Elucidating perceptions of Australian and Chinese industrial design from the next generation of industrial designers

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Abstract: China is passing through a challenging transition: the labour-force expansion and surging investment that propelled three decades of growth are now weakening (Woetzel et. al. 2015). This is a natural stage in a country's economic development, yet it raises questions as to where the new sources of growth lie. Australia is experiencing similar issues. In Australia the economy over this same period has survived on mainly mining of natural resources mostly exported to China. This cannot be sustained and a push from a resource economy to a knowledge economy needs to start. Australian manufacturing has suffered significantly with high labour costs and cheaper offshore markets. This is where design should be fundamental to the national agenda and be used to keep manufacturing strong. China, on the other hand is in an opposing position where manufacturing has been strong, however the economy now needs new avenues to grow.

This study goes into detail about perceived issues associated with industrial design programs at a university level in both China and Australia. It then consists of a pilot survey targeted at Chinese and Australian industrial design students and recent graduates. This has been done to better understand the mindsets and opinion of the next generation of industrial designers, with an aim to better address issues that arise for government, universities and industry. The survey respondents are the people that need to act and push design in areas it hasn't been before. China and Australia are used in this pilot study as that is where the authors reside — and is where the survey data has been obtained — however, there are many countries in similar situations that could use this study as a base for further research.

Keywords: Industrial design, China, Australia, stereotypes

Introduction

Design is a global, multi-disciplinary profession that meets people's needs and draws from national and international resources. Good design requires understanding of social, cultural and economic needs in a cross-cultural environment.

The underlying problem this study is addressing is the lack of priority given to design in both China and Australia, and the misguided stereotypes that exist among the younger generation. Countries that have done this have seen a rise in national competiveness and shown that industrial design can be a much more powerful weapon strategically, as well as operationally than ever suspected (Lorenz, 1994). China and Australia need to look at exemplar countries — such as Korea, Germany and the US — to prioritise strategies to put design at the forefront of policy and government agendas.

The survey aims to better understand the mindsets of the next generation of industrial designers, as they will be the people in positions to truly develop change. The survey confirms many stereotypes associated with both China and Australia — which is to be expected — however, by questioning the next generation of industrial designers they will hopefully realise the importance of their role within their country to help strengthen their discipline and dispel myths and stereotypes.

Industrial design education – China and Australia

An identified concern with international design teams is how to successfully manage the process of reaching a shared understanding of the domain, the requirements, the object of work, the design process itself and the roles and commitments of team members. Design is, according to Bucciarelli (2002), "as much a matter of getting different people to share a common perspective, to agree on the most significant issues, and to shape consensus on what must be done next, as it is a matter of concept formation, evaluation of alternatives, costing and sizing."

In an Australian Government report titled "National Statement for Engaging Young Australians with Asia in Australian Schools" (2006), it explains the importance of why Australian students need to link closely to Asia. While this report is directed at a secondary level, the same applies to tertiary education. The fact that many Australian universities are ensuring all students have the opportunity to engage with Asia at some stage during their degree reflects this importance. Australians require new skills, knowledge and understanding related to the Asian region, as Asia is an important economic partner, which is inextricably linked to the future growth of Australia.

The importance of Australians linking with Asia is to take advantage of a market that is geographically close and represents more than three billion people. Economic development in China and India in particular will result in unprecedented markets for Australia – and strengthened competition. Increased education and affluence in those countries mean new competing business and workforce capacity globally (National Statement for Engaging Young Australians with Asia in Australian Schools, 2006. p. 6). This is not a bad thing. Design is a

global profession and competition should exist in all corners of the globe, which will result in better, more competitive products, systems and services being produced. From an education point of view this gives greater importance for student exposure to other cultures in which one day they may work, or at least engage with in some form. Designer's work with clients, suppliers and manufactures from all over the world. The end users of their products and services are often in another country. Thus, the ability for design students to integrate cultural understanding and empathy through design projects is an important graduate attribute.

Australia needs to focus on developing a skilled and educated population, deal forthrightly with Asia and promote excellence if it is to be a leader in the Asian Century. The Asian Century presents many challenges and opportunities for Australians. Designers who graduate with an appreciation of Asian culture, influence and maturity, will enhance their skills and intellect to keep Australia at the cutting edge of a global knowledge economy, which it so desperately needs. Australia needs to prepare and position for a new Asia, one that is generating both new knowledge and new demands at a rapid pace (Prime Minister's Manufacturing Taskforce, 2012).

