

The Wheel: A teaching tool for fashion design students

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Abstract

Fundamental shifts are evident in design (Giacomin, 2014). Firstly, ensuring that fashion design praxis becomes more meaningful, with regard to value-adding relevance to design-with-intent in relation to fashion design education (Smal & Harvey, 2017). Secondly, to integrate research and design at a fourth year level where students embark on a research project that culminates in a collection. To emphasise design-with-intent, we opted to focus the research and subsequently design on a human-centred approach, to find effective methods in teaching environmentally sustainable strategies. Muratovski (2016) suggests that research should be externally-driven and inform design praxis, instead of adopting an inward-looking process that promotes personal self-expression. To apply a design-with-intent approach, with the primary focus on human-centred design (HCD) and environmental sustainability, we developed a tool to assist students as a way-finding method.

We explore the application of the tool by fourth year students in their research-led design projects of the 2017 BTech Fashion cohort. Through a focus group interview with the current 2018 student group, we reflect on the teaching tool to determine if it fosters an externally-driven culture to research and fashion design praxis that leads to relevancy, value-adding and meaning-making in and through design praxis. The key findings indicate that the teaching tool helps students develop a focus on a particular open complex design problem, and that an alternative approach to fashion design praxis, such as HCD is applicable and necessary in the changing world of design.

Key words: Fashion design praxis, fashion design research, environmental sustainability, human-centred design

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Introduction

Over the past three years, student unrests (the #Feesmustfall movement) started much needed shifts in South African tertiary education with regard to decolonisation and transformation which necessitated a meaning-making and student-centred knowledge-generating approach in teaching and learning (Smal & Harvey, 2017). In 2015, student protests forced the South African Higher Education sector to reconsider the predominantly Westernised colonial Eurocentric epistemological academic models. The notion of Africanisation of an education system in itself is a highly complex issue that required, and still does today, serious deliberation on a multi-modal complex phenomenon (Smal & Harvey, 2017). In 2017, at the national Design Educators Forum of Southern Africa (DEFSA) conference themed *#Decolonisation! Design Educators reflecting on the call for the Decolonisation of Education*, we reported on an aligned approach to teaching fashion design at the University of Johannesburg (UJ). In that presentation we reported on the first iteration of the teaching tool known in this paper as the pilot study. The work reported on in this paper, is thus the first application of the teaching tool known as *The Wheel*. In order to contextualise the above, the approach to fashion design education taken by the Department of Fashion Design at the University of Johannesburg needs to frame the range of offered programmes, from diploma to PhD degrees.

Studying fashion design at UJ

As a department offering fashion design education at tertiary level, we intentionally moved the focus of teaching and learning from a more vocational scope of design-focused offering to that of deeper understanding about the praxis of fashion design and adding meaningful depth to the discourse. Design makes a significant annual contribution to the South African economy and has the scope to boost employment levels and address social change. Industry insiders and educationalists alike acknowledge the importance of equipping designers with the appropriate competencies and knowledge to meet the demands of social, economic and environmental change. Therefore, the objective of the programme offering is aimed at students who wish to become professional fashion designers with a focus on design thinking, entrepreneurial ability, an awareness of our social environment and design-with-intent for social change (Fashion Design, 2015).

The discipline of fashion design traditionally placed emphasis on craft-based practical skills training and self-reflective studio activity. Theoretical aspects for undergraduate curricula concentrated essentially, on what can be termed as ‘trade theory’ as offered in the diploma programmes. From this, the current BA offerings developed. In the context of global transformation, these aspects are no longer adequate to meet the needs of complex contemporary environments and industry growth. This situation resulted in a disconnect between theory that is needed to guide and inform practice. Although the

concept of fashion as a social phenomenon is studied from multidisciplinary perspectives (Kawamura, 2005; Barnard, 2007; Svendsen, 2012), fashion design, like design in general, is essentially a discipline of design activity and practice (Lawson & Dorst, 2009; Nelson & Stolterman, 2012). Hence, fashion design, can and should be pursued to reflect the changing developments in design thinking and theory.

As an interdisciplinary field of study, fashion design promotes the conceptualisation of design, from both theoretical and technological perspectives, thus making an important contribution towards environmental, economic and technological development. Design theory and thinking supports the exploration of technological, theoretical and historical issues as a unitary concept that requires engagement in academic discourse that interrogates fashion as both theory and practice within an integrated global system. Thus, academic discourse in fashion design should reflect the higher orders of design thinking and theory that promotes design for social purpose.

Deepening of research in the department

Since 2008, the Department has gradually emphasised the development of research in the discipline of fashion design. In 2008, only a third of the staff had engaged with research and obtained a masters degree but ten years later, all staff have masters degrees and half of the staff hold, or are in the process of completing, PhD degrees in related fields. The intake of masters students has also increased 400% in the past five years. Two of these PhD studies, one with a focus on the role of fashion design praxis for environmental sustainability in South Africa, completed by Desiree Smal, and the other, a new approach to fashion design education by Neshane Harvey, in which a HCD approach for fashion design is explored. Our own knowledge accumulated through our respective studies and the complexity of the areas of enquiry resulted in the development of the tool for successful application and implementation of highly complex issues such as environmental sustainability. Previously, students chose a personal focus on design without aligning to, or working from, formal empirically-based researched information. This method, although not incorrect, focused on a technology-driven-design (TDD) approach, which encourages applying design to and for market research (Sanders & Stappers, 2014). Welters (2015) and Fletcher and Tham (2015) argue that the above perpetuates over consumption thus counterproductive to developing environmental sustainable approaches.

The need to greater clarity

To contextualise the development of this teaching tool, it is necessary to briefly explain the programme mix offered at this particular tertiary institution in South Africa, namely the University of Johannesburg. At present, the tool is applied in the Baccalareus Technologiae (BTech) Fashion Design programme.

