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Author:
Ramirez, Mariano Jr

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Making Poverty History: Alerting Industrial Design Students to the Millennium Development Goals

Mariano Ramirez Jr
University of New South Wales, Sydney, Australia

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ABSTRACT

The Millennium Development Goals (MDGs) were adopted by the United Nations as a blueprint for building a better world in the 21st century, with the main strategy being poverty eradication by 2015.

To this end, third year Industrial Design students at the University of New South Wales were challenged to investigate issues and explore creative solutions to address hunger, achieve universal primary education, empower women, reduce child mortality, improve maternal health, combat killer diseases, and ensure environmental sustainability. Students chose to remotely design for peoples in Africa, India and Southeast Asia, working on such projects as simplified educational equipment, drinking water safety, malaria and HIV, and minimizing childbirth risks. As part of the preliminary research they interviewed international aid volunteers and relief workers who have had firsthand experiences with working with indigent communities in those countries.

The MDG studio project has been helpful in introducing design students to social responsibility and cultural sensitivity, and confronts the typical designers' approach of targeting primarily end-users in advanced markets. This activity follows a growing trend among proactive design groups to regard the vast majority of the world's population in the "bottom of the pyramid" as a huge market that is under-served and disadvantaged by design.

INTRODUCTION

In September 2000, the United Nations agreed to help the world's poorest countries in achieving better lives for their citizens by the year 2015. This intention was to be realized through an 8-point plan known as the Millennium Development Goals (MDG), illustrated in Figure 1. "Make Poverty History" was adopted as the slogan of the global MDG campaign.

It has been widely proposed that the "bottom of the pyramid" (BoP), being the largest but poorest socioeconomic group, represents the biggest potential market (Prahalad, 2005); this group includes the 2.6 billion people who live on less than $2 a day. However there are concerns that many global companies, if motivated solely by profits, will view the BoP market as "consumers with purchasing power" rather than "citizens in need"; it is advocated that generating community value should instead be the primary driver of BoP enterprises rather than "selling to the poor" (Dhanarajan & Fowler, 2008).

Figure 1. The eight Millennium Development Goals. (Source: (www.unmillenniumproject.org)

I. DESIGNING FOR SOCIAL RESPONSIBILITY

Polak (2009) contends that "the majority of the world's designers focus all their efforts on developing products and services exclusively for the richest 10% of the world's customers… nothing less than a revolution in design is needed to reach the other 90%." Inspired by this assertion, the Smithsonian Institution Cooper-Hewitt National Design Museum in New York launched "Design for the other 90%", a travelling exhibition and book which explored the growing movement among designers who develop low-cost solutions for the survival needs of the world's marginalized people (Smith, 2007); indeed this exhibition demonstrated how design can be a dynamic force in saving and transforming lives around the world. Recently Project H Design, a team of humanitarian designers engaging locally to improve the quality of life for the socially overlooked, released "Design Revolution", a compilation of 100 products that are changing the lives of people in the developing world (Pilloton, 2009).

Fuad-Luke (2009) talks about an emerging stream of "design activism" among people who passionately "use the power of design for the greater good of humankind *and* nature". He claims that many design-inspired organizations are now fundamentally challenging how design can catalyze positive impacts to address sustainability. For instance, IDEO's free toolkits and field guides on designing for social impact (IDEO, 2008) and human centered design (IDEO,

2009) invite the design industry to come up with inspiring new solutions to difficult challenges within communities of need. IDEO calls for a shift to participatory, transformative and human-centered "design thinking", which they define as a "collaborative process by which the designer's sensibilities and methods are employed to match people's needs with what is technically feasible and a viable business strategy… converting need into demand" (Brown, 2009a). IDEO's CEO Tim Brown observes that the design profession seems to be preoccupied with creating nifty objects even though it could have a bigger role in solving more pressing global problems, and suggests that design thinking can make a big difference here (Brown, 2009b).