To contrast this with China, the Chinese need to broaden their scope and look outside their borders for inspiration. The government make it difficult for Chinese students to travel abroad to experience design from different cultures – however, the past decade has seen a more relaxed reform and Chinese students are slowly allowed more freedom to travel. For design, this is of particular importance, as learning from best practice around the world will hopefully strengthen design within their own country.

Design is rapidly expanding in China. The boom in Chinese design education and design related industries has grown significantly in recent times, however there are still many problems that need to be improved. In all issues, improving the design education and building an innovative social culture are the most important for Chinese students and designers, along with more support from the government. In the case of "Shanzhai culture" (imitation and pirated brands and goods), design is still prevailing in China and trying to find its place. The way this is done is by educating students about the importance of design and its impact on society. This is not taken lightly in China. The development of design education and industry in China is in its early stages of flourishing. In March 2013, "1305 Design" was officially announced as one of the general subjects in the Chinese education system by the Ministry of Education of the People's Republic of China, and design education reached an unprecedented point at a national level. Specific to industrial design education, there are 353 institutions offering industrial design (Engineer) bachelor degree and 346 institutions offering product design (Art) bachelor degree (http:/gaokao.chsi.com.cn). That's a total of nearly 700 institutions offering very similar degrees. The point of difference surely has to be greater international exposure and partnerships with quality institutions and industries from around the world. To contrast this to Australia, there are only 24 institutions offering industrial design programs — 19 higher education and 5 vocational education programs (http://www.hotcoursesabroad.com). Australia obviously has a much smaller population

(23.13 Million [2013] compared to China 1.357 Billion [2013]); however don't let the figures deceive you. China's population is nearly 59 times greater than Australia's. Per capita Australia has 2 times more industrial design schools than China, therefore creating very similar issues. One could argue that there are too many industrial design schools in Australia, which is reflected in the flat student demand.

With all the efforts in China expanding design education, a look at postgraduate education should now begin. Currently, the design education is predominately focused on the bachelor level, as the education tradition of China focuses on skills training and knowledge transmission, rather than scholarly research that has the potential to reshape the Chinese design culture. Moreover, since China implemented the policy of reform in 1978, more and more Chinese companies have grown to become world-class business groups, namely Haier, Lenovo, and HUAWEI. There is now a significant industry platform that requires design, making world leading design education of utmost importance. To be specific, there were more than 20,000 design-related companies and over 250,000 design practitioners in Beijing alone by the end of 2012 (http://www.bjkw.gov.cn). This is only going to expand making skilful, qualified designers in more demand.

In a keynote speech at the 2015 Design and Business conference in Melbourne, Australia by the Dean of Hong Kong PolyU School of Design, Professor Cees de Bont, he spoke of the significant impact Chinese trained designers will have on the global economy stating the following:

"Designers who primarily have good drawing skills or engineering skills will compete against many skilled, low paid, Chinese designers. Those who can integrate between technology and people will be in high demand, but will face that companies with a manufacturing background are not always open to adopting design-driven innovation (de Bont, 2015)."

This statement is also very true for Australia where a large majority of manufacturers are SME's who don't necessarily understand the value of design, or at least don't have the R&D budgets to invest in it. On top of this — and similarly in China — the government lack support for design-driven innovation. However, it is up to the future design leaders to influence change and convince these traditional fields of what design can bring and the return on investment it can make. The mindset has to change and the younger generation of designers is the prime target to do this.

One of the major barriers in China for developing the next generation of 'good' designers is the current selection process for students transitioning from high school to university. The current selection of design students in China is based on a general college entrance examination system. The difficulty of the exam is descending by the order of "Science and Engineering", "Liberal Arts" and "Arts and Design". This standard leads more and more high school students to choose "Arts and Design" as an *'easier'* way to pass the entrance examination, rather than a pursuit of their own interests. In order to get the easy approach, tens of thousands of Chinese high school students choose to participate in a half or one year full-time 'painting training' program without learning regular high school courses. After the

completion of this they take a general painting exam, called an "Arts Exam", to get the qualifications to study "Arts and Design" in colleges. The phenomenon and rating system of college entrance examination mislead the public value perception of design. In addition, most Chinese high school students have an inadequate understanding about their future majors and as a result, many students and parents regard "Arts and Design" as a second-rate subject. This then spills in design schools where many only accept students from the "Arts and Design" approach; others accept students from both "Science and Engineering" and "Arts and Design", however a lot of "Science and Engineering" students, with the preoccupation of design, are not willing to study industrial design as it is deemed second-rate. In most cases the students that end up studying industrial design are those with lower grades who were not successful to get into a science and engineering stream. The reluctant acceptance of an assigned major, as well as the feeling of "demotion" from Science to Arts, triggers their negative attitude towards the subject, therefore the problems of the entrance and major selecting system fundamentally undermine Chinese design education, and promote a vicious circle.

