the focus**
- **It can be integrated into different subjects, already part of the school syllabus.**
- **We need to work out collaborations with a range of agencies to implement D& I.**
- **Set out to develop and test a training cycle with one collaborating school system to develop the process of implementing D & I.**

Participants in different groups:

Group 1 – Content

Participants

Sudhakar nadkarni, Immanuel suresh ,Chakradhar saswade,Jyotsna tiwari ,R Sandesh, Yogesh kulkarni, Kris kumar ,Raja Mohanaty, Sachin datt

Group 2 – Methods of learning design

Participants

A. G. Rao, Anand J.Dev ,Madhuri Naik,Dolly Biswas ,Vidya Joshi ,Meenal Joshi, Santhosh Kshirsagar,Sherline Pimenta

Group 3 Implementing Design in Schools,

Participants

Anirudh Natuu, Chandita Mukherjee,Neha Gautam,Nina Sabnani, Prasad P Bokil,Priya Srinivasan, Ravi Poovaiah, V K Agarwal,

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14 Prof. Anirudha Joshi, Faculty, IDC, IIT Bombay

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19 Prof. R. Sandesh, Faculty, IDC, IIT Bombay

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21 Prasad P Bokil, Ph D Student, IDC, IIT Bombay

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28 Jyoti Francis, Managing Executive, Navnirmiti, Mumbai

29 K. P. Vijay Kumar Director- Engineering,Texol, Pune + on Board, Vigyan Ashram, Pabal

30 Yogesh Kulkarni, Director,Vigyan Ashram, Pabal

31 Prof S Nadkarni, Sr. Design Faculty member, Mumbai

32 Dr.Pascal Chazot, Principal,Mahatma Gandhi School, Ahmedabad

33 Priya Srinivasan, Pomegranate workshops, Mumbai

34 Narayan Parasuram, Creative Director, Karadi Tales, Mumbai

35 Miss Dolly Biswas, HOD,Commercial Arts, B.D. Somani Institute of

Art and Fashion Technology< Mumbai

36 Dr. Jyotsna Tiwari , Incharge – arts curriculum, NCERT, N Delhi

37 Prof. K L Kumar, Head, Faculty, University of Botswana, Botswana

38 Neha Gautam, Faculty, Pearl Academy, N Delhi

39 Bakul Ayanji, Managing Executive, Navnirmiti, Mumbai

40 Purushottam Tripathi, Program Co-ordinator, Navnirmiti, Mumbai

41 Dr. V. K. Agrawal, Director,Zonal Institute of Education and Training, Kendriya Vidyalaya Sangathan, Mumbai

Please make your comment/suggestions/remarks/recommendations and send to:

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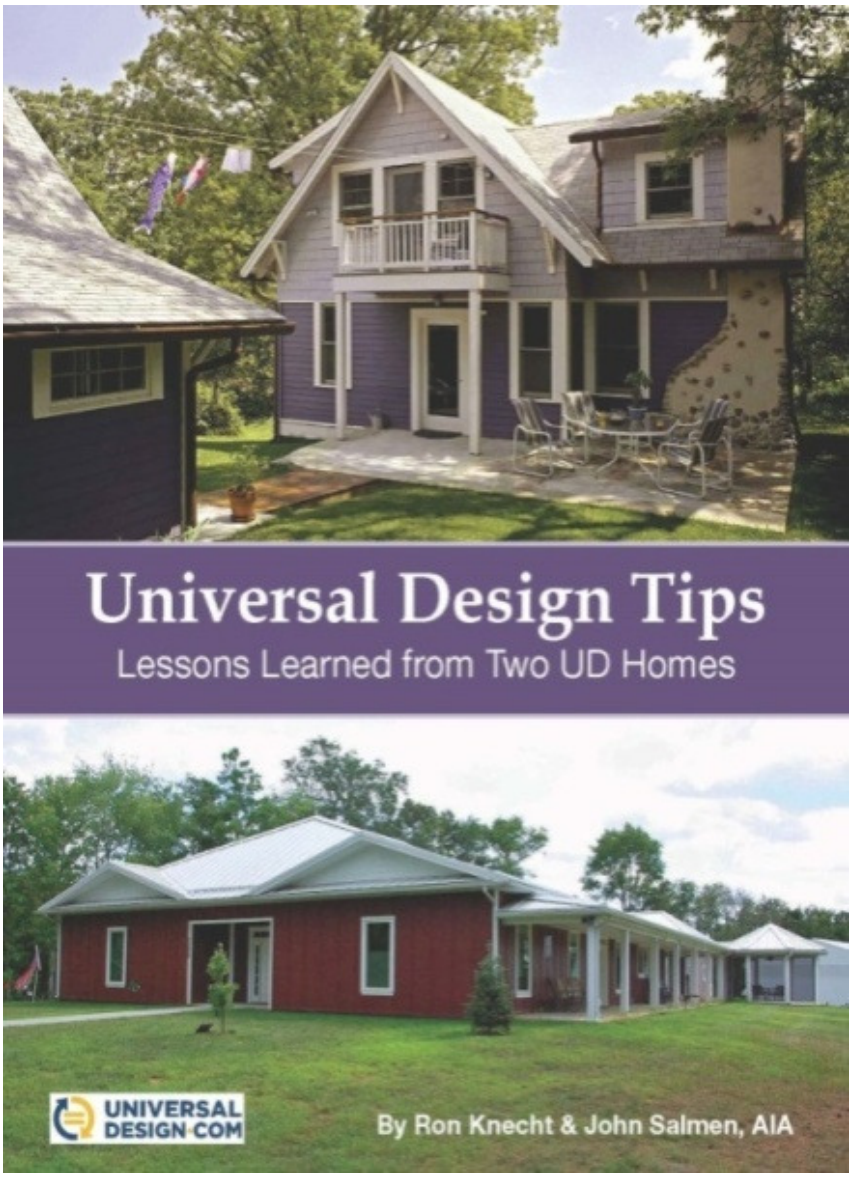
New Books:

A New eBook from UniversalDesign.com



Universal Design Tips: Lessons Learned from Two UD homes
This new electronic book from UniversalDesign.com is filled with tips and ideas that will help guide anyone through the process of designing and constructing their own Universally Designed home. The book was co-authored by John Salmen, AIA, the publisher of *Universal Design News* and founder of

UniversalDesign.com, and Ron Knecht, whose durable, energy efficient Universally Designed house was featured in the January 2012 issueof*Universal Design News.*

