CDF: sustainability in the curriculum:
Sustainable Thinking Project Log Pilot 2011/2012
prepared by Jane Penty

project summary.

The idea of the Sustainable Thinking Project Log originated from an identified lack of qualitative evaluative tools to support sustainable design thinking in an HE context

The log was devised as a tool to be used by students throughout the course of a design project to instigate sustainable thinking, help with decision making through comparative evaluations and encourage reflection on the process & outcomes in sustainable terms. The log focuses on the definition of sustainability as the creation of net value in economic, environmental and social spheres. In this sense it is intended to help students find opportunities for increasing the value of their interventions or design proposals.

The sustainable thinking log (appendix 1 p.4) was created in January 2012 and piloted with BA Product Design Stage 3 for their client project from February to June 2012 and with BA Product Design stage 2 from April to June 2012. At this stage 35 students took part. As an extension of the project, the log was further integrated into Unit 5 project work for BA Product Design stage 2 in the autumn term 2012 with 98 logs completed. This gave the project leader (Jane Penty) the opportunity to fully review the logs, correlate engagement with project outcomes and collate and analyse the feedback from a full cohort (98).

In addition to the log, there are two other comparative tools that students were encouraged to use to support their log: sustainable strategy wheel (appendix 2 p.9) and the comparative impacts matrix (appendix 3 p. 10). The log and tools are available on blackboard and the via the CDF network.

analysis.

All 131 logs were reviewed. The main observations after reviewing the logs and connecting this to the students project work are that:

- students who engaged with the log from the beginning of a project have generally recognised the creative opportunities of sustainable thinking at the early stages (research and idea generation) of a project. Effectively sustainable thinking is shown to be a strong creative driver to projects because it makes you questions products or ways of meeting needs much more broadly and deeply. The results for these students in their project work was very notable. These deeper thinkers were however in the minority. (15 - 20%)

- a greater number of students 40 – 50 % engaged with the log at a later stage of the project. For the majority this happened typically at the development and refinement stages where it was used effectively in the specification of technologies and materials and as a reflective tool. While there was still learning involved it led to much less radical or innovative design outcomes.

- the final group of students only engaged with the log after completing the project, so for these students (30 – 40%) the log served as a reflective tool. Many did realise that they had not used the tool in its most effective way especially when they saw in presentations the outcomes of some of the more forward thinking colleagues.

- comparing the results from the 3 projects groups where the log was introduced, the best results from the log were achieved when it was a requirement of the brief and more importantly when it was supported in weekly meetings and tutorials sessions.

student feedback.

Students were invited to give their feedback after using the log. 93 / 135 gave feedback. The full collated feedback is in Appendix 4 p. 11. The highlights of the feedback are as follows:

- helpful? 88 considered it helpful with the 2 most frequent responses being:
  - *'It helped me in making decisions and thinks more about sustainable issues, add more depth to my research and wider my understanding of sustainability'. (23 responses)*
  - *'It helped to gain a different point of view during the process and stress points that otherwise could be omitted during the idea and concept generation phase. It helped to give me more ideas and direction that could change the design in terms of the environmental impact'.(9 responses)*

- format? some were happy with the current format (11) but there were many suggestions for improvements of which the top 2 most frequent were:
  - *'Questions feel repetitive' (10)'*
  - *'Some of the text is not formulated clearly sometimes, causing confusion. Could be more clear (6)*
  - *'Good to reflect but feels almost separate from the project' (5)*
  - *'The format could be more exciting I think. Students may not find filling in a form very engaging.'(4)*

- content.? Again many positive responses to the content but the most popular suggestions were:
  - *'Some questions seemed unclear, of what is being asked.' (5)*
  - *'Instead of being handed in at the end of the project, it should be reviewed at the end of each stages (research, concept, development) and we should be given feedback, assistance and advice on how we could improve the sustainability element in our project' (3)*
  - *'The briefing was too short. More information for how to use the log, would have been helpful' (3)*

- what was missing? top suggestions.
  - *' A good awareness on sustainability in the global level. To understand or some helpful articles/books for reference in this documents would help students have a same start point in discovering the sustainability aspect in this design project'. (7)*
  - *'Follow up workshop, where we could talk through our concepts and design approaches in terms of sustainability/ drop in session/ lectures' (5)*
  - *'More case studies on how designers altered their designs to make the final product more sustainable. Design examples that do not have a sustainable starting point but a sustainable solution.'(4)*

conclusions.