In Australia, it is a similar system, however rather than be categorised within a discipline area; high school students are ranked against their peers and given a score. This score is awarded out of 99.95 and titled the Australian Tertiary Admission Rank (ATAR). The ATAR is a percentile score given between "less than 30" up to 99.95 (in a minimum increment of 0.05), which denotes a student's ranking relative to his or her peers upon completion of their high school education. This ranking is then used as a benchmark for admission into universities – the more prestigious the university the higher the entrance score, or the more popular the program, the higher the score.

The problem with this system is that each subject completed in high school is 'scaled' to reflect its difficulty due to the fact that some subjects require more time and effort, and have a higher difficulty level. This is understandable to an extent, however it undermines the importance of skills that the country desperately need. A majority of STEM subjects (Science, Technology, Engineering and Math) are scaled up which is good, however all art, design and humanities subjects are scaled down. This causes a similar effect to that of China where these subjects are taken as 'easier' options, which in turn affects their status.

For industrial design programs at Australian universities, many of the applicants enter purely on the basis of their ATAR score with no interview or portfolio submission. Therefore, someone who studies highly scaled subjects at high school regardless of if they have anything to do with design or not, can simply enter design programs at a university level – and will be welcomed as high achieving students who also have scholarship opportunities. Contrast to this is someone who may be very gifted in design but failed to reach the ATAR requirements for admission because all high school units were scaled down. This affects the pedagogical teaching methods in industrial design, as students have to follow a similar syllabus with different knowledge and skills. It makes art/design-background students struggle with the more technical engineering components of industrial design, and science/engineering-background students struggle with the creative/sketching side of

industrial design. It can be said that the university system should allow for this by ensuring the curriculum is understandable to all entrants, however, when they are currently being admitted which such vast skill differences this makes it very difficult.

Another thing affecting Australian industrial design programs is the lack of awareness of industrial design at a high school level. Product Design and Technology is a high school subject that is gaining momentum and is now offered in most Australian high schools, however, Visual Communication is still the default design subject in Australian universities, which directs most students wanting to pursue a design career into graphic/communication design at university. If governments start to promote the importance of industrial design and the influence this can have in industry, then it's highly likely schools will follow.

To conclude this section, entrance into industrial design programs in both China and Australia should be by merit and skill specific to the discipline rather than a score or a perceived 'easy' Arts exam. China obviously has the population to implement this quickly, however, Australia — with an open-capped university market and too many universities — may struggle to find enough 'good' students.

Survey

The aforementioned content that focused on industrial design education in China and Australia gives context to the issues that exist. In order to advance this research a pilot survey was conducted to better understand and elucidate issues from current students and recent graduates in industrial design in both China and Australia. By surveying both countries we can draw a comparison on similarities or differences that aims to present data that can be used for further research. The purpose is to identify the thoughts and opinions put forward by the next generation of industrial designers to understand their global awareness.

An initial focus group discussion to inform the questions in the pilot survey was considered, however due to the nature of this study the authors didn't think predetermining responses was appropriate. The insights given to the survey responses were initially kept open-ended to ensure accurate perceptions were documented. As this study is a pilot survey, the authors can now take the results to build upon in future work.

This pilot survey consisted of 30 respondents from China and 30 from Australia and was conducted over a 3-month period between July–September 2015. At present, the credibility of survey research findings is largely a function of response rate. Low return rates are presumed to suggest biases in data (Edith et. al., 2005). Because of this, the authors have ensured survey conditions were similar in both China and Australia and the response rate was the same. 30 respondents from each country present enough data in this pilot survey for further investigation.

The survey consisted of 10 questions focused on perceptions about Australian industrial design from Chinese respondents and Chinese Industrial design from Australian respondents. By understanding stereotypes that exist among the next generation of

industrial designers, we aim to highlight areas that need clarity for universities, students, industry, government and the general public to advance the design agenda. By doing this, we aim to promote industrial design as a legitimate discipline that should be taken more seriously.

Following are the 10 questions combined with both Chinese and Australian responses to provide comparison data and a summary concludes each question:

Options	Responses
YES	0
NO	30

Chinese responses (30)

Options	Responses
YES	14
NO	16

Australian responses (30)

Figure 1   Question 1. Have you travelled to Australia/China?

