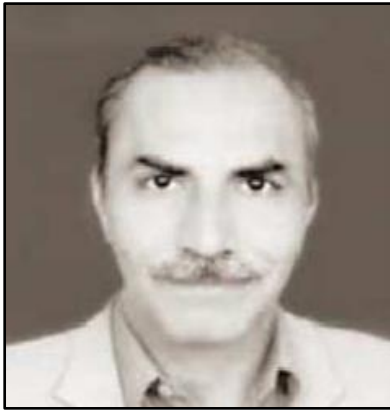


Design for All



Guest Editor: Prof Elivio Bonollo University of Canberra Australia



Letter from the Chairman's Desk By Sunil Bhatia PhD

One day I was looking toward sky and found "stars are placed randomly but placing of seven stars are having unique group structure that attracted my attention" it is known as seven sisters. That grouping has given unique name Pleiades in astronomy.

I was driving my car for Sunday prayers toward church and noticed traffic signal had group of different colours of light and that astonished me for I have never given thought over such a simple product design by using concept of 'group'. My car radio was on and there was chorus song was broadcasting where group of singers were supporting the lead singer. Immediately I recalled that in church choir singing is in praise of God where worshipers sing in synchronized voice that too in group and it appears as single loud but melodious voice. This singing concept in group might have surfaced in absence of amplifier and collective voice of singers was so loud that everyone present in the church could hear properly. Radio has knob for adjusting for change over for desired radio station for listening the programs by using frequency selector and volume can be adjusted by tuner or volume controller was possible because of concept of group. On special occasion, I noticed there was orchestra that was accompanying the singers. Orchestra is nothing but group of musical instruments producing required musical notes. In

structure of family, man and woman satisfies each other physiological as well as psychological needs and off springs is the outcome that constitutes group and are forming basic unit of family in social structure. When I was student and placed under certain group what we call class for effective learning. Group has played very significant role for progress of humanity and it is since primitive times.

Primitive people used to hunt in group for animal food and they had realized that an individual could not outperform the strength of the wild animals since at the times man could be victim by large animals. They might have found that individual adrenaline rush from the gland secretion is low compared to when they attacked and chased the animals for killing in group. As primitive people started separating the skin, meat from bones that very moment idea of group was playing. When every member of the group sat around the killed animals for satisfying their hunger was treated everyone of the group equal and allowed free to eat without discrimination. The same practice is still prevailing in religious functions where everyone occupies seat for dinning and treated equal and free to eat according to hunger. I have noticed when I eat in group I eat more compared to when I am eating alone without community. Our meal is amalgamation of varieties of ingredients required to function our organs and it is still mystery for us how came our digestive system to segregate specific from the group of ingredients and supply to particular organs. How came the idea of design of fist have first struck in the mind of the primitive people and realized hitting with slap by open fingers of the hand is natural and impact is not severe but fist is manmade design where group of fingers tightly comes together for effective hitting. Growth of hair is natural and it is the men who were aware about art of management as well design in attractive

artistic manner for designing braids. Braids are where number of groups of hairs formed strand by interlocking are helping in management for not to disturb the person by covering face or vision. Braid is not confined to hair rather it is complex structure or pattern formed by interlacing three or more strands of flexible material such as textile yarns or wire. Primitive people were expressive and used to struggle hard for communication; there first communication manmade apart from natural voice was instrument of brushes for painting by assembling number of similar size of hairs in group. Certain people have developed the skill of flower decoration where they used group of variety of flowers in such a way it created arresting effects. Idea of decoration might have come from observing nature's fruit are in group. Banana, grapes and many other fruits are in bunch and create special effects to attract others by their striking colour for highlighting their presence in their respective plants for allow the seeds spread properly for new lease of life. The moment humans designed the garland with flowers in group that very moment idea of manmade design started identifying fault in nature and thought it should be in this manner. Design of garden or landscaping was an attempt of improving the nature by grouping flowers, decorative plants what he wished it should be . Later on design of necklace by pearls or stones was based on grouping. They also erected their abode by grouping different materials.

Discovery of fire added new dimension in their thought process and they learnt the art of management of fire and found single tinder or log did not have nature of producing high intensity of heat as well as light compared to group of logs burning together. Later coal was discovered that had capacity to hold the fire for longer once it caught fire and they added it in group over burning

woods. Woman uses blow pipe for pumping air for fast catching of fire in consecutive manner in group and that act of her allow smoke should not hinder her prospects by forming cloud close to fire. She designed the clay fire kiln for keep the group of smoke should not stay and fly off that keep fire alive with proper supply of air from the bottom.

As humans progressed and started living on agriculture where unwanted elements were physically segregated from the food grains was nothing but grouping. Winnowing fan is designed to take away unwanted elements for separating edible foods in groups. Knowledge of milk and it contains fat that is good for humans allowed to separate this by design of churner and how came the idea of curd that develops group of bacteria that helped digestion is still mystery for us. Knowledge of single oil seed was containing oil and to effectively extract the oil they used group of large number of oil seeds for extraction.

Nature has concept of group where raindrops formed river and ultimately sea. Scientists have found atom has various numbers of electrons that group is responsible of constituting various elements .When person is under attack of fever or suffering with cold his body shivers and it attacks in groups to counter for stabilizing the health of the suffering person. Systematic arrangement of elements is nothing but group design. Our body is constituted with group of various elements. Each and every element is nothing but group of various parts arranged in organized and systematic manner for achieving specific objectives and it is further extended in industries where concept of assembly of different parts for production is possible when we can group and establish the priority and it reminds me where group of stairs are arranged in such a way it helps in climbing vertical height.

Plants are different because grouping of cells are different but basic genes remain same in all living beings. Ants or bees are living in group and we should learn the art of management from their behaviour. Living in group for animals is compulsion to protect the pregnant animals that carry of next generation and protect the infant at the time of attack by enemies by surrounding them so that their genes can carry forward.

Design of clothes were possible where cotton fibres are twisted in group for achieving required strength and weaving by arranging threads in vertical and horizontal in specific pattern in group. Stitching was the extension of the knots arranged in group and later people turned into art of embroidery. Buttons to hold the dress properly has group of holes arranged in geometrical pattern for meeting the challenge of stretch pressure of the dresses. Later layers of dresses are in group use by person to control the vagaries of weather. Design of communication got further power when humans thought to design alphabets and arranging the specific group was words , then grouping words in special manner was sentences then paragraph, section and ultimately in book. Design of library where number of books arranged and placed in specific order is possible because of knowledge of grouping. Design of radio Morse key was design for communication and different grouping of striking the keys was sending by clicking. Euler geometry basic foundation is zero dimensions by calling dot and groups of dot designed lines and later geometrical shapes.

In our day to day life we use products designed with grouping concept but we never noticed that phenomena exists around us and making our lives better. Key ring holds the group of keys for better management. Design of comb was possible where numbers of teeth are arranged in group for managing hair. Fire stove was

allowing cooking the food in sequential manner but design of group of stoves as we did LPG gas stove allowed to cook in multitasking. Churner has group of wings at the one of the end for easy churning. Fork has number of tines or prongs arranged in group for holding foods. Refrigerator has two compartment one freezer that has low temperature compared to normal and as we placed the items for storing we group according to requirement. When washer man holds the dirty clothes by wrapping under long clothes he uses single knots when it is light but heavy weight needs group of knots one over another to hold the items and does not allow to open on the way. Our traditional Indian slippers made of wood are mostly used by seers and saints where a single vertical toe hold sticking out from the wooden base was uncomfortable but use of straps revolutionized where group of knots were responsible for allowing the feet to slip and hold was more comfortable design. Running shoes has group of eyelets for holding the feet properly with lace. Musical instruments has group of holes like in flute for producing various sound and group of keys for producing desired sound. Number of strings arranged in group in certain musical instruments produces different sound.

Grouping has helped in commercial world and concept of 3 in 1 or 5 in 1 helped in reducing the cost of the items compared to buying individually. Initially it was started with army knife where many daily use tools were assembled in group for saving the space and load of bag carried by soldier. Later radio, record player and number of different items added to make things affordable and value for money. Nail cutter, filing and cleaning of nails are grouped in one product. Similarly juicer, grinder and other activities is grouped in food processor. LED lights are arranged in group in specific design for proper desired illuminations. Garden tools to remove the dried leaves fallen from the tree are taken out

by design of group of long teeth as leaf rake or garden rake. Jam, pickles bottles has cap design that turns once for closing because contents is in paste and does not spill fast or shelf life is high but highly volatile or inflammable or items to protect from external forces that can easily lose its affects or liquid that can easily spill, we use cap with design with group of threads for proper turns to close.

Cycle as means of transport was designed with single wheel but it required the rider special skill to pedal with balance for forward motion. Introduction of bicycle where two wheels were arranged for motion was not difficult as single wheel. They designed teeth wheel and metal chain made with group of links. Later group of three wheels and four wheels have given us proper balance, easy to manoeuvring and speed. Each wheel was designed with group of spokes for bearing load as well for maintaining proper alignment. Single step and group of steps has given us design of staircase. Where ever a battery is not able to supply desired power, we use concept of group arrangement for effective operation arranged in parallel or series. Concept of group has led us to mass transportation and designers thought for automobiles of four and more seats for passenger car, bus, railways etc.

A person ailing with disease administered with group of medicines for proper treatment. Our aim is to sensitize the minds of the designers for using the concept of universal design/ design for all for designing products services in such a manner it should be comfortably use by all.

“Design for All and All for Design”- Prof Elivio Bonollo. We are grateful to Prof Elivio Bonollo University of Canberra Australia for making this special issue an international issue by inviting different contributors from different parts of the world.

Enjoy reading

With regards

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Editorial Foreword



Elivio Bonollo

University of Canberra

Australia

Design for All and All for Design

Design is a fundamental and active part of the history, culture and technology of societies all over the world. It has evolved, in all of its conceptual and practical manifestations, in parallel with the evolution of the human species, often inspired by *designerly* functions occurring in the natural world—that is, natural phenomena and structures which have kept on evolving in animal and plant species for thousands of years, despite many negative human interventions. In general, design may be interpreted as an information processing and creative problem-solving process that, when projected and applied in society, business and industry, affects prosperity and health, especially personal and environmental health mindful of the many inequalities that still exist throughout the world. In essence, design may also be viewed as a practical formula for living and survival when used wisely by anyone for the right purpose.

As informed by important promotional and educational activities, such as those conducted by the *Design For All Institute of India*, the *World Design Organisation* (formerly ICSID) and *Good Design Australia*—among many other national and international bodies concerned with promoting the characteristics and benefits of design—our quality of life is affected greatly by the products and systems that are developed in societies, especially through collaborative design, manufacturing and construction professions such as engineering, industrial, graphic, interior, fashion and architectural design. In the main, the *physical, spiritual* and *emotional* outcomes of the design process (and the associated *syntactic, pragmatic* and *semantic* characteristics) are not independent of related human consequences. These outcomes affecting the human experience are usually *interdependent*, sometimes in a beneficial sense and often in an extremely dangerous and harmful sense. As witnessed, for example, by the tonnes of plastic items polluting our oceans and being ingested by fish, birds and turtles, and consequently affecting many elements of the human food and health chain, along with many other critically important areas.

Clearly, in the above holistic context *Design for All*, as a beneficial concept, is concerned with *practically all* areas of human needs and related social and environmental interventions. As this important concept continues to develop as a factual reality all over the world, it follows that even relatively small, positive design actions by a few people will lead to many beneficial outcomes; everyone can contribute. On the other hand, if we ponder the complimentary concept *All for Design*¹, it seems

¹ *With apologies to Alexandre Dumas, author of the 'Three Musketeers' and their motto "All for one and one for all".*

reasonable to suppose that, in parallel, many people will come to accept the benefits of design *for all* and, hence, this concept will also develop as a factual reality. While these two concepts may be viewed as *partners* in an ideal and positive philosophy supporting an acceptance of good design for all people, they clearly pose serious attainment challenges for society including politicians, designers, engineers, industry, institutions and corporations, especially in terms of allocating priorities, acquiring resources and introducing educational initiatives, and in developing equitable policies and equitable design-centred economies; these are challenges that cannot be ignored in 2017 and beyond.

Apart from the widely acknowledged serious climate change effects, world-wide poverty, famine, human slavery and pollution problems, these challenges include solving serious human health and wellbeing conditions which may not be as widely considered or recognised as they should be. These include implementing design solutions appropriate to the whole spectrum of human *disabilities, ageing* and *palliative care* situations, as discussed for instance by my colleagues in papers later—*human cradle to the grave* design needs can't be discounted, and this is where '*Design for All*' plays a crucial role as a practical concept with many achievable objectives.

To continue, we know that the key design criteria nowadays include '*quality of life and social worthwhileness*', given the finite resources of energy and materials in a world with rapid population growth and diminution of resources, especially food and water (Australia is one of the driest continents in the world; regrettably the average city household uses up to 500 litres of water per day). To reiterate, the physical outputs from the design process,

especially in terms of creative thinking and problem solving, can have significant effects on our artificial and natural worlds: positive if they contribute to our health and wellness, and negative if they damage the environment in which we and our neighbours live. Of course, many designed products and systems give rise to both positive and negative effects and this has led, for example, to the well-known *Eco Design* and *Design for Sustainability* movements among others, which aim to minimise the negative effects and achieve a reasonable balance between the two. Similarly, 'service design', 'user-experience design', 'universal design' and 'inclusive design' have all become prominent in theory and practice; but there is still much work to be done especially in areas related to human health in developing countries.

In an overall sense, it follows that what governments, institutions and corporations are prepared to do is a key consideration with respect to achieving the beneficial objectives of design and technology and solving the world problems of the future. In the last twenty years, *design* in Australia has developed a significant media-centric and political focus especially in the environmental context where climate change is a serious contemporary issue affecting everybody. Renewable energy initiatives, mainly through solar and wind turbine installations, are now commonplace in all Australian states, including the development of a recent grain-ethanol conversion plant in the State of Queensland. On a more specific social level, the Australian State and Federal Governments have legislated for a National Disability Insurance Scheme, and innovative renewable energy initiatives are increasingly being implemented. Recycling is also very developed in all Australian States and research into solar cell development and other

significant engineering innovations are also proceeding rapidly. And there are other important trends that need consideration such as where and for what purpose design and engineering is heading in the future. Relatedly, STEM education (including design as a core component) in primary and secondary schools is now being promoted widely internationally as a logical foundation for meeting many human problems including employment opportunities of the future. Design is now a global process; we know that it is becoming more people-centred and that it is crossing discipline boundaries more often than in the past, but more research needs to be done in terms of identifying significant future directions for this discipline. Importantly and as already mentioned more than once above, the global process of design also carries with it associated ethical, social and environmental responsibilities.

As the Guest Editor of this issue of the Newsletter, I am privileged to introduce and present research papers by my colleagues from Australia, America and Singapore who have developed expertise in a variety of areas related to *Design for All*.

In all, six contributions are enclosed beginning with a paper by Carlos Montana Hoyos and Lisa Scharoun from the University of Canberra. This is entitled '*Industrial and Graphic Design for Paralympians*'. Lisa and Carlos collaborated with the Australian Olympic Committee (APC) in a practice-led research project for the 2012 Olympic Games in which they explored, in a creative, different and useful way, some of the roles of visual culture in design for athletes with disabilities.

This is followed by a paper by EunSook Kwon, from The University of Houston, which is entitled '*Designing Education Contexts to Empower Students' Contextualization of Their Learning Experiences*'. EunSook has reported on an interesting, insightful and thorough approach to curriculum design, based on *constructivism* and related important questions about *what and how to learn*. The presented curriculum design includes realistic learning experiences for industrial design students based on human-centred and inclusive design projects, in this case for persons with disabilities. The resulting curriculum design approach is socially worthwhile, knowledge rich and rewarding, and provides self-motivating, inclusive learning experiences for industrial design students.

Thomas Ask, John Boll and Alexander Nesbitt have raised very important issues in the third paper presented entitled '*Steps towards Integrative Palliative Care in the Developing World*'. This is a design-research area seldom raised in the literature, and yet products, systems and medical resources for people in palliative care in the developing world (and elsewhere for that matter), and for people who are critically ill, definitely comes within the *Design for All* framework for important design initiatives. This is a milestone paper which describes the palliative care scenario and, hopefully, many more similar papers will follow.

Brandon Gien, of Good Design Australia, has presented an outline of how the World Design Organisation (WDO) has developed from the International Council of Societies of Industrial Design (ICSID). His paper is entitled '*The Journey to Become the World Design Organization*', and describes how the aim of the ICSID Board was to "create a bold and aspirational new vision for the organization

that is more closely aligned to the emerging solutions economy and our brand promise - *Design for a better world*". Needless to say, this development is an important step forward for *Design* as ICSID includes over 140 member organizations from 40 nations worldwide and, hence, represents a powerful, influential force in the *Design for All* context as well as *Design for a Better World*.

Resulting from research undertaken at Temasek Polytechnic, Singapore, colleagues Wei Kong and Eric Koh's paper is entitled '*A User Research Study on the Perceptions of Older Singaporeans on living in an Assisted Living Facility*'. Eric and Wei Kong have researched "...the perceptions of older Singaporeans on living in a purposefully built Assisted Living Facility (ALF). This study provided insights into the lifestyle needs, preferences and motivations of potential residents and their stakeholders towards the planning and building of such a facility in Singapore". The health and economic problems associated with ageing populations is clearly and important area for design research. For example, by 2050 in Australia, the proportion of elderly retirees compared to persons still in the workforce will have increased significantly, resulting in increased burdens on health facilities as well as the national economy and many other areas. As a result, the retirement age is being increased, people are being encouraged to stay in the workforce as long as possible, and retirement homes are springing up everywhere. In this context, *Design for All* clearly serves important health and wellbeing functions.

The final paper by Mandy Lau, of Reach & Match Australia, is entitled '*Designing Inclusion in Education*'. To quote from her paper: "Inclusive education allows students with and without disabilities to learn and participate together in the same classes".

This valuable, benchmark paper outlines the challenges which are present in achieving an inclusive classroom for students with learning difficulties, especially in mainstream schools where such students may be grouped with students that do not have these difficulties. To this end, Mandy has undertaken extensive, in-depth research and developed a unique and specialised inclusive learning tool which she has labelled “Reach & Match”—this is illustrated clearly in her paper.

I now encourage readers of the Design For All Institute of India’s Newsletter to read and explore the topics in these papers; I hope that you find them interesting and informative; please contact me and the authors if more information is required.