Based on the analysis of logs and corresponding project outputs together with the student feedback in BA Product Design, the Sustainable Thinking Project Log is a tool that injects a workable framework for sustainable thinking through all stage of design project work. Although project results and feedback from the students generally point to a positive intervention there remain area for improvement. The two main areas of improvement that emerge are around graphic layout and clarity of content and more guidance and support to navigate through the sometimes complex issues the log throws up.

The following are specific actions that would improving the log.

- avoiding repetition of content and improving clarity
- improving the format through specialist graphic design input to make it more engaging and clearer
- creating an online / electronic version to encourage regular input and
- including more diagrams / checklists
- creating guidelines with references and suggestions of tools to support the log
- tailoring the log to specific briefs and product typologies and subject disciplines

In addition, the log needs to be disseminated to a wider group of 'champions' in other subject disciplines across the university where it can be tailored to meet their needs. It does need champions who will pioneer

this in their specific subject areas in the way that best suits their way of working and thinking until such practices are more widespread with staff and students. Holding workshops that introduce the log and build in space to adapt these to specific discipline /programme requirements would be a more hands on and direct way to engage a new wave of champions across the University.

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appendix 1. Sustainable Thinking Project Log

Sustainable Thinking Project Log

overall goal:
a log to help to integrate sustainable thinking throughout your design project
the big challenge is how can the new design create more value: socially?   economically?   environmentally?
<mark>Please add your comments and feedback on this tool as you use it. (end of doc)</mark>

Part 1: research & idea generation phase

establishing broad sustainable thinking & strategy for the project.
research:
• what are the most negative impacts in this product area - cameras and electronic products? max 3. Think socially (the human experience), environmentally, economically.   **tool:** you can use the sustainable strategy wheel to compare existing products – you can edit this to suit you with your own parameters
• are there examples (not necessarily in this area) where these needs are met more sustainably through a better experience or with less impact?
• identify clearly where the opportunities are for a more sustainable design
setting your personal brief:
• define the need(s) you are satisfying and define your design direction & objectives for the project.

idea generation:

*be creative **within** your boundaries – push the edges*

- are there other ways / new scenarios where this need can be met more sustainably? Imagine really new ways of doing this.
- explore the opportunities you identified in your research for a more sustainable design – how can I meet this/these need(s) through a better and more desirable experience, with high added value and least environmental impacts?
  tool: storyboard new scenarios of consumption and production.

describe briefly the ideas you have come up with for new ways of meeting the needs you first identified. These don't need to be integrated at this stage – you can generate ideas around separate issues. This is often more helpful at this stage to really allow space for new ideas.

Part 2: design concept selection and design development

evaluating concepts decision & making best choices

design concept selection:

compare your concepts from a sustainable point of view.
tools: matrix and sustainable strategy wheel – customize with your own parameters

concept 1:

concept 2:

concept 3:

If your chosen concept is not the most sustainable, how could you bring in some of the more sustainable thinking into this concept without loosing its integrity?

design development:

decision making: consider how you can add most value through the following

- the human experience – pleasure in user experience, interface, social exchange, emotional bonding, changing consumer behaviour

- materials & finishes – choice and quantity – achieving performance differently, with less material and/or better material.

- design details – disassembly, remanufacture, modularization, adaptability, longevity

- the product in use - technology – consider choices in technology – ways to achieve the same or better functionality using less material, energy & water in its use phase through choice of technology, user behaviour & motivation - intuitively or intrinsically

- end of life – opportunity for product take back (closed loop), recycling, upcycling or reuse

- economics – product or product service system, value added, new business models

tools:
- ESPdesign.org design strategies checklist – to identify considerations that apply to your design http://www.espdesign.org/sustainable-design-guide/design-strategies
- Pré Consultants eco-design guidelines / eco IT simplified LCA for choice comparisons
- use bibliography to find other sites & tools

Part 3: reflection

reflect honestly on the added value, pros and cons of your new design

1. social sustainability – the human experience:

+ in what ways does your design make the human experience (for all stakeholders) better?