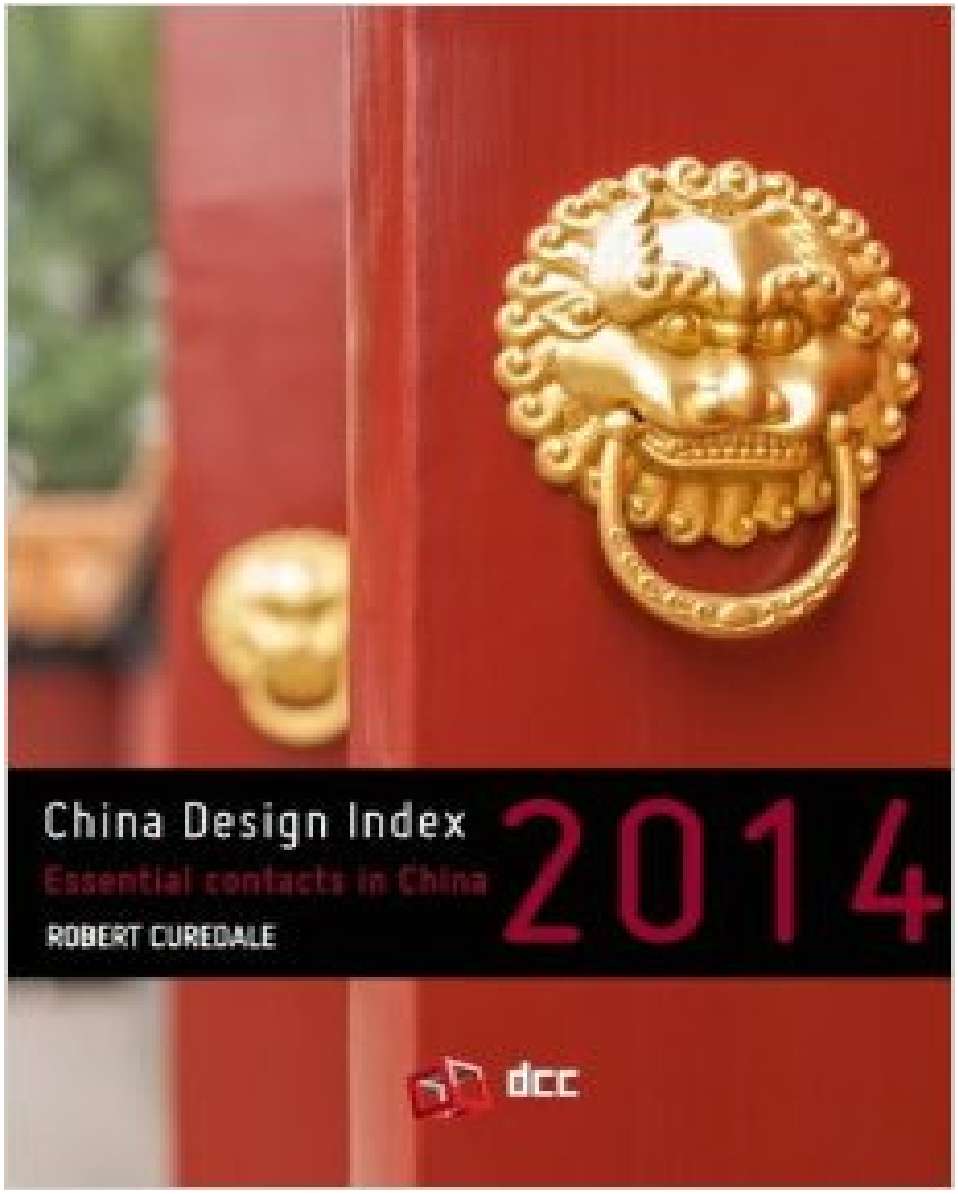
The first section of the book deals with the planning process, providing insight on how to choose a location for the house, consider activities of daily living during planning, best use various types of design professionals, finalize a floor plan and develop a building schedule.

The rest of the book is organized according to different areas or elements of the home (i.e. exterior doors, bathing, and kitchen counters, just to name a few.) Whether designing a whole house or simply remodeling one area, *Universal Design Tips* makes it easy to quickly refer to the relevant section and find valuable tips that ensure success. Each of these sections includes design tips, photos and important lessons that the two authors learned through their personal projects.

John Salmen has been working in the field of accessible architecture and Universal Design for over 30 years, and he put this expertise to good use when remodeling a historic property to create the Universally Designed house he and his wife hope to live in for many years. Salmen's "Home for the Next 50 Years" has been featured in various media outlets: including *The Washington Post*, *Fine Homebuilding*, AARP's television show *Inside E Street* and the book *The Accessible Home: Designing for All Ages and Abilities*. Now, readers will be able to explore Salmen's home in even greater detail and apply his experience to their own Universally Designed home projects.

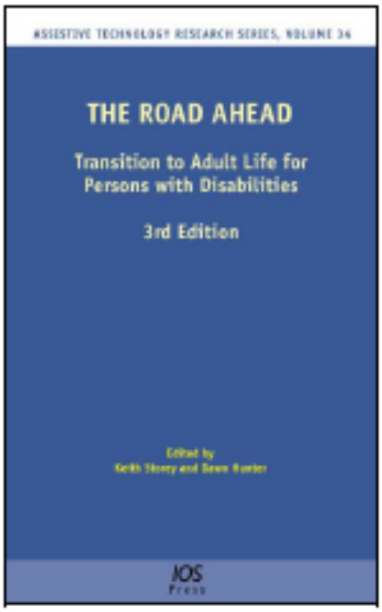
Ron Knecht's experience with Universal Design started after his wife of 46 years became ill with cancer. As her health worsened, Knecht learned first-hand the importance of accessibility for maintaining independence, safety and one's quality of life. Before Knecht's wife passed away, she extracted a promise from him that he would move to a Universally Designed house located closer to their daughter. Knecht was underwhelmed by both the houses that he saw on the market and the UD house plans that he found online; he realized that he would have to plan and build a custom house in order to fulfill his promise.

China Design Index 2014



China Design Index 2014: The essential directory of contacts for designers Paperback – February 1, 2014 by Robert A. Curedale (Author)

The Road Ahead, Transition to Adult Life for Persons with Disabilities



The Road Ahead

Transition to Adult Life for Persons with Disabilities

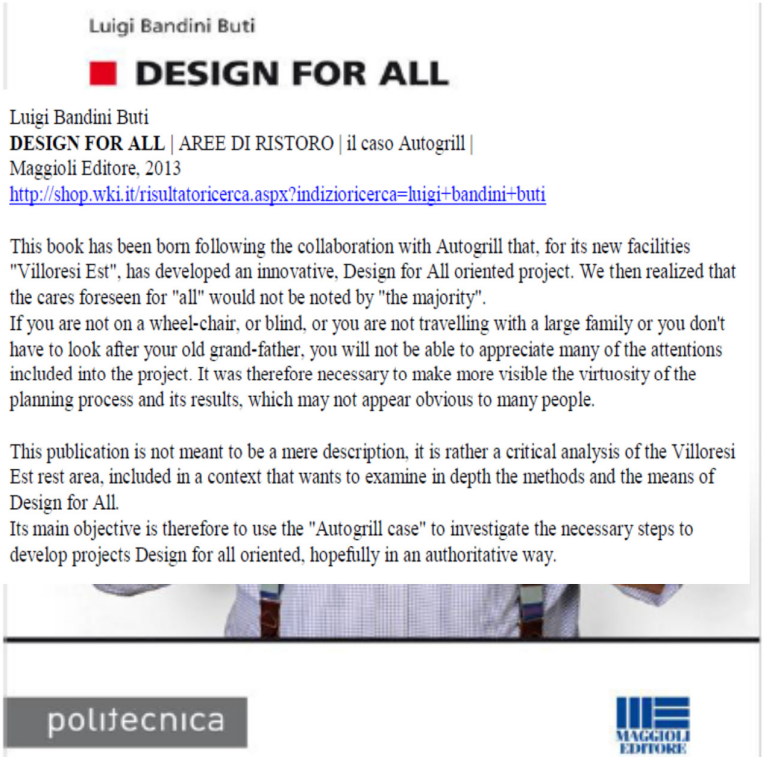
Volume 34 Assistive Technology Research Series
Editors: Storey, K., Hunter, D.
December 2013, 318 pp., hardcover (revised 3rd edition)
ISBN 978-1-61499-312-4 (print)
ISBN 978-1-61499-313-1 (online)
Price: €69 / US$100 / £59

Successful transition from school to adult life has always been difficult for people with disabilities, especially in the area of employment. The vast majority of people with disabilities are either unemployed or underemployed with low wages and few benefits, and many governments are struggling to find a way of providing employment and benefits to people with disabilities without creating disincentives to work.