Since travelling abroad is still not a very common activity among Chinese college students, none of the respondents from China have travelled to Australia. This is obviously not to say they haven't travelled abroad, however for this study the questions are specific to Australia showing that no one within the respondents had knowledge about Australia from actually visiting. The Australian responses however showed that almost half of the respondents had experienced China, which provides greater cultural context to the Australian answers. This question helps contextualise the answers and clearly shows the lack of understanding about Australia from the Chinese respondents, whereas, the Australian responses by definition should have a better understanding of the questions related to China.

Options	Responses
15–18	0
19–21	0
22–24	11
25–27	17
28–30	2
30+	0

Chinese responses (30)

Options	Responses
15–18	0
19–21	7
22–24	14
25–27	1
28–30	5
30+	3

Australian responses (30)

Figure 2 Question 2. What is your age group?

The age distribution of Chinese respondents centres around 22–27, showing that they are predominately in their final year of study or recent graduates. All respondents from China have gone through the standard education system in China and completed undergraduate education majoring in industrial design. The data was collected from five different Chinese provinces showing a realistic view of the perceptions about Australian design.

The Australian respondents were spread across a wider age demographic with the largest concentration between 22–24 years of age. The surveys conducted in Australia were mostly

from industrial design undergraduate students towards the end of their degree, with a number of recent graduates working in an industrial design capacity. All respondents were residing in Melbourne at the time of the survey.
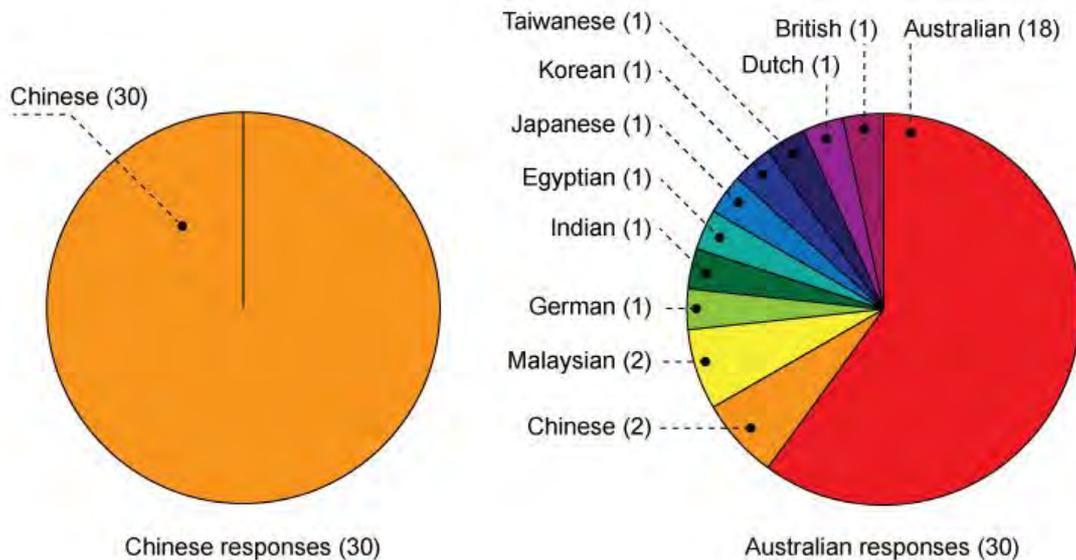

Figure 3   Question 3. What is your nationality?

This question has presented statistically significant data showing a clear difference between China and Australia in respect to the cultural make-up of the society. Melbourne, Australia — where the Australian-side of this survey was conducted — is well known for its multicultural society, which this question has validated. Nearly half of all respondents are not Australian citizens showing true diversity and global relevance to this survey. Among the respondents in the Australian survey two were from China, which presented certain bias towards those responses, however, worth including.

To further emphasise the multiculturalism of Australia, statistics from the 2011 Australian Census show 27 per cent of Australians were born overseas. The proportion of these that were born in Asia has grown from 24 per cent in 2009 to 33 per cent in 2011. This equates to almost 1.75 million Australians who were born in Asia (National Statement for Engaging Young Australians with Asia in Australian Schools, 2006. p. 6). This is a good thing. A diverse cultural society brings many challenges but also brings many benefits. For design, it brings different ways of thinking and different desires that could lead to better quality, globally significant outcomes.