- in what ways does it make it worse or not improve the status quo?

2. environmental sustainability:

+ in what ways does your design create less environmental impacts or even an environmental benefit? – think across the life cycle

- in what way does your design increase the environmental impacts or not improve the status quo?– think across the life cycle

3. economic sustainability:

- does it add perceived value to potentially increase profit margins?
- is it affordable for its intended audience?
- is the profit benefit shared - new business model?

4. Reflecting overall:

- if you were to do this again, what could you improve on?

- what remain the biggest barriers or challenges to making this more sustainable?

pilot: feedback & comments

please give your feedback on the log. in helping you

generally - has it helped you to make more sustainable decisions during your project? if yes what aspects? if no why not?

feedback on the format – suggestions for improvements and modifications

feedback on the content - suggestions for improvements and modifications

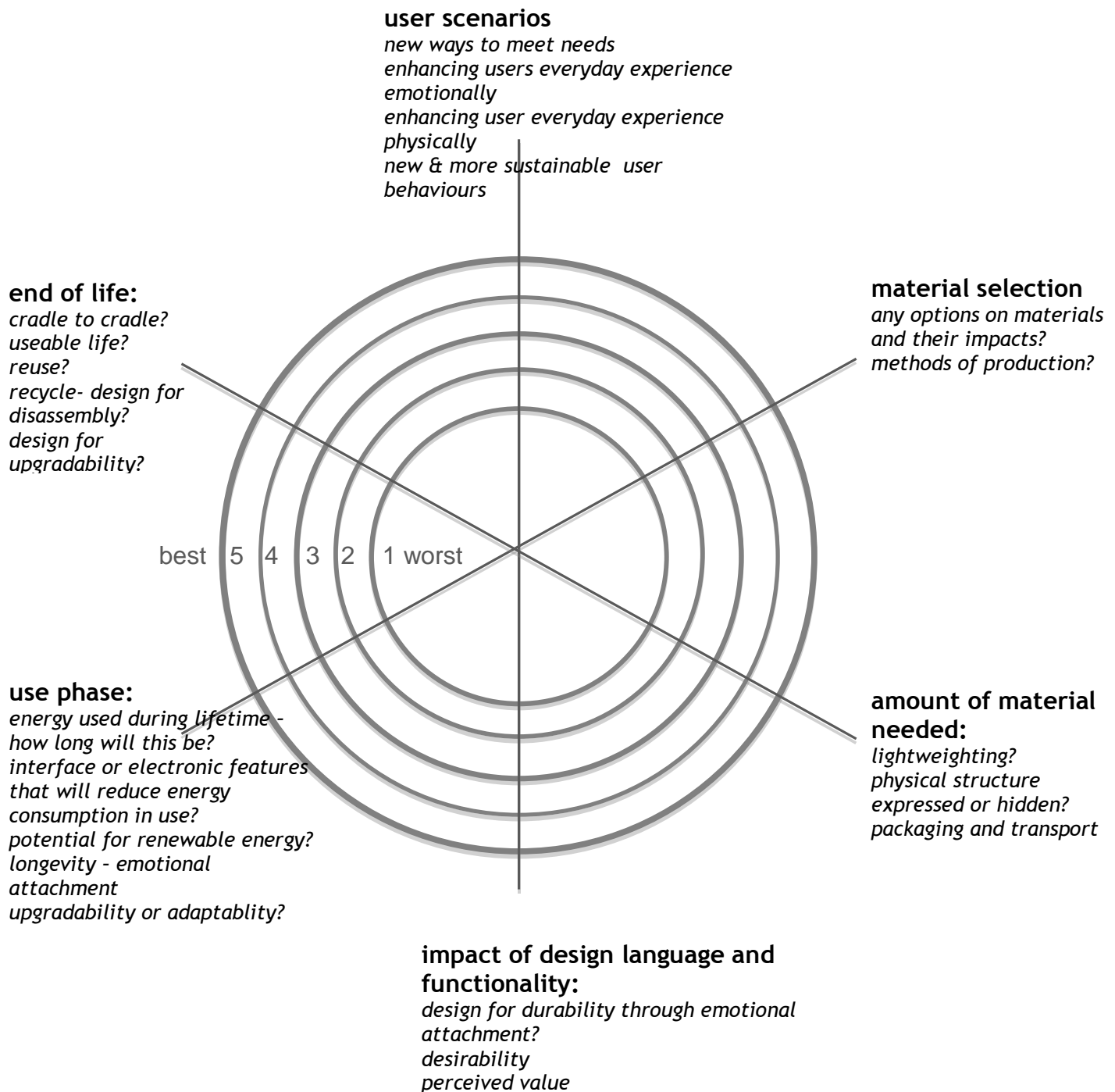what is missing that would have helped you?