Elivio Bonollo, BE MEngSc PhD (Melb), CPEng MIEAust, CEng MIET, is one of Australia's leading industrial design educators and researchers. In 2008 he was conferred with the Honour of Cavaliere (knight) by the President of Italy for his collaborative work in design and education. He is Professor Emeritus of industrial design at the University of Canberra, following on from earlier appointments as foundation Professor of Industrial Design, Dean of the Faculty of Environmental Design and a Pro Vice-Chancellor of the University. After a cadetship in manufacturing engineering at General Motors Holdens in Melbourne, he began his teaching career at RMIT University as a Lecturer in the Department of Mechanical and Production Engineering, and later joined the Department of Design, in the Faculty of Art, as the Senior Lecturer in charge of Industrial Design. Elivio was foundation Professor and Director of the Centre for Industrial Design at Monash University. He is the founder of the industrial design discipline at Monash University and the principal author of the original industrial design degrees at RMIT and Monash University. He is also the principal author of the first postgraduate diploma in Quality Management in Australia (RMIT) and co-author of the first double degree in mechanical engineering and industrial design (Monash). He has been a

***visiting professor in the School of Design and Environment, National University of Singapore, and in design faculties at Ubon Ratchathani (where he developed postgraduate degrees) and Mahasarakham Universities, Thailand. He has taught and consulted in a number of universities including appointments as external examiner in design at Ngee Ann and Temasek Polytechnics in Singapore. He is a member of the Good Design Council, Australia, <https://www.good-design.com>; a member of the International Advisory Board of DART (Design Advanced Research Training Group), <http://dartplus.org>; a member of the Research Gate network, <www.researchgate.com>; and Academia, <www.academia.com>. He is currently an active researcher and PhD supervisor at the University of Canberra and in 2012 was awarded the Vice Chancellor's Award for excellence in the supervision of higher degree by research students. He has published widely and details of the 2015 edition/2016 printing of his book "Product Design: A course in first principles" may be viewed at: <http://www.amazon.in>; <http://www.amazon.co.uk>; <http://www.fast-print.net/bookshop/1877/product-design-a-course-in-first-principles-mono>
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Industrial and Graphic Design for Paralympians

Carlos Montana Hoyos and Lisa Scharoun

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Abstract: Collaborating with the Australian Paralympic Committee (APC), the authors developed a practice-led research project in two parts (mainly a graphic design and an industrial design one) which explored some of the roles of visual culture in design for athletes with disabilities. This paper discusses this design research project developed with the APC for the 2012 Paralympic Games. The first part encompassed historic and visual research to produce 13 posters about the Australian Paralympic history. The second part involved Masters in Industrial Design (MID) students to develop design solutions for the APC's Paralympian of the Year (POTY) 2012 award ceremony. Conclusions discuss implications of designing for athletes with disabilities, as well as merging research-based teaching and practice-led research in design through exploring the social contribution of design within the community. This is a summary paper of a full peer-reviewed journal article originally published in the International Journal of Designed Objects.²

Keywords: Paralympic Games, Industrial Design, Graphic Design, Design for Disability,

²***Full paper citation: Montana-Hoyos, C. & Scharoun, L (2014) Design for Paralympians: Exploring Roles of Graphic and Industrial Design in Promoting Awareness of Athletes with Disabilities. The International Journal of Design in Society - ISSN:2325-1328 (print), 2325-1360 (online)***
http://ijgs.cgpublisher.com/product/pub.236/prod.47/m.2/fid=1623408/G13_42669_DesignforParalympians_Final.pdf?

Introduction

Paralympic sports are very important in Australia. According to the Paralympic Education Program (APC 2013), “today the Paralympic Games is one of the largest events in the world, eclipsing in size the Commonwealth Games. In total, 146 nations sent 3,951 athletes to compete at the 2008 Beijing Paralympic Games, including 179 athletes from Australia making it the second largest sporting event after the Olympic Games.”



Figure 1: Photograph of Paralympian and Logo of the Australian Paralympic Committee

Source: Australian Paralympic Committee 2012

The research presented in this paper was developed from the question: *How can design improve the public’s perception and knowledge of people living with disability?* In collaboration with the APC, design professors and students from the University of Canberra (UC) aimed to provide new insights into how design can be influential in improving the public’s perception and knowledge of people living with disability. In this study, a positioning of the APC was outlined through the development of two design projects (a graphic design and an industrial design one) within a practice-led design research framework, reflecting on the current attitudes towards people with disabilities and how this perception can be influenced by design.

Conceptual Model

Based on the project's literature review, a conceptual model was developed in order to visualize some of the topics relevant to this project (Figure 2, below). The Paralympic movement has an important role in society, yet it is not well understood; marketing, advertising and promotion for the Paralympics are challenging as historically these have taken a tone of positive affirmation that can border on being patronizing to the athletes. Graphic design and industrial design are disciplines which can contribute to developing 'design products', which will become part of the 'visual culture' around the Paralympic movement. Our current society is defined by this material or *visual culture*. According to Rogoff (in Mirzoeff 2004, p.24) visual culture is "opening up the field of vision as an arena in which cultural meaning gets constituted."

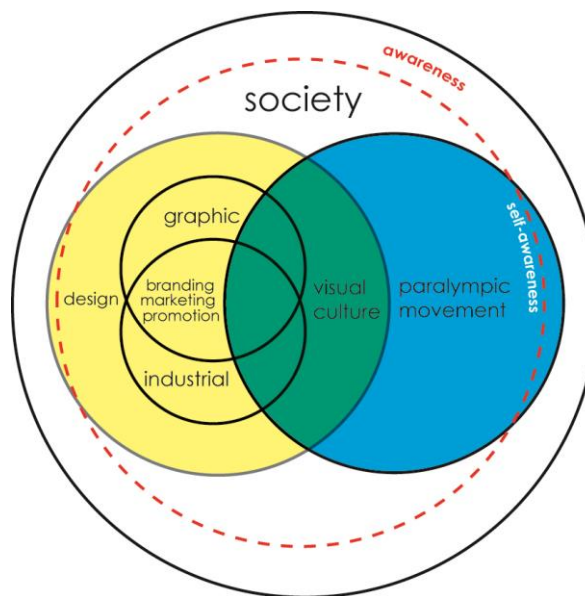


Figure 2: Conceptual Model of the Project. Source: Montana Hoyos, 2013

The study of visual culture, therefore, provides the visual articulation of the continuous displacement of meaning in the field of vision and the visible. Within this visual culture, the creation of these 'design products' (in the forms of visual or 3 dimensional elements) can help communicate 'self-awareness' within the

Paralympic movement, as well as help communicate the Paralympic movement to the broad society, creating an awareness of it. Some possible relationships of these concepts are visualized in Figure 2, above.

Methodology and Design Research Methods

This project applied contemporary approaches to design research in order to explore possible roles of design for the community, specifically dealing with perception of groups of people with disabilities. The recent 'constructive design research' (Koskinen et al 2011) is defined as "design research in which construction - be it product, system, space or media - takes centre place and becomes the key means in constructing knowledge."

Within this project, two parts were developed as follows: 1) visualization of Australian Paralympic history (graphic design), supported by data collection from the archives of the APC and 2) table centrepiece designs (industrial design) for the major biannual event of the APC, the POTY award. The overall research process for the entire project was completed in the following stages:

- *Stage 1: Review of literature regarding sports and design, marketing and promotion, community attitudes towards people with disabilities, community awareness campaigns and attitude change.*
- *Stage 2: Application to a Linkage Research grant*
- *Stage 3: Development of each individual part*
- *Stage 4: Reflection on the design process and solutions*
- *Stage 5: Dissemination of results through academic papers*

Part 1: Visualization of Australian Paralympic History (Graphic Design)

According to the APC, whereas lots of motivational materials for the Olympics exist, there is not much in the way of motivational materials/display for the Paralympics. The APC felt that a poster set of this nature was necessary to both validate the achievements of past athletes and to motivate future/current athletes to achieve their goals. In the first part of this project, Lisa Scharoun created 13 colorful posters that visualize the Australian Paralympic history.

The posters aimed to be motivational tools for the 2012 Australian Paralympic athletes by showing them the previous accomplishments of athletes performing in their sport. This objective differs from advertising the sports/APC to an outside audience (however it was mentioned that later on, they would like to hang the posters in the APC national office for stakeholders and visitors to see).

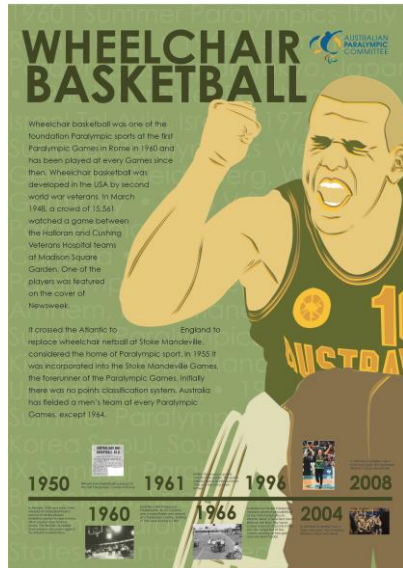


Figure 3: Initial Proposal and Colour Scheme for History of Australian Paralympic Movement



Figure 4: Final Proposal and Colour Scheme according to APC Branding and Logo

Source: Lisa Scharoun 2012

The posters also visually summarized and helped explain the importance of Australia's contribution to the Games to athletes from other nations. Posters were displayed in the Olympic Village, as athletes have a lot of time between events, and were meant for aesthetic purposes (to make the bland rooms in the village more appealing) as well as for educational/entertainment, and motivational purposes.

The colour scheme for the posters reflects the APC logo colours and aligns with the highly recognized current branding, as requested by the client. Although traditionalists may assert that posters should utilize a minimal amount of text, the posters were commissioned by the client to provide a maximum amount of historical data, as their main purpose was to be a learning tool for the athletes and visitors to the village. In this sense the posters could also be described as 'Infographic' a term coined in the 1960s, which according to Oxford Dictionaries, is defined as "a blend of information and graphics."



Figures 5 & 6: Examples of the Final Posters
Source: Lisa Scharoun 2012

Overall, this poster design project suggests that posters can be an effective means to communicate to and empower the APC athletes, and this has the potential to be extended to the community as a means of showing a more positive perception of the Paralympic sports and their athletes.

Part 2: Designs for the Paralympian of the Year (POTY) award 2012 (Industrial Design)

For the second project, Carlos Montana Hoyos and a group of 9 Masters in Industrial Design (MID) students from UC, from both first and second year, worked together within a vertical studio project on design solutions for table centerpieces for the APC's Paralympian of the Year (POTY) awards ceremony, celebrated in November 2012. Based on an initial research about Paralympic branding and through the study of visual elements derived from the APC imagery and graphic material and the 2012 London Paralympic Games – including logos, architectural icons or landscapes and images of athletes in action – the group of students designed and managed the manufacture and distribution of 100 centerpieces, within the general guidelines and event design concept discussed with the APC, as well as an external event-design-management company and the venue managers.

The design process of the centrepieces was as follows. Firstly, an initial meeting with the APC (namely Tony Naar, and Sally Jarvis, events manager) to define client objectives was shared with Part 1 (poster designs). Initial discussions informed the development of the design brief, which aimed for novel, beautiful and sculptural table centerpieces incorporating light, to convey the message of the Paralympic spirit, Australian identity and the context of London 2012 Paralympic Games. Secondly, during the initial

academic week, representatives of the APC gave an introductory lecture to UC-MID students. Australian Paralympian and Gold Medallist Peter Brooks introduced Paralympic games and the APC, also sharing with the students his personal experience and his Paralympic medal. Thirdly, the students individually generated initial design concepts, supported by a task clarification phase and preliminary research. Initial research explored and evidenced the roles of Industrial Design as a tool for branding, communication, marketing and promotion.

For example, many of the designs for the Olympic and Paralympic Games of 2012 were based on ideas of cultural identity and iconography of London. The Paralympic Games branding and logos also offered insight into what values needed to be communicated through forms, materials, colours and textures. In their initial concepts, all MID students used the Paralympic logo and its three elements, translating them from 2-Dimensional figures to 3-Dimensional forms.



Figures 7 & 8: Pin-up of Examples of Initial Centrepiece Design Concepts by MID Students
Source: UC-MID students, as per acknowledgements, 2012.



Figures 9 & 10: Pin-up of Examples of Initial Centrepiece Design Concepts by MID Students
Source: UC-MID students, as per acknowledgements, 2012.

Furthermore, by using as an example the history of the development of the iconic Olympic and Paralympic torches, the team of industrial design students explored ways of communicating culture and national identity through the design of a product. After an internal evaluation, two proposals were chosen. One of the chosen designs was mainly inspired in 2012 year's Olympic and Paralympic torch (designed by Edward Barber and Jay Osgerby) as seen in Figure 9, while the other one was mainly inspired by London's iconic building in 30 St Mary Axe (formerly the Swiss Re Building, and informally also known as 'the Gherkin', designed by Sir Norman Foster and Arup Engineers), as seen in Figure 10.



***Figures 11 & 12: Examples of Final Centrepiece Prototypes Designed and Manufactured by MID Students
Source: UC-MID students, as per acknowledgements, 2012***

Fourthly, in view of the 2 chosen solutions by the APC, the 9 MID students were randomly divided in 2 groups, of 4 and 5 students respectively, to collectively refine, detail, and eventually manufacture each of the 2 chosen centrepiece proposals. Fifthly, the groups of students managed the manufacture of the 2 chosen designs within a budget. The project required 3 different quotations from potential suppliers (either of parts or the complete product). In view of the manufacturing costs and the lack of related suppliers in the region, both groups of students had to sub-contract the production of some of the parts, and eventually had to assemble by themselves the 100 final products.



***Figure 13: Manufacturing of 50 Units of Each Design Chosen by APC Staff
Source: photography by Montana Hoyos, 2012***

This proved to be an excellent, although very time-consuming, learning experience. The experience of personally assembling the products was very valuable for the students, and after personal reflection they expressed that “they would definitely consider the assembly of their designs more carefully in the future”. Finally, both groups were also challenged with the packaging and delivery of the final centrepieces, and several delivery options were evaluated, mainly in view of one of the final designs resulting very fragile. Due to time constraints with the manufacture and assembly, the students delivered the final centrepieces by themselves. This was coordinated with the attendance to the POTY award ceremony, to which all students and staff who participated in this project were invited.



Figures 14 & 15: Final Centrepieces in Use during the Paralympian of the Year (POTY) Award Ceremony. Source: photography by Montana Hoyos, 2012

Although time-consuming (and at some point competing with other academic assignments of the students), the project proved to be an invaluable learning experience, as students were exposed to the complete cycle of a product development, starting from conceptualization and going through costing, manufacture, assembly, packaging and distribution. Furthermore, anecdotal evidence suggests that attending the award ceremony and seeing their designs in the event was a great experience for the students, as expressed informally by social media through comments like “having a blast in the POTY award”.



Figure 16: Staff and MID Students with Their Designs during the Paralympian of the Year (POTY) Award Ceremony. Source: photography by APC staff, 2012

Summary

The roles of design disciplines in promoting general public awareness and self-awareness of Paralympic sports have been rarely discussed in academic literature, and this collaboration with the Australian Paralympic Committee (APC) provided a good opportunity for exploring this. Design, marketing and promotion for the Paralympics are challenging, as historically it has taken a tone of positive affirmation that can border on being patronizing to the athletes. Due to their disabilities, Paralympians are often portrayed as victims, rather than the elite athletes they are, and the competition is perceived by the public as less rigorous, as compared to Olympic sports. However, this situation is changing, and this was evidenced in the London 2012 Paralympic Games through the coverage, sponsorship and media campaigns. Overall, this 'practice-led, constructive design research' project allowed both students and staff to critically reflect on both design processes and the roles of Graphic and Industrial Design within society.

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Designing Education Contexts to Empower Students' Contextualization of Their Learning Experiences

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I Introduction

With the emerging paradigms of the knowledge-based society and the advancement of technology and globalization, design education faces the need to reform and restructure its curriculum to address many new challenges and changes. This essential reorganization paradigm combined with all the additional learning requisites requires that we ask the following questions: 1) what appropriate topics should be covered within the design curriculum; 2) how can those learning components be developed to generate quality learning experiences; (3) how can we develop curricular contexts and learning systems that offer a meaningful experience and impact the personal and social life of each student involved in the process; and (4) how can we introduce new values within the design education to empower students' identities through the learning process? These challenging questions can be answered by and explored with the fundamental research on educational theories and principles. This paper presents how a new industrial design program at the University of Houston has developed a curriculum based on constructivism and turned those challenges into opportunities through representative projects.

II Constructivist Design Learning

From the conception of the Industrial Design (ID) program in 2003 within the College of Architecture and Design, University of Houston, the foundation of the ID curriculum was initiated on the premise of constructing cognitive and social learning in a socially interactive context that could provide an alternative perspective of enhancing the quality of design learning and design practice. Based on this premise, the curriculum was developed on the framework of constructivist learning theory and imposed critical questions to students' real learning experiences based on constructivism (Kwon, 2007). Unlike objectivism, which is based on the notion of independent and objective reality, constructivism develops a theory of knowledge in which "knowledge does not reflect an objective ontological reality, but an exclusive ordering and organization of a world constituted by our experience" (Watzlawick, 1984, p. 24). Constructivism focuses on the transformation of knowledge and its development within students by emphasizing active learning, and participating in and interacting with the surrounding environment in order to create a personal view of the world (Duffy &Jonassen, 1992; Perkins, 1992). Constructivist learning theories emphasize the importance of experience, and the positioning of cognitive experiences within the authentic learning needs. These experiences are applied to the design learning process and contextualized for the student's active and participatory learning experiences to help create his/her own personal view of the world.

In the studio-centric curriculum at the University of Houston, we have created design projects which address a broader understanding of human issues through: 1) development of

socially equitable and fundamentally sustainable design solutions based on the methods of human-centered design, 2) inclusive design, 3) universal design, 4) transgenerational design, 5) participatory design, and 6) action research. These issues and methods have arisen within the context of a major paradigm shift in how we view different people in society. We focus extensively on iterative learning feedback and interaction from both the researchers and the investigated users which informs the human activity and actions. Inclusive design requires that comprehensive design methods include a broad range of documented experiences from all users in order to improve products and/or systems. Participatory research is explained as “an alternative philosophy of social research often associated with social transformation in the Third World” (Kemmis & McTaggart, 2000, p. 568). Action research is a process of deep inquiry into one’s practices aligned with values that seek opportunities for improvement. By using and combining these methods, the human-centered design learning processes and its outcomes can connote the human relationships found in the action and emancipatory theory. Design projects included in this paper illustrate how design students have learned, used, and adapted a variety of design research methods to meet the requirements and desires of people of diverse ages and capabilities within a wide range of situations, and how their learning experiences have empowered the students’ capabilities and identities.

III Case I: Participatory Action Research

One of the most illustrative cases of human-centered and inclusive design is a studio project created for Justin Farley, a founder of *Unlimiters*, who promotes and recommends high-quality products which ‘unlimit the limiters.’ It took six months to investigate the diverse constructive learning methods in order to

a build reflective and dialectical relationship between Justin and the design students, and to create a ten-week design curriculum for the *Unlimiters*. Justin, who has cerebral palsy, was exclusively investigated by thirteen juniors as the user and the developer of the project. The curriculum design was based on the PAR (Participatory Action Research), which emphasizes “illuminating and clarifying interconnections and tensions between elements of a setting in terms that those participants themselves regard as authentic” (Turnbull, Friesen & Ramirez, 1998, p. 573). The learning process was planned to ignite dynamic communications between the researcher (outsider, Etic) and the investigated user (insider, Emic), and to encourage participatory and collaborative activities for their common goal, where both the outsider and the insider could experience a high sense of well-being, autonomy, competence, respect, equality and confidence. Based on the merits of an inclusive research strategy, PAR could be used for not only the research methodology but for educational pedagogy embedded in the design process with three phases: plan/observe, act/design, and reflect/revise through iterative feedback loops that continually informed the design questions.

- a. **Plan and Observe:** This is the phase in which specific research activities are planned and human relationships are built between the researcher and the investigated user. For the process of data gathering, which focused on making the unfamiliar familiar, students chose observation, video ethnography, and interviewing in order to identify Justin’s issues and latent needs. Justin agreed to be observed and shadowed for 7 days a week, and almost 24 hours a day. Within several weeks, throughout the iterative observation processes, students were able to acquire the Emic view and

address Justin's issues through illustrations and expressive explanations.

- b. **Act and Design:** Students interpreted the collected data and clarified the interconnected events and behaviors of Justin. Coping with uncertainty and resolving tensions between the researcher and the investigated user was one of critical learning elements for the student. Students carried on multifaceted investigations, and engaged in tacit knowledge and personal experiences with Justin.
- c. **Reflect and Revise:** Through this phase increases in research utilization for designing reflected the design processes and consequences. Students co-developed design problems with Justin and acted in accordance with an explicit value position. By building participatory partnerships with Justin, students used design research to become more flexible, reciprocal, and representative.