For China, no respondents were citizens of a different country. This makes the Chinese responses consistent, however may lack global awareness.
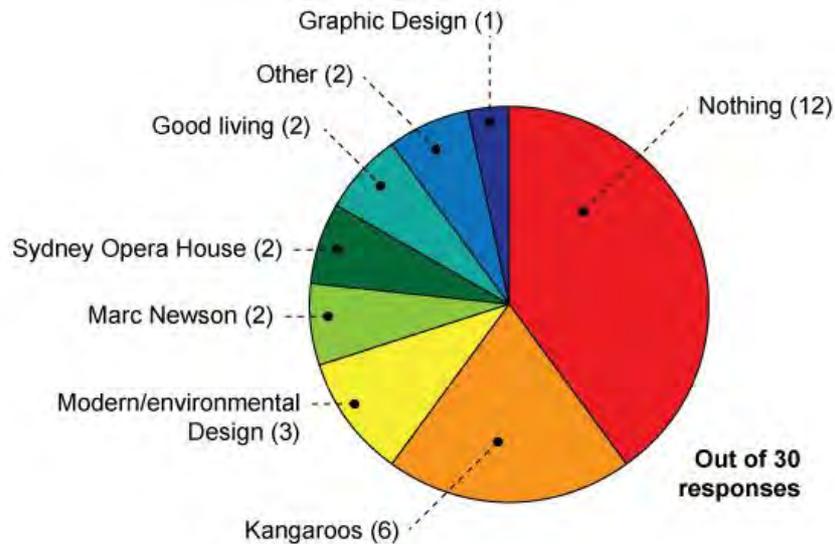
*Figure 4a Question 4. What is the first thing that comes to mind when thinking about **Australian** industrial design? (Responses from Chinese survey).*
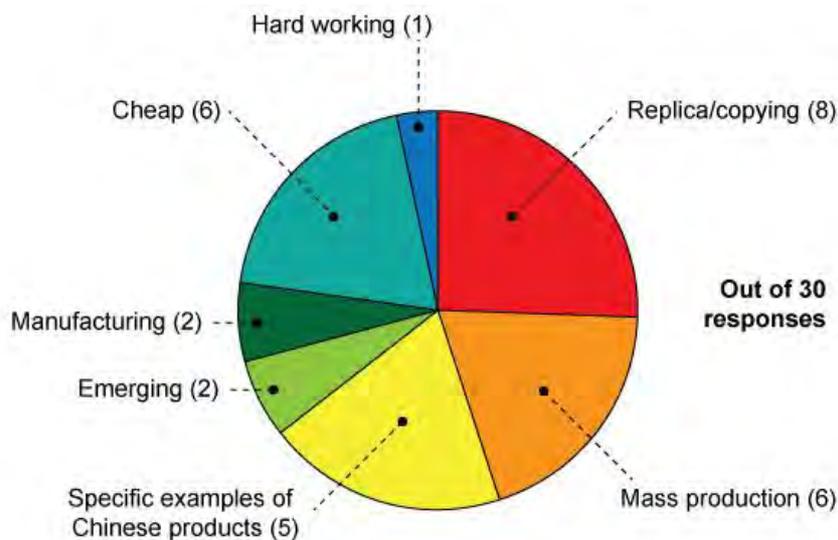

*Figure 4b Question 4. What is the first thing that comes to mind when thinking about **Chinese** industrial design? (Responses from Australian survey).*

The impression about Australian industrial design from Chinese respondents suggests that most Chinese design students and practitioners do not have a clear image about Australian design. Only two respondents mentioned Marc Newson because he had just joined Apple at the time of the survey. This phenomenon is partly due to the absence of Australian design introduction in Chinese design education, as well as the lack of prominent design identity in Australian industrial design.

However, Australia is recognised in China as a 'mega diverse' country whose design theories and practices show concern for the natural environment. In order to develop a recognisable design style, the ecological and whole-human concern may become the identity of

Australian design from a Chinese perspective. Rather than 'kangaroos' or 'nothing' that dominates two-thirds of the responses.

The respondents from Australia were mixed with positive and negative responses. There was a large focus on manufacturing and mass-production, which is something Chinese industrial designers need to take advantage of. The negative was almost half of responses mentioned replica/copied products and cheap manufactured outcomes. These are the stereotypes that can certainly be changed by concentrating on truly innovative products with a lot more attention to quality.
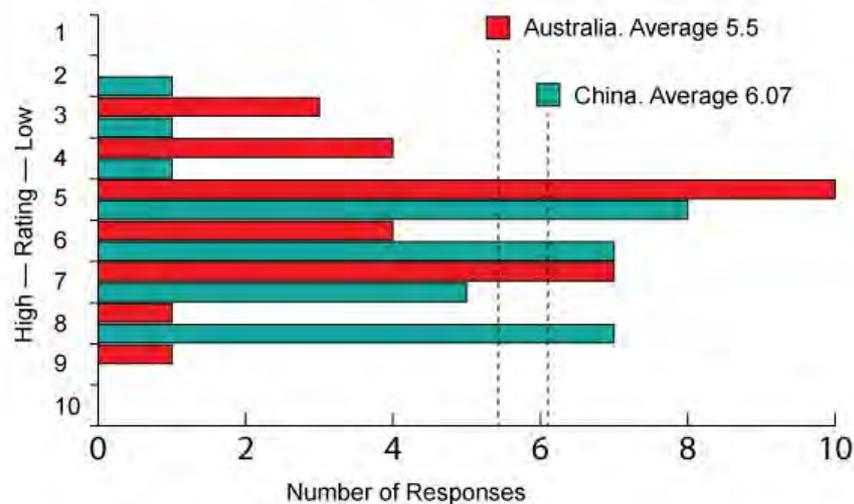