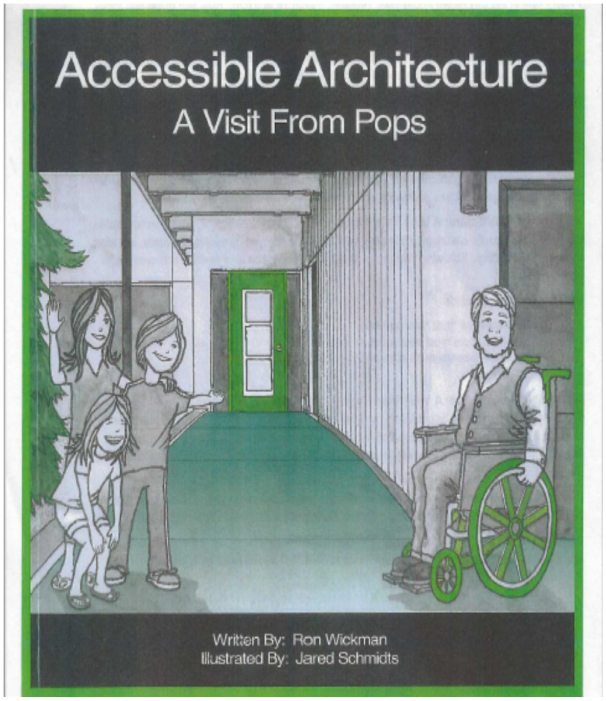
This book provides strategies and ideas for improving the lives of people with disabilities, exploring new ways of enabling a successful transition to an integrated adult working life by providing effective instruction and support. Following an introduction which outlines the importance of transition services and meaningful outcomes, topics covered in the remaining chapters include: person centered transition planning; enhancing competence and independence; employment assessment and career development; collaboration between agencies for a seamless transition; independent living and supported living; and community functioning skills.

The book will be of interest to all those who work with transition age students as well as those who work with adults with disabilities and want to enable them to have the best life possible. To paraphrase Helen Keller: "People with disabilities not only need to be given lives, they need to be given lives worth living."

Design for ALL, Aree DI Ristoro



Accessible Architecture



Edmonton Architect publishes - Adult Children's Book—Accessible Architecture: A Visit From Pops.

Edmonton Architect Ron Wickman launches his first book titled: ***Accessible Architecture: A Visit From Pops*** at the City Room in City Hall, Tuesday, March 18 at 6 p.m. Ron, son of the late Percy Wickman, MLA Edmonton-Rutherford 1989-2001, is a story written on the focus of Percy and his 3 grandchildren. Ron is best known for his accessible design. His most recent endeavor published by Gemma B. Publishing draws on this knowledge. Edmonton draughtsman Jared Schmidts illustrates with wit and precision the need for a house to be visitable by everyone.

As a child, Ron Wickman learned firsthand about the need for accessibility. His father became paraplegic after being injured by an industrial accident. Ron wheeled his father into many inaccessible places. A longtime Edmonton City Councilor Percy Wickman advocated for people with disabilities throughout his life.

Ron Wickman studied architecture in Edmonton and in Halifax, Nova Scotia, specializing in barrier-free design, designing houses and public spaces that were both beautiful and accessible.

Accessible Architecture: A Visit From Pops—is an adult children's book, which demonstrates the three principles for ensuring a house can be visited and enjoyed by everyone equally, including those with a disability. Following Wickman's design and renovation also enables homeowners to age in place.

Visitability principles include

- the front entrance must have no steps;
- all main floor doors must be at least 36" wide
- an accessible washroom must be on the entrance floor.

Accessible Architecture: A Visit From Pops, by Ron Wickman, illustrated by Jared Schmidts and edited by Sarah Yates, is published by Gemma B. Publishing, a Winnipeg-based publisher. Gemma B. Publishing creates heroes and heroines living with a disability, in both fiction and non-fiction. The book will be launched at Edmonton City Hall, March 18 at 6 p.m. and available later at Audrey's Books in Edmonton.

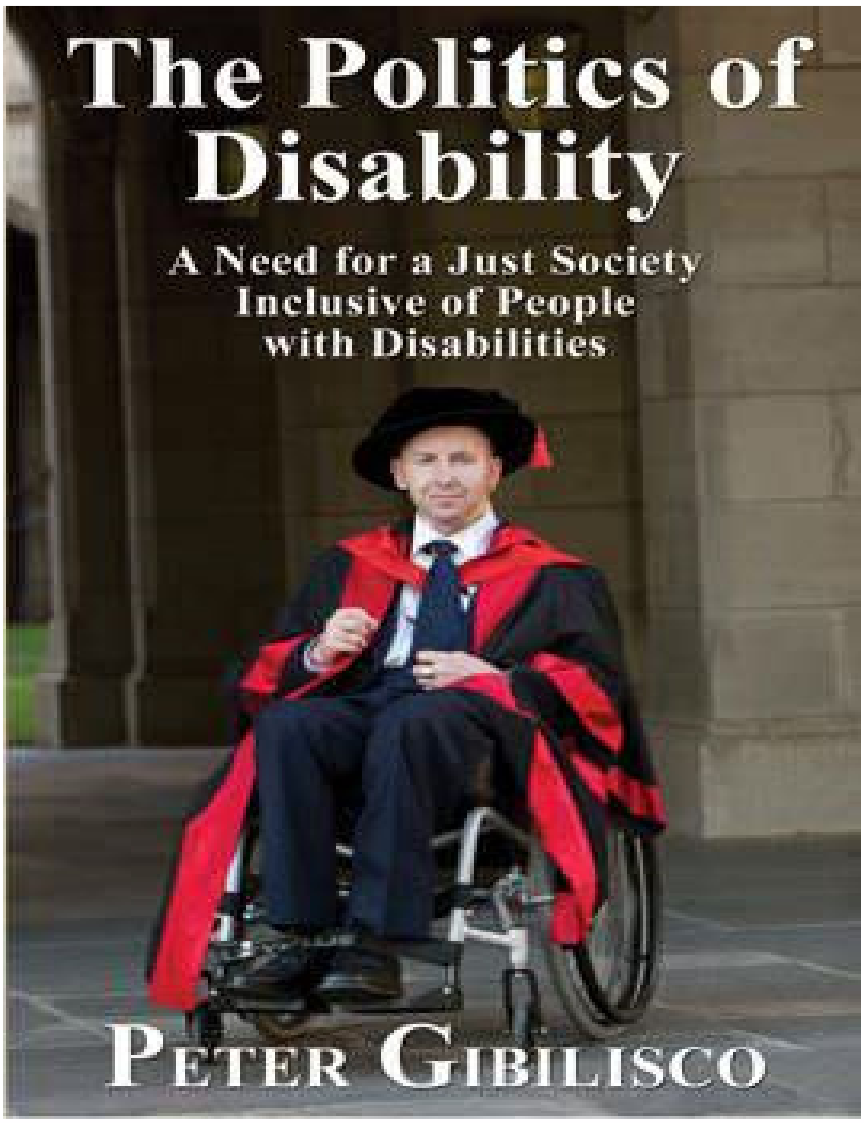
Ron Wickman will be available for interviews after the press conference at City Hall. His lecture at the Buildex Conference, Edmonton Expo Centre, Northlands will be held Wednesday, March 19 at 2:30 p.m.