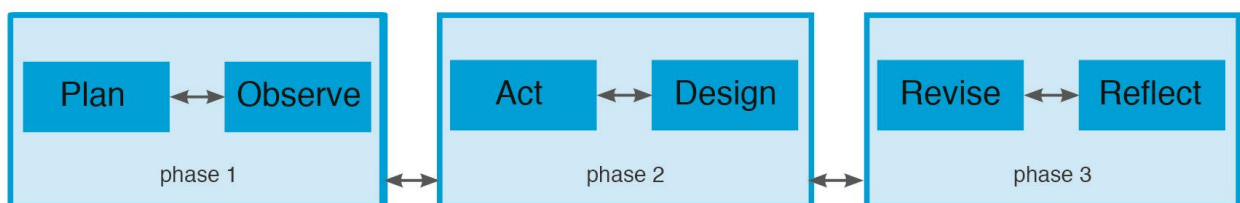


Figure 1 the PAR design process

From the PAR design process, illustrated in Figure 1, students reflected on their recognition of Justin's issues and could also ascertain how to make improvements to their designs through continued reflection and integration of their design performances. From the first phase of plan/observe, the importance of possessing an Emic view was introduced and emphasized in studio discussions. Fortunately, this challenging task was achieved relatively easily since students had developed a friendship with Justin. By establishing a close camaraderie with Justin the

students were able to think and act on his behalf and define an insider's view of their practice. It was also encouraging that students reflected upon their activities frequently in their design processes, and asked critical questions for realistic and desirable design outcomes for Justin. Due to the totally immersive and authentic learning experiences that were developed between Justin and the students they were able to overcome their ambiguity and concerns regarding the cultural and communicational barriers.

Design Outcomes & Review

At the end of the ten weeks, final designs were presented to Justin, his family members, friends, and the *Unlimiters*. The goals were to increase mobility, changing socio-cultural communication patterns, improve self-reliance and competency for useful and desirable design solutions. The final design solutions were wide-ranging, which included kitchenware, a showerhead, a pouch, a purse, a body stabilizing system, extended mobility system, and transportation products. Moving beyond barrier-free design, the enhancement of self-esteem with a new product/system was a challenging task facing both the students and Justin. After the final design review, Justin responded by sharing what he learned from this study.

"Being involved with the Industrial Design program made me realize just how many products there are that could be made or improved to make life easier for people with disabilities no matter how simple or complex. Some of the designs presented at the final review I could see myself using and/or sell on my Unlimiters website... Participating in this project was amazing. I learned a lot about myself

through the observations of the industrial design students and made friends along the way.” (Justin)

From ID students’ self-evaluations on the project, students responded unanimously concerning the significance of the learning experiences they received through the design research and affirmed the value of the lesson that they learned. They accepted that the experience of this project had significant influence in their personal design process. Students were not satisfied with the traditional criteria of design excellence, but reflected critically upon the implicit and explicit value of their design solution in the context of Justin’s life. Students’ responses also revealed the importance of action and empowerment of the design studies was significant. Students reviewed their success, failures, fears and frustrations related to inclusive design study and how, as a designer and/or social activist, they contributed to Justin’s life.

“The experience that I gained during this project has not only affected my design ability, but has influenced my goals as a designer. I never used to be one to believe that “design can save the world”, but now I understand that my design outcomes have the ability to play a crucial and impactful role in the lives of those around me. Not only do I hope to engage in a similar project again, but what I learned from this experience has guided the path that I have chosen to take as a designer. This path includes using my design and problem-solving abilities to better the lives of those who stand to gain the most from the presence of design.”(Student T)



Figure 2 the PAR design review

Exposing and exploring a real problem was challenging, but the PAR learning process expanded the students' views on the real user and finally enabled and empowered all participants in this study. Even after the project, students have continuously reviewing the *Unlimiters'* experiences and questioning the critical role of a designer in the socio-cultural and geo-political context: who am I as a designer? Matthew Burton, one of thirteen students, pushed his *Unlimiters'* design exploration further and received the first prize award from *the International Housewares Design Competition* a year later. His design, *Connect*, is an adapter for an electrical outlet which assists individuals who experience physical limitations by simplifying the insertion and removal of plugs, reducing clutter, and requiring very little effort or electrical experience to install. *Connect* is specifically designed to increase the functionality and usability of electrical outlets for those with physical limitations whether it is a lack of grip strength, failing eyesight, limited dexterity, or a lack of height, but can be of great value across markets and across generations. This design empowers Justin and people all around the world. The recognition of *Connect* has reinforced Matthew to reflect on the

meaning of design and its processes in the socio-cultural context. Recently, he was asked to review his identity development as it relates to his design education. He stated clearly that the inclusive design project with Justin was the most impactful and meaningful project that expanded his views on what would be possible through design.

"This inclusive design process not only leads to the development of meaningful and effective solutions that addressed relevant problems in Justin's life, it created a sense of responsibility for the work we were doing. This new way of thinking reinforced the concept of the interconnectedness of everything and everyone around me. I began to see that meaning and purpose was achieved through a better understanding of those relationships, and through being of service to others. It shed light on the deep responsibility I have to work toward the betterment of the collective. It is our choice, our responsibility, to understand who we really are, to allow that understanding to guide our purpose, and to act with integrity from that place. We have the ability to move beyond them, away from exclusion; and in doing so to realize our innate and limitless potential to understand relation, to experience deeply and ultimately to love."

Since this case study was initiated four years ago from the development of a ten-week design curriculum, it has continuously empowered the people engaged in the learning process including Justin, Matthew, and the author. It has become a process of self-liberation. Justin has continued to build his knowledge for *Unlimiters* to liberate him and people within his community. Matthew has supported design education through the non-profit organization *Matter* he created to focus on the preservation and

enrichment of humanity and the ecosystems that support us. The author has studied constructivists learning theories, and developed inclusive and social design strategies, which include interdisciplinary groups of people to create authentic and actionable changes in our society.

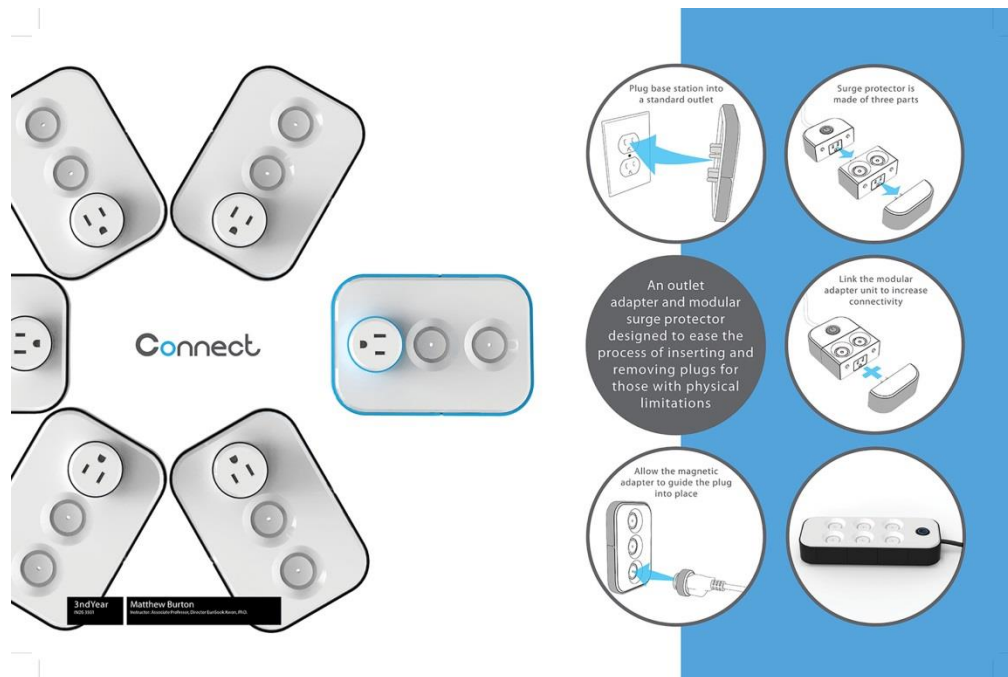


Figure 3 Connect

IV Case 2: Interdisciplinary Collaborative Design Exploration

Another case that explored human-centered and inclusive design was an interdisciplinary capstone course which combined an industrial design studio with a computer engineering technology laboratory to achieve the goal of creating a dynamic learning context. This integrated studio/laboratory study provided several inspiring curricular enhancements such as: (1) knowledge and tools in the two disciplines could be shared and enhanced for the achievement of a real-world, collaborative, and interdisciplinary research process; (2) skill sets within the two disciplines were found to be complementary, which allowed students to design and build a working prototype; (3) critical thinking was used to analyze and synthesize the effectiveness and quality of the

problem-solving process and its outcomes were intensively integrated through cross-boundary discussions.

The team members achieved all these learning activities after they acknowledged the differences within the two divergent teams and thereby built a foundation of unprejudiced attitude. *My Voice* was born when a consensus was reached and they linked face recognition technology with the sign language user. Sign language has helped bridge the communication gap between those who hear and those who cannot, but many people are still not fluent in its motions and hand shapes. Using face recognition technology, this team was able to establish an innovative language translation system that would provide the hearing impaired community with a voice and a way to be included more expansively in society. From in-depth interviews and observation methods, the team created an innovative user scenario to enhance conversation between a hearing-impaired person and a person who does not use sign language. *MyVoice's* concept focuses on a handheld tool with a built-in microphone, speaker, soundboard, video camera, and monitor. The industrial design students researched the application of *MyVoice* by reaching out to the deaf community to understand the challenges associated with others not understanding sign language, while the engineering technology students had the arduous task of programming the device to translate motion into sound. The software translates the hand gestures in order to define the words, letters and phrases. The biggest difficulty was obtaining and building a database of images of the sign languages. It involved 200-300 images per sign. The team was ecstatic when the prototype came together. Regarding the impact of the project, a design student reflected:

"While designing and developing MyVoice, it turned into something very personal. When we got to know members of the deaf community and really understood their challenges, it made this project very important to all of us. We hope to work with someone to implement this as a product. We want to prove to the community that this will work for the hearing impaired. We are proud of such a contribution to society through MyVoice, which breaks the barrier between deaf community and common society."



Figure 4 MyVoice

As a result, this new system demonstrates how we can eliminate the verbal and social barrier between the two communities. This case also illustrates that the impact and value of human-centered and inclusive design can be scaled up through the interdisciplinary and collaborative learning with an emphasis on the technological, social-economic and social-cultural progress. After *Unlimiters* and *My Voice*, more design projects have been developed to challenge the human-centered and inclusive design issues with diverse users and stakeholders. Designing new curriculum has been a

challenging and rewarding task, and also empowers students to contextualize their active and participatory learning experiences. This process helps students recreate their own personal view of the world and cultivates the industrial design program as a living organism.

V Summary

This paper discussed the significance of curricular contexts and learning systems that extended themselves meaningfully into the personal and social life of everyone involved in the process. Case studies focused on its inherent pedagogical value in which design placed the investigated user at the heart of the design process both in traditional design studio settings and new interdisciplinary studio/laboratory settings. From the students' reflective responses, it was found that the human-centered and inclusive design projects have encouraged students' active and reflective learning by acknowledging the power of design research and the impact of design outcome. It also empowered students' identities through the learning process based on constructivism.

After considering similar research methodology, this study chose Participatory Action Research (PAR) as a primary driver of human-centered and inclusive design development. From the case studies, the author recognized the significant values of PAR in design education, especially for its collaborative and participatory efforts that enhanced the authenticity of human relationship in the entire processes of design research and development. PAR's research methodology became a critical ingredient in which to generate meaningful actions and activities aligned with design values and outcomes as a philosophical focus on human-centered design and inclusive design. Although this study was an overview of PAR and interdisciplinary collaborative project as a

methodological approach to solve inclusive design problems, it brought to light a broadened view of the roles and relationships between education and social change: (1) This study has initiated and broadened the dialogue in cognition, design pedagogy, reflective action for social change, and emancipatory design in design education; and (2) The vitality of the reflective discussion with design students provided evidence of sharing views on their roles, identities, and leadership. We hope this study can be a relevant and persuasive resource to elevate more participatory and action research, and its integrated curriculum development in design education.

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Steps towards Integrative Palliative Care in the Developing World

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Abstract

Treatment for suffering in low resource areas can benefit from easy access to medicines that treat pain, gasping, terminal secretions, nausea, anxiety, and delirium. Because suffering needs to be contextualized within prevailing cultural forces, individuals with communal connections with the patients must be empowered to administer these medications and provide care giving services. Additionally, designing and developing low cost medical dispensing systems allows a wider range of treatment. Artificial intelligence can be combined with voice recognition for both patient diagnosis and innovative medical products to improve efficacy of treatment.

Introduction

Design can address complex problems through inquiry, synthesis and creative exploration. Problems that lie outside mechanistic solutions are fertile areas for design processes that strive to motivate creative improvements and innovations. Improving healthcare is a type of problem that challenges deductive logic and benefits from 'design thinking'. This inquiry recognizes that the resource driven model of healthcare has overwhelmed the relational needs required for palliative patient care. This paper wishes to extend the medical discourse beyond the well-understood effects of disease and the positivistic validations of

pharmacology. While it is presumptuous for those steeped in US medical traditions to assert appropriate systems of palliative care in the developing world, this reflection on palliative treatment intends to offer a different perspective that appropriate local decision makers may find helpful.

Palliative care can consider three tracks: medical, relational and spiritual. The medical realm can include adjuncts to pharmaceuticals while the relational can cover areas of concern ranging from the relationship between caregiver and patient to the effect of patient pain and psychosis on family members. The spiritual realm addresses deeply held beliefs about the patient's relationship to a deity in their faith tradition.

Background

Reducing suffering requires identifying a cultural framework that connects pain and suffering. The acceptance of pain and the expectations of palliative care require a subjectivist, interpretive epistemology. This epistemology draws upon the humanist arguments against exclusive positivistic approaches that highlight limitations of the scientific method and its inappropriateness for assessing human thought and actions (Feyerabend 1993).

A theoretical construct for understating the relational component of palliative care, beyond pharmaceutical approaches, lies with the integration of psychological and sociological theories. The identity theories, along with the phenomenological perspective of an ideal self, suggest that when people identify as part of a group they will deeply nurture each other's attributes that tend to maintain the group identity. Motivation for the cooperative exercise of caretaking can be founded on the development of an identity associated with a group. The identity theory asserts that

one's self-esteem is derived from the identity developed from social interactions. The sense of self is based on the roles that one assumes in a society or group with which one identifies (West 2014, Stets and Burke 2000). A shared group identity can promote a desire to protect against those in other groups.

As noted by Illich, pain is connected to both social and individual identification:

Pain is shaped by culture into a question that can be expressed in words, cries, and gestures, which are often recognized as desperate attempts to share the utter confused loneliness in which pain is experienced (Illich 1976, p. 140).

Reducing pain and suffering is more complex than medicinal treatment. Addressing palliation requires deference to cultural motivators, self-identity and other powerful, foundational forces. An effective system for palliative care moves beyond medicine and includes encouragement of relationally rooted interaction between the patient and caregiver as well as spiritual nurturing. The caregiver's personal connection with the patient is a key factor in reducing patient anxiety and maintaining patient dignity. This caregiver relationship is especially important for terminally ill patients. The medical treatment considers medication appropriate for treating pain, gasping, terminal secretions, nausea, anxiety, and delirium.

Clinical Pain in the Developing World

Pain is the most commonly feared symptom listed by individuals contemplating their eventual terminal illness and death. Unfortunately, throughout much of the developing world,

hundreds of thousands of people realize this fear daily. The World Health Organization estimates that more than 30 million people each year are in need of care to support them and palliate their symptoms during their terminal illness, but the vast majority cannot get this care. Millions suffer from untreated pain annually. This includes more than 5.5 million who die from cancer and more than one million from end stage AIDS (NGO 2011). Opioids are one essential class of medication to treat such pain, but access to these medications is very limited in much of the developing world. Efforts to improve appropriate access to this class of medications are an important part of the worldwide palliative care movement. In addition, increasing access to non-opioid medications and non-medication analgesic measures is also an important component in the effort to reduce worldwide suffering in the sick and terminally ill.

Comfort Kit

In established palliative care systems, providing patients with an emergency symptom kit (or 'comfort kit') is a routine component of preparing for the common forms of suffering which afflict humans contending with advanced illness. The most common such symptoms are pain, dyspnoea (air hunger), nausea and vomiting, delirium (an acute confusional state) and anxiety. Medications that are commonly included to treat these symptoms include non-opioid pain medications (such as paracetamol or diclofenac), anti-anxiety medication (such as lorazepam or diazepam), anti-emetic (vomiting) medications (such as prochlorperazine), and anti-psychotic medications (such as haloperidol). Some such packs also include anti cholinergic medications to treat the terminal secretions ('the death rattle') that often accompanies the terminal state. Provision of a comfort kit, as depicted in Figure 1 below, including these inexpensive medications alone, or even better,

including simple commonly needed care items such as simple dressings, a urinal, and perhaps antibiotic ointment, would greatly enhance the comfort and the dignity for those who are ill and suffering.

Pain	<ul style="list-style-type: none">• paracetamol• diclofenac
Anti-anxiety	<ul style="list-style-type: none">• lorazepam• diazepam
Anti-emetic	<ul style="list-style-type: none">• prochlorperazine
Anti-psychotic	<ul style="list-style-type: none">• haloperidol
Terminal secretions	<ul style="list-style-type: none">• anticholinergic
Other care items	<ul style="list-style-type: none">• dressings• urinal

Figure 1: Comfort kit contents

Interpersonal Relations

Medical practitioners typically enrol medications to ameliorate acute symptoms. However, the notion of pain is contextual and culturally moderated. Therefore, palliative care must rely most deeply upon the personal relationship between the caregiver and patient. The patient must conclude that the caregiver understands the suffering of the patient. The caregiver must ask the question, "What would you most like me to know about you so that I can take care of you?" This inquiry is easy to present in the abstract but the patient-caregiver relationship is an entanglement comprised of a web of values, history, social norms, and regulatory requirements.

A caregiver will never fully understand their patient's suffering, but must rely upon a deeply held sense of personal responsibility in treating and comforting the patient. This type of relationship is derived more naturally from family relationships than from the medical community. In addition, the patient's expectations can motivate the approach to palliation.

Consequently, the attending physician must understand:

- *Social and cultural norms*
- *Pain is contextual and subjective*
- *Patient recognizes not all suffering will be lifted*
- *Relationship between patient and caregivers*
- *Effect of illness on family*

Spiritual

Faith traditions are important in contextualizing suffering and identifying a purpose to pain. Given that the experience of suffering frequently challenges the core of an individual, such faith traditions can be an important aspect of providing care both to the patient and to their family. Through the values and meaning in a faith tradition suffering can represent a means to develop character and hope in the midst of an illness. Alternatively, patients can believe that the purpose of their pain is for discipline, correction or an indiscernible purpose, but that it is still governed by their deity. Therefore, addressing the spiritual can be an important part of palliation and subsequent comfort for the suffering individual. The above integrative palliative care factors are illustrated in Figure 2:

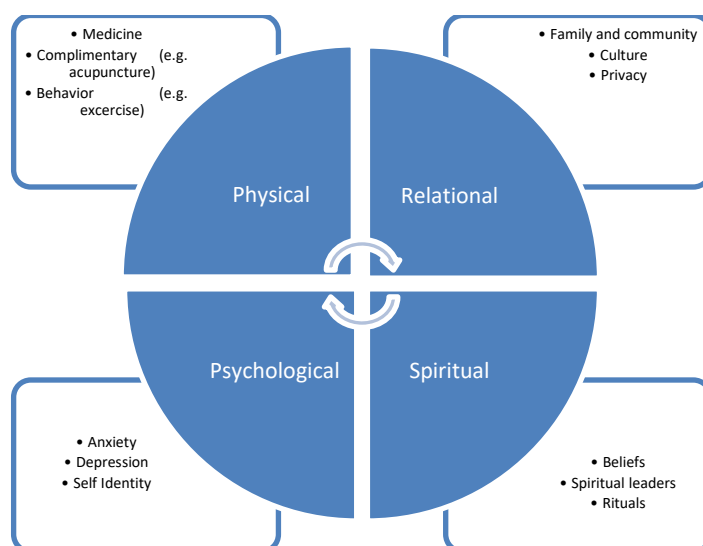


Figure 2: Integrative palliative care factors

Artificial Intelligence

Artificial intelligence (AI) can democratize access to patient assessment and guide dispensation of medicine. Computing systems incorporate AI, such as expert systems and artificial neural networks that strive to model human thought in a manner that can be processed on a computer and accessed by a non-expert user. However, sharing human knowledge and expertise is a difficult task. People use very sophisticated and intricate thought processes to solve problems, recall information, and make decisions. Although expert systems are an excellent technology to save and disseminate knowledge, transferring that knowledge from the domain expert to the computer is difficult. Acquiring knowledge for an expert system is the art of structuring human instincts, experience, heuristics ("rules of thumb"), guesswork and all the other words, which can never quite explain the human thought process.