Figure 5   Question 5. On a scale of 1–10 (1 being the lowest and 10 being the highest), how do you rate Australian/Chinese industrial design on a global scale?

According to the Australian industrial design evaluation given by the Chinese respondents, '5' was rated the most giving an overall average of just over 6/10. It indicates the appreciation of Australian industrial design from Chinese, even when they just have a vague understanding about it. On the one hand, Chinese believe that the developed Australian economy, technology and education can provide a fertile ground for innovation and design. On the other hand, there is a lack of satisfaction and trust in Chinese design education and industry among them.

Australian respondents gave an average score 0.5 lower than Chinese respondents but still resulted in a satisfactory score. It is interesting to see a spike on the rating '8' in the Chinese respondents when evaluating Australian industrial design, suggesting that Australian industrial design is good, but minimal knowledge exists to provide a more informed answer.
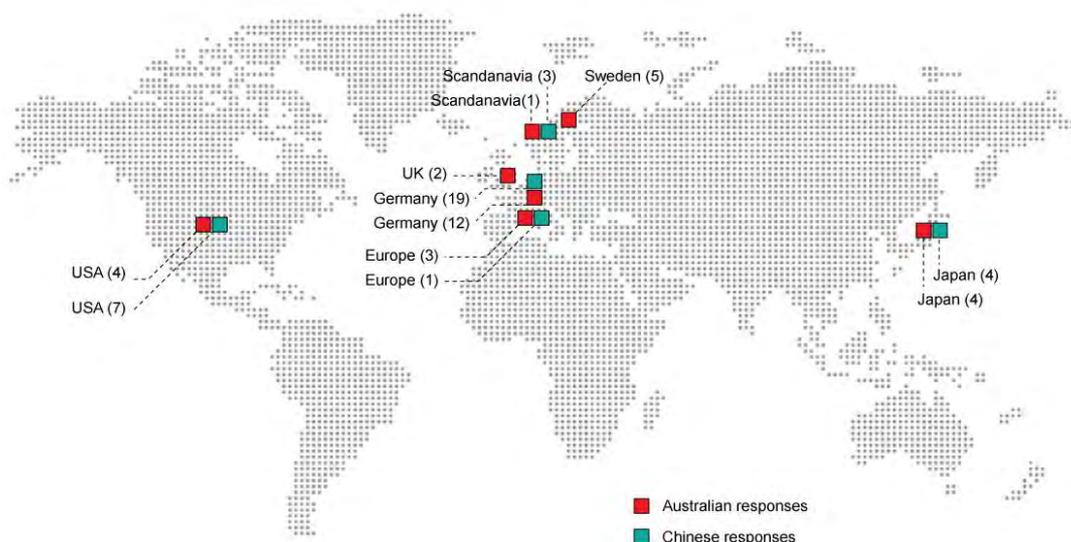
Figure 6   Question 6. What country do you associate with having the best Industrial design?

Germany is the clear stand out in this question, which dominated the responses from both the Chinese and the Australians. This was followed by the USA, Scandinavia and Japan.

German design generally won its name among Chinese and Australian design students for two main factors. First, Germany is well introduced to Chinese and Australian design students from design history such as the Bauhaus, and more recently premium automotive brands such as Porsche, Audi, BMW and Mercedes – to world class design awards, namely Red Dot and iF. Moreover, as the originator of modern industrial design, Germany has a mature design education system, clear design characteristics and high quality precise manufacturing. The close connection and communication between its education and industry ensures its success and reputation.

The USA is well known by both countries as a leader in the global economy and technology, and its advanced commercial design and well-developed education are leading the design trends. Japanese design and Scandinavian design are famous for their unique styles and well-accepted design theories, which perfectly integrate regional culture to modern design.