Accessible Architecture: A Visit From Pops ISBN978-0-991697-0-8 sells for $20.

– 30 –

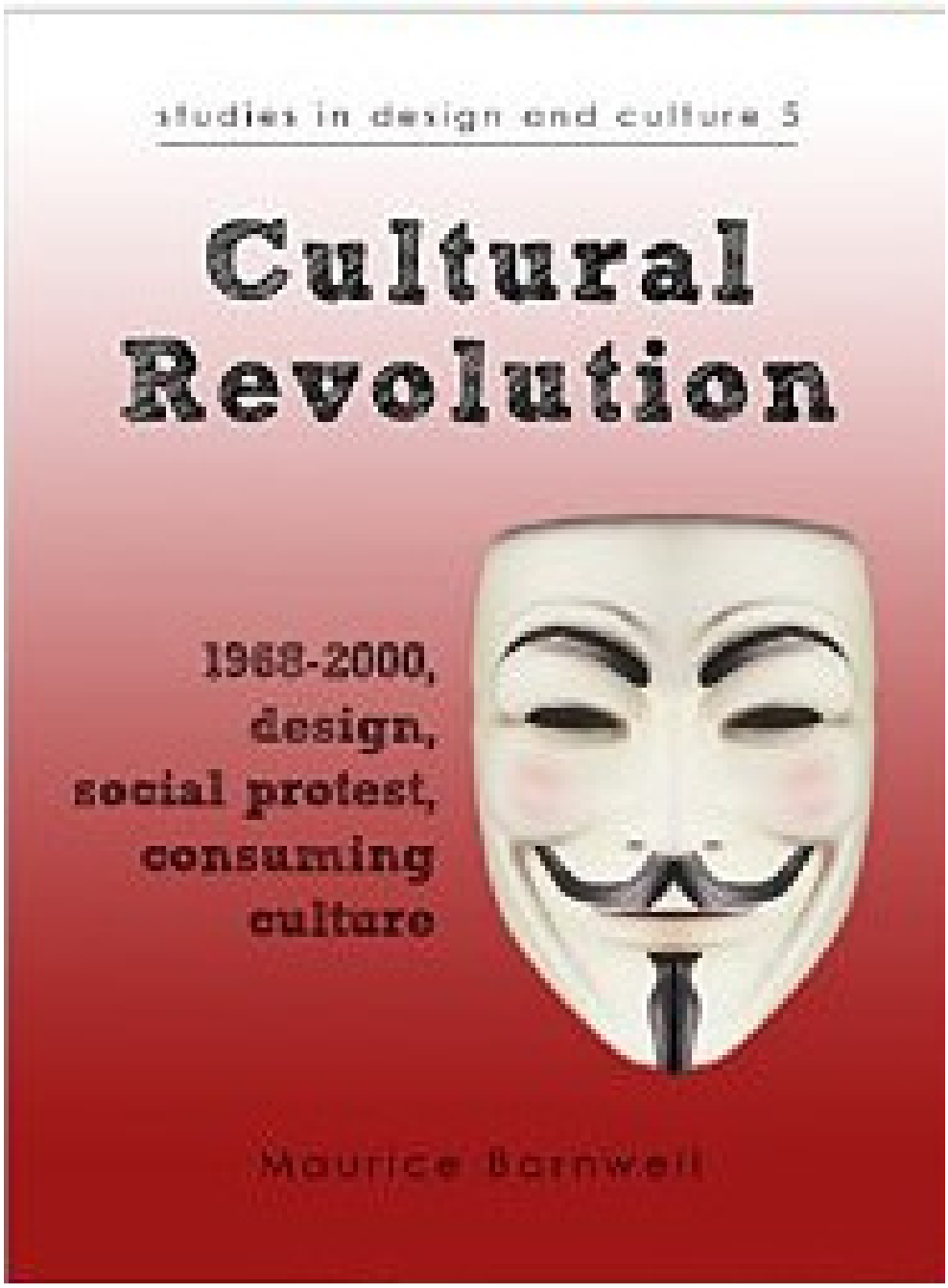
For additional information, contact:
Ron Wickman
Architect
780-430-9935
E-mail: rwickman@shaw.ca

The Politics of Disabilities, Peter Gibilisco



This book will retail for a recommended price of $19.95 USD ISBN 978-1-77143-155-2, with an ebook version also available at a recommended price of $7.95 USD ISBN 978-1-77143-156-9. You'll be able to buy it from all the usual places - Angus & Robertson, Bookworld, Fishpond, Amazon, Kobo, iBookStore, and Google's Play Store, amongst others.

Cultural Revolution by Maurice Barnwell (Author)



Design For All – the project for everyone.

Methods, tools, applications Volume 1 – 2 (Steffan, 2012)

Design for All — the project for everyone. Methods, tools, applications.
Volume 1- 2 (Steffan, 2012)

The publication highlights the multidisciplinarity and cross-disciplinarity of the Design for All approach, both in terms of issues addressed and of field of application. The accessibility of places and objects is nowadays a minimum requirement: it is only the starting point to allow their use by the widest range of people possible. Through professional experience and research, the paper tackles problems, methodologies and working tools, benchmarks.
The first volume covers the main areas of research and presents some examples at urban scale; the second volume illustrates examples of architectural design, products, services, university education.
The lack of compliance of the built environment and of the products, with needs that can be very different, causes a state of handicap. The lack of ability is a handicap only if the project has not taken it into account.
With these books we intend to stimulate debate, in-depth research, specialized studies, so that Design for All can be increasingly known and applied in more and more research and professional areas.