Expert systems use fuzzy logic to make decisions. That is, the confidence of an output is quantified and that value can be handled separately from the output. The confidence output is then used in determining the best, final decision of the expert system. The combination of outputs and the confidence associated with them adds intelligence to the system. In this way, the "degree of truth" of information can be managed.

Neural networks use a large number of processors with each artificial neuron dedicated to a specific task. The neural networks organize the links between inputs, outputs and hidden intermediate layers of decision making. Sensory or database information is fed through this network with each neuron processing the data independently and progressing its results

through the network. Generally, a feed forward approach is used where information flows from the input neurons, through the intermediate neurons and finally to the output without a feedback mechanism. In this manner, large amounts of information are processed to identify relationships and therefore create a dynamic algorithm that can accurately develop conclusions from salient inputs.

Voice recognition is often coupled with AI allowing computing systems to recognize natural language usage and discern emotion. AI driven voice recognition allows simplified access to computing power. Currently voice systems are more than 97 percent accurate in identifying individual words and are being quickly implemented due to commercial interests (Brown 2016). However, reliance upon AI driven voice recognition has potential problems with error and abuse.

Systemic Approaches

Improving the quality of life for people contending with the symptoms of serious illness requires the care best offered through those who have a personal connection to the patient. Medical approaches typically involve a professional caregiving team who develop and execute a plan of care (Ferris 2002). However, where this resource intensive approach is not possible, a system of palliative care requires altruistic volunteers to provide treatment and personal support for the patient. These volunteers are educated and authorized to give support, evaluate and treat using prescribed protocols. The volunteers are given comfort kits through the medical establishment. If a volunteer from a family, community, or religious group were unable to provide care, a para professional would need to be engaged; however, this is not the optimal arrangement because the altruism becomes distorted by

financial forces. The comfort kit would need to be issued specifically for one patient; however, the comfort kits have value and therefore present potential for misuse. The contents could be resold, which is the most direct problem with the effective distribution of comfort kits. In addition to financial gain, the distribution system provides power over the patient that could be misused. Additionally, administration of medicine could be met by resistance within the medical establishment as well as social forces that resist a layperson's ability to dispense medicine. Control of medicine delivery could be addressed by technical solutions such as time-release containers, drone deliveries or other 'just in time' systems.

However, these delivery systems are vulnerable to theft and abuse. Caregiver training and adjuncts can improve suitability of treatment. The caregiver adjuncts can range from video supervision by a physician to cards with photographs and corresponding treatment protocols. The medical community must recognize untreated, acute pain can develop into chronic pain. Therefore, aggressive treatment of acute pain through opioid and other medicines is recommended so that chronic pain will be reduced.

Future Approaches

While relationships and spiritual connections will always be key components of palliative care, mechanistic designs can provide helpful improvements. These can range from AI guided medicine dispensing systems to human powered refrigeration compressors. In addition to AI guided and remotely based medical supervision, advanced design approaches would call for low cost/high impact devices. Some technologies are seemingly difficult to develop such as systems that deter opiate abuses and secure medicine

distribution. Improvements can be more product specific, such as refrigeration and fluid delivery systems. If patients have refrigeration available, they can store and dispense a broader range of medications.

Appropriate technologies may include human powered refrigeration compressors, solid-state thermoelectric refrigeration, high thermal mass systems, and minimized volume super-insulated storage systems. Low cost, easy to use fluid and drug delivery systems such as in fusional subcutaneous and syringe driver systems would also aid treatment. Usage of medical products can be facilitated using AI driven voice recognition. Additionally, drone delivered medicine and radio and video communication allows treatment in remote areas. These low cost/high impact approaches are shown in Figure 3.

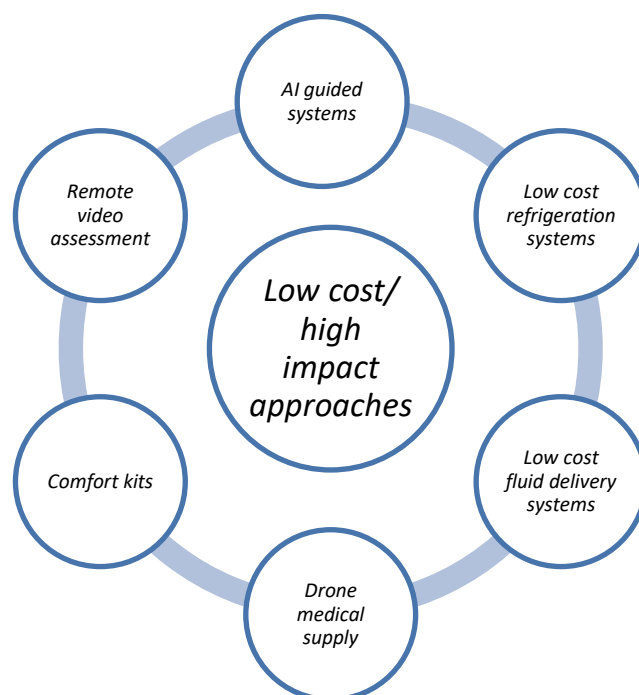


Figure3: Low cost/high impact approaches for palliative care in resource poor or remote areas.

Conclusion

Palliative care transcends medicine and technology. The spiritual and interpersonal relationships infuse into patient care in forms that are difficult to characterize. However, in low resource or remote populations the administration of medicine and care is best administered by altruistic individuals such as those affiliated with the patient by family, community or religion. These caregivers need to be richly empowered to provide treatment necessary to address issues of pain, dyspnoea, nausea and vomiting, delirium, and anxiety. Comfort kits should be provided to caregivers that would include non-opiate painkillers such as paracetamol and diclofenac. Other medications would include paracetamol, diclofenac, lorazepam, diazepam, prochlorperazine, and haloperidol. Other items such as bandaging and a urinal would also be provided.

Within the realm of product and systems designs, technical advances that allow remote monitoring and AI guidance can provide improved diagnosis and treatment. Moreover, low cost versions of refrigeration and drug delivery systems will aid in treatment options. Developing non-addictive pain medicines have been largely unsuccessful; however, customizing pharmaceuticals such as abuse deterrent opiates designed to genomically key to the individual could reduce abuse. Palliative care in the developing world can be improved by empowering nonmedical personnel who are communally connected with the patient. These individuals can best answer the question, "What would you most like me to know about you so that I can take care of you?"

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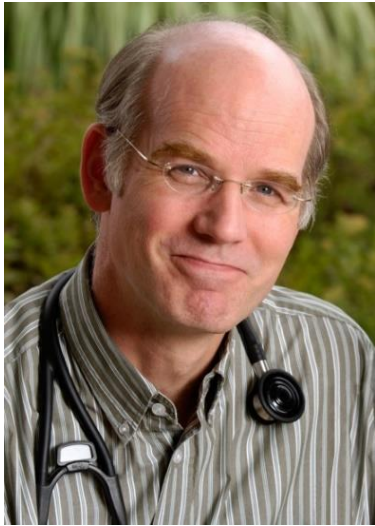
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The Journey to Become the World Design Organization

Brandon Gien

Good Design Australia

There is no doubt that our world is becoming more and more complex and is being faced with an ever increasing number of meta-challenges. The power of the Internet is connecting our world like never before. Technology development is accelerating at such a rapid rate it is often difficult to keep up. Our global population is fast approaching nine billion people and, by 2050, more than 70% of these people have been predicted to inhabit our cities. Coupled with undisputed evidence of the harmful impacts of an industrial civilization driven by a culture of over-consumerism, there is no doubt that our world is facing serious social, economic and environmental challenges.

Design helps; it creates more efficient products, services and systems. It helps build more sustainable places and spaces for us to inhabit. It helps create a more balanced and resilient society. It helps to improve the *quality of life for all*, not only the privileged few. Most importantly, good design if leveraged correctly can be a valuable tool through which *we can not only imagine what a better and brighter future for our world could be, but also provide a proven methodology and framework to help make it real*. While many businesses struggled during the recent economic downturn, there has been significant growth in economic activity targeted at solving larger social and environmental problems. The emerging solutions economy, when viewed through a design lens, has the potential to unlock trillions of dollars in social benefit and commercial return for business, governments and more

importantly, for the global design community.

About ICSID and the World Design Organization (WDO)

Driven by this shared and aspirational conviction that design can help drive us towards a better and more prosperous world, I had the privilege of leading a dedicated Executive Board of Directors during my term as President of the International Council of Societies of Industrial Design (ICSID), the peak global body for Industrial Design with its origins dating back to 1957. ICSID is a non-governmental organization that promotes the profession of Industrial Design and its ability to generate better products, systems, services, and experiences; better business and industry; and ultimately a better environment and society. ICSID is the only global design organization to have United Nations Special Consultative Status. Beginning with 12 founding professional design associations in 1957, ICSID has grown to include over 140 member organizations from 40 nations, engaging them in collaborative efforts and providing them with the opportunity to be heard internationally. This is the story of how we re-aligned the problem-solving capacity of Industrial Design and the organization itself towards some of the biggest and most pressing challenges facing our world today. Our aim was to create a bold and aspirational new vision for the organization that is more closely aligned to the emerging solutions economy and our brand promise - *Design for a better world.*

As an international non-governmental organization approaching its 60th anniversary in 2017, the Board felt it had a responsibility to craft a powerful new design narrative—one that appealed to our common humanity as custodians of this planet and one that gave designers a clear and common cause to focus their unique talent and skills as problem solvers. We believed that as the world

organization for Industrial Design, the 'new' ICSID was uniquely positioned to steer the design industry towards a solutions-focused environment and more prominently champion design's role in effecting positive change in our world. Our Board worked hard to articulate this renewed vision and mission, developing a regional member engagement framework that was aimed at aligning, connecting and activating designers at a local and regional level.

The strategy was to work with the organization's vast network of members from all parts of the world and the design communities they represent to identify and help solve challenges at a regional level that could then inspire change at a global level. Another important aspect of our work towards this new direction for the Industrial Design profession was to ensure that the organization had an updated definition for the profession. As the peak global body for Industrial Design, the world turned to ICSID for this definition and although the existing definition had served its purpose well over the years, it did not reflect the significant changes since the last definition was scripted in the early 70s.

The process to re-define the profession was no easy task. ICSID engaged the global Industrial Design profession through its vast network and leveraged the power of social media over a 12-month period to get as much feedback in to the process as possible (a co-design process at its finest). With more than 500,000 responses, the task at hand was to distil all this information into a succinct definition that better reflected the rapidly changing nature of Industrial Design. After countless drafts, the following definition was approved to take to the General Assembly for ratification:

"Industrial Design is a strategic problem-solving process that
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drives innovation, builds business success, and leads to a better quality of life through innovative products, systems, services, and experiences.”³

In contrast, the previous definition proposed by Tomas Maldonado in 1969 read as follows:

“Industrial design is a creative activity whose aim is to determine the formal qualities of objects produced by industry. These formal qualities are not only the external features but are principally those structural and functional relationships which convert a system to a coherent unity both from the point of view of the producer and the user. Industrial design extends to embrace all the aspects of human environment, which are conditioned by industrial production.”⁴

While the new definition was succinct and better reflected the changes to the profession over the last 60 years, the Board felt it was important to create a more comprehensive definition, which read as follows:

“Industrial Design is a strategic problem-solving process that drives innovation, builds business success, and leads to a better quality of life through innovative products, systems, services, and experiences. Industrial Design bridges the gap between what is and what’s possible. It is a trans-disciplinary profession that harnesses creativity to resolve problems and co-create solutions with the intent of making a product, system, service, experience or a business, better.

³www.icsid.org/about/defintion

⁴www.icsid.org/about/definition/industrial-design-definition-history/

At its heart, Industrial Design provides a more optimistic way of looking at the future by reframing problems as opportunities. It links innovation, technology, research, business, and customers to provide new value and competitive advantage across economic, social, and environmental spheres.”⁵

Finally, to represent the realignment of the organization as a modern, solutions-focused and relevant voice for Industrial Design and the wider design community, our Board also unanimously agreed to adopt a bold new name: the World Design Organization (WDO). This aspirational new name was established to better reflect the organization’s renewed vision and mission and more clearly connect it to existing events and initiatives including the: World Design Capital®, World Design Impact Prize®, the World Design Partner® Programme and its overall mandate - *Design for a better world*.

The new name, mission and vision for the organization and a new definition for Industrial Design were unanimously approved at the 29th General Assembly in Gwangju, South Korea in October 2015.



Members of the 29th ICSID General Assembly, Gwangju, South Korea, October 2015 (Images courtesy of ICSID)

This was no doubt that this event is one of the most significant milestones not only for ICSID but also for the Industrial Design

⁵www.icsid.org/about/defintion

professional as a whole. The new aspirational vision for design, driven by Industrial Design, is about positioning design-led innovation as a critical problem solving process capable of solving some of the most challenging problems facing our world.

It is about shifting the design narrative and creating a new era for Industrial Design that will ultimately position the profession to be more globally relevant, effective and as transformational as it deserves to be. More importantly, it is about creating a narrative that relates to the next generation of aspirational designers, innovators and entrepreneurs. Using a holistic approach and new technologies and applied design methodologies, our next generation of designers and innovators that will be poised to elevate design as a catalyst for positive change—a viable way of doing business that prioritizes real human needs over consumer demands.

The hard work now lies ahead for future Board Members to ensure this new vision for the organization is successfully implemented. The change of name to the World Design Organization (WDO) officially takes effect on 1 January 2017 and in the meantime, new programs and initiatives have since been established to strategically align design to this new direction including the World Design Talks program, the ongoing promotion of the World Design Capital program and the World Design Impact Prize. Already, there are many encouraging signs that we are moving in the right direction with countless examples of *design for good* being promoted through the organization, inspiring others to greatness. Here are just a few examples of design for a better, more prosperous world.

Warka Water – Winner of the World Design Impact Prize 2015-2016

As recipient of the 2015-2016 World Design Impact Prize, organized bi-annually by ICSID, Warka's Water harvesting technique and construction system are inspired by nature



Warka Water Project (Images courtesy of ICSID) www.warkawater.org

Access to clean drinking water is one of the biggest challenges facing our world today and low-cost, innovative solutions to help solve this problem are now more important than ever. Warka Water works by capturing moisture from the atmosphere (rain, fog and dew) through an ingenious netting design and structure. Warka Water is designed to be erected, owned and operated by local villagers. The tower not only provides a fundamental resource for life–water–but also creates a social place for the community, where people can gather under the shade of its canopy for education and public meetings.⁶

⁶www.warkawater.org

Flow Hive—Winner of the 2016 Australian Good Design Award® of the Year

With bee populations around the world slowing declining and the complexity around domestic ownership and maintenance of beehives, a father and son team from Australia identified a design problem worth solving. The Flow Hive is a design innovation that has completely changed the landscape and created a new value eco-system that started with a good idea in a backyard. The end result is a beautiful example of design for a better world. The Flow Hive delivers honey on tap—directly from a beehive without the need to open the hive and sometimes aggressively shaking the bees off the frames prior to harvesting the honey with an extractor. It’s an invention that has literally changed forever the way honey is cultivated and is now being used all over the world. Honey harvested from a Flow Hive does not require any heating, filtering or processing - it comes out pure and clean with all of the aromas and flavours of the local flora.



Flow Hive, Winner of the 2016 Good Design Award® of the Year (images courtesy of Good Design Australia)

The Flow Hive frames have been designed to work with any

beehive of standard depth and, due to their modular design, can be lengthened or shortened as required to suit any box. Simple, functional design for both bees and beekeepers was a driving factor throughout the development phase. The size, depth, angle, wall thickness and dividing split of the cells were all factors to ensure bees felt at home while discouraging them from using the cells for raising brood. The Flow Hive has been designed to last a lifetime and allow for simple, single part replacements if needed. The frames are made from food-grade, closed loop, PP, co-polyester and stainless steel, and the hives made from 90% FSC certified timber.

About Good Design Australia and Australia's Good Design Awards

Good Design Australia is an international design promotion organisation responsible for managing Australia's annual Good Design Awards and other signature design events. The Australian Good Design Awards was originally established by the Industrial Design Council of Australia in 1958 and is recognised as one of the oldest and most respected design awards in the world today.

Good Design Australia is committed to promoting the value and benefits of design to business, industry, government and the general public and to help foster a culture of design, creativity and innovation in Australia and internationally. *We passionately believe in the transformative power of design to improve our quality of life, shape a better Australia and create a more sustainable and prosperous world (www.good-design.org).*



Brandon Gien, PhD (Canberra) is the Founder and CEO of Good Design Australia and Chair of Australia's Good Design Awards – the oldest and most prestigious design award program in Australia with its origins dating back to the Industrial Design Council of Australia established in 1958. He holds a PhD in Environmental Design from the University of Canberra's Faculty of Arts and Design. He is an Adjunct Professor of the University of Canberra, and in 2015, was inaugurated as a Senator of the World Design Organization (WDO), the global body for Industrial Design. He was a member of the Board of Directors for three consecutive terms and elected President of the organisation from 2013 to 2015, the first Australian to ever hold this position. Under his leadership, Gien spearheaded the strategic transformation of the organisation, resulting in a new name, new vision and mission and a new global definition for the Industrial Design profession. The World Design Organization was originally established in 1957 as the International Council of Societies of Industrial Design (ICSID). It is an international, non-governmental organisation that promotes and protects the profession of Industrial Design and its ability to generate better products, systems, services, and experiences, better business and industry and ultimately a better environment and society. Today, the organisation has more than 140 member

organisations from 40 nations and represents the interests of more than 300,000 Industrial Designers worldwide. As a former President, Brandon Gien is currently the Convenor of the Senate and regularly consults to the Board of Directors on the future strategic direction of the body. Prior to founding Good Design Australia, Brandon Gien was the Executive Director of Design Strategy and Head of Corporate Services at Standards Australia, recognised by the National Government as Australia's peak standards body. Through his work on the World Design Organization's Executive Board, he was instrumental in creating the World Design Impact Prize to honour Industrial Design driven projects that make a positive impact on our social, economic, cultural and environmental quality of life. Today, the World Design Impact Prize is recognised as one of the most prestigious awards in the Industrial Design profession.

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A User Research Study on the Perceptions of Older Singaporeans on living in an Assisted Living Facility

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Preamble

This is a small qualitative study carried out by the Centre for Ageing Studies (CAS), Temasek Polytechnic, to uncover the perceptions of older Singaporeans on living in a purposefully built Assisted Living Facility (ALF). This study provided insights into the lifestyle needs, preferences and motivations of potential residents and their stakeholders towards the planning and building of such a facility in Singapore. This study was conducted with the Asia Philanthropy Circle (APC), a group of philanthropists piloting the first built-to-purpose ALF in Singapore.