Articulating from the three year Diploma in Fashion Design, the BTech programme was in essence an opportunity for a diploma student to acquire a first degree. The programme offering has since changed with the diploma and BTech programme offerings replaced by a BA Fashion Design and BAHons Design programme respectively.

Initially, the tool was developed to facilitate a change in thinking about and application to fashion design education. Typically, at a fourth year BTech level, greater emphasis is placed on the design and making that ultimately ends in a fashion collection. The programme consists of three modules namely, *Specialised Clothing Technology* comprising of design and construction, *Theory of Clothing* where students are required to do formal research and lastly, *Business Studies*. Two of these modules, *Specialised Clothing Technology* and *Theory of Clothing* are totally interlinked. In other words, the research needs to inform the practice and the practice needs to emerge from the research. Although such an approach aligns well with the purpose of a diploma programme, it definitely did not allow for deeper depth in thinking as required from 'degree thinking'.

In the past, most often, BTech student collections were based on celebrity culture or personal preference with very little value-add to any discourse in the discipline (Smal & Harvey, 2017, p. 280). Hence, design trends and personal interest informed collections resulting in students relying on secondary visual research information to inform their design thinking and practice. Very often, a disjuncture between research and practice occurred, which might have resulted in a beautiful collection but with very little theoretical grounding. The need for greater depth in research at this level was needed. Therefore, an alternative approach to teaching fashion design at a fourth year level required that teaching and learning ensured more meaningful and value-adding fashion design praxis so that thinking started from primary research and contributed to an identified social issue that could be solved through fashion design practice (Smal & Harvey, 2017, p. 280).

The research report expected for the module *Theory of Clothing* follows the format of a traditional research mini-dissertation. Students need to identify an area of investigation, determine a research question, an aim and three objectives. The first objective relates to the review of selected literature, the second to the research design and methods applied and the third, to the application of findings in their design work. The layout of the research report is presented in Figure 1.

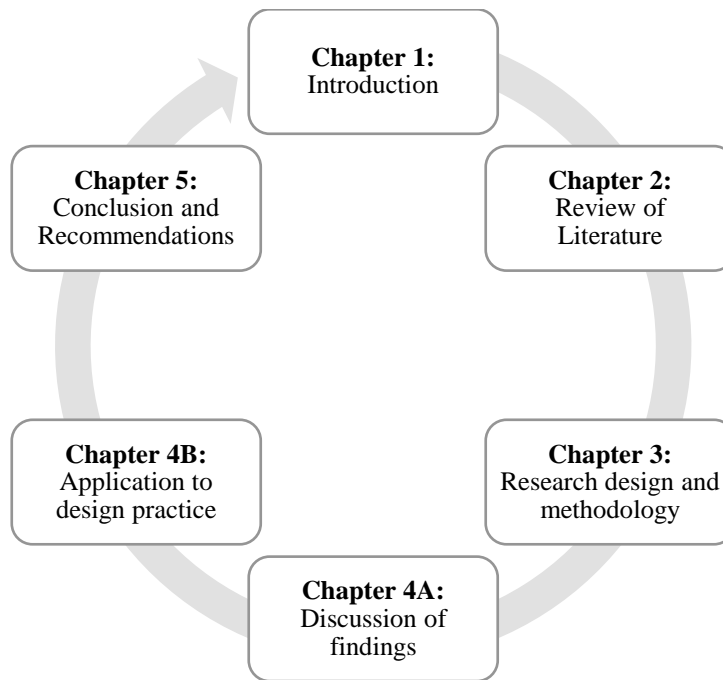


Figure 1: The research report

On successful completion of this programme, students have the option to articulate into a masters degree in the discipline. Hence, the objective of this approach is to ensure that those students who wish to take an academic route are equipped to articulate. The throughput from BTech to masters is slight, as most students leave to pursue employment after completing their BTech degree. It must be noted that the South African tertiary qualifications framework is undergoing change hence the previous BTech programme will, after 2020, no longer be offered at any Higher Education Institution. In 2017, the Department started offering the BA in Fashion Design mentioned earlier, which articulates into a BAHons in Design.¹ Although we knew that the BTech degree would be terminating, we used the opportunity to develop the tool for continued application in the BAHons Design programme. The first use thereof will be for the cohort enrolling for the 2019 academic year.

Literature

The literature that informed this paper focused on shifts that are happening in design thinking and in particular in design education. In addition, this section specifically focuses on how the shifts in design thinking, application and approach infuse how we communicate a complex topic such as environmental sustainability effectively in a relatively short period of time, in order for students to understand and meaningfully interpret their new knowledge, and apply the findings in their practice.

Shifts in Design

Sanders and Stappers (2014, p. 27) remark that the 1980s saw design unfolding under the TDD banner, commonly known as the market-driven paradigm, where designers were considered as the experts primarily responsible for the design of material products. The problem is that these designers did not “explore what to design” but rather “how to design what the client asked for” (Sanders & Stappers, 2014, p. 27). As such, the 1980s TDD movement was rife with market research, design was for people and unfolded in marketplace contexts. Researchers studied people as subjects whilst designers received this information and assumed the expert role in the design process (Stappers & Visser, 2007; Sanders & Stappers, 2014; Smal & Harvey, 2017). Although the TDD movement may have dominated the design scene, the design landscapes are changing and design paradigms should move away from TDD to HCD and sustainable design practices (Fry, 2009; Krippendorf, 2006; Sanders & Stappers, 2012; Sanders & Stappers, 2014).