In 2006 the Industrial Designers Society of America (IDSA) started a "Design for the Majority" professional interest section whose mission is "to bring attention to the large group of humans that most of us do not currently design for" (Speer, 2006). There is also evidence that many design education institutions are starting to seriously consider their broader responsibilities to society. The Massachusetts Institute of Technology D-Lab[i] runs a series of courses and field trips to host communities in developing countries where students work on improving the quality of life of low-income households through the creation and implementation of low-cost technologies; this educational vehicle allows university students to gain an optimistic and practical understanding of their roles in alleviating poverty. MIT also hosts the pro bono service DesignThatMatters[ii], where academia and industry professionals can donate their design expertise to create breakthrough products for underserved communities in need. At the DesignMatters[iii] department of the Art Center College of Design students from all disciplines can participate in courses, internships and special projects, in collaboration with international development agencies and nonprofit organizations, to explore the many ways design can address humanitarian needs in the larger world. A graduate course on Entrepreneurial Design for Extreme Affordability[iv] is ran at the Stanford Institute of Design, aka d.school, where students are immersed in the fundamentals of design thinking and then travel to international project sites to experientially develop comprehensive solutions to challenges faced by the world's poor. At the Delft University of Technology a large body of master's thesis works has been done by industrial design engineering students who have spent months of internship periods in developing countries to co-design with locals some solutions to their needs in education, healthcare, food and nutrition, water, energy, housing, materials, connectivity, and entrepreneurship (Kandachar et al, 2009).

In the Kyoto Design Declaration, 124 design universities committed to furthering the education of young designers "within a value system where each of us recognizes our global responsibility to build sustainable human centered, creative societies" (Cumulus, 2008). Moreover, 2005 to 2014 has been declared as the United Nations Decade of Education for Sustainable Development (2005 to 2014), and thus we are challenged to rethink and reform education to become a vehicle of knowledge, thought patterns and values for building a sustainable world (UN, 2002).

II. Designing for MDGs at UNSW FBE

The IDES3221 Industrial Design Studio 3A course at the Faculty of the Built Environment provides the main vehicle for University of New South Wales industrial design students to immerse in environmentally sustainable and socially responsible design projects. This is offered in the fifth semester of their degree.

"Designing for the Millennium Development Goals" was a project which ran in IDES3221 for 7 weeks in 2008 and 2009. A comprehensive briefing is given on the first day of the project, which included a talk by a representative of Caritas Australia (the Catholic agency for overseas aid and development) and a slide presentation from the lecturer-in-charge (the author of this paper) showing product and service system solutions which have been successful in helping people in extreme poverty.

After the briefing the students self-selected themselves into research groups: they nominated their MDG target topic and the geographic community that their group intended to design for. The target country should be outside Australia and preferably one where the MDG issue is most prevalent. Australia was excluded so that students would be obliged to design for a country which is likely to be foreign from their own (see Box 1). To guide them into this decision making, each table was provided with copies of the latest MDG reports (UN-DESA, 2009). The rest of the morning was devoted to planning the group's data collection strategy and topic allocation.

Groups were given only one week to collect the data below and present them as A3 research posters and compiled into a soft-bound document

- Statistics about the target country
- Day-to-day lives of the affected people: to be presented as a fictional but fact-based photo-essay, "A Day in the Life of X", from waking up to the end of the day
- Personal interview with 2 relief workers or volunteers from an international aid agency who has had firsthand experiences with working on the target MDG issue or country: to be presented as a transcript
- Magazines or newspaper clippings, web data, statistics, reports about achieving the MDGs, particularly through product design solutions.
- Internationally accepted standards or guidelines relevant to the MDG topic, such as for potable drinking water, sanitation, public health, etc.
- Web or print brochures or catalogues from manufacturers of various solutions in the selected MDG topic area

The research presentations the week after showed students were very much engaged into their topics. Aside from the posters (Figure 2), they enthusiastically present collections of web videos of their MDG topic or country, email exchanges with international aid volunteers, and other interesting stories, myths and belief systems from the other cultures.

Box 1: Student Topics for "Designing for MDG" Project		
MDG Target	Countries	Example of student solution
Target 1a: Reduce <$1/day population	Malawi	DS: Community biochar kiln
Target 1b: Achieve decent &productive work for all	India	KZ: Efficient scavenging cart
Target 1c: Reduce hunger	India	
Target 2a: Achieve primary schooling for all	East Timor	JK: Locally produced backpack and lap desk
Target 2a: Achieve primary schooling for all	Philippines	AL: Vocational training packages for primary schools
Target 3a: Promote gender equality	Ethiopia	QW: "E" game: volunteers' equipment to teach empowerment of women
Target 4a: Reduce child mortality	India	KL: Cooking oil packaging that enables home soap-making
Target 4a: Reduce child mortality	Sierra Leone	JS: umbilical cord clamp with cutter
Target 5a: Reduce maternal mortality ratio	India	WC: Eclampsia Prevention Kit
Target 5a: Access reproductive health	Kenya	YNF: Simple urine testing kit for abnormal levels of blood components
Target 6a/b: Reverse spread of HIV/AIDS	South Africa	LH: Dynamo powered wall projector for raising AIDS awareness in villages
Target 6c: Reverse incidence of malaria	Ghana	DT: Community indoor residual spraying kit
Target 6c: Reverse incidence of tuberculosis	Thailand	CQ: Sleeping screen to prevent spread of TB to sufferers' family members
Target 7a: Reverse loss of env iresources	Uganda	SDS: Compressed compost block system
Target 7b: Reduce biodeversity loss		
Target 7c: Access safe drinking water & basic sanitation	India	TB: Community made water filters retrofit into soft drink bottles
Target 7d: Improve slum living	Kenya	JT: Retrofitting international aid buckets into human waste separators