1 Introduction

Singapore has one of the fastest ageing populations in Asia, and according to the Inter-Ministerial Committee on Ageing Population 1999 report, 18.7% of Singapore's population will be over 65 years in 2030 and one in 5 residents will be 65 years or over. Compared to countries in Europe which took over 115 years to double its population of 65 years and above from 7 to 14 percent, Singapore has only 27 years before its population of 65 years and above doubles. Population ageing has implications for

current public policies and poses new challenges for families and the community. One of the challenges is the caring of the ageing population during the later years when morbidity sets in and the availability of appropriate facilities equipped for the aged to age-in-place gracefully and with dignity.

Hitherto, Singapore still relies heavily on the family to provide care for the aged family members, often with the assistance of a foreign domestic worker. The majority of aged care is at home with support available through various home-based care services, or other Ageing-In-Place (AIP) related initiatives. When AIP at home is no longer manageable, residential care facilities made up of nursing homes are currently the next option.

Between home-based and residential care, there is a group that falls in between; they are not ill enough to require round-the-clock nursing care but require help in certain Assisted-Daily Living (ADL) tasks. This group will grow in line with the ageing population and greatly increase demand for aged care services and resources. For this group, Singapore currently lacks housing options that allow them to be as independent and empowered to fully age-in-place; and facilities that are affordable and integrated as part of the vibrant social and supportive communities.

This notion of a purposefully built 'Assisted Living Facility' (ALF) combines housing, support services, health care and social integration, a concept that could facilitate this group to better age-in-place and a place that they can call home. Before such a facility can be realised, there is a need to understand the latent needs and values of older Singaporean and also identify those who are likely to move into such a facility. This study was

conducted with a client to better understand older Singaporeans and their challenges and underlying needs for such a facility.

2 Methodology

A qualitative and purposeful sampling methodology was adopted to uncover perceptions and readiness of potential residents. A purposeful sample of 12 respondents was recruited based on the inclusive criteria. A topic guide resulting from a literature review of existing studies on elderly housing and assisted living was developed. This topic guide was used in the semi-structured interviews that followed. Some of the salient points derived from the literature review were:

- *Elders stay in their current residence if gains outweigh losses and they relocate if losses outweigh gains.*
- *Homelike characteristics for residents of an assisted living facility included having an appreciation for cleanliness, decorations, and furniture accommodations.*
- *Psychological characteristics included having an ability to bring personal histories into the space through beloved items and cherished furniture.*
- *Social characteristics included having an ability to meet new people and to engage in positive interactions with staff members at the facility.*

The interview topic guide covered the following broad topics:

1: Lifestyle, Purpose & meaning.

2: Care needs.

3: Perception of care facilities.

4: Requirements for an assisted living facility.

2.1 Ethics and Interviews

Respondents were briefed on the purpose of this study and signed the consent form before interviews were conducted. They were told that they can stop the interview at any time if they felt uncomfortable to go on or had decided that they did not want to continue with the study. Respondents were ensured that all information collected would remain anonymous and all contact information used during the research work would be deleted on completion of the study. The in-depth interviews were conducted in the respondents' homes. The purpose is to develop a deeper understanding of their daily challenges, desires and values. Conversational style semi-structured questions encourage respondents to share freely and reflectively to gain insights into their own personal construct of reality and thoughts. The interviewer facilitated the conversation without priming or leading the respondent in uncovering their thoughts on ALFs.

Recruitment and Inclusion Criteria

A total of 12 respondents were recruited based on the inclusion criteria below:

- *Age 65 years old and above living at home, Male or Female*
- *Singles, Married, Widowed, Couples*
- *With and Without children*
- *Living in subsidised housing or private residence*
- *CAT 1 to CAT 3 only (require assistance with ADLs but not demented).*⁷

⁷*Category 1: Physically and mentally independent; may or may not use walking aids; do not need or need minimal assistance in activities of daily living (ADL). Category 2: Semi-ambulant; require some physical assistance and supervisions in activities of daily living; may have mild dementia, psychiatric/behavioural problems. Category 3: Wheelchair/bed bound; may have dementia or psychiatric/behavioural problems; need help in activities of daily living and supervision most of the time. Category 4: Highly dependent; may have dementia, psychiatric and behavioural problems; require total assistance and supervision for every aspect of daily living.*

3 Analysis And Translation Of Results

The interview transcripts were analysed and coded into the 4 broad categories of the topic guide as shown in Table 1 below; on the right column are the codes derived from the analysis of the transcripts.

<p>1: Lifestyle, Purpose & Meaning</p>	<p><i>Lifestyle. Understanding. Communication. Service. Work. Longevity. Spiritual. Happiness. Achievements. Material. Family. Social Enablers</i></p>
<p>2: Care needs.</p>	<p><i>Health status. Challenges. Help. Decision making.</i></p>
<p>3: Perception of care facilities.</p>	<p><i>Perception. Relocation.</i></p>
<p>4: Requirements for an assisted living facility.</p>	<p><i>Assisted Living. Perception. Finance.</i></p>

Table 1: Analysis of transcripts results

A tiered value pyramid model referencing Maslow’s hierarchy of needs was adapted to provide a contextual framework for the understanding of the respondents’ motivators (Fig.1).

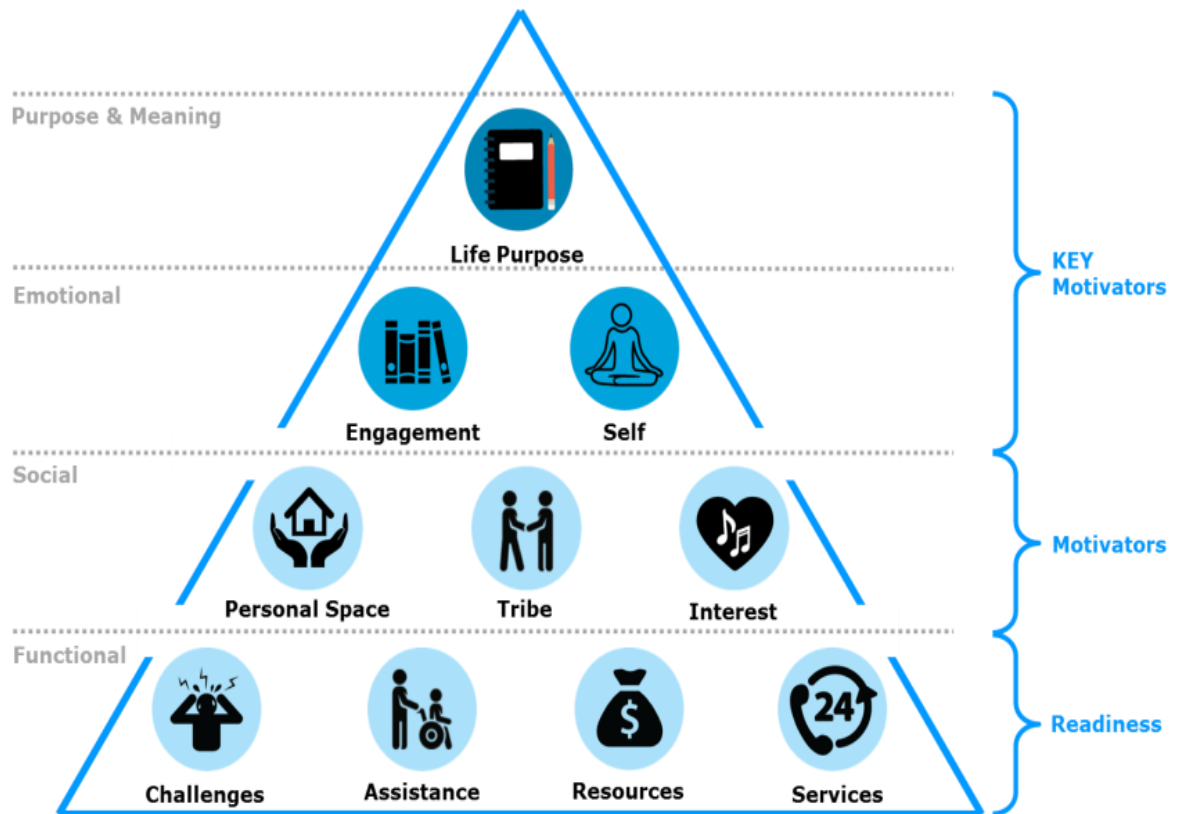


Fig.1: Value pyramid (icons designed by Freepik)

Elements on each tier are touch points representing respondent motivators consolidated from the raw findings and generalised for easy understanding and communication (Fig. 2). The value pyramid shows the different motivators and degree of motivation of respondents in the context of considering staying in an ALF.

The findings suggest that the higher up the pyramid, individual motivators go, the greater the likelihood they would consider ALF if it meets their requirements and expectations.

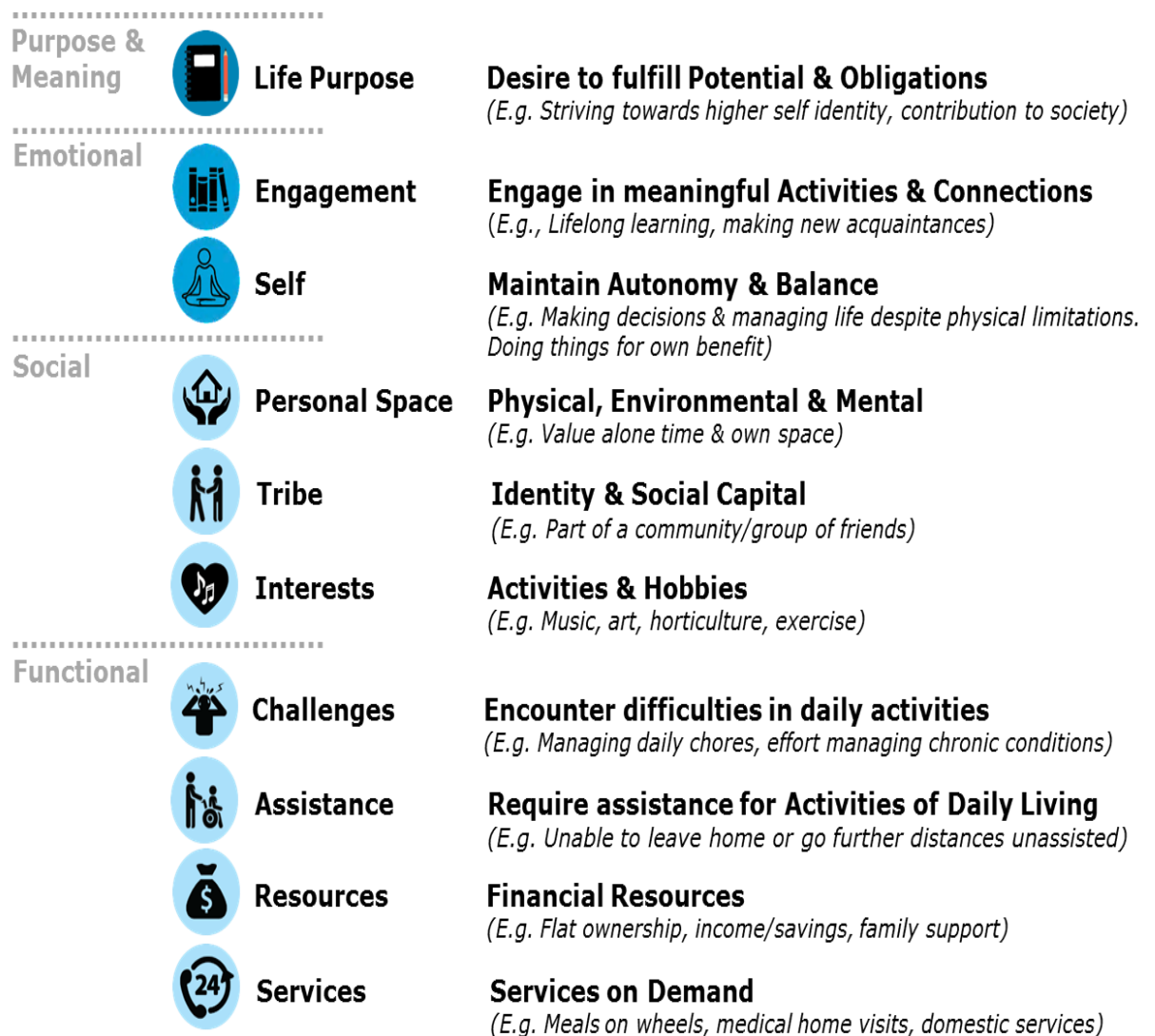


Fig. 2: Elements (touch points) representing respondent motivators.

Hence, one or more elements from the two top tiers need to be attained for the potential residents to consider staying in an ALF. At the same time, elements from the base of the pyramid also need to be in place for the potential residents to be ready to make such a consideration. Non-residents are those who only attain pyramid base elements. Fig.3 below illustrates the differences between a potential resident and non-resident. Most cases range in between as shown in the findings.

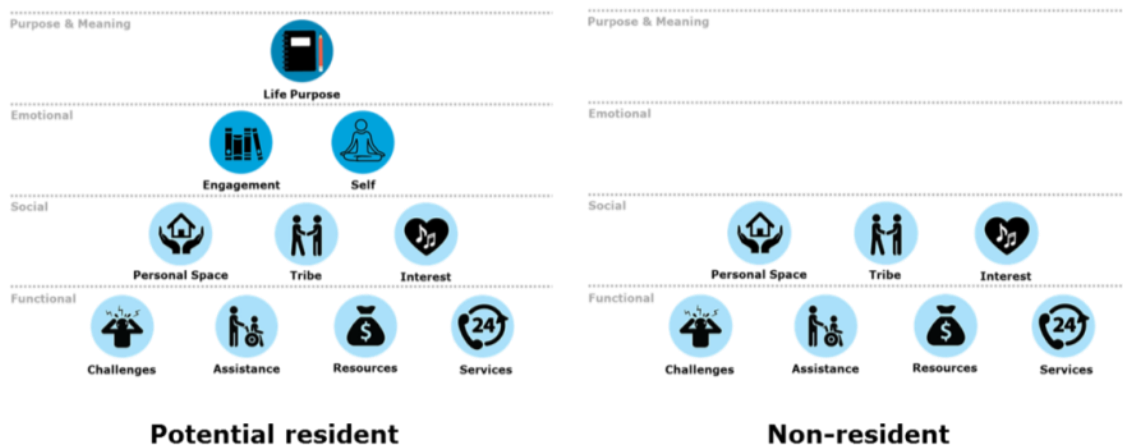


Fig. 3: Differences between a potential resident and non-resident.

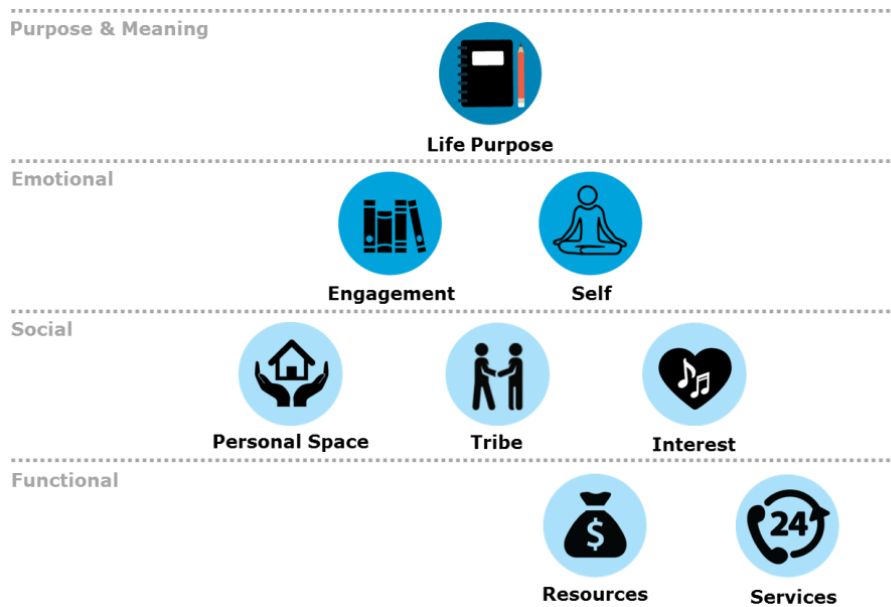
4 Respondent Profiles and Findings

The research findings for the 12 respondents were summarised using the value pyramid. Below are two profile summaries of a potential resident and a non-resident for ALF. For the purpose of this paper, only summary of the profiles are provided.

4.1 Respondent R1 Profile Summary



Chinese female	Age: 73	Education: Secondary
CAT 1: Lives Alone (Private - Studio)		Religion: Buddhist
Status: Widow (since 1999), 5 children (all in Singapore. 3 daughters, 2 sons)		



4.2 Respondent R7 Profile Summary



Chinese male	Age: 73	Education: Graduate Diploma
CAT 1: Lives with wife and daughter (4-room HDB)		Religion: Buddhist
Status: Married, 1 daughter & 1 son (in Singapore), 1 son in Shanghai China		

.....
Purpose & Meaning

.....
Emotional

.....
Social



Tribe

.....
Functional



Challenges



Resources

5 Summary Of Findings

The findings of the 12 respondents can be grouped into the following:

5.1 Potential ALF residents able to self-finance

Purpose and meaning are strong motivators with this group. Respondents attain elements from both top and bottom tiers of the value pyramid. They, individually or with their children, would be able to self-finance an ALF place. These respondents are generally confident and independent (notwithstanding the challenges) and have a clear purpose in life, for example:

***“I’m independent unless I cannot manage then I have no choice, for example now for too heavy things I will get someone to do for me”
Respondent R1***

***“Do you see a maid here... (Laughs)? No, I don’t eat outside...I don’t enjoy eating outside...I do housework myself, everything myself.”
Respondent R2***

5.2 Potential ALF residents requiring social support

Purpose and meaning are also strong motivators with most of this

“Sometimes we take taxi. If not enough money we take bus. Depend, if rains, we take taxi, if not bus. If it’s raining heavily and no money, we call to change appointment and tell them that the heavy rain does not permit us to travel out...they understand.” Respondent 9

group. Respondents attain elements from both top and bottom tiers of the value pyramid. However, they are reliant on social support and the issue of affordability is a genuine concern for this group. An example would be one respondent (R9) who could benefit from staying in an ALF but clearly would not be able to because of affordability. This respondent lives with a spouse in a 2-room government subsidised housing and lives on the \$500 monthly withdrawal from his \$40,000 savings in the Central Provident Fund (CPF). Still independent despite having limited mobility as a result of 2 strokes over the last 6 years, this respondent (R9) is still independent and would be one that could benefit from an ALF placement.

5.3 Non-residents Purpose and meaning are not strong with this group. Respondents attain few or no elements

“They look after me very well...taking care of me...I do not want to stay other place.” Respondent R12

“We go out very often, sometimes we go out for dinner, sometimes we go to the park with our children....Must check with our children, we usually make the decision but we will discuss.” Respondent R5

from the top tiers, mostly social and functional elements from the bottom tiers of the value pyramid. They, individually or with their

“Honestly...I feeling myself very dejected, everything have to slow down, slow, slow, slow...then I walk one step must be careful not to fall.” Respondent R7

“I didn’t go to school, follow grandma. Last time the people don’t go to school...people last time, plenty who do not go to school. I just do housework only.” Respondent R10

children, would be able to self-finance ALF. However, because they are already well supported by family, they do not need or want to consider staying in an ALF. The findings suggest that this group prefers to be with their family members rather than to be in an ALF where they have to manage on their own.

The findings could suggest that the family dependence could be the result of their lack of purpose and desire to be independent.

6 Conclusions

The findings suggest that respondents with purpose and meaning in their lives have clear perceptions and varying levels of readiness towards the idea of staying at an ALF. This includes those with mobility issues (CAT 2) or other challenges. It is interesting that those in this group tend also to be emotionally stable and able to overcome current challenges and finds ways to keep themselves engaged in meaningful activities and connections.