Despite these calls, scholars confirm that the challenges of a TDD paradigm continue, but recommend alternative approaches to counteract the situation (Endsley & Jones, 2012; Norman, 2013). The shift toward alternative approaches pave the way for transformation given that Sanders and Stappers (2014, p. 28) assert that the manner of working changes but mind-sets also shift. Fuad-Luke (2009, p. 18) writing from a design activism and ethical design perspective, argues that designers can act as agents of change and be driven by a “strong sense of altruism or morality” which in turn informs their purpose and goal-orientation for social good. Turning to fashion design, although shifts towards sustainable praxis and HCD are evident, Sanders and Stappers (2014, p. 30) clearly point out that fashion design still functions in the traditional mind-set of designing for people. Several scholars writing about fashion design, coincide that the TDD paradigm continues to dominate praxis but this creates the culture of overabundance and conspicuous consumption, materialism, marketing and commercialisation hence fashion has become fast fashion (Fletcher, 2015; Joy, Sherry Jr, Venkatesh, Wang, & Chan, 2012; Pookulangara & Shephard, 2013; Welters, 2015).

Scholars are rejecting fast fashion and traditional TDD forms of praxis and argue for change and a move towards user-centred design (also known as HCD), and environmental sustainable approaches (Clark, 2008; Fletcher, 2008; Fletcher & Grose, 2012; Fletcher & Tham, 2015; Hethorn, 2015; Peterson, 2015; Walker & Giard, 2013). Fletcher (2008, pp. 192-193) argues that even though fashion designers may play a fundamental role in the design processes, design no longer remains the work of the specialist fashion designer and the user is no longer a passive audience, but has a voice and acts as a co-creator and partner. Aspelund (2010, pp. 55-56) argues that fashion designers should not retain superannuated techniques and approaches based on traditions but should rather question how and why things work and embrace the notion of alternative values and beliefs that may well direct choices and decisions to bring about change.

Environmental sustainable praxis

In 2014, the South African Sustainable Textile and Apparel Cluster (SASTAC) commissioned a report on the perception of environmental sustainability in various sectors of the South African fashion and textile industry (Smal, 2016; SASTAC, 2014). Several problematic issues were highlighted in the report, most of all, the industry's non-interest in environmental sustainability. The report stated “the absence of a need for the understanding and implementation of key aspects relating to environmental sustainability” (Smal, 2016, p. 5). At same time, Palomo-Lovinski and Hahn (2014, pp. 88-97) and Smal (2016, pp. 5-6) suggest that industry’s inability to address environmental sustainability is partly due to the designers not being enabled to do so. These authors further emphasise that designers need a clearer understanding of what environmental sustainability in the fashion industry means in order to understand their role as designers.

Fletcher and Grose (2012) note the complexity of the fashion system in relation to environmental sustainability in their book titled *Fashion and Sustainability: Design for change*. In addition, these authors present possibilities for alternate ways of doing and thinking that fosters embracing the opportunity for practicing from an environmentally sustainable point of view, or the TINA approach (there-is-no-alternative) as suggested by Esty and Winston (2009). Fletcher and Grose (2012, pp. 155-156) argue that, to relate to environmental sustainable praxis involves moving beyond known boundaries. Accordingly, we should prepare our students to consider their praxis with new perspectives and move beyond their known discipline. The result is that fashion design praxis becomes an open-complex problem but foregrounds the question – how to align what and how we teach in order to prepare our students for this.

Research Design and Methodology

The case

The research method followed for this paper was a case study. For the case, we purposively selected two groups to participate in two data collection phases. In Phase 1, a desktop method reflected on the research reports produced by the 2017 cohort enrolled for the BTech Fashion Design programme. Copies of their research reports, which include visuals of their design work, is kept in the department as reference. There were four candidates in the programme in 2017. The research report followed the format presented in Figure 1 and thus included their review of relevant literature, their research design and methods, empirical findings and a narrative with visual representation of the application of their findings to their design work. *The Wheel* was used as the framework for data collection, analysis and reporting. The current student group enrolled for the 2018 BTech Fashion Design programme consisted of seven participating students in Phase 2 data collection. A focus group interview was held with these

students, the interview analysed and the findings thereof reported. Both data sets inform the discussion of the findings.

Ensuring quality of research

It must be noted that both authors share lecturing responsibility for the module *Theory of Clothing*, hence are very familiar with the work of both cohorts. Nonetheless, we tried to remain objective in Phase 1 data gathering and meaning creation of Phase 2 data. The Department of Fashion Design gave permission to conduct the focus group interview and all participating students from the 2018 cohort signed and submitted a consent letter. Data gathered will remain in the possession of the authors. In addition, it should be noted that Smal and Harvey presented a paper outlining *The Wheel* tool at the DEFSA conference in September 2017. That paper entitled *Transforming Fashion Design Education to Design with Intent* (Smal & Harvey, 2017, pp. 277-287) formed the basis for this particular paper.

First iteration – developing a framework

The first iteration (pilot study) of *The Wheel* tool was developed for the 2016 BTech Fashion Design cohort to assist them with finding a more coherent focus for their study and to enable the research module (*Theory of Clothing*) to inform the practice in the design and product development module (*Specialised Clothing Technology*). The framework required focus on design in three specified categories. The first category focused on local markets with directed consideration towards: by, for or with local markets. The second category referred to people, which required students to focus on alternate ways of doing, lifestyles, human needs or social needs. The third category revolving around multiple-use, suggested a focus on multi-functionality, lifecycles and re-use (Smal & Harvey, 2017, p. 281).

The 2016 cohort comprising of five students positioned their projects accordingly, as presented in Table 1.