sample for electronic goods. Can be tailored to suit different product typology by selecting the impact axes.

Sustainable Design Strategy Wheel[1]: consumer / electronic product:

Fill in the sustainable design strategy wheel for the designs / formats you are comparing by giving them a score on each axis).
This should help to identify the areas that most need improving.

user scenarios
new ways to meet needs
enhancing users everyday experience emotionally
enhancing user everyday experience physically
new & more sustainable user behaviours

end of life:
cradle to cradle?
useable life?
reuse?
recycle- design for disassembly?
design for upgradability?

material selection
any options on materials and their impacts?
methods of production?

best 5 4 3 2 1 worst

use phase:
energy used during lifetime - how long will this be?
interface or electronic features that will reduce energy consumption in use?
potential for renewable energy?
longevity - emotional attachment
upgradability or adaptablity?

amount of material needed:
lightweighting?
physical structure expressed or hidden?
packaging and transport

impact of design language and functionality:
design for durability through emotional attachment?
desirability
perceived value

1. based on the EcoDesign Stratgey Wheel Brezet and van Hemel, 1997

Making more sustainable design decisions: comparative impacts matrix

For your design alternatives, give comparative ranking scores from 1-5 where 5 is best and 1 worst and a brief reason behind your scoring. Can you draw any clear conclusions?

alternative design options being considered	environmental: production phase	environmental: use phase	environmental: end of life	social impact: positive / negative, emotional experience? personal experience? social interactions?	economic impact: *this may be hard to determine but there could be cost implications and perceived added value*

While we cannot quantify these impacts without very specific information, this exercise will help you to identify where the main   impacts are for different design choices

appendix 5. feedback summary

Sustainable Thinking Project Log summary of feedback		
Q1 Generally- has it helped you to make sustainable decisions during your project? If yes what aspects? If not why not?	Comments: Numbers from 1-21 BAPD Stage 2 unit 7 / 3 unit 11 2011/2012 Numbers From 22-98 BAPD Stage 2 2012/2013 *For Unit 5 if my Brand was a Camera*	Total
Yes	'Yes, it helped me in making decisions and thinks more about sustainable issues, add more depth to my research and wider my understanding of sustainability'. (9)(12)(28)(41)(45)(46)(48)(49)(52)(53)(54)(55)(56)(61)(64)(65)(66)(68)(74)(86)(91)(92)(93)	23
Yes	'It helped to gain a different point of view during the process and stress points that otherwise could be omitted during the idea and concept generation phase. It helped to give me more ideas and direction that could change the design in terms of the environmental impact'. (1)(4)(10)(16)(15)(17)(43)(44)(88)	9
Yes	Helped me to know more about recycled materials, which I would consider in future designs. (6)(14)(70)(69)(75)(90)	6
Yes	'Definitely the log it has help me in many ways, guidance was given throughout the sheets that makes me think of the sustainability aspect on top of the design process. It certainly has equipped me with ideas about business models on social aspects (31)(34)(36)(38)(67)	5
Yes	The log led the students into questioning about the sustainable aspects of my design, which required more decision-making ('e.g. to give up functionality for sustainability') and new solutions that would maintain the essence of my design concept while becoming more environmental friendly. However, this log continues to stress on the question 'how can you make it more sustainable?' this question could become more constructive by giving some specific examples on how are different aspects in consumer products we can investigate to improve our designs. (11)(23)(24)	3
Yes	'Throughout the whole design process, working on it keep reminding me the important of sustainability' (76)(77)(78)	3
Yes	'Thinking about the negative impacts more instead of only focusing on the positive '(85)	1
Yes	'It has made me think more about sustainability aspect but I found it too forceful as if my product had to be as sustainable as possible, which might not have fitted with the brand I had' (42)	1
Yes	'The fact that we had to submit the log helped me consider more out-of-the-box solutions and possibilities. I did not blindly stick to ranking results (E according to www.rankabrand.com). Although I knew that manufacturing methods and materials used Oakley are not environmentally sound, I decided to do research and found more sustainable energy sources. I also looked into concept of design for disassembly. The log also helped me to discover the community built around the brand-	1