The groups worked together for the research part only. During the same day as the research presentations, they also had to individually show a design brief and 3 concept proposals for tackling their group's MDG issues. With the help of their tutors and peers, they then selected their most feasible concept and proceeded to develop it intensively. Every week, students were required to show that they are making significant progress throughout the project, communicating the continual development through detailed sketches and mock-ups.

The final submissions on Week 7 required full-sized or appropriately scaled appearance models and A3 posters of technical drawings, the product presented in its context of use, a scenario storyboard detailing how it fits into the day-to-day life of the affected community and a description of the solution with a rationale justifying their appropriateness their chosen materials and manufacturing process. It was expected that all final designs for presentation considered the minimization of their lifecycle environmental impacts. All works were displayed around the studio in a gallery format; all students were given an opportunity to view their peers' works prior to the oral presentations.

Works were assessed by the student's tutor and an external member of staff; two peers were also at hand to provide a short written comment on the merits of the project and its presentation as well as to recommend how those could be further improved. The students were assessed based on the harmonious and well-balanced integration of research, technical resolution, practicality, aesthetics, innovation and communication.

III. Results

Students showed a remarkable degree of enthusiasm as they started the project. It was apparent that they were eager to use their design talents to help people in need. The first evidence of this was during the research outcomes after one week of intensive group fact-finding. Tutors were impressed by the wealth of information that students have collected in such a short time; it was initially thought that the one-week research time was insufficient for coming up with useful discoveries but it was argued that this group work comprised only the initial research phase was only intended to "ignite the spark". Of particular interest among the findings are the social taboos, superstitions, cultural beliefs and other stereotyped racial behaviors (such as contracting a sexually transmitted disease was considered a "rite of passage" in Africa; violence against women culturally acceptable) as well as the current political-economic issues

Figure 2: Sampling of students responses to the Designing for the MDG brief. (From left to right, top to bottom: Daniel Sutherland, Jason Khiang, Queenie Wong, Kin Jing Ly, Wai Yin Cheng, Luke Huang, Alemina Vranas, Jarred Twigg)

Box 2. Comments on the challenging nature of the MDG Project
JnZ: I knew this project was not going to be easy in the first place.
JZ: I realized that my knowledge was limited to the issues that had a remote effect on me here in Australia and not of those that are deemed critical on a global scale.
KJL: This project was rather intense as I found a real drive to try and figure out a solution to the problem. It was an awesome project that broadened my perspectives.
YNF: I was struggling in the beginning, as there were too many aspects that I needed to consider as I design this product, and this product has to find a balance in response to all those considerations.
DV: Designing for the MDG was by far the most exciting studio project I have completed during my ID studies. I felt it was the first opportunity that we were given to design a project where there is an actual need present. This inspired me to do well in this project and encouraged me to work harder than I have in past projects.
DS: This project has been an eye opener to say the least. For the first time, we have been exposed to a more responsible kind of design. Designing to help alleviate hunger in India forced us to place the wellbeing of our intended user at the forefront of the design.
SDS: The MDG project was really interesting; it allowed us to think outside the square and consider designing for communities to which we don't always focus on.
KA: I think it's great to be able to design something that can help others achieve a better life. I learnt that designing products is just not for pleasure of use or decorative business. There is the more important objective of assisting the community.
KC: I enjoyed the project because the design problem given is real, challenging and serious. Designing for safe-drinking water wasn't easy, and I struggled for seven weeks. The number of people dying from consuming contaminated water is quite heartbreaking and therefore your design had to be realistic, functional and can be made available for the people in desperate need.
JT: The first awakening was trying to come to grips with just how impoverished the lives of these slum dwellers were and how much the political system had let them down. They had so few chances to improve their situation and early on in the design process I also felt a certain amount of frustration knowing that anything I could develop relied so heavily upon a system founded upon corruption.
AV. Researching malaria in Ghana provided me with a great insight to Third World countries. I didn't realize till further research the significant difference between life in rural and urban areas in Ghana.