Published in Italian in December 2012 by Maggioli Editore (Santarcangelo di Romagna RN, Italy).
http://ordini.maggioli.it/clienti/product_info.php?products_id=8832 Volume 1
http://ordini.maggioli.it/clienti/product_info.php?products_id=8831 Volume 2
The on-line English version is also available since October 2014:
http://www.maggioli-editore.it/ebook/tecnica/design-for-all-the-project-for-everyone-first-part.html
http://www.maggioli-editore.it/ebook/tecnica/design-for-all-the-project-for-everyone-second-part.html

"Ideas, even good ideas, flourish only when practitioners commit to sharing their experiences, perspectives and aspirations. By organizing this publication and convening a distinguished international group of contributors, Editor Isabella Tiziana Steffan helps to establish the current state-of-the-art and affirms the significant potential of Design-for-All. She also delivers fresh inspiration to an expanded audience critically important to engage if Design-for-All/Universal Design is to realize its promise in the coming years.(...)We salute Editor Steffan for her passion, focus and hard work to bring this valuable contribution to fruition." (Valerie Fletcher)

Appeal:

universal design expert favorite 2016

universal design consumer favorite 2016

UNIVERSAL DESIGN

Press release

"From universal design award to universal design favorite"

During the leading industry event, Munich Creative Business Week 2016, iF UNIVERSAL D be presenting the favorites for 2016 to the UNIVERSAL DESIGN experts and a 100-strong The universal design expert favorite 2016 and universal design consumer favorite 2016 priz awarded.

iF UNIVERSAL DESIGN, a member of the iF Industrie Forum Design e.V. family since 2013 honoring the international UNIVERSAL DESIGN favorite for the fifth time as a partner of th bayern design GmbH. Subsidization from the Bavarian Ministry of Economic Affairs and M Energy and Technology underlines the economic importance of the awards.

The competition is open to all designers, companies, universities, students and start-ups, would like to present themselves and their concepts, scenarios and products online in the Design, Architecture, Technology and Service Design on iF UNIVERSAL DESIGN's digital n addition, the entries will also be unveiled to a specialist audience and visitors to the Munic Business Week alike in a jury exhibition as part of the Oskar von Miller Forum.

The eight-day jury exhibition is accompanied by a comprehensive "UNIVERSAL DESIGN p which opens up further opportunities for UNIVERSAL DESIGN favorite 2016 participants to and network. Alongside the option to conduct a live presentation of the products for the U DESIGN favorite Session 2016 committees, areas of UNIVERSAL DESIGN will also be pres discussed in workshops, presentations and speed information events.

Active international cooperation will also play an important role in 2016 (designaustria, Inte Association of Universal Design, Japan; School of Architecture Aarhus, Denmark; Joanneu (Austria), Coburg University of Applied Sciences and Arts, Macromedia University of Appli Sciences, Munich, Department of Industrial Design at the Technische Universität München

UNIVERSAL DESIGN sees itself increasingly as a fundamental vector and strategy to desi products, architectures and services which, in terms of their form, operation, and design, the needs of as many consumers and users as possible, reduce complexity to a minimum enable secure, fault-tolerant and sustainable innovations.

For iF UNIVERSAL DESIGN, positioning UNIVERSAL DESIGN as a pioneering social desig and reinforcing its position as an economic factor for industry and design is both an incent challenge.

Entries are open until December 31, 2015 at **www.if-universaldesign.eu**.

Press contact:
Thomas Bade (General Manager)
Phone: +49 (0) 511.54224 209
tb@if-universaldesign.eu

NEWS:

1.

Universal design for the less-able

The term "universal design" has made its way into the industry recently, but what does it really mean and how will it impact on design?

Universal design allows everyone, to the greatest extent possible and regardless of age or disability, to use buildings without the need for specialised or adapted features.[1]

"Universal design puts a person's experience at the centre of the design process. People who apply the principles of universal design ask themselves how they can make sure a product, building or environment can be used by everybody, equally," says Jane Bringolf of the Council on the Ageing NSW.[2]

People with disabilities are not a fringe group. Over four million people, or one in five in Australia, have some form of disability and have their mental, sensory or mobility functions restricted.[3]

A well-designed kitchen and bathroom can help people with reduced physical ability to be more independent, improving their everyday life and self-esteem.

The HLS ROPOX range has been developed to help people with disabilities to obtain an independent life.

While the height of a standard kitchen bench top poses an issue to those in a wheelchair, the height of a HLS Healthcare KitFrame Flexi benchtop can be manually or electrically adjusted by means of a handle or by a control switch.

The problem of height has also been addressed with the KitFrame Diagonal and KitFrame VertiElectric. The KitFrame Diagonal is a system for wall cupboards which makes them adjustable diagonally downward and forward. The KitFrame VertiElectric is an electrical height adjustable frame for wall units, which allows the user to reach items in a wall unit that otherwise would be impossible to reach.

The Kitframe Hot' n Cold is another clever kitchen modification and it allows cupboard or built-in appliances to move vertically up or downward.

The importance of accessibility for the elderly doesn't stop in the kitchen, with the ability to use the bathroom central to their independence.

Installation of a support basin could be a simple adjustment that drastically improves the user's quality of life. HLS Healthcare's Basin is height-adjustable and ideal for bathrooms used by multiple users with individual needs. It is easy to clean and use and is available as a fixed height or manual and electric height adjustable versions.
In situations where a person needs to be bathed lying down, the HLS Changing/Shower Bed is a solution. It is an electrical height adjustable bed and can be lowered for the person to be transferred – e.g. to a wheelchair, as well as raised to a suitable working height for the carers.
Toilet supports are another nifty way to increase the functionality of a bathroom design. The HLS Healthcare Toilet Support provides a good surface, good support and easy cleaning. The toilet support arms have the option of being height adjustable. The wave editions provide the optimum height when transitioning between standing and sitting while the low part of the support arm is optimal during visits to the toilet.
For more information, head to www.healthcarelifting.com.au.
[1]The Council of Australian Governments. (2011). National Disability Strategy 2010-2020. Commonwealth of Australia. https://www.dss.gov.au/
[2] Chua, G. (2014). Australia's first universal design conference puts user experience at centre of design process. Architecture & Design. http://www.architectureanddesign.com.au/news/australia-s-first-universal-design-conference-puts
[3] Stats and Facts. Australian Network on Disability. http://www.and.org.au/pages/disability-statistics.html
(Courtsey : Architecture & Design)

2.

Persons with disabilities seek review of building code

NEW DELHI: As the Government embarks on its mega Smart Cities projects, persons with disabilities in India have decried the "segregated approach" so far, and has sought a review of the National Building Code (NBC) to provide them access to public infrastructure.

In a letter to Consumer Affairs Minister Ram Vilas Paswan, who heads the Bureau of Indian Standards, which is reviewing

the NBC that falls under its purview, the National Centre for Promotion of Employment for Disabled People (NCPEDP) said NBC 2005 has a "segregated approach" to persons with disabilities, which only finds mention in an annexure with regard to the planning and design of public infrastructure.

"Large-scale construction is happening all over the country, even in small towns and rural areas. There is also a mega plan of the Government to create smart cities. If this opportunity is missed, by the time the next revision of NBC takes place .... persons with disabilities would further be left behind in the development process," the NCPEDP said in the letter.

Calling for correction of the "special" and "patronising" approach to persons with disabilities, Javed Abidi, Honorary Director, NCPEDP, said "There should not be two separate standards – one for people with disabilities and another for those without disabilities," demanding that "disability access should be integrated into the regular standards."

NCPEDP also urged the Minister to set up a task force of experts in the area of universal design to make the NBC "contemporary, comprehensive and inclusive."