The findings also highlighted that most respondents are not aware of existing ALFs that are available overseas (Europe, Australia & USA). They also referenced ALFs to the local nursing homes. Interviewers had to clarify the idea of ALF was not a nursing home, rather ALF would be a new home but with value-add

services in place to support residents desired lifestyle (within reason or affordability). Even in this more positive context, the preference of respondents would be to stay in their current homes. Fitter active or ambulant respondents in their 70's spoke in terms of maybe needing ALF in 10 to 20 years' time. Hence there is a need to educate the population about the concept of an ALF as it is perceived as another nursing care facility.

While the findings from one small sample cannot be extrapolated to represent larger population, the range of respondents interviewed can be a good indicator of the perception and readiness of seniors towards staying in an ALF.

Acknowledgements

The authors wish to acknowledge the substantial contributions made to this project by the following research team members:

**Shereen Pong, MSc Ergonomics, BA Hons Industrial Design
Researcher (Principal Investigator)**

**Ee Sharifah Rose, BA Sociology & Communication, Grad Dip
Gerontology Researcher**

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Wei Kong, BA (Hons) Industrial Design, MA Industrial Design, DeMonfort University is the Manager, Research and Development of the Centre for Ageing Studies (CAS), Temasek Polytechnic. Wei's background in product research and development has taken projects from business idea through to implemented solutions for local to global markets. He built and led inter-disciplinary teams combining commercial, R&D and production resources to tackle the (often conflicting) demands of creating successful products and services. At the Centre for Ageing Studies, Wei brought his industry experience to work with colleagues and partners in public, private and non-profit sectors in tackling Singapore's national agenda on ageing. He leads a team from industry and academic backgrounds to work with product and service partners in aged-care tackling opportunities and issues around the process of ageing. To such collaborations Wei brings to table capabilities in development and application of methodologies to understand consumer behavior and create better consumer experiences. Foremost in his work Wei drives the need to first clearly understand and effectively translate both latent and explicit needs of the elderly before thinking about possible solutions. He does so by finding ways to give the elderly a voice in the narrative around ageing, communicating these insights with lessons learnt from a

broad working experience plus a lifetime of interacting across different cultures.

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Eric Koh Cheok Howe, BSc (Hons) Product Design, Art Centre College of Design; California, MSc Human Factors Engineering, Nanyang Technological University; MSc (Merit) Gerontology, King's College London, is the Joint-Director of the Centre for Ageing Studies(CAS)in Temasek Polytechnic. He is an accomplished design professional and also a design gerontologist who has extensive experience in product design and development. He has won awards for his designs including the G-mark Japan award and Singapore Design award. As the founding director of CAS, his current focus is in design for ageing and research. In 1999, he founded the Centre for Design Innovation in the School of Design, Temasek Polytechnic. This was the first design research centre in Singapore dedicated to the advancement of the design profession and the search for new directions in design. As deputy director of the School of Design (2007) in charge of academics, he revamped the school's academic structure and designed a new block academic system. In 2010, concurrently as deputy director of the School of Design, he was appointed the director of the Greater than 60 National Design Centre - a joint collaboration between School of Design, Temasek Polytechnic and the Ministry of Culture, Youth and Sports (now called the Ministry of Social and Family Development). He has also won several scholastic awards

such as the prestigious Economic Development Board, Singapore scholarship, the Osaka Prefectural Government Training Scholarship and the Temasek Polytechnic Staff Sponsorship. His major competencies include design thinking, design research and methodology, design management & innovation, academic & organisational leadership and initiating new start-ups.

The Temasek Polytechnic's Centre for Ageing Studies (CAS) undertakes applied research and offers programmes related to ageing under 4 platforms: Ageing & Work, Ageing & Wellbeing, Ageing & Society and Ageing & Learning. The centre responds to the needs of Singapore's ageing situation and takes an inclusive and universal approach in its study and research. It aims to provide a better understanding of the ageing process and its implications and seeks to find innovative ideas and solutions to issues related to the larger context of ageing in the society. It is interdisciplinary in approach and collaborates with the Schools and other research centres in TP, and the industry and community in response to its mission and commitment to Temasek Polytechnic's vision to be a world class institution reputed for its programmes, applied research and learning. Contact: cas@tp.edu.sg

Designing Inclusion in Education

Mandy Lau

CEO Reach & Match Co.

Australia

The Challenges of Achieving Inclusion

Inclusive education allows students with and without disabilities to learn and participate together in the same classes. Most students with special needs are educated in mainstream schools. The mainstream schools should be providing high quality support for the majority of children with special needs and working collaboratively with various service providers to support the needs of students with special needs. However, to create an effective inclusive classroom can be challenging and complicated. Simply putting children with and without disabilities together does not mean inclusion; inclusive education requires good understanding and ongoing advocacy, support and commitment.

Every student has unique characteristics, abilities and learning needs, hence students with special needs have different barriers in learning and participating in classes. An effective education system should be designed to take into account these needs. A diverse group of students may have learning difficulties for a wide range of reasons, such as sensory or physical disabilities, learning disabilities, autism, emotional and behavioural challenges.

Educators may feel challenged to reduce or remove all the barriers that students with disabilities face in schools.

However, it is important for each of us, including teachers, parents, and education designers, to know those barriers and how they may hinder the development of the children. In order to help children to achieve their academic potential, we cannot ignore the importance of their social and emotional development as they all are correlative. Teachers are required to have high skills and knowledge to support individual student's needs. Teachers have to develop genuine relationship with the students and know each of them, not just the general class, in order to help all students to achieve academic and behavioural goals.

Together We Learn Better: The Importance of Diversity

A lot of research by sociologists, scientists and educators show that socially diverse groups are more beneficial and healthy for the growth of our society. An effective implementation of inclusion has demonstrated academic and social benefits for both students with and without special needs. These findings show that everyone involved in inclusive education can benefit from the learning experience. Students with different abilities and diverse backgrounds improve the collaborative learning more creatively and effectively. Interaction between students would minimise the social and cultural barriers, and also a big benefit for students of all abilities.

There are many positive effects of inclusions where both students with and without special needs benefit. Children with disabilities show improvement in areas of communication and social skills, positive peer interactions and educational outcomes. Inclusion gives students with special needs the best opportunities to fully achieve their academic potential. Research has also shown that

positive effects on children without disabilities include the positive attitudes and perspectives to their peers with disabilities⁸. An inclusive learning environment is important for preparing young students to live in a diverse world. Educators should develop a meaningful and supportive environment for students with disabilities and their peers participate in an equal way.

Research Project: A Specialised and Inclusive Education Tool - Reach & Match®

The Reach & Match project, which I have developed, has involved looking at the braille literacy and its global change throughout recent years, the research on early childhood education for visually impaired children, and social and cultural barriers that children with multi-disabilities are facing in mainstream settings. The Reach & Match project is designed to help children with vision impairment develop an incentive to learn braille at their early age. Children with vision impairment may have additional disabilities—such as cognitive, developmental, hearing, or mobility impairments. Therefore, activities and games are designed to help children with multiple learning needs to develop functional skills such as body concept, position in space, figure-ground discrimination, gross and fine motor skills, tactile awareness, communication and social skills. Most importantly, it is designed as an inclusive and fun resource joining children with differing abilities together.

Braille Literacy

The invention of braille is ingenious, elegant and an efficient language for visually impaired people. Braille is a system of

⁸*Bennett, T., Deluca, D., & Bruns, D. (1997). Putting inclusion into practice: perspectives of teachers and parents. Exceptional Children, 64. 102 March 2017 Vol-12 No-3 Design for All Institute of India*

reading, writing and printing by embossing dots onto paper which can then be read by touch. Since braille is a writing system where tactile perception is used, as opposed to visual perception, a braille reader must develop new skills. This skill of reading is beautiful; as braille readers do not read dot by dot, or even character by character. Braille must be read serially, with the reading finger sliding unencumbered straight across the line. Readers do not pause on each cluster of dots but feel a rhythm of rising and falling dots as the finger moves. Braille is not only a tool to help people function, it is an art that composed of beautiful, orderly lines of words that can convey a different idea that can stimulate the reader. Reading braille provides a sense of accomplishment and satisfaction for visually impaired people. Marc Maurer, president of the National Federation for the Blind, said, "All the current technology isn't going to make everything all right unless I know how to put my hands on a page that has words on it and read them."

According to different studies, partially sighted children will be at greater risk of literacy deficiencies than children who are fully blind; hence it is also very important for visually impaired children to learn braille as well. Furthermore, people who learn braille at an early age did just as well, if not better, than their sighted peers in several areas, including vocabulary and comprehension. Braille is more easily learnt by young children whose fingers are still soft. Therefore, children with visual impairment should be exposed to braille as early as possible⁹. Studies show that the students in United States of America who were taught to read braille have declined from 57% in 1963 to less than 9.5% in 1998.90% of blind adults who are braille literate are employed. However,

⁹Ruby Ryles, Ph.D, "Early Braille Education Vital", 2004.

among adults who do not know braille, only 1 in 3 is employed¹⁰. Therefore, braille literacy is extremely important for those children's independence and career in the future.

Early Intervention: The Impact of Visual Impairment on Usual Development

With an increasing demand from parents to help in the home management of their preschool blind and partially sighted children, there is subsequently a growing interest of professionals in handicapped children, and also a developing awareness of the importance of early child development, with a variety of programs for early intervention being developed.

However, early intervention must provide consistent, interdisciplinary support to the child and his/her family. Infants who are visually impaired are at risk of delayed development. General intervention is not sufficient enough to meet the special needs of children who are blind. Competent specialised intervention is important in all areas of development: cognitive, communicative, visual, emotional, motor, social and daily living skills.

Importance of Sensory Play

We interpret process and use sensations to respond to all the demands of our everyday activities; to satisfy our needs, to learn, to communicate and to survive. To observe the play group of visually impaired children, I shared the joy and excitement with the most curious and innocent children (see examples below). It was important to make a more deliberate effort to develop and refine sensory abilities in blind children than would be necessary

¹⁰ *National Federation of the Blind, 2006*

with sighted children. As designing for children, it is important to understand the relationship between play and children.



Observations of children's play activities, Vision Australia, 2011

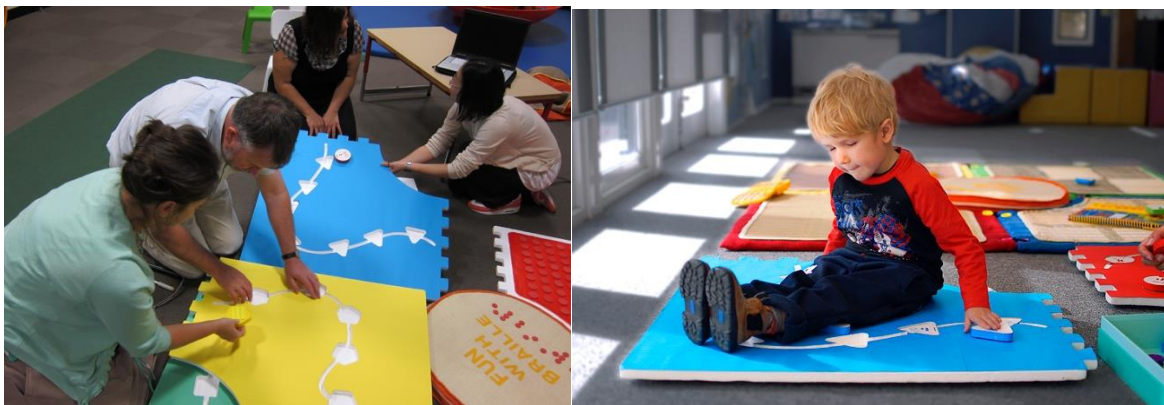
User-centric Design Methodologies and Co-operative Approach

As described here, the Reach & Match project's research and design was developed in collaboration with early childhood educators, vision support teachers, speech pathologists, occupational therapists, orientation and mobility instructors, and parents. A wide range of research and design methodologies were used: background study (including social, cultural and economic problems), study of user profiles, market research, focus group interviews, group observation analysis, concept development, anthropometric analysis and model testing for children who have different degrees of vision loss with/without additional needs.

To create a truly inclusive design, we needed to understand the physical and social needs of the students with these complex needs. The dialogues with different stakeholders opened up a deep consideration on every detail, and the design concepts would

not be possible made without understanding the complexity of early intervention for children with sensory impairment and additional needs.

The design was a direct response to the actual circumstances and needs of blind children, such as tactile fantasy, hearing pleasure and bodily awareness. As portrayed below, the observations and testing were the most valuable research tasks to select the best communication options, as they helped us to understand the limits and possibilities for children with varying needs.



Prototype testing at Vision Australia, 2011

What is a Reach & Match® Learning Kit?

Reach & Match is a beautiful combination of braille and print literacy, sensory elements and interactive features which allow children with and without disabilities to play inclusively. Meaningful activities were designed which focus on exploration, interaction and active movement. The whole kit is composed of different parts: double-sided sensory play mats, braille and print double-sided sensory tiles containing four sounds, a cushion and a portable bag. The kit also comes with an inclusive learning program which provides a detailed guide for users.

The Reach & Match Kit is also unique in its flexibility. It allows children to learn dexterity, hearing and tactile skills. It can also be used to create complex games depending on children with varying abilities in training in better memory, direction and special awareness. Reach & Match can be made into both 2D and 3D configurations; multiple mats can be combined to create unlimited ways to play. Reach & Match is designed with a purpose for a class-sized group in order to maximise its use and it's also portable, which enables therapists and visiting teachers to carry it to different places for a wider range of users.

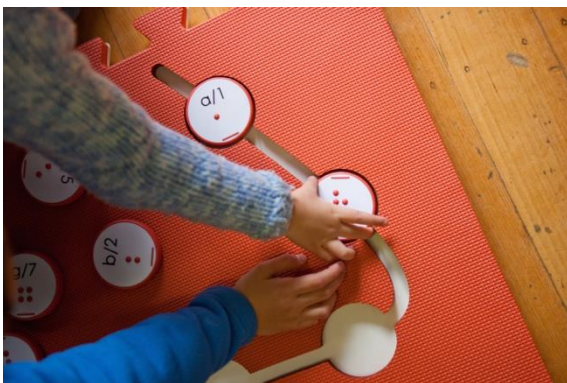


Typical components of the Reach and Match Leading Kit.

Design challenges

The objective of this project was obvious and direct at the beginning but, during the concept development stage, it opened up into a deep consideration on every detail of the design elements and specification, design modification and refinement— which cannot be done without research from direct observation of children with vision impairment and multiple needs and consultation with professionals.

There were many ideas generated during the concept development stage of the project. However the selection of design features and functions were challenging. While testing the prototypes with vision impaired children, it was found that each of them had a different degree of vision as well as additional needs, and therefore each of them had a different response to the Reach and Match learning kit. Their reactions depended on how much vision they possess and their physical and mental abilities, which provided the important identification for the difficulty levels of the game. The addition of highly visually tactile elements benefits students with blindness/low vision but also students with multiple special needs. In order to design it in an organised, consistent and meaningful way, the design must be conducted very carefully and with discipline. Also, a longer period of time for observation and testing was required. The discussion with educators and professionals was valuable; the feedback provided helpful guidance to solve the problems and helped to create a much richer design.



Showing the Kit in use at the premises of Guide Dogs Victoria, 2013

Social Impact

The Reach & Match Learning Kit was deliberately designed in a way that is welcoming to children to play—it's colourful, tactile and friendly that simultaneously bridges the gap between children with different needs. It is also flexible and versatile and able to create different activities beneficial for children with a wide range of learning needs and abilities.

The design helps to raise the public awareness of inclusive education for the disadvantaged groups. Parents and teachers need to make deliberate effort to offer young blind children with positive early experience of braille. Blind children should have the opportunities to develop the incentive to learn braille literacy, like their sighted peers.

Reach & Match's impact of inclusion on children with and without special needs has been tremendous. It teaches mutual respect and understanding, and raises awareness of different forms of languages. For example, sighted children ask questions about "What is braille?" "Why do some students need to learn braille?" The learning experience generates opportunities for sighted students to appreciate and learn braille literacy. It also highly encourages children with low vision to learn braille at a young age. Also, there are games on the hearing skills and tactile skills, such as matching and sorting games, where all students are required to be blindfolded. It is pretty often that the blind students win the listening games (each shape of tiles has the same sound when you shake it). It really gives a new perspective on the sighted students and provides them with a lot of learning opportunities beyond their reliance on their vision only.

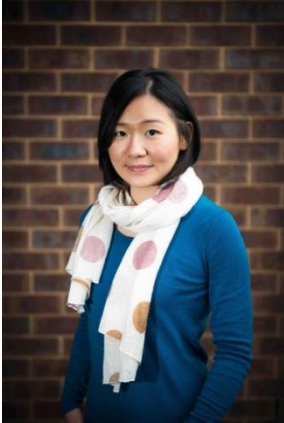
I have also collaborated with the educators and therapists to develop a Reach & Match Inclusive Learning Program which

include thirty activities to teach children important skills such as body concept, motor, social and communication through play. Teachers, therapists and parents shared their inclusive ideas for achieving active participations of all children. Hence, it creates a strong community network and empowering movements.



Learning session at the premises of Guide Dogs Victoria, 2013

Reach & Match has been exceptionally well-received, and it has been adopted by leading service providers and schools for blindness and low vision in Australia, enabling a lot of vision-impaired children with their families across Australia to enjoy its benefits. It has also achieved awards in areas of Education, Inclusion and Assistive Technology such as Australian Good Design Award (Social Innovation), Red Dot Award (Education), and Monash Vice-Chancellor's Social Inclusion Design Award. In last few years, it was also presented and exhibited internationally: Milan Well-Tech Award (Milan Design Week), Red Dot Museum in Singapore and Design Museum of Barcelona (Exhibition - Design for Life: 99 projects for the real world).



Mandy Lau received a Bachelor of Product Analysis with Design (Hons), with First Class Honours, at Hong Kong Polytechnic University, with a focus in designing and developing tools for people with disadvantages. She was then awarded an International Postgraduate Scholarship by Monash University to study a Master of Design. She is a passionate social entrepreneur, designer, engineer and art therapy instructor who specialises in social innovation and empowering people through her inclusive designs. She approaches design with an open and curious mind and designs products highly focused on user experience, research and analysis. Mandy Lau has designed an inclusive education kit for children with multi-disabilities to learn in mainstream settings. It has received the Monash Vice-Chancellor's Social Inclusion Design Award as well as other international awards such as James Dyson Award (Australia), Red Dot Award, Milan Well-Tech Award and Good Design Award. She founded her company Reach & Match in 2013 and the education kits have been adopted by leading organizations and schools working with children with multiple needs across Australia. Mandy Lau is accepted as a Singularity University Impact Fellow 2016-2017; Impact Fellows are distinguished leaders shaping the future of social impact in their

fields and communities. Mandy Lau is working on new design solutions to amplify inclusion and empathy in education.

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Forthcoming Issues

April 2017 Vol-12 No-4

Dr. Sandeep Sankat Associate Professor, Department of Architecture, School of Planning & Architecture, Bhopal India will be the Guest Editor.



May 2017 Vol-12 no-5

Ravishankar is a Sr. Faculty member, Coordinator, M Des Universal Design Program at National Institute of Design, Bangalore and has authored the curriculum and the course modules. He offers courses in Design Methodology, Universal Design Thinking, Experience Design and mentors design projects



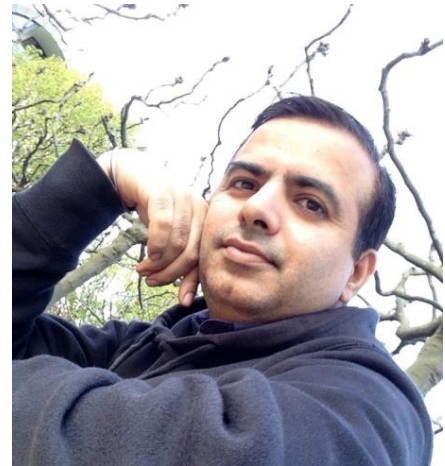
in Product design, Digital Interfaces & Media and Retail. He has co-authored the Universal Design India Principles UDIP.