Table 1: 2016 BTech Fashion cohort (Smal & Harvey, 2017, p. 281)

STUDENT	CATEGORY SELECTED	FOCUS OF PROJECT
A	People and multiple use	Trans-seasonal collection Functionality
B	People and multiple use	Multi-functional modular collection, predominantly made from organic fabrics
C	Local markets	Organic fabrics and using local crafters
D	Local markets and multiple use	Collecting waste fabric from various regional manufacturers for her collection. The fabric cost of this collection amounted to approximately R500/€30
E	Local markets	Using a local crafter to inform product development

Upon reflection on how these students engaged with a more focused approach, the result of this cohort showed that their research was starting to inform their practice in a more meaningful manner that enriched their design. The projects reflected serious engagement with the identified areas of research that resulted in innovative design with meaning (Smal & Harvey, 2017, p. 285). Even though we deemed the approach successful, the students found working in a much focused area easier but finding their way in literature, more daunting. In order to facilitate this process, *The Wheel*, a teaching tool to assist with finding focus easier, was refined.

The Wheel

Environmental sustainability in its self is such an enormous concept, that for a novice researcher, it could be a daunting task to decide on what and how to investigate this concept. The wheel consists of three specific layers as presented in Figure 2.

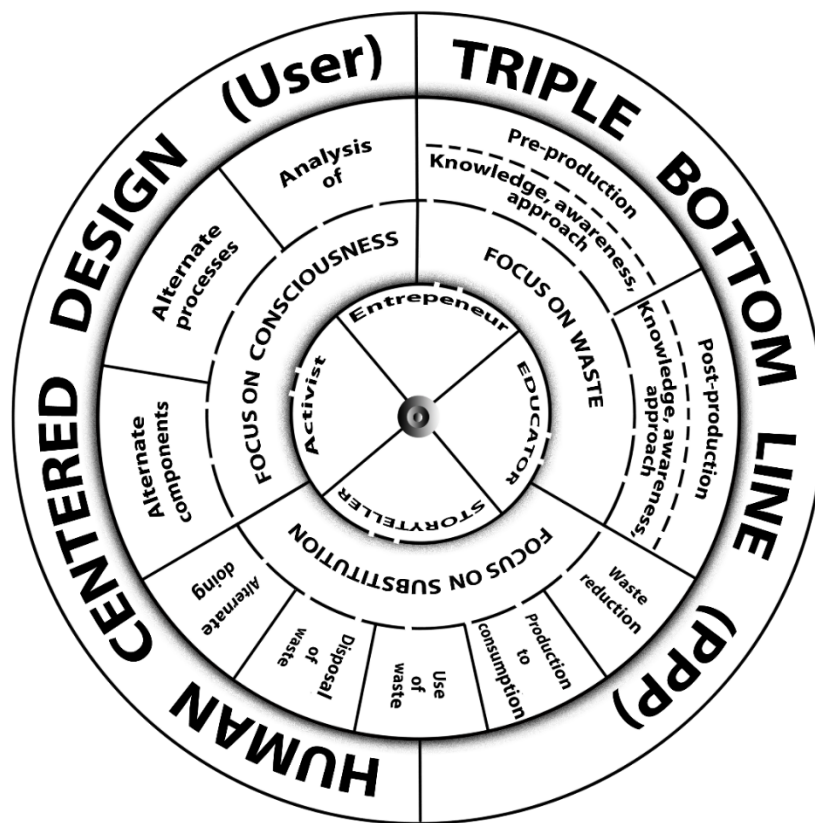


Figure 2: The Wheel

The three layers rotate on a central axis that allows the student a multitude of research options. The first layer considers the 'own lens', or designer-lens of the student. The 'own lens' includes that of an activist, the storyteller, the educator and the entrepreneur. The four selected areas are based on Fletcher and Grose's (2012, pp. 157-179) suggestion for transforming design praxis. In summary, and our

interpretation thereof, we developed the four categories (Smal, 2016, pp. 118-120). Asking students to determine what they feel their role as designer should be encourages them to take a very specific designer-lens as presented in Figure 3.

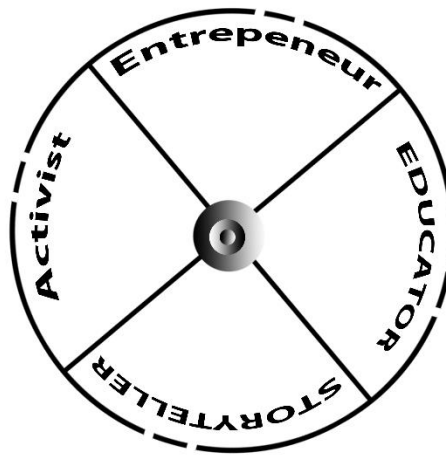


Figure 3: My own (the student's) designer-lens

In the designer-as-educator, the student needs to firstly understand the concept of environmental sustainability. In other words, define it before 'informing others' can take place such as, communicating to others or using fashion design as a tool for communication. The designer-as-entrepreneur requires the student to explore environmental sustainability as an avenue for new ways of doing and thus explore new ways of doing business. The student that selects the designer-as-activist lens needs to firstly explore how design can foster change and how design can challenge current thinking and praxis. The designer-as-storyteller is a softer approach where the designer uses stories to inform, discover and explore environmental sustainability.

The second layer of the wheel allows the student to select a very particular area of research foci within the greater domain of environmental sustainability. In her study, Smal (2016, pp. 122-124) interpreted a suggested paradigm for environmental sustainability from Armstrong and LeHew (2011, pp. 41-56). In brief, Smal (2016, p. 122), visualises the paradigm as presented in Figure 4 by using this framework for environmentally sustainable thinking as part of data gathering an analysis for her doctoral study.