In India, the number of disabled persons went up by 22.4 per cent in 2011 compared with the 2001 Census, with 2.08 crore households reporting persons with some form of disability.

"This estimate is on the rise due to the ageing population and the rapid spread of chronic diseases, and the infrastructure in the country is just not suited for them," the statement read.

Urging the Government to make public roads, buildings and transportation barrier-free for persons with disabilities, as mandated in the Act concerned, it said accessibility has been recognised as a basic human right by the United Nations.

(Source: The Hindu Businessline)

3.

8th Fortnight Barrier Free campaign launched

IMPHAL, Oct 17: The 8th Fortnight Barrier Free Campaign 2015 was launched today at the Manipur Press Club by the

Handicapped Development (HD) Foundation, Manipur in association with the Office of State Commissioner for Persons with Disabilities, Government of Manipur.

The HD Foundation has been organizing "Fortnight Barrier Free Campaign" every year since 2008 with the main objective of creating an environment which is accessible and useable by everyone in the society, including people with disabilities. The foundation gives main focus on the barriers faced by the persons with disability in the society, community and State.

A barrier free environment is allowing people to move around freely and safely, independently and without any restriction. The environment includes public or private buildings, roads, transportation, public places, educational institutions etc.

As part of the fortnight State wide campaign, various activities are set to take up in various places. From October 18 to 30, 5000 posters will be pasted in public and private places to create awareness to the masses.

5000 more leaflets will also be distributed in public and private areas to spread the message of the Fortnight Barrier Free Campaign.

Awareness programmes at club and school levels will be organised where all stakeholders of the locality including Counsellor, pradhan, members of Gram Panchayat, Meira Paibi, village chiefs etc will be included. Besides such programmes, the first State level open Slogan Competition with the theme 'Break Barriers, Minimized Disabilities' to draw attention and involvement of public will be held.

Further a workshop programme to promote barrier free environment will be conducted at the closing ceremony of the 15-day long campaign.

Speaking at the inaugural function of the campaign, Director of the State Commission for the Persons with Disabilities, Government of Manipur L Nabakishwar said that to make a barrier free society, more of such campaigns are needed.

He further said that under the PWD Act of 1995 (Equal Opportunities, Protection of Rights and Full Participation) Act, disabled persons are entitled to various benefits from various

sectors of the public like adaptations of universal design in transport systems like bus, railways and aircraft.

Further, ramps in public buildings including hospitals, banks, schools, institutions, market sheds etc should be made easily accessible for wheel chair users.

He urged all concerned to break the barriers.

Secretary General of HD Foundation, Dr Sapam Jasowanta requested the people to spread the message that handicapped people should be brought up by the changing outlook towards the disabled persons.

He added that people need to reset their mindset to help the disabled persons come on par with the normal people and break the barrier.

As part of the opening ceremony of the 8th Fortnight Barrier Free Campaign, poster and leaflets of the campaign were released by the dignitaries present at the function.

(Courtesy: The Sangai Express)

PROGRAM & EVENTS:

Welcome to CII Design Excellence Awards 2015

In an ongoing pursuit to establish design as a tool for national competitiveness, CII initiated the 'CII Design Excellence Awards' in 2011. In its fifth year, we are pleased to announce that applications are now open for the CII Design Excellence Awards 2015.

Endorsed by The India Design Council, CII Design Excellence Award is a celebration of Indian Design which will present the emerging face of design in India and its newer manifestations. The award seeks to demonstrate the value of design to the Indian industry and will be a true acknowledgement of the prowess of Indian design, innovation and originality.

This Design Award is a perfect opportunity for your company to hog the limelight and gain increased appreciation for being a design-led organization.

32 AWARDS
4 CATEGORY WINNERS
28 SUB CATEGORY WINNERS

Eligibility

Design

- The entry submitted for the CII Design Excellence Award has to be designed for / designed in India and manufactured and or marketed in India
- Submitted by a company registered in India

Period

- Design must be fully commissioned and in market or usage at the time of entry
- The design must have been realized in the calendar year of 2014 or 2015
- Prototypes cannot apply
- The entries must comply with the mandatory applicable standards for the given entry

TypographyDay 2016
Focus on 'Typography and Education'

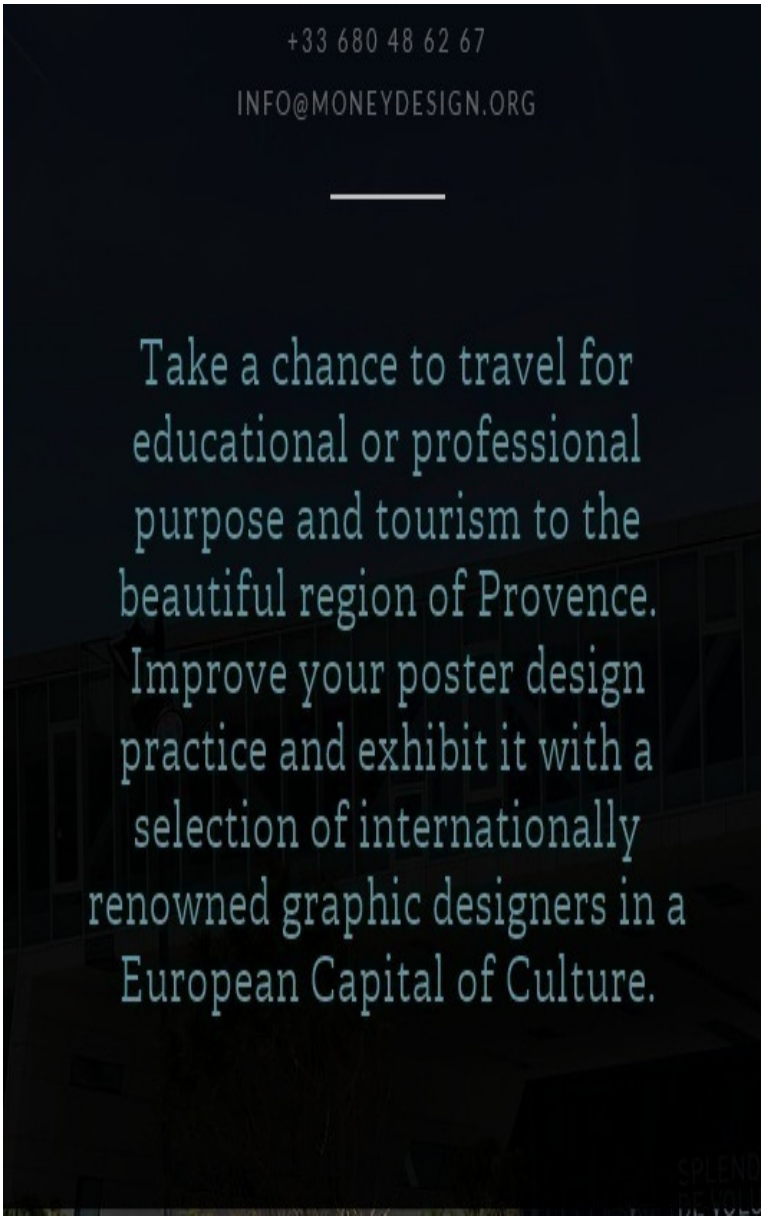
25 - 27 February 2016 at Srishti Institute of Art, Design and Technology, Bangalore
Call for Logo (deadline 31 July 2015)
Call for Papers (deadline 30 September 2015)
Call for Poster Design (deadline 31 October 2015)

http://www.typoday.in

Transportation connects us all.