(graft and corruption in government, civil war, international aid not welcome, etc). As expected, some groups performed better and covered more ground than others. Most were able to confidently answer questions about daily life in the country they were designing for. The insights shared by the international aid volunteers, relief workers and missionaries have been helpful, particularly in pointing out to the students how different life and culture in the MDG countries is to that in Australia; however the students grumbled of the difficulties in getting hold of one who either has been to the country they are designing for or who has been involved in their MDG topic, for instance maternal health or sanitation.

As the groups broke up and the project ran in individual mode, some students began to show signs of struggling. It was obvious they were not prepared to design for people who have practically nothing in their pockets and have poor literacy. The previous studios focused on products attuned to contemporary western lifestyles, as what can be expected from a design school in a cosmopolitan and global city. While students had prior learning from past studios on matching their products with market segments (young adults, children, elderly, etc), none of those segments came close to the insufferable way of life they discovered in the Third World. Box 2 illustrates these.

Box 3. Comments on the difficulties in progressing in the MDG Project
KC: During this project, I learnt to let go of my ideas and concepts and move on to something else. It was quite painful trying to think of new and better concepts every week, starting over again and again.
KJL: We were trying to develop solutions for people half way around the world and that's really hard when you can't get firsthand experience of what they're going through. It's one thing to get publication sources that state 'facts', it's another to really try to 'walk in their shoes' and bring aid to their lives.
With an extra week I would have been able to refine the form to a point that would be quite solid as well as address areas such as semantics in more detail.
JZ: It was a hard learning experience for me, but it was much harder imagining myself in the situation of the people I was designing for.
MCW: Overall, it has been a good experience for all students. The topic is hard because there is detailed limited information from the Third-World countries. We can only find the most important news over there but not the most common life-style, especially those from rural areas.
DV: Looking back at the journey of my product I am able to see where I lost a lot of time that was spent clinging to an [unworkable] idea. From this I have learnt to be more open minded for designing and try not to get stuck on one idea.

Students generally displayed difficulty in understanding the real situation in the developing countries they were designing for, as very few of them have actually been to those regions. They were relying only on information from interviews, current affairs news, government reports, and web-accessible literature and videos. The consequence of this is that several of the results were not fully appropriate to the communities in need.

As the weeks progressed students discovered that their concepts were more complex to resolve than anticipated. Some concepts lacked viability from the beginning. Some students got stuck in a bad idea: tutors had at an earlier stage tried to steer them away from the unworkable idea but students wouldn't let go of them until the last minute, when they had less time left to explore more feasible ones. See Box 3.

The project required that they consider all the details of the product, including the choice of an appropriate material and technology. While a production cost calculation wasn't required, some did work on their costs and in the end were better able to develop more feasible solutions and that also helped in defending their final proposals. It was important to demonstrate a reasonable understanding of the user and the particular constraints that the user presents. They had to justify through scenarios how the proposed product or service system can fit seamlessly and culturally with the day-to-day living of the people in the community.

The projects proposed ranged from water filters, portable teaching shelters, educational toys, medical test strips, water or milk pasteurizers, and others. See Figure 2 and Box 1 for a sampling of the projects submitted in each MDG target.

IV. Discussion & Conclusions

Overall students found the project successful in helping them realize the broader responsibilities of a designer to the majority of the world's population, beyond that of "creating

Box 4. Reflections on overall learning gained.
QW: I never thought that design would be that hard and I only thought design was all about being creative and having good concepts. I believe my thoughts in design became more mature because I learnt to consider so many issues as in a design process.
QW: A product might not always be very highly technical or have complicated machinery, but should focus on what the target users needed. In this case the target users are Ethiopian children, which means the product should be as cheap and simple as possible, with less text and very user-friendly. A high-end or technical product that would exist in Australia might not be working for them.
DT: The MDG Project has given me a level of satisfaction that others haven't as it is aimed at resolving our greatest development challenges. It helps those in greatest need.
DT: In the past few weeks, I've learnt about the designer's role in a greater social context. I've gained a deep understanding about what all the MDGs are, not just the one I was assigned which was combating malaria. I think all practitioners should have a social conscience and the environment should be part of our professional ethics, especially when we play such a large role in designing "stuff".
DJC: Before this project, I thought ID is all about designing a product that can visually appeal to people and maximizes the profit. I have learnt that industrial designers also have the responsibilities to design products for the community, society and environment.
DS: In hindsight, this project was possibly the most well-rounded and fulfilling I have completed during my time at university. I am considering picking up my product as my major work next year. The valuable lessons learned will be a good addition to the methods I apply when completing my 4th year major project.
AV: I discovered the little things we take for granted. I thought of a glue trap for trapping mosquitoes but soon realized that Ghanaians live on <$1 a day and unlike you and me cannot simply go to the shops and buy glue. My final design was a basket which uses sweaty clothes as a lure (from study by Kenyan scientist Njorge) and a glue trap with sap from the shea tree.