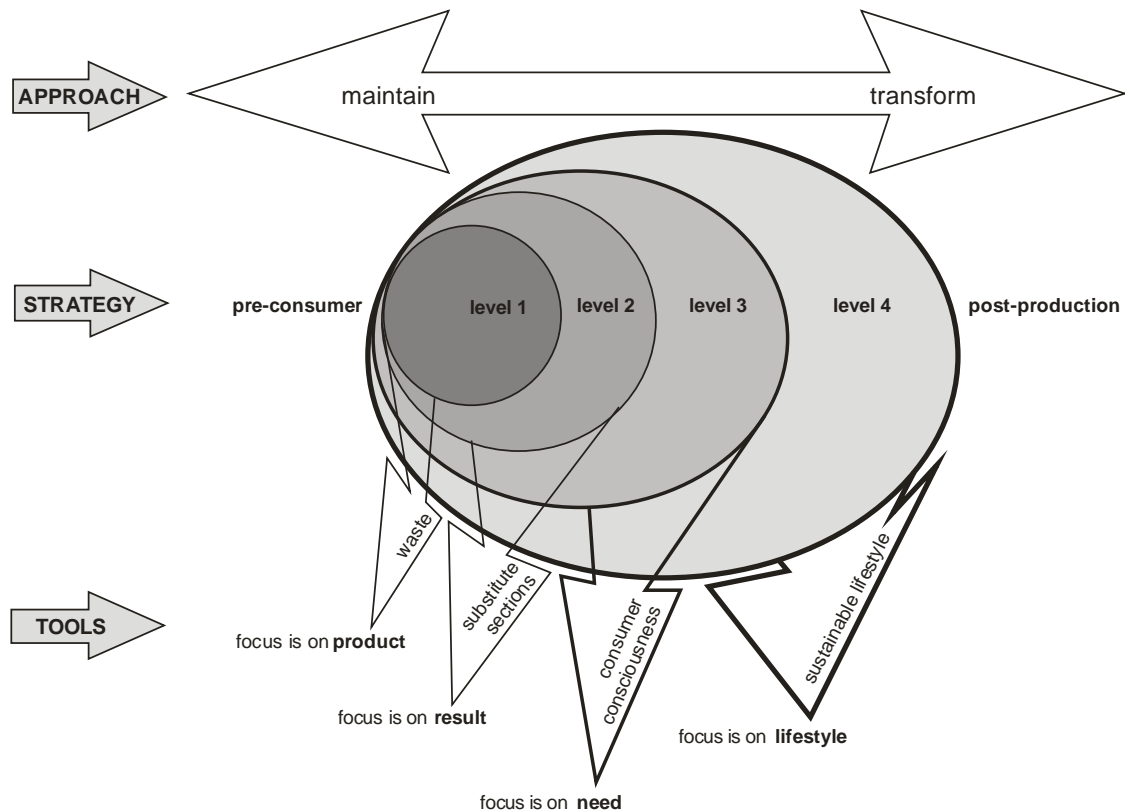


Figure 4: Smal’s interpretation of the Armstrong and LeHew suggested paradigm (Smal, 2016, p. 122)

For the purposes of the teaching tool, the framework provided background to the environmentally sustainable focus areas. In essence, the framework denotes approach, strategy and tools that could be applied for an environmentally sustainable intervention. The four levels lie on a continuum between pre-production, where environmentally sustainable approaches need to be maintained, and an approach of transformative post-production. Even though each level has a very specific focus and strategy aligned to it, the four levels cannot be seen in isolation hence each level should build on the previous one. Table 2 expands on the framework.

Table 2: From Maintaining to transformation

	LEVEL	APPROACH	STRATEGY	TOOLS	
Maintain	1	Pre-dominantly pre-consumer	Focus is on the product	Waste	Disposal of waste
					Re-use strategies
	Reduction of waste				
	Product			Improve product within positive practices	
			Alternate practices		
2	Substitution Reducing environmental impact	More efficient sustainable solutions			
		Assessing lifecycle (LCA)			
		Specific design strategies, i.e. design for disassembly (DfD) or Zero Waste			
Transform	3	Moves towards consumer participation (post-production)	Consciousness	Developing products that add value	
				Designer consciousness of pre- and post-production	
				Consumer consciousness through providing knowledge and association	
	4		Environmental well-being	Empathic design	

Whereas 'maintaining' an environmentally sustainable approach primarily focusses on efficiency in sourcing and use of resources, effective manufacturing and sensible disposal of waste, a 'transforming' approach requires consciousness of environmentally sustainable practices and changing lifestyle. In the maintaining side, the designer needs knowledge of, whereas in the transformation side the designer would require greater insight into the effect of unsustainable development, consumption and disposal of their 'designed' work in order to affect change.

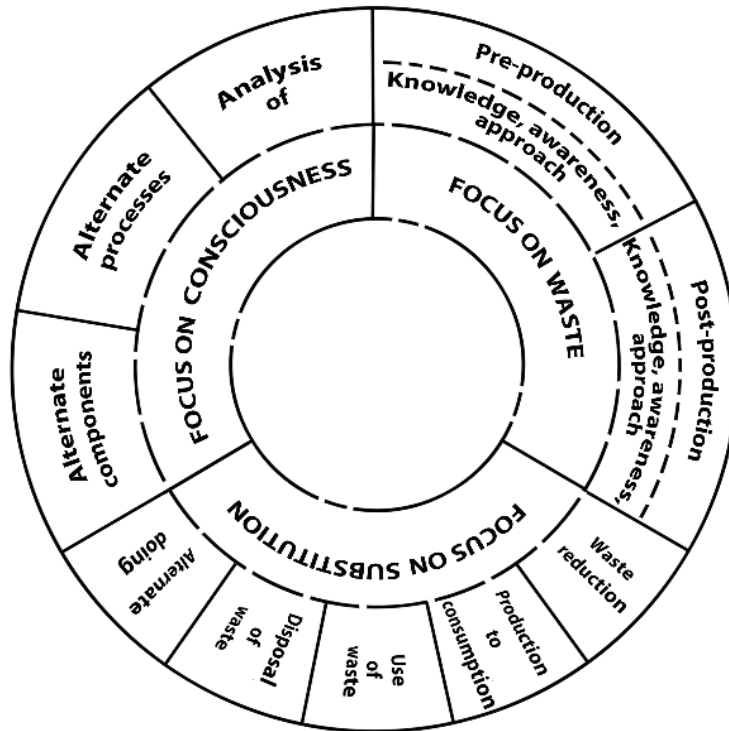


Figure 5: Focus on sustainability (authors' interpretation)