Whether it's simply getting from home to work or using products shipped over distances near and far, in every region of the world transportation impacts our daily lives.
At first glance, transportation may simply appear to be about the movement of people and goods. But looking deeper, it's also closely linked to equality, access to healthy food and good schools, and wildlife impacts, for example.
As the mobility demands of people and freight have grown, so too has the need for products, systems, and services that will make the transportation sector more life-friendly, for both people and the planet.
Registration is now open
Learn biomimicry and how to apply it while competing for cash prizes with students from around the world.

Register your team for immediate access to the biomimicry design resources and start developing your design solution today!



Transcend 2015

Interaction Awards 2015

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EBU, The Vision for Equality Award

The voice of blind and
partially sighted people in Europe

The Vision for Equality Award

The EBU Vision for Equality Award is given to European organisations, institutions, policy makers, enterprises or individuals in recognition of their commitment to protect and promote the rights of blind and partially sighted people and to improve their living conditions. The Award, which consists of a certificate and a piece of art by a visually impaired artist, is presented every four years on the occasion of EBU general assemblies.

Nominations may be put forward by EBU national members and are processed by the EBU Awards

IR THE 2015 EBU "VISION FOR EQUALITY" AWARD

臺北設計獎

Taipei International Design Award 2015


FINISTERRA
IV
ARRÁBIDA
film art & tourism festival
CONVITE
6 de Maio – quarta- 10 horas
Fundação Portuguesa das Comunicações em Lisboa
Carlos Sargedas, diretor do Finisterra Arrábida Film Art & Tourism Festival, a Fundação Portuguesa das Comunicações, a Câmara Municipal de Sesimbra e Arrábida Film Commissison teem o prazer de o convidar para estar presente na Sessão inaugural da 4ª edição do Festival
organização
FUNDAÇÃO PORTUGUESA DAS COMUNICAÇÕES
ARRÁBIDA FILM COMMISSION
sesimbra

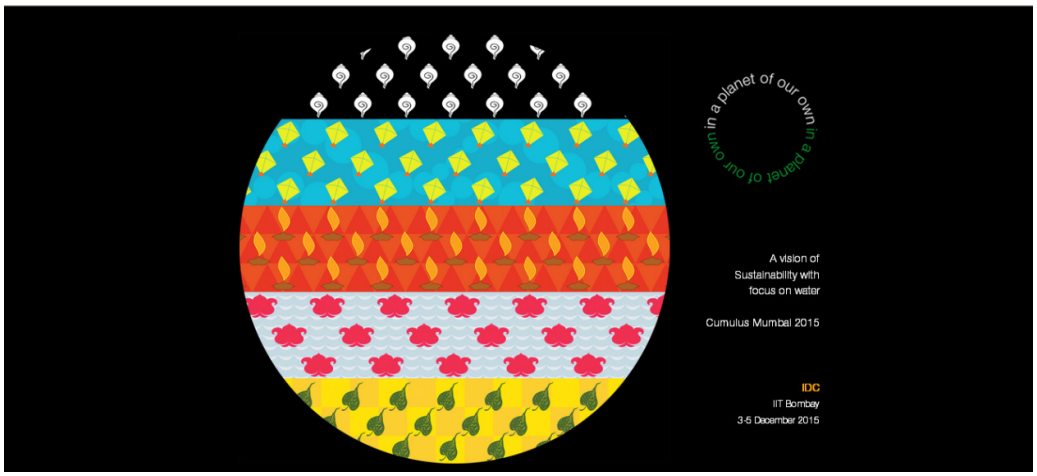

14th Participatory Design Conference
15 - 19 August, 2016
Aarhus, Denmark


AIAP WOMEN in DESIGN AWARD
aiap
associazione italiana design della comunicazione visiva
AIAP
WOMEN
in DESIGN
AWARD
PREMIO BIENNALE DESIGN
DELLA COMUNICAZIONE
AIAP
WOMEN
in DESIGN
AWARD
AWDA


SPARK
CALL FOR ENTRY
출품작 공모
INSCHRIJVING GEOPEND!
徵件中!
火热征集
AUSSCHREIBUNG ZUM WETTBEWERB
応募者募集中
DEMANDEZ VOTRE ENTRÉE!


PHOTOABILITY.NET
INCLUSIVE IMAGES
Real People,
Real Lives,
Real Progress
DISABILITY INCLUSIVE
PHOTO CONTEST
Sponsored by New Mobility Magazine
and PhotoAbility.net Stock Images
We are looking to break the mold and discover the best inclusive photos that will change the way the public, advertisers, magazine editors and business owners see disability. Your images can help eliminate social, structural and professional barriers!
Images should depict real people with disabilities of all ages in the following categories:
1. Lifestyle activities (dinner with friends, gardening, working, parenting, or enjoying a hobby)
2. Travel
3. Creative (unusual places, stylized, creative use of wheelchair parts, reflections, shadows, etc.)
4. Sports
5. Business/education
6. Portraits
NM
NEW MOBILITY
The contest will run for 4 months, from September 1 to December 31, 2015. We'll announce monthly winners online and award the Grand Prize in the February 2016 issue of New Mobility.
Monthly winners will each receive a $100 cash prize
Finalists and winners will be published on Photoability.net (you'll receive royalties for images sold)
Finalists and winners will be featured in a special gallery on Photoability.net
Winning images will be published in New Mobility
Grand Prize winner will receive a $500 cash prize and a write-up in New Mobility that includes the Grand Prize image
Photos must be taken with a camera that is at least 8 megapixels and may include iPhones and other mobile. All people featured in the images must be willing participants in the competition and sign a model release. You may enter as many photos as you wish. See all terms and conditions and register for contest and upload images at photoability.net/disability-inclusive-photo-contest.html


WORLD
HUMANITARIAN
SUMMIT
WE WANT TO HEAR FROM YOU
1845 people have participated from
157 countries
The World Humanitarian Summit is seeking ways to better meet the needs of people affected by conflicts and disasters.
Show your support for the actions needed to make humanitarian action fit for future crises.



Design Carnival: Exhibition on Sustainability Projects

- An exhibition of projects on sustainability from Art, Design and Media Schools

3-**5 December 2015** at IDC, IIT Bombay India

www.cumulusmumbai2015.org/ exhibition.html

CII DESIGN EXCELLENCE AWARDS 2015

Transforming communication through design

CII Design Excellence Award is a celebration of Indian Design, which will present the emerging face of design in India and its newer manifestations. The award seeks to demonstrate the value of design to the Indian industry and will be a true acknowledgement of the prowess of Indian design, innovation and originality.

DESIGN EXPERIENCE is an initiative conceived by designers, made possible through designers and directed to designers.

We organize **a one-week intense seminar in Barcelona** where we explore the main concepts of Office Management, Project Management, Teamwork, Customer and Space Psychology, Creative Process, Sustainable and Ethic Design.