new stuff" for the relative minority. It was a rigorous exercise that shook their views of a seemingly undemanding future career as a designer. For some there was also the realization that design solutions need to be appropriate to the context and living conditions of the user. From their reflections they mostly said that if they were to do this project again, they would dig a little bit deeper in research in order to have a better understanding of who they're designing for and to use the information to inform their designs; moreover almost everybody admitted that their time management skills needed improvement. See Box 4.

Industrial design students appear to be predisposed to create high-technology gadgets; there is a seeming belief that having such products in their portfolio is what it takes to get future employment as a designer. While some proposals had photovoltaic panels, kinetic-energy powered and dynamo driven mechanisms, there were also several who had used batteries without any strategy in place as to where the poor people would buy replacement batteries or where they would find an electrical point to recharge those.

Many students overlooked the costs involved, resulting in solutions which cannot be considered affordable solutions to their indigent customers. They relied on the availability of some large international aid funding or a multinational corporate sponsor. Apparently students did this on the advice of the casual tutors, who unfortunately lacked the experience in designing for developing countries. It is convenient to think that in such desperate situations where the customers are poverty-stricken help can only come using a top-down approach; that is, rich nations donating to poorer nations.

However, there is wide evidence that top-down programs have failed in helping the plight of the world's poor. Using a grassroots approach Polak (2009) helped lift 17 million people out of poverty and busted the "Three Great Poverty Eradication Myths": that we can donate people out of poverty, that national economic growth will end poverty, and that Big Business, operating as it does now, will end poverty. We have to stop thinking of poor people as charity recipients, but as customers instead. Polak's successful bottom-up strategy was to enable the dollar-a-day poor in earning more money through their own efforts, using innovative and low-cost tools to generate income. "Affordability isn't everything, it's the only thing", Polak underscores.

A better comprehension of the cross-cultural aspects of design was required, including a paradigm shift to appreciate that the market they were designing for was totally different to the First World they were used to, and that approaches for solving the problem needed alteration. It is promising to see that some students have successfully used their learning in socially responsible design to pursue their final year graduation projects, which is the culminating work of their student career and which somehow discloses the kind of designer they are interested in becoming.

In the future I hope that our educational experiences at UNSW in designing for the Millennium Development Goals could become part of a bigger project where students could actually engage with communities in those developing countries, similar to the other universities discussed in the first part of this paper. As Polak (2009) suggested, we have to "go where the action is, talk to the people who have the problem, and learn everything about the specific context". He further shares his Don't Bother Trilogy principle: "if you haven't had conversations with at least 25 poor people before you start, if it won't pay for itself in the first year, if you can't sell a million of them – then don't bother designing" (Polak, 2009). Dieter Rams said: "Indifference towards people and the reality in which they live is actually the one and only cardinal sin in design" (Lidwell & Manacsa, 2009). Two of the tenets of Project H are "Design with, NOT for" and "Design systems, NOT stuff" (Pilloton, 2009).

Given the short 12-week duration of the undergraduate design studio, international development projects may be difficult to achieve or manage, but certainly this could be a final-year undergraduate project, or an MPhil or PhD research degree project. Perhaps we can co-design with counterpart schools in Africa, South America or Asia, using a similar style of data gathering and sharing as demonstrated by Whitney & Kelkar (2004).

Nelson Mandela famously said: "Education is the most powerful weapon you can use to change the world". It is never too late to sow the seeds of sustainability and responsibility among the next generation of industrial designers. As the Chinese proverb goes: "The best time to plant a tree is twenty years ago; the second best time is now". It's time for designers to make a difference.

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[i] http://d-lab.mit.edu

[ii] http://www.DesignThatMatters.org

[iii] http://www.designmatters.artcenter.edu

[iv] http://extreme.stanford.edu