In the second layer of *The Wheel*, as presented in Figure 5, it was decided to select only three areas that focus on environmental sustainability for this iteration of *The Wheel*. The first area represents a focus on substitution and consists of finding alternate components, discovering alternate processes or, alternative analysis of current practice. The second area of focus considers consciousness directed towards knowledge of, awareness of, or approach to environmentally sustainable consciousness in pre-production or in environmentally sustainable consciousness in post-production. The third area considers a focus on waste where students can select waste reduction, waste in the process from production to consumption, the use of waste, the disposal of waste, or alternate ways of doing.

The third layer of *The Wheel*, require students to view layer two either from a people, planet, profit perspective (PPP) or a HCD perspective. The decision made here would ultimately inform the way in which students would approach their research design for the project. The reason to include HCD as a perspective is derived from level four of the framework (refer to Figure 4), which considers a transformative approach to design praxis and more so, towards environmentally sustainable design solutions. Alternatively, students have the option to have their project informed by investigating markets or business models that could align to transformative or alternative way of doing.

How The Wheel works

The three layers of the wheel are moveable. Thus, students themselves determine their designer-lens, their focus on environmental sustainability and whether to approach the research and practice as a HCD project or a triple bottom line aligned project. Figure 6 presents two possible examples:

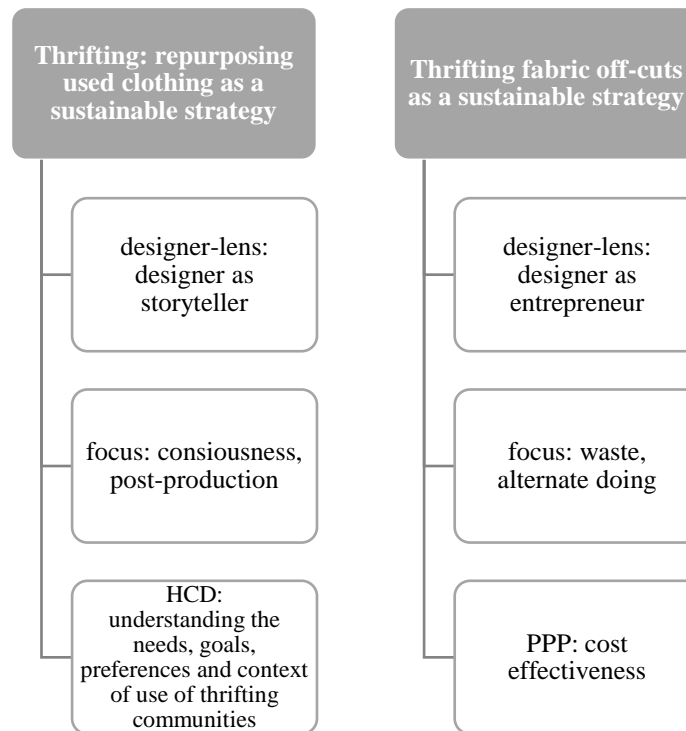


Figure 6: Example of applying the wheel

As discussed before, the research projects include finding relevant literature that will inform the thinking and determining the research design and methods appropriate for obtaining and analysing data in order for this information to infuse the design process.

The sample and the data

The data collection unfolded in two phases. Phase 1 entailed reviewing the research reports of four students from the 2017 cohort. The work of these four students was reviewed from the perspective of *The Wheel* with a two-fold intention. Firstly, to determine how the students approached the selected topics. Secondly, how the students interpreted their literature review in order to contextualise their approach to design. As each student produced a research report of approximately 40 pages recording the above, the four documents served as the desktop method of data collection. Each research report was first reviewed from the design perspective of activist, educator, entrepreneur and storyteller regarding the approach taken in environmental sustainability, for example, substitution, consciousness or waste. Secondly, by using the same perspective (designer-lens) and how this aligned to a HCD

approach or focused on the triple bottom line of environmental sustainability in relation to people, the planet and profit (PPP).

A content method of analysis was applied to analyse Phase 1 data. The categories decided on for analysis aligns to the information provided in *The Wheel* and colour coded for analysis purposes. As there were no specific categories for the third layer of the tool, the approach taken by students in relation to HCD or PPP were categorised as design-driven, user-driven or process-driven as presented in Table 3. The four students' research reports are referred to in this paper as 17.1, 17.2, 17.3 and 17.4.

Table 3: Categories for analysis of cohort 2017

Designer-lens in relation to design practice	Focus from business or people	Human centred design	design-driven	How the cohort approached their practice
			user-driven	
			process-driven	
		People, planet, profit	design-driven	
			user perception	
			process-driven	
Designer-lens in relation to knowledge affordance	Focus taken on sustainability	Substitution	alternate components	How the knowledge gained influenced their practice
			alternate process	
			analysis of	
			Other (people, doing)	
		Consciousness	Pre-production	
			Post production	
			Overall	
		Focus on waste	Reduction of	
			Production to consumption	
			use of	
			disposal of	
			alternate doing	

For this cohort, the focus of analysis was centred on the personal designer-lens by the student. Therefore, the individual designer-lens taken by the students regarding HCD or PPP as well as how their designer-lens influenced their discussion of environmental sustainability, formed the basis of the analysis.