Important Barcelona designers will open the doors of their offices for us, will show us their construction sites and will tell us about the way they work.

We organize visits and round trips in the most important factories, showrooms, retails, places and sites in the area of Barcelona.

We discuss in a design environment about the most advanced topic about the design process

Job Openings:

1.
Sales and Administration Associate
ARTISANS' Gallery/Shop, 'where art craft and design converge' is right in the heart of Mumbai's Kala Ghoda art district. We are passionate about traditional and contemporary art craft and design. We are looking for a Sales and Administration Associate who works to realize all aspects of the gallery/shop –billing, inventory, visual merchandizing, and display, to maximize sales and deliver an exemplary customer service. Experience in shop/design/arts management, using Word and Excel, excellent communication skills, written and verbal (English and Hindi), are essential, together with a proactive approach, great organizational skills, and time management.
More on Linked in: https://www.linkedin.com/jobs2/consumer/overview/76662049
About ARTISANS': http://www.facebook.com/artisans.centre

If this sounds like you or anyone you know, please write to me at artisanscentre@gmail.com and cc radhiparekh@hotmail.com, with more information.
Radhi Parekh
Director
A R T I S A N S'

2.
Pearl Academy is looking for *Great Teachers* who will help inspire, shape and lead the *Designers for the Future.*

Openings for :
Product/Industrial Design Faculty
Lecturer / Senior Lecturer / Assistant Professor / Associate Professor / Professor

Qualifications :
Must have minimum 4-20 years of Academic/ Industry Experience in product and/or industrial design

Locations:
NCR and Mumbai
3.
SAP Labs, Bangalore is looking for experienced interaction designers to join Business Intelligence Core Innovation User Experience Team.

Please find the JD below.

The Team
SAP Technology and Innovation Platform (TIP) – Business Intelligence, User Experience team is spread across various SAP location including India, China, Germany, France, Ireland and USA. The team's mission is to design and deliver simple, beautiful user interfaces with high quality that provide users with desirable user experience for Business Intelligence product portfolios like SAP Lumira, Mobile Intelligence, Web Intelligence,

Business Intelligence Platform, CVOM Charting Libraries etc. . This is achieved through extensive user research, user centric design methodology, task analysis, definition of detailed use cases and end user personas, interaction design and extensive usability testing.
Responsibilities:
· Lead and drive the project end to end from conceptualization to execution with multiple stakeholders.
· Engage with Business Intelligence customers from different geographies to clearly understand business cases, gather functional / business requirements and conceptualize requirements to interaction flows
· Drive co-innovation with customers and conduct extensive user research and design-thinking sessions.
· Define information architecture and UI interaction flow of Desktop and web apps from concept to completion
· Define and communicate user interface designs flows and interaction using various prototyping techniques and documented in UI specification
· Verify designs through customer validations, end user interviews and formative usability testing.
· Provide Ux support to development team to execute the design during development phase.
· Collaborate with fellow interaction designers across the globe and work with visual designers and product owners .
· Play the role of the end user and evangelize the importance of Ux and simplicity within different development teams and overall organization.
Qualifications / Requirements:
· Degree in Information Design, Human-Computer Interaction or related field
· Exceptional portfolio showcasing a wide range of interaction design work in business and consumer applications (Please include your portfolio or a link that we can access.)
· Broad experience in user experience projects encompassing entire life cycle from user research through design to validation
· Experience with tools such as Illustrator, Photoshop , Visio and Omnigrafflc.
· Outstanding presentation and interpersonal communication skills.
· Plus: Experience developing working prototypes in HTML5, iOS or Android and Windows 8.
Desired:
· Minimum 5-6 years experience in Interaction design.
· Experience in designing application for Desktop and Web HTML 5.
· Experience working within global, cross-functional teams.
· Interested candidate may apply with their updated CV and portfolio to sujit.ramesh.a@sap.com

BI User Experience Team.
SAP Labs India, 138, Export Promotion Industrial Park, Whitefield, Bangalore 560 066, India
T + 91 80 4139 7434 | M + 91 9686454835

4.
Job Title-Senior UX Designer
Function- User Experience (Technology)
Work Experience – 3-4 yrs
Company name - Delhivery

Location-Gurgaon

Company profile:

Delhivery helps merchants and brands create successful online businesses through modular E-Commerce services and core logistics. Our operational capabilities are designed to meet the needs of any business looking to go online. We provide sellers a modular suite of e-commerce technologies coupled with pan-India logistics operations, helping them achieve fast, reliable and flexible business fulfilment solutions.

Our proprietary e-commerce technologies provide sellers a way to develop and manage their entire online channel - including setting up a web-store, catalogue management, studio services, and integration with marketplaces, payments, SEO/SEM, customer analytics and inventory management. All our IT is built in-house and is completely customized to cater every unique need of our clients.

Delhivery was founded in June 2011 by alumni of IIM Bangalore, IIT Bombay, IIT Kanpur, IIM Calcutta and IIT Delhi. We currently work with over 700 E-commerce players across 150 cities and are the fastest growing startup in the Indian E-commerce landscape. As we grow the Delhivery team, we are looking for individuals from all kinds of backgrounds who have a passion for hands-on work, tremendous drive and the ability to work in diverse groups.

Website- www.delhivery.com

Skills/Background Required:

Our team is a diverse mix of inter-disciplinary experts from backgrounds like : Graphic Design, User Experience, User Interface development, Interaction Design and Design Thinking. We are extremely passionate about crafting seamless, delightful end to end experiences across various devices.

We are looking for a Senior User Experience Designer with a strong background in User research methodologies, Usability reviews and heuristic studies, and hands-on experience in conducting Usability testing. Candidates must have experience in creating low and high fidelity wire-frames for desktop and mobile form factors and are aware of the design language followed by popular platforms such as Android, Windows and iOs.

Candidates should have minimum 3-4 years of strong experience in applying user centric design methodologies to projects involving diverse stakeholders. Good theoretical knowledge of Usability principles, and great attention to detail are a must. Any experience in Graphic Design or UI programming would be a major advantage.

- **Strong prototyping skills in Paper and Balsamiq/ Axure/iRise etc.**
- **Experience in doing lean usability tests on site/ remotely.**
- **Strong theoretical background in usability and user centric design.**
- **Must be able to adapt to a fast changing environment.**

· Ability to work independently as well as collaboratively within the team.
· Project management, project reporting and planning, Stakeholder management.

Professional Skills:

1. **B.Des/MDes/M.S in User Experience, Interaction Design, Industrial Design or related disciplines from IITs or NID.**
2. **Strong analytical and problem solving capabilities.**
3. **Ability to defend design decisions with theory/best practices.**

Contact - chandni@delhivery.com

5.

We are looking outstanding Designers for Mobile Application. Opportunity is based out of Noida Location. Experience and salary is not a constraint. Designers will be part of a seasoned team hence lot of growth opportunity in terms of polishing your existing skills.

Interested candidates with all employment status i.e. Full Time/ Part Time / Freelancers are welcome to drop us a note preferably with your CV and portfolio.

rachnamt@yahoo.com

Advertising:
To advertise in digital Newsletter
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