All countries mentioned above have common properties as follows:

- Design culture, heritage and theory
- Mature education system
- Industry and government resources
- Economic and market support
- High quality manufacturing
- Knowledge-based economy
- Recognisable designers and designed products
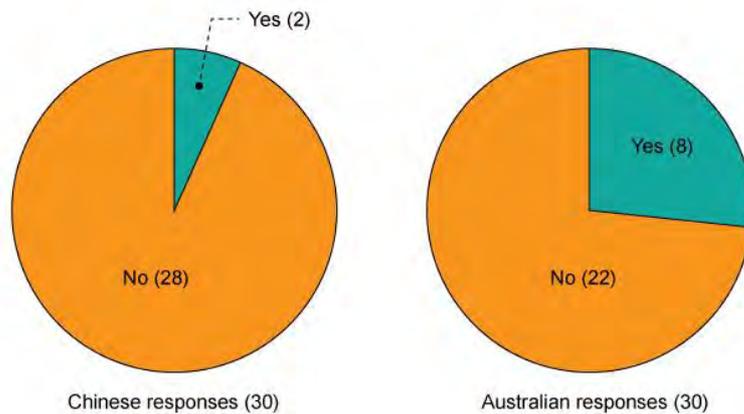- Strong connection between universities and industry

Figure 7   Question 7. Can you name a famous Australian/Chinese Industrial designer or product? If so, who or what?

This question clarified the intentions of this survey by showing that minimal awareness on industrial design exists in both countries. The two responses for China were Marc Newson who recently joined Apple, and a majority of 'Yes' responses from Australia were associated with replica products that don't necessarily respond to the question correctly. However, both Chinese citizens that responded in the Australian survey mentioned Chinese designers who they were aware of. It is clear that more work needs to be done by both countries to expose the quality design that occurs on a global scale. This will help alleviate many stereotypes and grow the awareness of industrial design on a global scale.
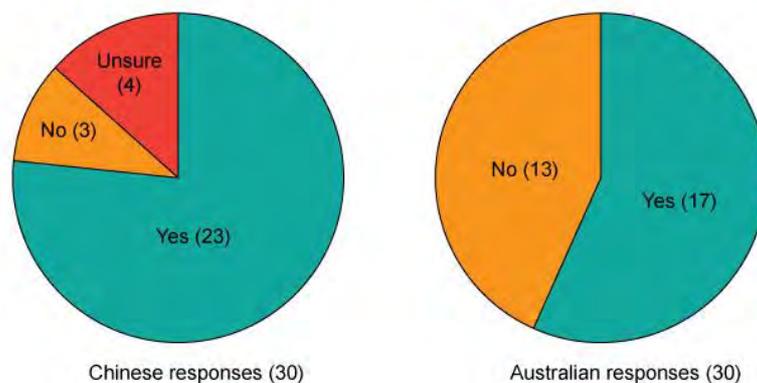

Figure 8   Question 8. Do you think Australia/China produce world-class Industrial designers? Why?

Generally, based on four main reasons, Chinese design students think Australia has the potential to produce world-class industrial designers. First, Australia is a developed country with a good economic foundation to support design innovation. Australian design also has a relatively mature education system and resources and high design acceptance on a global scale. The issue is there is just not enough of it.

Therefore, nearly 77 per cent of Chinese respondents believe Australia has the ability to foster superb industrial designers. While the doubts of others come from the consideration of manufacturing capacity, market size and design features.

A relatively positive response is seen from the Australian respondents also. Over half suggest that China has the ability to produce world-class designers. The main reasoning was because of the strong manufacturing base and the large population. There was a belief that with more people comes more problems, and with more problems there's more industrial designers to find solutions.
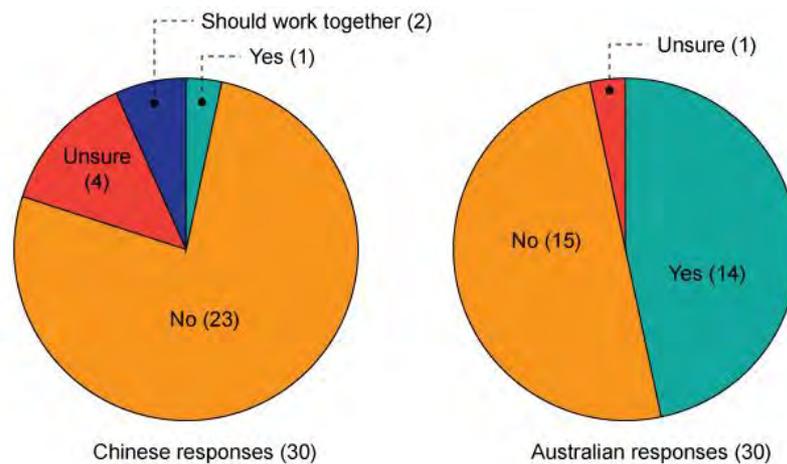

Figure 9 Question 9. In relation to Industrial design do you see Australia/China as a threat to China/Australia? Why?