He also coordinates the NID-MSME Design Clinic Scheme for the South Zone. He is a recipient of the Business World - Design excellence award in 2006. He has been a Jury member of the India Design mark 2015& 2016 of the India Design Council,

Mahindra Rise Design Challenge 2015 and has been a proactive enthusiast in promoting Design Thinking among Industry and academia through various workshops and will be guest Editor.

June 2017 Vol-12 No-6

Dr. Gaurav Raheja Associate Professor, Department of Architecture & Planning Joint Faculty, Centre for Excellence in Transportation Systems Indian Institute Of Technology (IIT) Roorkee, Uttarakhand State, India will be the Guest Editor



July 2017 Vol-12 No-7

Mark Watson was chosen from an international field of Designers to participate in the International Society of Councils of Industrial Design Interdesign Workshop, a two week workshop looking at Smart City solutions to social, environmental and economic problems in Mumbai . Mark has a 15 year long engagement with Design in India presenting at leading Design Conferences on Design Thinking and Experience Design and is currently adviser to the Indian Design Festival.



Mark Watson MDIA Managing Director Design Providence <http://www.designprovidence.com.au> Lead Partner Design Thinkers Group Australia <http://www.designthinkersgroup.com/> Co-Founder Indo Australian Design Research Alliance <https://www.>

September 2017 Vol-12 No-9

Prof Lalita Sen, Ph.D. Department of Urban Planning & Environmental Policy Texas Southern University Houston, Tx 77004 will be the Guest Editor.



October 2017 Vol-12 No-10

Dr. Sushma Goel, Associate Professor at department of Resource Management and Design Application, Lady Irwin College, Delhi University has been teaching from past more than three decades. She has authored subject manuals, modules for distance education, text book, etc. She has several publications in national and international journals to her credit. She has been supervisor for 60 masters' dissertations and 9 doctoral researches (some ongoing). She had been principal coordinator for projects with DDA slum wing, DST, Ministry of health and family welfare, Ministry of social Justice and empowerment and Delhi University Innovation projects.





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From Principles to Practice
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Edited by
Sheryl E. Burgstahler
Foreword by Michael K. Young



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UNIVERSAL DESIGN IN HIGHER EDUCATION

From Principles to Practice, Second Edition
EDITED BY SHERYL E. BURGSTAHLER • FOREWORD BY MICHAEL K. YOUNG

This second edition of the classic *Universal Design in Higher Education* is a comprehensive, up-to-the-minute guide for creating fully accessible college and university programs. The second edition has been thoroughly revised and expanded, and it addresses major recent changes in universities and colleges, the law, and technology.

As larger numbers of people with disabilities attend postsecondary educational institutions, there have been increased efforts to make the full array of classes, services, and programs accessible to all students. This revised edition provides both a full survey of those measures and practical guidance for schools as they work to turn the goal of universal accessibility into a reality. As such, it makes an indispensable contribution to the growing body of literature on special education and universal design. This book will be of particular value to university and college administrators, and to special education researchers, teachers, and activists.

SHERYL E. BURGSTAHLER is an affiliate professor in the College of Education at the University of Washington in Seattle, and founder and director of the university's Disabilities, Opportunities, Intermediating, and Technology (DO-IT) and Access Technology Centers.

"Sheryl Burgstahler has assembled a great set of chapters and authors on universal design in higher education. It's a must-have book for all universities, as it covers universal design of instruction, physical spaces, student services, technology, and provides examples of best practices."

—JONATHAN LA ZAR, PROFESSOR OF COMPUTER AND INFORMATION SCIENCE, TOWSON UNIVERSITY, AND CO-AUTHOR OF *ENSURING DIGITAL ACCESSIBILITY THROUGH PROCESSES AND POLICY*

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http://www.amazon.co.uk/Product-Design-course-first-principles/dp/1784562939/ref=sr_1_fkmr0_1?m=A2U321JN96E0UZ&s=merchant-items&ie=UTF8&qid=1456434788&sr=1-1-fkmr0&keywords=Bonollo+Prrroduct+Design%3A+A+course+in+first+principles

Amazon.com

http://www.amazon.com/Product-Design-course-first-principles/dp/1784562939/ref=sr_1_sc_1?ie=UTF8&qid=1456434322&sr=8-1-spell&keywords=Bonollo+Product+Design%3A+A+course+infirst+principles

Product Description

In this book, Elvio Bonollo takes us on a 'learning journey' about design including a scholarly explanation of the characteristics and power of the design process. It provides valuable insights into the attitudes, knowledge and skills that underpin the design discipline at an introductory level of expertise, and has been developed to meet the needs of aspiring designers in many areas including industrial design, design and technology, art and design and architecture. Elvio uses an operational model of the design process - along with related educational strategies, learning outcomes and an ordered set of design briefs - to develop a systematic, problem-based method for learning design from a first principles viewpoint. The beauty of this approach is that it brings structured learning to aspiring designers whilst being mindful of diverse cultures and backgrounds. Each part of this book encourages self-expression, self-confidence and exploration: it is has been carefully designed to take the reader on a highly motivating journey of design thinking and creativity, supported by excellent sample solutions to design problems, lucid discussions and extensive references. These solutions, developed by design students, serve as novel examples of how to solve real problems through innovative design without restraining creative freedom and individual personality. The design learning method and strategies in this book will greatly assist design and technology teachers, students of design, aspiring designers and any individual with an interest in professional design practice.

I cannot recommend this book highly enough, it was a complete lifesaver throughout my undergraduate studies and honours degree and now continues to serve me well as I move into industry practice. The content is easy to understand and follow, providing a practical guide to understanding design principles and every aspect of the design process. It includes great project examples and reflects the wealth of knowledge and experience possessed by this accomplished educator. I have purchased multiple copies of this book for peers and would suggest any student who is studying a design discipline to pick up their own copy as this has quickly become the most useful book in my design collection.

Comment | Was this review helpful to you? [Report abuse](#)

★★★★★ A 'Must Have'.

By Amazon Customer on 7 April 2016

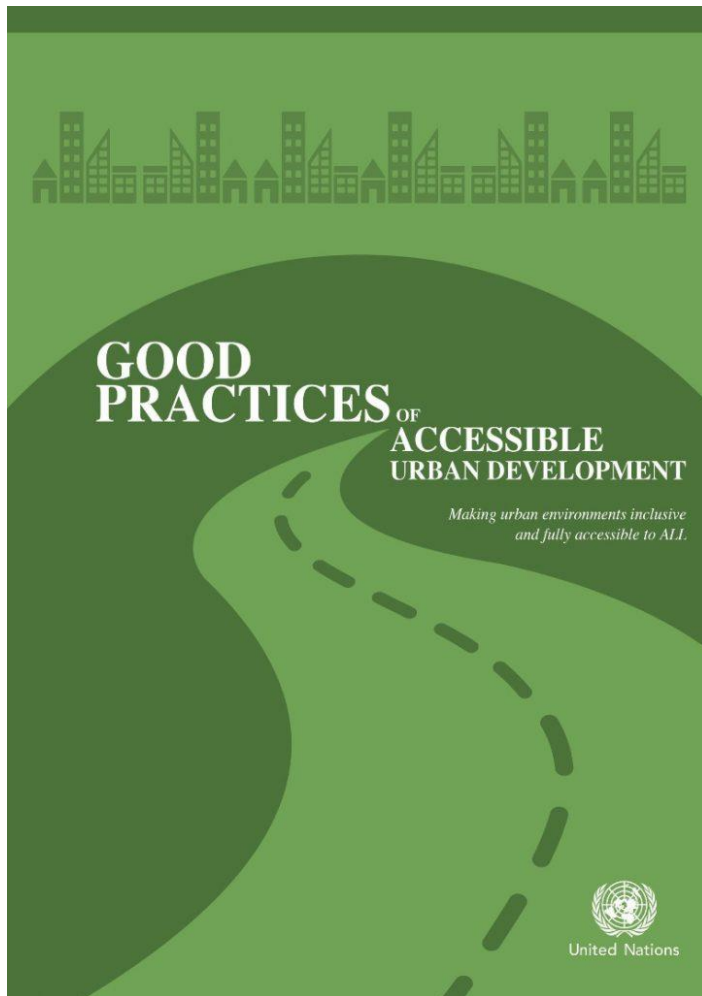
As a Design Education professional of many years standing, I endorse this book without reservation. It is comprehensive, lucid and above all, useful in a very accessible level at the coalface. Professor Bonolo has an enormous cache of experience as an engineer, designer and design educator and his experience is well demonstrated in this book. A 'must have' for anyone in the business of educating or being educated in the product design arena.

TAPPING INTO HIDDEN HUMAN CAPITAL

How Leading Global Companies Improve their
Bottom Line by Employing Persons with Disabilities



DEBRA RUH



In light of the forthcoming United Nations Conference on Housing and Sustainable Urban Development (HABITAT III) and the imminent launch of the New Urban Agenda, DESA in collaboration with the ESSI Foundation (Zero Project) and others have prepared a new publication entitled: “Good practices of accessible urban development”.

The publication provides case studies of innovative practices and policies in housing and built environments, as well as transportation, public spaces and public services, including information and communication technology (ICT) based services.

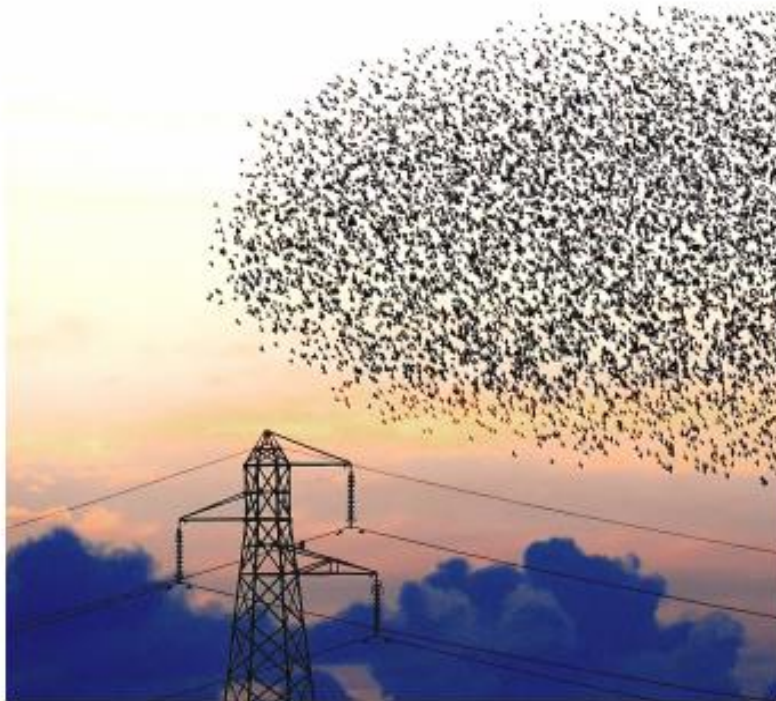
The publication concludes with strategies and innovations for promoting accessible urban development.

The advance unedited text is available at:http://www.un.org/disabilities/documents/desa/good_practices_urban_dev.pdf

FROM MODULARITY TO EMERGENCE

A PRIMER ON THE DESIGN AND SCIENCE OF COMPLEX SYSTEMS

Chih-Chun Chen and Nathan Crilly



CUED/C-EDC/TR.166
Engineering Design Centre
Department of Engineering

 UNIVERSITY OF
CAMBRIDGE

Dr Chih-Chun Chen and Dr Nathan Crilly of the Cambridge University Engineering Design Centre Design Practice Group have released a free, downloadable book, [_A Primer on the Design and Science of Complex Systems_](http://complexityprimer.eng.cam.ac.uk).

This project is funded by the UK Engineering and Physical Sciences Research Council (EP/K008196/1).

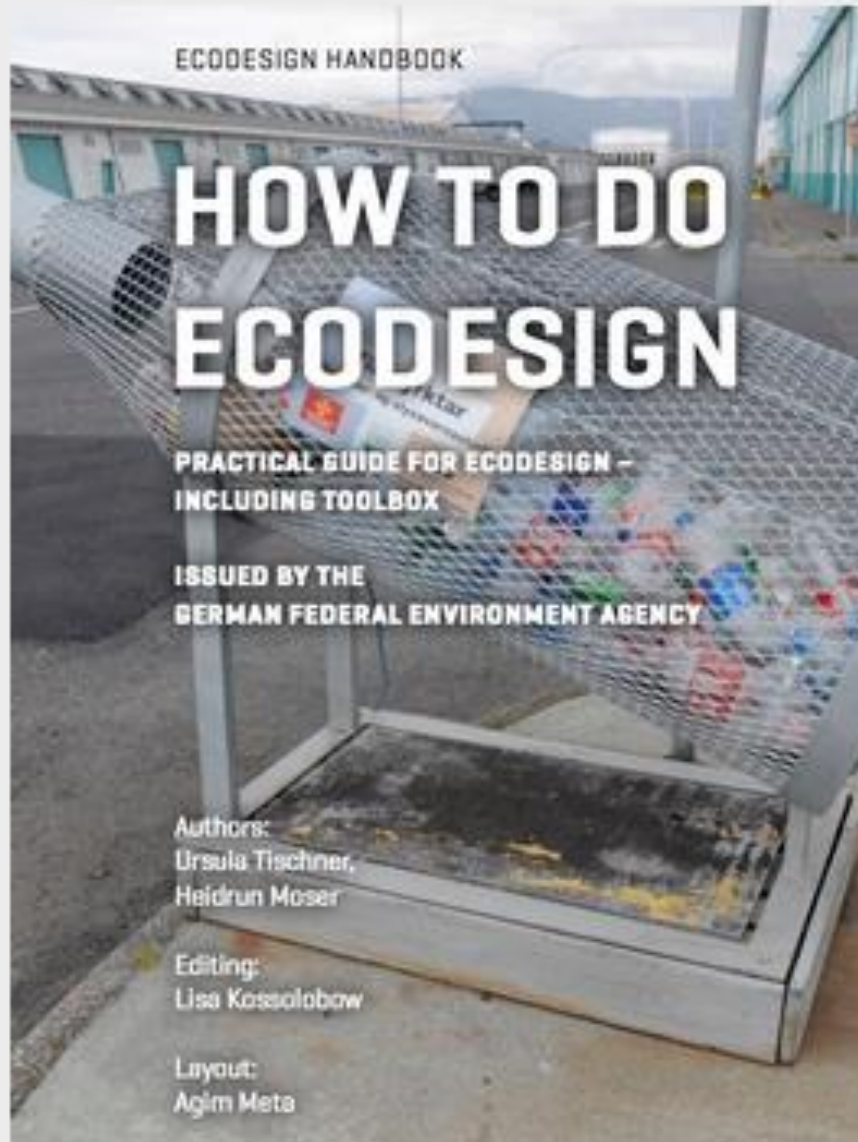
The book is available at URL:

<http://complexityprimer.eng.cam.ac.uk>

Changing Paradigms: Designing for a Sustainable Future

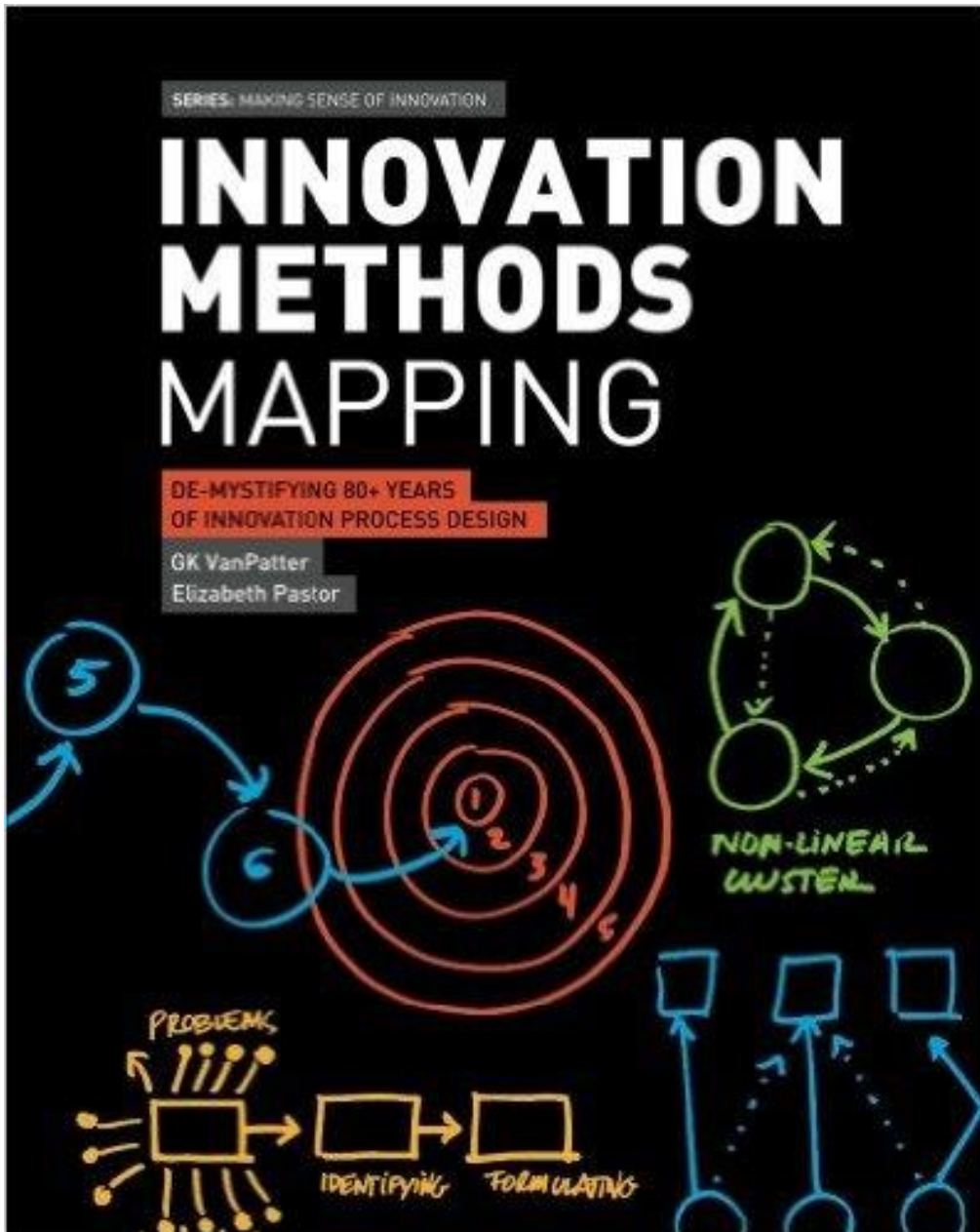


**New iBook / ebook:
HOW TO DO ECODESIGN**



Practical Guide for Ecodesign – Including a
Toolbox

Author: Ursula Tischner



Humantific's new book: Innovation Methods Mapping has just been published and is now available on Amazon.

https://www.amazon.com/dp/1540788849/ref=sr_1_1?ie=UTF8&qid=1482329576&sr=8-1&keywords=Humantific

You can see the preview here:

https://issuu.com/humantific/docs/innovation_methods_mapping_book_pre

TRANSFORMATIONS
7 Roles to Drive Change by Design
Joyce Yee / Emma Jefferies / Kamil Michlewski

TRANSFORMATIONS

7 Roles to Drive Change by Design



Joyce Yee / Emma Jefferies / Kamil Michlewski

BIS



Appeals

Dear All,

We have recently experimented and developed new input interactions for flexible displays that aims to increase efficiency, effectiveness and satisfaction of target zooming for one-handed interactions. A work that we did for last six months, i would like to share with you. please provide feedback if you have any.