Phase 2 was a focus group interview with the seven students in the 2018 cohort. The objective of the focus group was to determine how useful, or not, they found *The Wheel* in relation to:

- determine their focus and topic selection for their research and design,
- focus their search for relevant literature and
- apply their selected area of research through to their design work

In Phase 2, the findings of the focus group interview was structured around the overarching theme of the affordances of the teaching tool comprising of three categories namely, 1) streamlining the complexities of sustainability, 2) the layers affording knowledge generation and research-led design and 3) transformed role of the designer, thinking and approach taken by the designer. To support the

authors' meaning creation, the findings are narrated with student raw data extracts cited with a coding system for example, FGI:P1. FGI represents a focus group interview whilst P1 reflect the data from the first of the seven participants.

The affordances of the teaching tool

Reflection on how the 2017 cohort applied the tool

The reflection of findings from Phase 1 data will firstly highlight the designer-lens taken by the student group with regard to their focus on HCD or on PPP. Secondly, by reviewing their designer-lens with regard to the focus on environmental sustainability, namely, substitution, consciousness or waste. The 2017 cohort was a very vocal and active group but a small group consisting of only four students.

HCD (17.2; 17.3; 17.4) was the predominate approach taken by the 2017 cohort, mainly driven by what the user would expect or need from the final products presented. Students mostly took the role of being an advocator for the chosen user group very seriously, thus foregrounding an activist (17.3) or an educator (17.2; 17.1) approach. In addition, a focus with regard to a process-driven approach was also observed in the data. With this particular cohort, the concept of HCD in praxis was a very new approach to design, hence interesting that students predominately focused on this. Combining the newness of HCD with a user-driven focused approach to doing from a predominant advocator (activist and educator designer-lens) was often difficult to resolve as their safe-space/known-space was still based in a TDD approach to design praxis which was the predominant approach to design applied in the preceding years of learning. The result for these students was that, understanding how to infuse user needs with their own thinking was challenging and most difficult to resolve when one takes a strong activist approach (17.3).

The analysis of how their designer-lens aligned to the knowledge and application of environmental sustainability revealed a predominant educator approach. This in itself is interesting, as it suggests that this student group still needed to build their knowledge of environmental sustainability. Students seemed to be most comfortable with focusing on reduction of pre-production waste in their thinking and project outcomes (17.2; 17.4). In a small cohort such as this group, it would be difficult to see a good representation across all environmental sustainability options *The Wheel* suggested. The stronger focus on reduction of waste is most probably also how students influence each other and how possibly stronger-minded students take a lead for others to follow. The strong focus on waste might also have been the easiest go-to option in a daunting sea of information. Other significant areas considered by the group related to finding alternate components as a form of substitution (17.2), consciousness of pre-production processes (17.4) and the use of waste, which indicates an alternate approach to doing (17.2). Student 17.4 choose the option of storytelling in an HCD aligned practice but found the move from a

TDD approach almost impossible thus resulting in a disconnect between knowledge gained and application in practice.

In the literature review, students seem to find the correct literature to support their argument. However, application of thinking in their practical work often resulted in a disjuncture (17.1; 17.3; 17.4). As a result, the understanding of the topic seems to develop but the application thereof, not. We suggested to students to end their report on a personal reflection of this journey. Two of the four students could relate the importance of their thinking, be it environmental sustainability or the need to include the user in their thinking and doing.

Although 50% of the cohort understood the task, it did foreground the following concern. Firstly, how do we get students to use the tool effectively, find an area to investigate and how to apply this to their design work? Secondly, using HCD as an approach in fashion design practice that includes their ‘design voice’. After all, HCD is not about “asking users what they want and then giving it to them” (Endsley & Jones, 2012, p. 7) but rather it is about designer-user mutual learning, shared collective creativity and collaboration (Sanders Brandt & Binder, 2010; Steen, 2011; Sanders & Stappers, 2012). However, we note that Neshane Harvey whose PhD revolves around HCD was on sabbatical leave in the latter half of 2017 hence the absent knowledge may possibly be the reason why this student group misinterpreted the exclusion of their design voice in practice.

The analysis of Phases 1 and 2 data sets happened simultaneously. Thus, what revealed itself in the four research projects of Phase 1 data group mimics the areas that emerged in the Phase 2 focus group analysis, is insightful. The focus on understanding the field, building your own knowledge and how to think differently emerged in Phase 2 data set.

Reflection on how the 2018 cohort interacted with the tool

The three areas identified from the focus group interview are discussed. The first of this was *streaming the complexities of environmental sustainability*. Students in general found the notion of sustainability as a board-based complex phenomenon with multi-dimensional perspectives and approaches. Students acknowledged that although they had some insights about the broader scope of sustainability but previously, they were not aware of the multiple-pronged angle nor associated it with fashion design. The situation changed on application of the tool because it foregrounded a new founded awareness, consciousness and thinking about the different dimensions and approaches to sustainability. As such, *The Wheel* “definitely” (FGI: P3; FG1:P2) afforded options, streamlined and focused the research foci and design approach thus eradicating the daunting task of an externally-driven, research-led design. One student remarked that:

“sustainability is so big, it’s so broad and I don’t think we have ever been consciously aware of it because we know sustainability as the environment, it’s about the planet, it’s the animals but I don’t know if we ever consciously kind of linked it to fashion and with this tool, it helped us narrow down a focus on the various path-ways of sustainability within the fashion industry. This tool helped us narrow it down to focus on the various links to fashion. It helped us be conscious of aspects such as, where do these clothes come from, how are these clothes made because we heard of stories ... but you never really think of where your clothes come from or how they made ... if these are sustainable ways” (FGI:P1).