	very positive phenomenon'. (27)	
Yes	'Yes! Even though I went for the concept that wasn't obviously sustainable it helped me to try to push it into sustainability anyway. I liked how it made it clear that sustainability can take different shapes- knowing it theoretically and using it in your design process is really important'. (80)	1
Yes	'Writing this sustainability log actually made me feel quite bad about my project, as there are only a few aspects that make it sustainable and most probably the camera would end up in landfill when disposed of. Having sustainable decision in mind but at the same time designing something for a brand that does not seem to deal with sustainable issues a lot, was quite difficult'…(29)	1
Yes	'I think even if sustainability is not advertised by some brands, it still a way from them to increase their revenues. The use of spare parts for examples. I believe that the most important thing is to questions your design. And this is what this sheet has allowed us to do. It was able to help me make certain decisions that I otherwise might not have done.'(84)	1
Yes	'In conclusion, the sustainability log has most certainly encouraged me to think more about the sustainability issues in regards to mass manufactured products, and therefore has affected my design thinking for the better. By keeping this log I was able to constantly edit my design and the materials I intended to choose by comparing different process and seeing what effects each decision I made had on the environment. I feel that my design is therefore more though out than it would have been without this log. And I truly feel that it would be a more successful product if it was actually released onto the market- than it would have been without the sustainability thinking behind it….(57)	
Yes	'I think I would have made those considerations anyway but the log made me put it down in words and encouraged me to research the details about materials & their impact properly. (18)(21)(19)	1
No	'I feel that the sustainability log was a after thought something to deal with after all our work is done instead of part of the process'.(51)(62)	2
No	'Not really, sustainable has been considered as a constraint' (98)	1
No	'If the questions were not reflective but in fact instructions as where to look and how to question of sustainability' (32)	1
No	'I find that I don't really need a log as such to think about sustainability during my design. I prefer to use common sense and logic to make my decisions…(81)	1
No	'This log, is why designer brainwashed and does not teach anything about being sustainable but only make designer aware of sustainability, it is a collective responsibility among the design process and this is not stressed enough'. (2)	1