While Chinese people confirm their appreciation of Australian industrial design, 90 per cent of respondents did not regard it is a threat to Chinese design – the remaining did not give a clear attitude. Partly because of the influence of traditional harmony culture, the majority of respondents believe China and Australia can provide mutual promotion to each other in design. In the era of globalisation, Chinese design practitioners act much like learners than warriors. Any innovations and breakthroughs in other countries can be a learning motivation and target. So, most Chinese people think that Chinese industrial design and Australian industrial design will not form a competitive relationship, but a friendly and cooperative relationship.

In order to give an opinion, other respondents evaluated the two countries' situation and prospects in industrial design. The number of people, who think Chinese industrial design is more promising than Australian, is nearly the same as their dissidents. The result, frankly, indicates the improvement in self-confidence of Chinese design among Chinese design students and designers.

The result for Australian responses was very different. Nearly half agreed that China is a threat to Australian design and the general consensus was that with China's large manufacturing base and much cheaper labour design will grow in China and may take Australian companies and designers along with it. This is a realistic phenomenon that may

occur, which gives greater importance to Australian industrial design and what is should stand for.

Options	Responses
Improved design education	18
Stronger emphasis on creativity and innovation	18
Government design agenda	14
Greater support for design start-ups	12
Larger design industry	10
Improved design identity	7
Better manufacturing sector	7
Improving design awareness	1

Chinese responses

Options	Responses
Less copy/originality	8
Greater exposure to international design	8
Better quality/improved styling	8
Greater focus on innovation	5
Unsure	2
More sustainable	1
More passionate approach	1
Respect for intelegual property	1
More publicity	1

Australian responses

Figure 10 Question 10. What do you think is needed to improve Australian/Chinese Industrial design?

The above respondents are self-explanatory and provide an indicative list of areas for further research. Particularly the dominance of improved education, stronger emphasis on innovation and a government agenda from the Chinese responses regarding Australia, and the issues with copying products, exposure to international markets and improved quality for the Australian responses regarding China.

To summarise the survey it is clear the Chinese respondents took a more rational look at the development of domestic design, and then started to change focus from criticising "Shanzhai Culture" to exploring the definition and future of Chinese design. Respondents suggest that Chinese designers tried to rethink traditional culture and to find Chinese design DNA from heritage. Indeed, the frame of Chinese design is getting clearer, from architecture, products and a booming fashion industry – let's hope this continues for industrial design.

In Australia, the survey portrayed a similar sense that Australian design has minimal impact on a global scale. There were more Chinese respondents associate Australian design with kangaroos than actual designers. It is obvious Australia is strong in certain areas and has a

global presence as a nation that produces quality natural products, however, from a design point of view a lot of work needs to be done. There is no reason Australia and China can't be a world leader in industrial design.

Conclusion

While designers in China are as reliant on economic, political, and cultural conditions as that elsewhere, Chinese designers are also extremely focused on building and maintaining their brand image – an area where they recognise their lack of experience (Tsui 2009). In a highly competitive environment, start-up funding for new independent designers is hard to come by. Their most likely routes to finance are private family funding or relationships with manufacturers to develop small clothing lines as an example (Tiziana et al, 2012). In Australia there is also a lack of support for start-ups and the ability to take 'risks' is not common practice. This is where government plays a key role by assisting (financially) start-ups to firstly survive and secondly make a profit. By doing this, the culture of innovation will grow and enable greater exposure to design-led innovations.

It is clear from this study that both China and Australia are experiencing commonalities and both should look at prioritising design for economic stability. While both countries are financially strong, the reasons for this are on a slow decline making it more important to act now on the next source of growth.

The focusing question is whether and how China can be transformed from the maker of products designed elsewhere in the world to an original source of design. The answer to this question will be determined, at least in part, by the form that design education in China takes in the future (Buchanan, 2004). What will make the difference for Chinese industry in the future is the quality of design thinking that distinguishes its products and makes them desirable abroad and at home (Buchanan, 2004).

The same can be said for Australia to alleviate the pressures of a declining manufacturing workforce. Australia has clever — world-class — manufacturing, however, without clever design intervention this will continue to disappear to cheaper offshore markets.

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