In addition, one student responded that *The Wheel* was a “building block, a base because at the beginning of the year, I had no idea of how to start attacking the whole BTech situation so this really helped in terms of being a building block and a base in terms of how to start my whole research journey” (FGI:P2). The implication here is that engaging with an externally-driven, research-led design approach at a BTech level was initially intimidating but the “interactive and easy” (FG1:P2) tool served as a framework and scaffolding tool to commence with the research and afforded a sense of design praxis direction and purpose.

The second category identified was *the layers affording knowledge generation and research-led design*. This category found that the layers of the tool formed a logical progression with the outer layer focusing on the triple bottom line (PPP) of sustainability and HCD. Navigating the layers of *The Wheel* to align the outer with the inner layers, afforded students a sense of direction to think about research and design praxis from a specific designer-lens of either activist, educator, storyteller or entrepreneur. Then again, the designer-lens foregrounded a deeper sense of mindfulness because students iteratively questioned their designer stance to link with the layers of the tool. For example one student responded that the lens was that of an “activists with a focus on consciousness, conscious in what way or if you want to create an awareness but then, awareness in which field ... with the focus on pre-production side of things or the post-production ... helps in directing the research to prevent confusion” (FG1:P3).

From another angle, navigating through the layers of *The Wheel* and engaging with externally-driven, research-led design praxis not only afforded students the opportunity to learn about and apply empirical research to inform design but also the attainment of new forms of knowledge due to profound understanding of sustainability and its multiple perspectives. Students in general confirmed knowledge generation with responses such as, “I did not know that you can focus on so many different aspects such as production, user waste or the disposer of waste” (FG1:P6). In another example, seeing research and design through the lens of a storyteller with a focus on consciousness and post-production, one student noted that “as a storyteller, you are not only informing your audience, but you are also informing your audience having learnt something yourself through the research process ... somethings you never knew. It’s a learning process for you as well as the researcher, as the designer” (FG1:P1). The implications is that the role of the designer and researcher cannot separate itself nor continue as in the case of a TTD paradigm.

The third, and last, affordance the focus group revealed was a *transformed role of the designer, thinking and the approach taken by the designer*. Previously students associated fashion design with celebrity culture, glamorous frivolousness and trend following, but the tool and teaching ethos at the University of Johannesburg transformed this due to the underpinning of fashion as an "academic discipline" (FG1:P1) that goes beyond the level of glitz and glamour. As such, the application of *The Wheel* as a tool afforded a sense of responsiveness and shifted the mainstream thinking about fashion design to more meaningful actions. One student noted, "more aware of your actions and how you can actually change your ways ... makes you more aware of everything you do in the process of fashion ... did not consider before" (FG1:P2). In doing so, *The Wheel* eliminated an inward-looking practice of the lone genius designer ethos and afforded an externally-driven design thinking and approach. With such a move, students confirmed that their role as designers changed from designing for imagined people from their own perspectives and assumptions in respect of what people need or want.

Students acknowledged that with the HCD approach, the experiences of designer and user are different hence, HCD "takes into account how people live more than how you perceive as their lived experiences" (FG1:P4). HCD "definitely" (FG1:P1; FG1:P5) changed designer perception and design approach with students admitting that what they thought the user needed was not the situation in reality. One student who approached praxis from a HCD angle commented:

"I also went in with the perception that this is what he [the user] needed and this is how I am going to do it but then with a lot of prototyping, what I had in mind was totally different to what he needed. So that also helped a lot because now I know what someone like that goes through and its not just about what I would think they needed. I would have a solution for something but that solution kind of backfired because something else was wrong ... so I also had to take into account if I do this, then this has to happen ... going back and forth the whole time" (FGI:P4).

From the above quotation, *The Wheel* forced students to realise the dynamics of cause and effects and to think about actions and consequences with prototyping design solutions via an iterative process because what the designer perceives does not always materialise in reality.

The way forward

The proverbial proof will be in the pudding. Two matters are noted, that of a teaching approach and the effectiveness of a teaching tool such as *The Wheel*. As with the 2017 cohort, we only really noticed the application to the design work at the end of the academic year when the work was presented as a whole. For this iteration, more communication and deeper theoretical and pragmatic understanding about the different dimensions of *The Wheel* between the lecturers of the two modules have already resulted in less confusion amongst students and better integration of research and theory with practice. Hence, *The Wheel* is not only a tool to facilitate deeper theoretical understanding and pragmatic application for

students but for lecturers themselves. In addition, students have, through guidance, found the ability to include the user in their design work and aligning their own designer voice through designer-user collaboration into practice. This is also possibly due to the return of Neshane Harvey from her sabbatical leave whose expertise around HCD may have facilitated the understanding and incorporation of students' personal designer voice with that of users. In addition, we are developing designers and the mere nature of design is to be innovative and forward thinking. As a teaching strategy, this has also resulted in a more open-communicative method of teaching.

As a teaching tool, *The Wheel* has certainly provided a method of teaching students to confront open complex design problems through alternative mind-sets, thinking about, and approaching the discipline of fashion design praxis. Similarly, different aspects and approaches found on *The Wheel* have been introduced for application to practice at a first year level (in the BA Fashion Design programme) with the intention of better articulation to a BA Honours fourth year level. As further research, we intend on evaluating and refining a generative tool designed specifically to assist students navigate through the complexities of framing complex design problems.

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ⁱ The BAHons in Design is a design programme that fosters interdisciplinary thinking in a broader design discourse before students apply their knowledge to their discipline.