Q2 Feedback on the <u>format</u>- suggestion for improvements and modifications	Comments: Numbers from 1-21 BAPD Stage 2 unit 7 / 3 unit 11 2011/2012 Numbers From 22-98 BAPD Stage 2 2012/2013 *For Unit 5 if my Brand was a Camera*	Total
	Format is good (7)(20)(17)(24)(28)(24)(41)(43)(61)(83)(88)	11
	Questions feels repetitive (4)(19)(20)(18)(39)(55)(61)(69)(75)(83)	10
	Some of the text is not formulated clearly sometimes, causing confusion. Could be more clear (20)(30)(48)(73)(76)(78)	6
	Good to reflect but feels almost separate from the project. (17)(18)(39)(45)(69)	5
	'The format could be more exciting I think. Students may not find filling in a form very engaging.' (16)(30)(42)(55)	4
	'I think the sustainable design strategy wheel is a good idea to locate our product on it' (46)	1
	'I think that the log works well for this project as it is packing and very relevant, but I think that the D&AD Oakley's brief would be harder to complete whilst keeping sustainability relevant. I think it is important to also include the sustainability aspect within the project portfolio, and the two should be more integrated rather than separate' (15)	1
	'The design development and the reflection are sometimes redundant. It is too linear, maybe another format might make it more dynamic and less walled' (14)	1
	More diagrams and visual aids (4)	1
	• Would be useful to integrate this, as a part of overall 'AL feedback sheets'	1
	• Would have been very useful if incorporated in 1&2 Year, so that the sustainable thinking approach could have integrated in our thinking and design process early on. (1)	
	'Maybe give us more examples or go to manufactures to have a look at the process' (23)	
	'I think it should have been more clear that the log is constructed out of three parts. I would have been very glad to see an initial explanation on what the inner links between the documents (parts) are (e.g that the strategy wheel should include information on our three concepts) '.(27)	1
	The brands selected don't care much for sustainability or it isn't part of the brand identity and design. Keeping with brand= not keeping sustainable with this mind (33)	1
	'Very well structured. I liked the fact that there is a place for mistakes and rethinking some issues for future improvement. Add a checklist out the end- make it more fun because not everyone is taking it seriously and it is actually very useful so try to change the students approach to it'. (36)	1
	'I think this is a great process of learning in this area – sustainability'. (49)	1
	Found the storyboarding – really hard (50)	1
	'I think there could be more questions of the economic aspect of recycling and sustainability. This is because most companies only recycle if they feel it adds economic value to their products'.(84)	1
	Email the forms online to our tutors- saves paper (56)	1

Q3 Feedback on the content- suggestions for improvements and modifications	Comments: Numbers from 1-21 BAPD Stage 2 unit 7 / 3 unit 11 2011/2012 Numbers From 22-98 BAPD Stage 2 2012/2013 *For Unit 5 if my Brand was a Camera*	Total
	Some questions seemed unclear, of what is being asked. (9)(18)(20)(42)(43)	5
	No suggestion, good content (6)(10)(11)(14)(24)(39)(88)(92)	8
	The briefing was too short. More information for how to use the log, would have been helpful (12)(36)(61)	3
	Content is interesting. Strategy wheel diagram was a good way of helping to make the category (15)(16)(47)	3
	'Instead of being handed in at the end of the project, it should be reviewed at the end of each stages (research, concept, development) and we should be given feedback, assistance and advice on how we could improve the sustainability element in our project' (19)(21)(47)	3
	'It would be good if some of the points could be more specific about the chosen brand/project (more in-depth)' (28)(36)(48)	3
	'I think that whilst this was an additional piece to hand in, it was an important one, and really we all should be thinking about this in every project' (15) (30)	2
	'The log covers the basics of any project but more time would be needed or indeed a separate 'sustainable project' for those who's brand does not conform to sustainable principles'.(33)(45)	2
	'I would appreciate if the sustainable design strategy wheel is incorporated in this format'. (34)	1
	' I think that if somebody was designing for a brand that does not have any or has bad sustainability values then this log could undermine their project, possibly prompting changes that do not reflect the brand'. (52)	1

Q 4 What is missing that would have helped you?	Comments: Numbers from 1-21 BAPD Stage 2 unit 7 / 3 unit 11 2011/2012 Numbers From 22-98 BAPD Stage 2 2012/2013 *For Unit 5 if my Brand was a Camera*	Total
	' A good awareness on sustainability in the global level. To understand or some helpful articles/books for reference in this documents would help students have a same start point in discovering the sustainability aspect in this design project'. (31)(32)(23)(70)(76)(77)(78)	7
	Follow up workshop, where we could talk through our concepts and design approaches in terms of sustainability/ drop in session/ lectures (15)(24)(61)(79)(92)	5
	More case studies on how designers altered their designs to make the final product more sustainable. Design examples that do not have a sustainable starting point but a sustainable solution. (11)(9)(42)(45)	4
	'A tool that would help us quantify the environmentally improvements, otherwise it all stays quite vague.'(14)	1
	Human behaviour could have been different aspect to consider in the project. Developing new design stagiest or communication tool (10)	1
	More knowledge information about recyclable materials (6)	1
	- Integrated a design method (template) that students can follow. - More detailed checklist to follow while working on the project coupled with weekly tutorials. - Some examples of approaches taken from other designers (1)	1