Brief: One handed interactions on traditional smartphones experience challenges of occlusion, reachability and regripping. We believe that similar challenges will be experienced in future flexible handhelds. We developed Flexzoom, 8 new input interactions through "bend" interactions and variations. These interactions support target zooming for images and can be extended to maps.

We have currently completed the study with 30 users comparing Flexzoom and traditional interactions techniques (e.g. double tap, pinch-in & out etc.) on smartphones

Please find the [details](#) and [video](#) of the FlexZoom.

We would love to get your feedback on the interactions proposed here.

Keyur Sorathia
Embedded Interaction Lab (EILab), IIT Guwahati
Technology for Societal Innovations

2.

Feedback Sought on Draft Information and Communication Technology Accessibility Policy

Students, faculty and staff are encouraged to offer their thoughts on the draft Information and Communication Technology (ICT)

Accessibility Policy at two upcoming public comment sessions in the Peter Graham Scholarly Commons, 114 Bird Library.

The sessions are Wednesday, Feb. 22, from 3-4:15 p.m. and Tuesday, Feb. 28, from 9-10:15 a.m. Real-time Translation (CART) and American Sign Language (ASL) services will be provided.

The draft policy can be found at <http://itsaccessibility.syr.edu/?p=586>

3.

Reward: €100,000 for ideas for smarter homes



The Design Challenge is looking for ways to make homes more 'adaptable, accessible and future proof'.

The process of buying or selling a house is made all the more stressful if the reason you're moving is because, whether through illness, disability, a change in life or simply getting older, your home doesn't work for you any more. What if there was a way to make houses and communities more adaptable, more user friendly and accommodating through all our life stages?

With a fund of €100,000 to find and develop solutions, the Homes for Smarter Ageing Universal Design Challenge from Rebuilding Ireland (rebuildingireland.ie) aims to do just that. It is based on the principals of Universal Design, that is: good design that makes

public and private spaces, tools and objects flexible, simple and intuitive to use. Universal Design champions ideas that are sustainable, require low physical effort, and accommodate all shapes and sizes, ages and experiences.

With organisations such as The Centre for Excellence in Universal Design (CEUD) in the frame, Ireland is at the forefront of this new design thinking, and as CEUD's Ger Craddock says, "the challenge is how do we design our homes and public spaces to have universal appeal, while at the same time not labelling them as accessible or just designed for the elderly.

Universal Design, says Craddock "isn't just for older people, it's for the whole family, and simple ideas can change people's lives." So how do you get involved? The Design Challenge is looking for ideas from individuals, but also from a cross-sector or community teams, on how homes can be made more adaptable, accessible and future proof. So, whether you're an architect, designer, or simply someone with a brilliant idea, they want to hear from you.

You'll find all the information at homesforsmartageing-ud.com, and the closing date for submission of ideas is March 13th. The winner will be announced on June 28th.



News

1.

Universal design approach can benefit all students

By Jamie Stoskopf



-
- *The College of Health Professions hosted a Universal Design of Instruction workshop for faculty, educators and staff at Wichita State.*
 - *Universal Design of Instruction means that course instruction and materials are designed for all students, including those with a range of abilities and disabilities.*
 - *A universal design approach to curriculum can contribute to a more inclusive university culture.*
-

Faculty, educators and staff from various Wichita State entities participated in a Universal Design of Instruction (UDI) workshop, hosted by the WSU College of Health Professions (CHP).

UDI is a scientifically based concept that emphasizes inclusive practices to maximize student success, including those with ranges in ability, disability, age, learning style, language, race and ethnicity.

Examples of UDI practices include ensuring physical access to facilities, arranging classroom seating for clear lines of sight, providing materials in accessible electronic formats and captioning and transcribing videos. UDI can be applied to all aspects of instruction, including classroom environment, delivery methods, information resources and technology, feedback and assessment.

“We need to ask ourselves what we can do to be proactive and not just responsive.”

– Sheryl Burgstahler

Sandra Bibb, dean of the College of Health Professions, says Universal Design of Instruction is about progressive positive change, and the CHP is moving forward in transforming their culture and how they think about instruction.

“Incorporating all these things without singling people out makes the Universal Design approach ideal for supporting diversity,” says Bibb. “We want to raise awareness regarding diversity that is invisible, in terms of learning needs, while continuing our focus on the importance of arranging for accommodation.”

Sheryl Burgstahler, affiliate professor in the College of Education at the University of Washington, designed and facilitated two small group discussions and a large workshop. In all three forums she emphasized that a universal design approach to curriculum can contribute to a more inclusive university culture.

“Most disabilities are invisible, and a student’s strengths and weaknesses are not always obvious,” she says. “We need to ask ourselves what we can do to be proactive and not just responsive.”

Burgstahler’s teaching and research focus on the successful transition of students with disabilities to college and careers and

on the application of universal design to physical spaces, student services, technology and learning activities. She is also the founder and director of the DO-IT (Disabilities, Opportunities, Internetworking and Technology) Center and the Access Technology Center (ATC).

For more information visit the Center for Universal Design's [website](#).

(Source: [Wichita State University](#))

2.

Future international standard on accessible tourism for all

From the initiative of the ONCE Foundation, the Spanish Association for Standardization (UNE) and the World Tourism Organization (UNWTO), the first working meeting for the development of an International Standard on Accessible Tourism for All was held in Madrid on 13-14 February.



The Technical Committee TC 228, responsible for tourism and related services within the International Organization for Standardization (ISO), will develop a global and transversal international standard that will include, initially, a systematic inventory of existing standards, technical criteria, recommendations and requirements in the field of accessible tourism. In addition, recommendations and requirements will be suggested for those segments of the value chain and related activities whose international standardization in terms of accessibility is still pending.

The future standards will be called "ISO 21902 Tourism and related services—Tourism for all—Requirements and

recommendations". In terms of scope, the new standard will set clear guidelines for tourism planning and destination management.

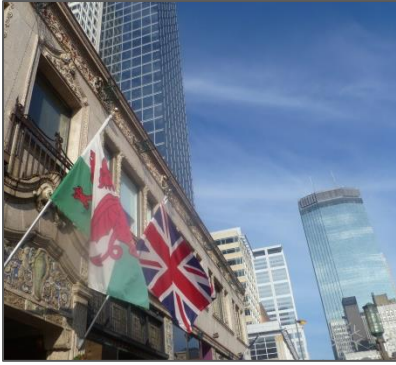
According to Jesús Hernández, Director of Universal Accessibility and Innovation of the ONCE Foundation, the new standard will be "a lever to promote Design for All in such an important economic sector as tourism at the world level. In many cases persons with disabilities cannot exercise their rights to leisure and the enjoyment of culture and tourism. This is discrimination. In addition, from an economic point of view, tourism activity that is designed for all people represents a source of wealth creation".

For his part, Márcio Favilla, UNWTO Executive Director, emphasized that universal accessibility is a right and a business opportunity for destinations and companies: "Accessible tourism is the answer to everyone's universal right to travel and discover the world. At the same time, it is an opportunity for the tourism industry to capture a global marketplace that includes millions of people with disabilities, seniors, families with young children and many others who encounter numerous barriers, both physical and cultural, when travelling."

Javier García, Director of Standardization of the Spanish Association for Standardization (UNE), stated that "technical standards are documents available to all, which contain the consensus of all parties related to globally-accepted good practices, helping organizations to establish their criteria for action. Currently, the Spanish catalogue contains 75 standards and draft standards that establish the accessibility requirements in many areas, benefiting persons with disabilities and their families, as well as society in general". UNE is the entity responsible for the development of technical standards in Spain and is the national representative at international and European standardization bodies.

To date, the working group established under ISO TC228 has representatives from Panama, Austria, the United Kingdom, Cyprus, Luxembourg, Portugal, Argentina, Malta, Canada, Ireland and Spain, as well as representatives of associations such as ENAT (European Network of Accessible Tourism), HOTREC (European Association of Hotels, Restaurants and Cafés), ECTAA (European Association of Tour Operators and Travel Agents), SBS (Small Business Standards, the European association representing SMEs in standardization), and ANEC (the European consumer association for standardization)

The new standard, which is expected to be approved in 2018 after reaching consensus at the ISO level and promulgated during 2019, will be applied to the different stakeholders of the tourism sector, both public and private and at different levels.



Programme and Events



Photo: Delfino Sisto

Legnani. Graphic Design: Groupa Ee

FARAWAY, SO CLOSE

25th Biennial of Design
Ljubljana, Slovenia
25. 5.–29. 10. 2017

The 25th edition of the Biennial of Design in Ljubljana is set to strengthen its role as an interdisciplinary collaborative platform where design is employed as a catalyst for change.

BIO 25, under the title *Faraway, So Close*, will be curated by **Angela Rui**, a Milan- and Rotterdam-based design critic and curator, and **Maja Vardjan**, curator of Museum of Architecture and Design (MAO).

In line with their focus on the humanistic side and expression of design, they will use the Biennial **to decode through design the effects** of environmental changes, asset migration, and reactions to the systemic crises.

In the face of the total failure of the theory of Positivism, we are now forced **to confront the crucial and still largely hidden meaning** of the consequences of "post-modernization", for which the city seems to have lost its authority as the territory where we look to find the source of quality existence.

Small changes are already taking place and gaining ground, and new inputs are slowly modifying our urban and rural environments. New frictions emerge out of the co-habitation of remote meanings and contemporary habits, as we look for new territories to signify, places to re-inhabit, ancient relations to re-enact, basic coexistences to re-imagine. **Can this friction between distant conditions produce new scenarios for a different present time?**

Along with the main subject-themes of the biennial, BIO 25 will de-centralize and will be interpreted as **a shift towards new territories** to be seduced by research and discourse, as well as by the idea of an event with which to produce knowledge. In

the age of super information consumed in real time, the challenge of a biennial becomes increasingly closer to real conditions of everyday systems; **to provoke and challenge the paradigms** related to design and architecture through their pragmatic application, acting as a “permanent work in progress”.

Slovenia, in accordance with its geographical conditions, will perform as a paradigm to stimulate, discuss and test the status of this global shift.

SAVE THE DATE FOR THE 25TH BIENNIAL OF DESIGN

Open Call 12 May - 5 July 2016
Kick-off event 15 September 2016
Process Autumn 2016 – Spring 2017
Exhibition 25 May – 29 October 2017

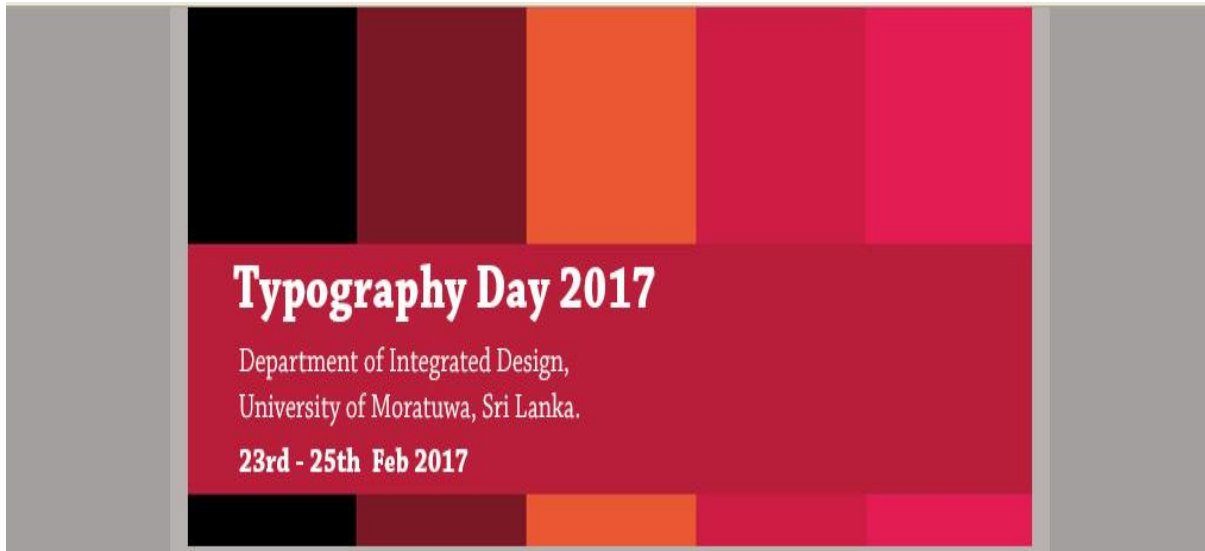
FINISTERRA
IV ARRÁBIDA
film art & tourism festival

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 Commission tem 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



DESIGN EXPERIENCE

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

INTERACT 2017 MUMBAI

6th IFIP TC.13 International Conference on Human-Computer Interaction - INTERACT 2017

Theme: Global Thoughts, Local Designs

at IDC, IIT Bombay 25-29 September, 2017 <http://interact2017.org/>



ud TODAY
LIVE & LEARN
May 15 • 16 • 17
Charleston, WV Civic Center

2017

Universal Design: Live & Learn (UDLL2017) is a collaborative conference offered in partnership with PATHS, Create West Virginia, RL Mace Universal Design Institute, CAST, WVU Center for Excellence in Disabilities and the Northeast Regional Center for Rural Development.

UniversalDesign.Today



Arts Access Awards 2017

Arts Access Awards 2017: nominations call

Do you want to see an outstanding disabled artist recognised? Or how about a leader providing access to the arts for people in New Zealand? Nominations to this year's Arts Access Awards, presented annually by Arts Access Aotearoa, close on Monday 3 April 2017.

30 September - 2016



UIA Awards 2017

The UIA Launch the 'Friendly and Inclusive Spaces' Awards 2017

FRIENDLY AND INCLUSIVE SPACES AWARDS

ENTER

RIAI Awards Administrator

THE BERKELEY PRIZE 2017

ARCHITECTURE REVEALS COMMUNITIES

Essay Competition
Travel Fellowship Competition



1987 JEREMY WOODS (PHOTOGRAPHY) - United Kingdom
1987 JEREMY WOODS (PHOTOGRAPHY) - United Kingdom
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ARCHITECTURE IS A SOCIAL ART

The BERKELEY PRIZE supports the study and teaching of the social art of architecture. The online, two-stage Essay Competition (In English) is open to undergraduate architecture majors in accredited schools of architecture throughout the world. The Travel Fellowship Competition is open to the Essay Competition semifinalists.

PURSE

Essay Competition: 25,000 USD; 5,750 USD first prize; Multiple prizes
Travel Fellowship Competition: Stipend and airfare; Multiple prizes

2017 JURORS



Saragotta Bagga-Mahia
Architect, Professor, Chandigarh College of Architecture, Chandigarh, India where she has conducted multiple collaborative student workshops focused on the examination of urban landscapes, environmental design and social issues; Internationally recognized figure in modern heritage conservation and urban social history studies of Chandigarh; and Member, BERKELEY PRIZE Committee.



Mark L. Olfen
Architect (FAIA) and Planner, Professor, architecture and urban design, University of Oregon, Eugene, U.S.A.; Director, School of Architecture's Ph.D. Program and the Urban Design Lab; Director of the International Association for the Study of Traditional Environments (IASTE); Principal of The Urban Collaborative, LLC, Eugene; and author of *America town: Building the Outpost of Empire*.



Oscar Khattab
Architect, Dean, College of Architecture and Chair of the Department of Architecture, Kuwait University; Responsible for major design projects including the Care Centre for the Mentally Disabled and the Kuwait Autism Centre; elected representative on the managing board of the IBSA Gulf Chapter; and co-author of *Cities in Transition: Transforming the Global Built Environment*.



Faig Men
Architect, former student, teacher and BERKELEY PRIZE Associate Teaching Fellow, Slovak University, Bratislava; current Fulbright scholar at the University of Michigan, Ann Arbor, U.S.A., studying the role of the built environment under writer colonialism in Palestine; Second Prize, 2012 BERKELEY PRIZE Essay competition; and Member, BERKELEY PRIZE Committee.

FOR MORE ONLINE: WWW.BERKELEYPRIZE.ORG

INTERNATIONAL VISUAL METHODS CONFERENCE 5 VISUALISING THE CITY

**16 - 18 AUGUST 2017
SINGAPORE
WWW.VISUALMETHODS.INFO**

The phenomenon of cities is an increasingly important aspect of the everyday life of individuals. The United Nations reports that as of 2014, 54 percent of the world's population live in urban areas, with that proportion rising to 66 percent by 2050. Asia and Africa are projected to contribute the most to this growth. Cities come in, and are engaged with, on a variety of scales, shapes and interactions. From global cities to urban neighbourhoods to the bedrooms of our informants, from walking to sensing to mapping the city – the ways in which we have seen, experienced and documented cities are myriad.

In this 5th instalment of the International Visual Methods Conference, we seek papers, presentations and performances that critically examine the city through visual methods. However, we also welcome proposals for topics not directly related to urban life, but nonetheless encompass visual methods.

CALL FOR PANELS, PAPERS AND OTHER CONTRIBUTIONS

Hosted in Singapore, itself a unique blend of city and state, we welcome presenters from a wide range of disciplines, from the arts to social sciences to STEM subjects – and particularly encourage interdisciplinary dialogues. Specific themes include, but are not limited to the following

- Critical Perspectives on Visual Methods
- Visual Methods for Urban Areas
- Walking, Sensing and Experiencing the City and other Spaces
- The Science and Technology of Visual Methods
- Mapping Everyday Life
- Visualising the Unseen
- Visual methods as an Agent of Change in the City
- Visual Methods in Teaching and Learning
- Open Stream

**SUBMIT ONLINE BY JAN 2017 AT
WWW.VISUALMETHODS.INFO/CFP**

IVMC 5
VISUALISING THE CITY
16 - 18 AUGUST 2017
SINGAPORE



HOSTED BY
SIT SINGAPORE INSTITUTE OF TECHNOLOGY



22-26 MAY, 2017 | CANCUN, MEXICO
2017 GLOBAL PLATFORM
FOR DISASTER RISK REDUCTION

FROM COMMITMENT TO ACTION

Call for Papers - COINs17 7th International Conference on Collaborative Innovation Networks "Resilience through COINs"

COINs17 takes place September 14-17 in Detroit, Michigan.

This year's topic is "Resilience through COINs".

We invite you to submit your papers, posters, and proposals for workshops.



Universal Design 2017 Conference NYC on 9th March 2017



Job Openings

1. Job Opening

Mail CVs at ankur.verma@themobilewallet.com

About TMW

The Mobile Wallet Pvt. Ltd. is the brain child of Mr. Vinay Kalantri and has launched The Mobile Wallet, India's first complete service wallet which empowers its users to complete their day to day payments in a simple and convenient manner. Through the innovative services backed by the best in technology and the highest level of safety, security and reliability, The Mobile Wallet Pvt. Ltd., offers consumers a unique app which will make complex household budgeting a thing of the past. In line with the national mission of making India a cashless society, The Mobile Wallet Pvt. Ltd., has launched The Mobile Wallet, which will not only make it easier for every Indian to be a part of the dream but also make it simple for the business person to accept payments and avail the benefits that would accrue to them under the new policy to be announced by the Government of India.

Key Responsibilities:

- Work closely with Marketing team on campaigns, collaterals, corporate websites, promotions across all our product offerings
- Produce high-quality visual designs from concept to execution, including those for app, web and mobile devices at a variety of resolutions (icons, graphics, and related materials).
- Develop the design rationale and explain visual choices to cross-functional teams; express concepts verbally and visually.
- Create and iterate on assets that reflect a brand, enforce a language, and inject beauty and life into a product.
- Ability and desire to expand into product design roles

Requirements:

- Highly proficient with Adobe Photoshop, Illustrator and similar design tools.

- **Excellent communication skills.**
- **Attention to detail and a demonstrated mastery of typography, color and page layout.**
- **Passion and strong knowledge on post production on photographic imagery. (desirable)**
- **Understanding of technical implementation and limitations of user interfaces in Web and Mobile.**
- **Strong portfolio that describes your skills as a designer** across platforms



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